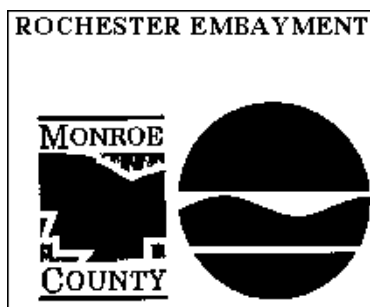


**Rochester Embayment  
Remedial Action Plan  
Beneficial Use Impairment (BUI) Indicator Redesignation (Delisting)  
for the BUI: Added Costs to Agriculture and Industry**



County of Monroe, Monroe County Department of Health  
(RAP Coordination)

Rochester Embayment Remedial Action Plan Oversight Committee  
(Technical and Advisory Committee Members)

Ecology and Environment, Inc.  
(Environmental Engineering Consultant)

New York State Department of Conservation  
(Great Lakes Areas of Concern Oversight)

March 2011

This BUI indicator redesignation report was compiled by Monroe County and NYSDEC primarily based on an assessment and recommendation draft report prepared by Ecology and Environment, Inc. along with the historical record and long-term efforts of the RAP Remedial Advisory Committee in collaboration with the current Rochester Embayment Oversight Committee for the Remedial Action Plan (RAP). RAP Coordination funding and consultation has been provided by the United States Environmental Protection Agency, Region 2. The redesignation of this BUI indicator has involved government agencies, professionals, peers, and the public in review. All substantive comments have been incorporated into this final publication. For information or copies please contact the lead RAP Coordinator in Monroe County Department of Health or NYSDEC Division of Water per the committee contact information in Appendix A.

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## **I. Executive Summary**

This Beneficial Use Impairment (BUI) indicator report identifies the background, criteria, supporting data, rationale and statements to redesignate (delist) the Added Costs to Agriculture and Industry Beneficial Use Impairment for the Rochester Embayment Area of Concern. No agriculture that relied on the waters of the AOC was identified in the Stage I process. Added costs in the AOC were identified only for a small number of industrial or municipal water supply users who faced additional financial burden due to the extra maintenance of intakes necessitated by growth of Zebra mussels (*dreissena polymorpha*) in the intake pipes. Delisting Criteria formulated in the Stage I RAP and continued into the EPA approved delisting document for New York AOC's developed by NYSDEC, the Rochester Embayment Remedial Action Plan Oversight Committee, and Ecology and Environment in 2009 were based on limited knowledge of these invasive species when the Stage I was completed. A combination of improved knowledge and spread of the species, and the related Quagga mussel (*dreissena burgensis*), which has supplanted the Zebra mussel in many parts of Lake Ontario, indicates that the problem is not unique to the embayment, and that the embayment and Genesee River are not a significant factor in the spread of the mussels. As these were the criteria established in the Stage I RAP and subsequent documents, this report makes the case that this AOC can be delisted for this Beneficial Use Impairment.

## **II. Background**

The Rochester Embayment of Lake Ontario is a shallow triangular indentation midway along the southern shore of Lake Ontario at the mouth of the Genesee River (see Figure 1). It has been designated as one of 43 Areas of Concern in the Great Lakes Basin. The accepted historic definition of the embayment is an area of Lake Ontario formed by the indentation of the Monroe County shoreline between Bogus Point in the Town of Parma and Nine Mile Point in the Town of Webster, both in Monroe County.

