

Addendum to Stage 2 Remedial Action Plans Rochester Embayment Area of Concern

I. Purpose:

This document briefly (a) outlines the existing Beneficial Use Impairments (BUIs), the purported causes and potential remedies as described in the Remedial Action Plan's (RAP) Combined Stage 2 Report published in September 1997, and (b) tentatively identifies a series of project-specific actions, either regulatory or non-regulatory, needed to accomplish the remedies and to ultimately justify re-designation of the BUI.

This document will be used to assist government and non-government organizations in focusing their efforts and funding opportunities on the most immediate "action-oriented" projects needed within the AOC, or its contributing watershed. Because this document has not undergone an extensive public consultation process, it should be considered as a interim planning piece of the overall RAP, subject to future changes as needed. In addition, this document will be used to support a more thorough strategic re-evaluation and planning process, currently underway in each AOC, in order to prioritize implementation projects specifically designed to address BUI delisting targets, and to direct public and non-public support as appropriate.

II. RAP Management and Coordination

The Monroe County Department of Health is currently funded via USEPA to coordinate the Rochester embayment RAP through the end of 2014. Additional funding will be needed to continue the coordination beyond 2014. Contact person is Charlie Knauf at 585-274-8440.

III. Current Beneficial Use Impairments, Likely Causes, Planned Remedies, Specific Actions

A. BUI – Restrictions on Fish and Wildlife Consumption

This is a Lake-Wide impairment. It is listed in the REAOC RAP documents because they were watershed based, and there are two individually listed waters in the non-AOC contributory watersheds, Canadice Lake, listed for PCBs, and Irondequoit Bay, originally listed for chlordane but recently listed for PCB's and Mirex.

1. Known or Suspected Cause – Mirex, PCBs, and Dioxin

(a.) Remedies & Specific Actions Needed:

- The main source of Mirex to LO is the Niagara River. There is documentation of contamination in sediments from Niagara to the Embayment (Scrudato and DelPietre, 1982). However, as these plumes are of large area and are in areas that may be likely to

naturally encapsulate, and are not unique to the Embayment, mitigation is not an AOC based project.

- PCB impacting the Lake originates in nearly all watersheds where it was employed, and is likely carried via atmospheric processes. Recent study around the Lake (Litten 2009) indicated that the two major sources to the Lake were 18 Mile Creek and the Black River and suggested that PCB's found in the Genesee River above the AOC and the CSOAP system might originate in 18 Mile Creek with transport via the Erie Canal. Areas of PCB contamination on the Westside of Rochester have been identified and the main source is in remediation, but this area is upstream of the AOC. PCB equipment removal is being undertaken by the local utility. A recommended project to accelerate PCB removal in industries and commercial operations is listed in the Stage II. Cost for removal, accomplished at the three SUNY Schools at SUNY expense during generation of Stage II, was 3 million dollars. 1997 estimate for inventory was approximately \$35,000.
- Dioxin is not indicated as originating from any specific manufacturing or disposal situation, but is a by-product of incomplete combustion. Litton 2009 indicates that the larger rivers flowing into Lake Ontario like the Genesee are greater sources, but this primarily a factor of the contributory watershed sources and larger flow than any identified source within the AOC.

Recommended Action: With the exception of the Niagara River, which is a documented source of Mirex, and Eighteenmile Creek, which is documented as a PCB source and is undergoing remediation, this BUI should be declared a lake-wide impairment and delisted for individual AOC's.

B. BUI – Tainting of Fish and Wildlife Flavor

1. Known or Suspected Cause – Phenol is indicated by NYSDEC sources as the usual cause of tainting complaints

(a.) Phenol in the Genesee River likely originates from Coal Tar seeping through the fractured bed rock from 19th-early 20th century coal gasification sites, and could be associated with industrial discharges to the river.

(b) A survey is recommended in earlier RAP documents to define if this problem exists. A check with Regional and Lake Ontario fisheries units indicates that no complaints have been received in the recent past.

(a.) Remedies & Specific Actions Needed:

- Resumption of Genesee River Water Column Phenol testing~\$5,000 per year

- Survey of anglers with non-AOC control group- This is found in the Delisting Criteria ~\$10,000 (The RAP Oversight Committee has indicated that this may not be the most reliable method for delisting due to the subjectivity of the respondents, based on other surveys conducted this would cost in the neighborhood of \$12,000)
- Panel Taste test- this has been suggested as an alternative to water column testing or angler survey- There are issues with using humans to check taste on material that has an advisory against consumption. This would also require a modification of the delisting criteria and monitoring methods.