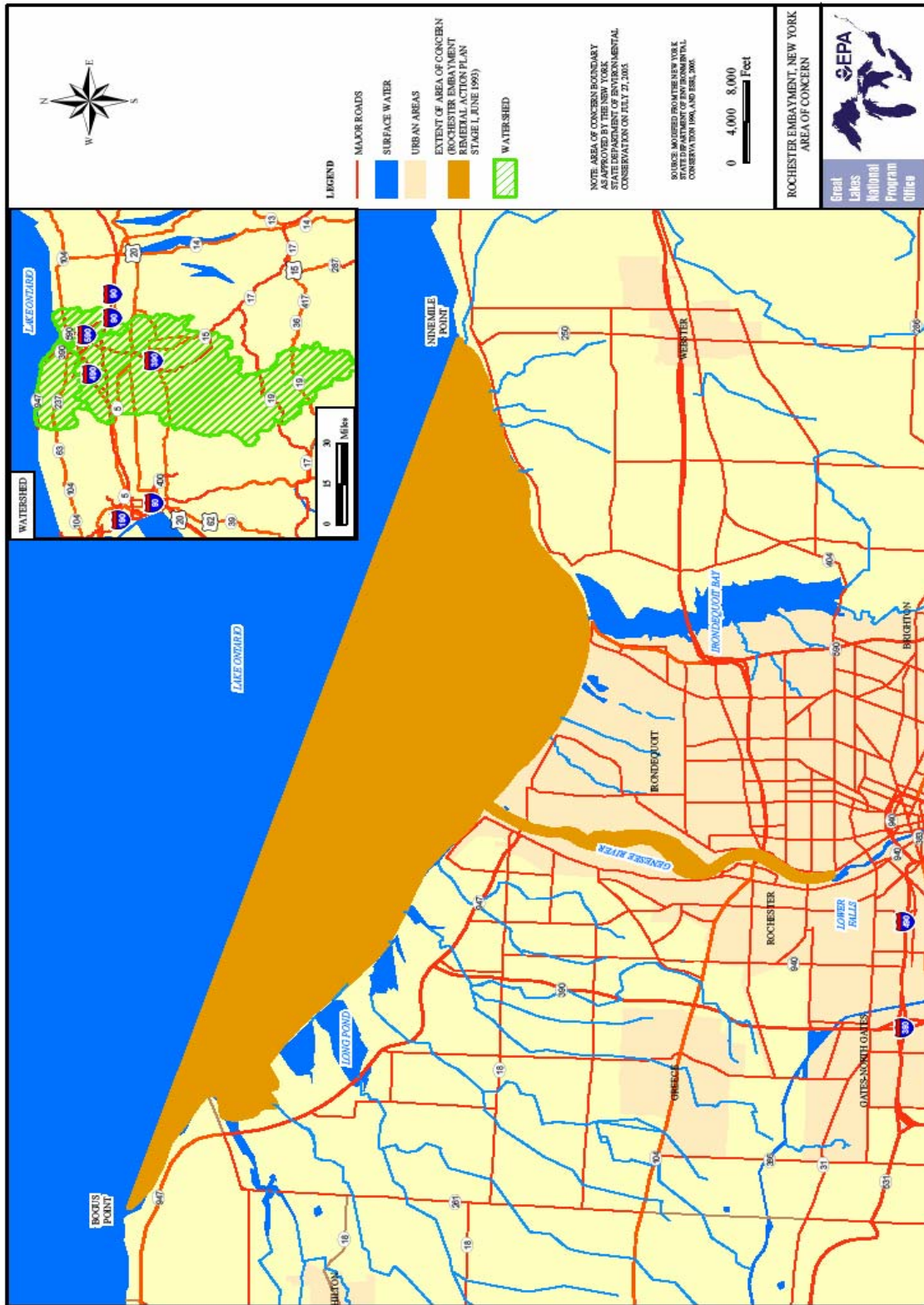


Figure 1. Rochester Embayment Area of Concern

The Stage I and Stage II RAPs indicate that zebra mussels (*Dreissena polymorpha*), a non indigenous species thought to have been introduced to Lake Ontario in ballast water from shipping, have resulted in extra water treatment costs, primarily for industrial and municipal water users. Two industrial and one municipal intake were identified in the Stage II RAP in the Rochester Embayment: Rochester Gas and Electric (RG&E) (now owned by Iberdrola), Eastman Kodak and the Monroe County Water Authority (MCWA) (see Figure 2). There are no municipal or industrial water intakes in the AOC portion of the Genesee River. The start-up cost to the MCWA for installation of a control system at its water intake for zebra mussels was \$800,000. The start-up cost to the RG&E Corporation for installation of control systems for cooling water at two generating stations was \$170,000. In addition to installation costs, there are operating and maintenance costs. (Rochester Embayment Remedial Action Plan Stage II,1997) Agricultural costs related to zebra mussels were not identified in Stage I as the Monroe County Cooperative Extension reported no record of added costs to agriculture due to pollution. There were no known agricultural withdrawals from the AOC in 2009 according to the Monroe County Soil and Water Conservation District (Myers 2009).

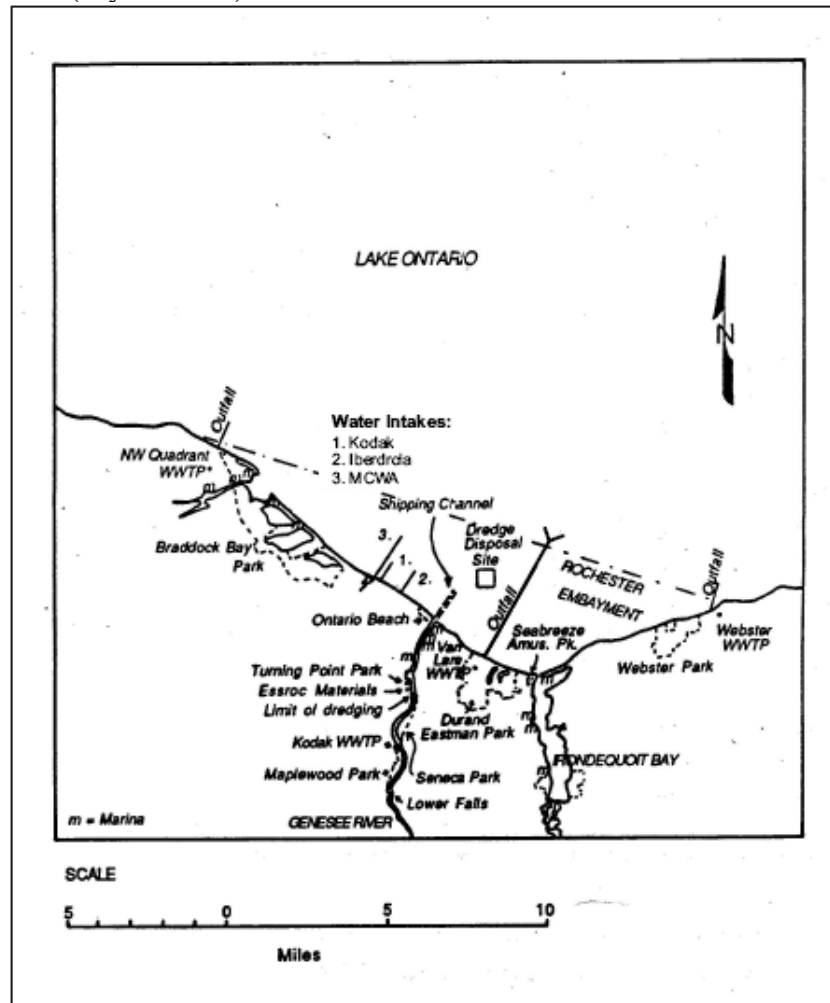


Figure 2: Intake and Outfall Locations in the Rochester Embayment  
Modified from Monroe County 1993