C. BUI – Degradation of Fish and Wildlife Populations

1. Known or Suspected Cause – Listed due to mink, which were reported in a NYSDEC study to be down on population and reproductive success all around the Lake, likely due to consumption of PCB contaminated fish.

(a.) Remedies & Specific Actions Needed:

- Studies completed by SUNY at Brockport researchers indicate that mink are present and surviving in self-sustaining populations.
- Suggestion has been made that habitat improvement for mink could be undertaken in the Braddock Bay Fish & Wildlife Management Area (western Embayment) and lower Genesee River wetlands.

D. BUI – Fish Tumors and other Deformities

1. Known or Suspected Cause – This BUI was not listed in the Stage I and has been identified as undetermined up until a 2009 consultant report, when all BUI's were either listed or not, and undetermined BUI's were listed. If this BUI is determined to be a problem, a likely cause would be PAH's, especially in the Genesee River, where the coal tar seeps would be a likely source. However, brown bullhead, the species typically used in the Great lakes AOCs for determination or impairment, is not common in the Genesee River, so all examined fish came from the Braddock Bay section of the AOC. Further scientific evaluation is needed.

E. BUI – Bird or Animal Deformities or Reproductive Problems

1. Known or Suspected Cause – This was listed as impaired for Mink reproduction.

The BUI was written with water column chemical analysis as the preferred method of determination, but NYSDEC Standards for Wildlife were modified during the period of approval for the Stage II and Addenda, and new risk-based values are now set at levels that are below analytical detection limits (Litten pers com.)

The same studies by SUNY at Brockport that support delisting of the Degradation of Fish and Wildlife Populations BUI might support delisting for mink, although the studies did report higher incidence of jaw lesions in shore area mink.

If questions remain concerning additional species, a study applicable to all AOC's is recommended to determine if deformities or reproductive problems do exist, and if they are found what the causes are. Especially for birds, that move so easily, documentation of a specific area causing any identified problem could be difficult.

F. BUI - Degradation of the Benthos

1. Known or Suspected Causes- Contaminants in the Genesee River or in the sediment of the Embayment.

(a.) Remedies & Specific Actions Needed –
Genesee River- the River met its Delisting Criteria of being assessed as un-impacted or slightly impacted in RIBS data collected (but not yet published) in 2005, and in 2010. - DELIST

Embayment- Sampling conducted under GLNPO grant GL97582701 (2007) found all sites to be slightly to moderately impacted. They were approximately equally distributed in the River and Embayment and Braddock Bay with no apparent pattern to the distribution. After an appropriate amount of time, a similar study could be conducted to see if anything has changed if it is judged that sufficient time has elapsed for further recovery.

G. BUI – Restrictions on Dredging Activities

1. Known or Suspected Cause – High coliforms in sediments resuspended and discharged to the river by the overflow process in use when the Stage I was initiated.

(a.) Remedies & Specific Actions Needed – A formal agreement between Monroe County and the USACE to prohibit overflow dredging is called for in the Delisting Criteria. However, both agencies have withdrawn from

discussion of the formal agreement as NYSDEC has made it policy to include the prohibition on overflow dredging as part of any permit to dredge the navigation channel.

2. Known or Suspected Cause – When MCDPH suggested delisting for this BUI, USACE objected that when sampling for the Patrick O’Rourke Bridge construction project was undertaken, sediments that had to be removed for the bridge pilings were too contaminated for Open Lake disposal, meaning that Delisting criteria # 2 was not met. While it was deemed unlikely that a private or municipal entity would have any need to dredge deeper than the 22-24 foot depth of the navigation channel, there was some concern that sediments in the 18-24 foot range could contain residual contamination that would render them unsuitable for open lake disposal. In a conference call including NYSDEC, EPA Region 2 and GLNPO, USACE, the City of Rochester, and the RAP Coordinator, a discussion of possible approaches to this issue was held. It was decided that for purposes of the BUI, dredging discussion would be limited to the area from the Turning Basin to the mouth as virtually all riparian areas upstream of that point were in public ownership and the likelihood of any development that would require sediment removal was unlikely, and that a Legacy Act determination for depth of contaminants in non-navigation channel areas of the river downstream of the Turning Basin would be sought, with the condition that if contaminants were found at levels deeper than the navigation channel they would be treated as candidate for natural encapsulation and not disturbed. Since that discussion, A NYSDEC response to a report generated by Arcadis Engineers for Eastman Kodak, indicating no significant sediment related problems in the river, cited bioaccumulation of silver in sturgeon as a problem requiring resolution. As the major habitat for sturgeon in the river is upstream of the Turning Basin and downstream of Veteran’s Bridge, an expansion of the determination to include some samples from this area should also be considered