Figure 2. Water Intakes in the Rochester Embayment

Since the development of the Stage II RAP the quagga mussel (*Dreissena burgensis*), an invasive freshwater mollusk native to eastern Europe and of the same genus as the zebra mussel, has risen to the position of dominating the food web niche formerly occupied by zebra mussels in a relatively short period of time. Quagga mussels are capable of surviving at greater depths and wider temperature ranges than zebra mussels and will colonize both hard and soft substrates, while the zebra mussel specifically colonizes hard substrates (Mills et al. 1996 and 1999). While the original listing of the impairment was due to the presence of zebra mussels within the Rochester AOC and the resulting economic impacts to industrial and municipal users, the impairment can now be generalized to encompass both species. The zebra mussel and quagga mussel both continue to proliferate in Lake Ontario. Early studies showed that there was a gradient of dominance across the southern shore of Lake Ontario with quagga mussels more dominant than zebra mussels at western sites along the south shore of Lake Ontario (including Olcott, Thirty Mile Point, Hamlin, Rochester Embayment and Smoky Point) compared to eastern sites along the southeast shore of Lake Ontario (Fair Haven, Nine Mile Point and Mexico Bay) (Mills et al. 1999). However, by 2002, Dreissenids were indicated to be dominating hard substrates to a depth of 100 m on both the north and south shores of the lake, and were increasing in abundance on the soft substrates (Johannsson, et al, 2007). As the literature is clear about the Zebra mussel's depth limitations and need for hard substrate, finding of mussels at greater depths and on softer substrates is a strong indication that the Dreissenid community had become quagga mussel dominated. For the purpose of delisting discussion, reference to zebra mussels will also refer to quagga mussel colonization, as the impacts of the two are similar in relation to this Beneficial Use Impairment.

#### **A. Delisting Criteria**

The International Joint Commission (IJC) set forth delisting guidelines for AOCs for developing their delisting criteria. The IJC delisting guideline for Added Costs to Agriculture and Industry is *When there are no additional costs required to treat the water prior to use for agricultural purposes (i.e., including, but not limited to, livestock watering, irrigation and crop-spraying) and industrial purposes (i.e. intended for commercial or industrial applications and noncontact food processing).*

According to the EPA-approved *Rochester Embayment Beneficial Use Impairment Delisting Criteria Report* (E & E 2009), the Added Costs to Agriculture and Industry BUI will be restored when the following delisting criteria are met:

1. Current scientific literature indicates that zebra mussel is a Great Lakes-wide problem; and
2. The Rochester Embayment watershed does not contribute to the presence of zebra mussels in the Rochester Embayment.

The monitoring method originally developed for this BUI consists of review of scientific literature on an ongoing basis to determine if the Rochester Embayment watershed may contribute to the zebra mussel problem.

The intent of the RAP program is to remedy the impairment when the AOC is the source; as such, the intent of this delisting recommendation is to show that the Rochester Embayment AOC is not

the source and is not significantly contributing to the continuing spread and high numbers of zebra and quagga mussels.

## **B. Endpoint**

The desired endpoint for the RAP process to address the added costs to agriculture and industry BUI is to determine that the introduction or spread of the mussel species is not caused by, nor enhanced by the Rochester Embayment of the Lake or the Genesee River in a way that would indicate some action to be taken locally to resolve the impairment. Such an action would have a significant impact that would lead to a reduction in mussel populations in the AOC and would have an impact on their continued existence and spread in the rest of Lake Ontario. With no actionable source identified that is unique to the Rochester Embayment, no unique remedial action is identifiable, and the condition can be attributed to natural or man-induced causes that occur throughout the Lake Ontario ecosystem, and that must be dealt with by implementation of remedial measures on a lakewide basis, if such measures can be identified. At this time, no practical remediation for the Dreissenids has been identified.

## **C. BUI Redesignation Comments and Report Preparation**

Support for the redesignation of this BUI was expressed at the Public Meeting conducted on September 22, 2009. Notes on this public meeting are contained in Appendix B. Specific comments or questions that are addressed by explanation or actual modification to this redesignation document are further detailed in the Responsiveness Summary in Appendix C. At the public meeting, support for the delisting was expressed by citizens, and committee members.

In response to comments received from NYSDEC, the initial report on this delisting criteria written by Ecology and Environment, Inc (E&E) has been rewritten to conform to guidelines provided by NYSDEC, incorporating the material employed by E&E, with incorporation of additional information that was either obtained through communication with researchers and purveyors or through review of more recent or additional literature.

## **III. Indicator Status Resolution**

### **A. Strategy and Rationale**

According to the “Restoring United States Great Lakes Areas of Concern: Delisting Principles and Guidelines”

“Re-designation of a BUI from impaired to unimpaired can occur if it can be demonstrated that:

- Approved delisting criteria for that BUI have been met;
- The impairment is not solely of local geographic extent, but is typical of upstream conditions OR conditions outside of the AOC boundaries on a regional scale. Such re-designation would be contingent upon evidence that sources within the AOC are controlled.
- The impairment is due to natural rather than human causes.