(a.) Remedies & Specific Actions Needed – Determination of the status of deeper, non-navigation channel sediments in the River is scheduled to commence early 2011 under the Great Lakes Legacy Act. If the determination finds areas in need of remediation/removal, a full Legacy Act project should be pursued

H. BUI – Eutrophication or Undesirable Algae

1. Known or Suspected Cause – Phosphorus discharged mainly from the Genesee River and AOC tributaries, but also suspected of reaching the Embayment from lakewide sources such as agricultural tributaries like Oak Orchard Creek. This surfeit of nutrients, trapped in the nearshore zone in the spring by the thermal bar, causes luxuriant growth of filamentous algae. Area available for algal growth has expanded due to filter feeding by Dreissinid mussels which creates clearer water, allowing sunlight to reach greater areas of the Lake bottom.

The Lake Ontario Coastal Initiative Monitoring Program documented this problem is occurring all along the shoreline of western Lake Ontario. The Lake Ontario Lakewide Management Plan (LaMP) currently has a series of studies underway to further examine its extent and nature.

Numerous Non-Point Source Best Management Practices (BMPs) implementation projects are needed, but virtually all would have to address sources upstream of the AOC. If ongoing studies on the nearshore present credible evidence that Oak Orchard Creek is a nutrient source to the Embayment, agricultural BMP implementation would also be required.

I. BUI – Restrictions on Drinking Water Consumption or Taste and Odor Problems

DELISTED - 2010.

J. BUI – Beach Closings

1. Known or Suspected Causes – Indicators include bacteria, algae, turbidity
 - Nearshore nutrient reduction needed to curtail or reduce growth of filamentous algae.
 - Erosion in the main channel and tributaries of the Genesee River, mainly upstream of the AOC and Monroe County, produce fine particulates from decomposition of filamentous algae.
 - Sources of Indicator bacteria include gulls and geese at the beaches, wildlife in the upstream areas of Durand Beach, improper pet waste disposal in upstream areas, stormwater falling on the beach itself and carrying bacteria to the near shore. NPS runoff from areas up-lake or tributary, possible failing infrastructure or onsite wastewater systems in areas up-lake or upstream from the beach, occasional (average of one per year per release point) CSO discharges, and re-growth of indicator organisms in algae mats or sand.

(a.) Remedies & Specific Actions Needed:

- Numerous NPS BMP implementation projects could be proposed, but all would have to be upstream of the AOC. If ongoing studies on the nearshore present credible evidence that Oak Orchard Creek is a nutrient source to the Embayment, agricultural BMP implementation would also be required.
- Actions to reduce sediment loads in the Genesee River would be expected to reduce turbidity in the Embayment. These would have to be undertaken mainly in upstream, non-AOC areas. Results of current research by NRCS in the watershed should better pinpoint areas where action will be most effective.

- Action by or in concert with wildlife management agencies to understand the attraction of the area for large numbers of gulls and develop a means of discouraging the use. Similar action to prevent buildup of Canada Geese (use of Border Collies has been discussed with Monroe County Parks). Support for creation of sewer districts and installation of associated infrastructure to replace aging and possibly faulty onsite wastewater systems. Public Education (ongoing).
- Actions evaluated in the USACE/URS Studies of Ontario Beach could be considered, but based on the results of that study, another source of match would need to be identified as local support for the levels of funding identified as necessary in that study were unacceptable.

K. BUI – Degradation of Aesthetics

1. Known or Suspected Cause – Decomposing algae along Lake Ontario shoreline

(a.) Remedies & Specific Actions Needed: Nutrient reduction as detailed in sections H and J, or algae removal.

2. Known or Suspected Cause – Objectionable odors from Coal Tar seeps in the area of the lower falls of the Genesee River

(a.) Remedies & Specific Actions Needed – Stage II calls for monitoring which is difficult and potentially dangerous due to the location of the seeps in the rock face of the gorge. A project to define the extent of the seeps and sources, with follow-up of blocking the seeps with plugs or dams was presented as possible by USACE but did not get traction with the RAP Oversight Committee when discussed. Costs are currently undefined.

3. Known or Suspected Cause- Alewife die-offs

(a.) Remedies & Specific Actions Needed- These were thought to be related to poor adaptation to the Lake by an invasive species. Food web interactions and habits of this species have been better defined, and as a result of the Salmonid stocking program in the Lake, die offs are rare, of short duration and magnitude, and not associated with any particular area of the lake. - DELIST

4. Known or Suspected Cause – Discarded Salmonids along the shoreline of the Genesee River due to fishing practices

(a.) Remedies & Specific Actions Needed: A poor practice of many anglers when snagging of spawning salmon was legal was to remove the eggs for sale, then leave the remains on the bank, or throw them back into the water. Enactment by NYSDEC of regulations prohibiting snagging of fish, and prohibiting the discarding of fish carcasses or entrails along streambanks have remedied this situation. - DELIST

5. Known or Suspected Cause – Litter along the lower river and lakeshore

(a.) Remedies & Specific Actions Needed –Coastal Cleanups have been held at numerous sites along the river and along the lakeshore every fall for more than 10 years. It is thought that we have reached the practical limits of behavior change through outreach in a developed area. An outreach is in discussion to be done under current funding linking access to fishing spot issues to litter in hopes that fisherpeople will begin to understand that in many cases where access has been curtailed, it has been as a reaction to complaints about abuse of the area from other users. DELIST as at practical limits of remediation for an urban area

6. Known or Suspected Cause – Genesee River sediment loading - Erosion in the main channel and tributaries of the Genesee River, mainly upstream of the AOC and Monroe County.

(a.) Remedies & Specific Actions Needed: Numerous NPS BMP implementation projects could be proposed, but all would have to be upstream of the AOC.

L. BUI - Added Costs to Agriculture and Industry

1. Known or Suspected Cause – Dreissinid mussels

(a.) Remedies & Specific Actions Needed – This BUI is in process of being delisted as a lakewide Use Impairment.

M. BUI –Degradation of Phytoplankton and Zooplankton Populations

1. Known or Suspected Cause – The Stage I does not discuss specific causes of this BUI, only presents evidence of its existence in the Genesee River. Stage II indicates that the likely source is sediment contamination in the Genesee River.

Status was listed as unknown in Lake Ontario. Reports of the “Status of the Lake Ontario Ecosystem: A Biomonitoring Approach” Project during the period 1998-2000, when the Rochester Embayment and Irondequoit Bay were included in the monitoring plan, indicate that in 1998 zooplankton were more numerous and more robust in the Rochester area nearshore, and chlorophyll A levels that could be seen as a surrogate for phytoplankton were also greater, that in 1999 zooplankton numbers were lower than for two other nearshore and embayment areas (Sandy

Pond and Sodus Bay), while chlorophyll A remained high and that in 2000 these indices were similar to the lakewide numbers. While the language of the IJC guidance only speaks to significant differences, their allowance of toxicity testing to determine impact implies that they are concerned with degraded populations or community structure, while the data from these studies indicate populations at least the equivalent of other nearshore areas of the Lake.

(a.) Remedies & Specific Actions Needed – Sediment remediation as discussed

earlier would be expected to have positive impact in the Genesee River.

No

possible remedies for the open Lake portion of the AOC were discussed in Stage I

or Stage II. If the current toxicity study is not satisfactory, a study of phytoplankton and zooplankton in the Embayment using the methodology summarized in Stage II section 4.7.2 could resolve this issue.

N. BUI – Loss of Fish and Wildlife Habitat

1. Known or Suspected Cause – actions such as wetland filling in the lower Genesee River, filling and drainage of other wetlands, deforestation and agriculture, and shoreline development associated with growth of the City of Rochester and suburbanization of the areas bordering and upstream of the waters of the AOC.

(a.) Remedies & Specific Actions Needed – Indicators of improvement were selected, including Mink, Sturgeon, Amphibian community structure, aquatic macroinvertebrate community structure, Loss of acreage of wetlands in the immediate drainage basin, loss of riparian buffers in the immediate drainage areas. It is unlikely that developed areas can be restored to habitat, but efforts can be made to preserve remaining undeveloped areas. Lower areas of the Genesee River where riparian wetlands have become established could be candidate for habitat improvement. Undeveloped parcels contiguous to the Braddock Bay Fish and Wildlife Management area could be acquired and incorporated into the unit.

2. Known or Suspected Cause – Loss of Black Tern nesting habitat in western AOC due to boat wake disturbance.

(a.) Remedies & Specific Actions Needed – As part of the Delisting criteria setting process, it was determined that the AOC was on the southern border of the species' breeding range and what was being viewed as decline in the population could be a natural shifting in the breeding range. Similar declines in nesting pairs were noted in Rose's Marsh, an

area contiguous to the western border of the embayment that is not subject to boat wakes. No action is currently indicated, but if discussion with NYSDEC wildlife management personnel reveals an action that could have positive benefit, a project could be developed.