In some cases it may not be possible to fully restore some uses because of natural factors or social or economic factors. In these special cases there may be very logical and practical reasons why the

impaired uses cannot be fully restored and these reasons and rationales should be provided in a Stage 3 Report.”

In the case of the Rochester Embayment Added Costs to Agriculture and Industry Beneficial Use Impairment, a case can be made that all of the above conditions are met.

### **B. Supporting Data and Assessment**

Zebra mussels were first documented in the Great Lakes ecosystem in the late 1980s (Mills et al. 1999). Quagga mussels were first documented in the Great Lakes ecosystem in September 1989 near Port Colborne, Lake Erie (Bensen et al. 2009). Zebra mussels spread rapidly in Lakes Erie and Ontario and were identified in Lake Superior, Lake Huron and Lake Michigan as early as 1993 (Kraft 1993). By 1996, the quagga mussel had spread through Lakes Erie and Ontario and the St. Lawrence River (Mills et al. 1999, Watson et al. 1999, Nalepa et al. 2001).

The occurrence of these species in Lake Ontario and the entire Great Lakes ecosystem is now widely documented (see Figure 3). Both species are now prevalent in all five Great Lakes (Nalepa et al. 2001, Watson et al. 1999), with occurrences of quagga mussels in the upper Great Lakes on the rise since 1999 (Fleischer et al. 2001). In Lake Ontario, a 1999 study identified that Olcott (located at the mouth of the Eighteenmile Creek AOC) and Rochester Embayment AOC, in addition to Thirty Mile Point, Hamlin and Smoky Point (non-AOCs) all had both quagga and zebra mussels in 1992 and 1995, and the densities of quagga mussels increased between years (1992 to 1995) at almost all depths at all sites. Other locations not identified as AOCs on Lake Ontario were sampled across these years (Fair Haven, Nine Mile Point and Mexico Bay) and the sampling results clearly exhibited an increase in both species across study years, although the quagga mussel was less dominant at eastern Lake Ontario sites (Mills et al. 1999). This study of invasive species mussel biomass and distribution at multiple sites across years indicates that the presence and numbers of zebra and quagga mussels in Rochester Embayment were not unique compared to other locations in Lake Ontario.(Table 1.) Likewise, the Rochester Embayment AOC is no more significant a source or a contributor to the impairment of Added Costs to Agriculture and Industry given the historic and continuing lake-wide presence of these species.

Table 1. Numbers of Zebra and Quagga Mussels captured in 10 minute bottom trawl samples - Lake Ontario south shore 1995 (adapted from Mills et al , 1999)

Location	Olcott	Thirty Mile Point	Hamlin	Rochester	Smoky Point	Fair Haven	Nine Mile Point	Mexico Bay	Cape Vincent (St Lawrence River)
Zebra Mussels	143	359	301	498	653	47	231	300	300
Quagga Mussels	990	1159	537	418	716	20	30	23	8



Zebra and quagga mussels are both native to European nations and are believed to have been introduced into the Great Lakes as a result of ballast water discharge from foreign ships entering the Great Lakes system (Mills et al. 1996 and 1999, Wilson et al. 1999, Benson et al. 2009). However, the rapid spread of these organisms is attributed to other factors including larval drift into freshwater river systems, causing mussel colonization in tributaries to the Great Lakes ecosystem, including the Genesee River (Bensen et al. 2009). Further, fishing and boating activities are identified as a primary cause of the rapid colonization of these species, which allow for the mussels to be transported over land to other freshwater systems (Watson et al. 1999, Bensen et al. 2009). Both species have been found attached to hard substrates, including the hulls of ships, and transport by boat movements overland is believed to be the primary causes for both species prevalence in the upper Great Lakes (Lakes Superior, Michigan and Huron) (Watson et al. 1999).

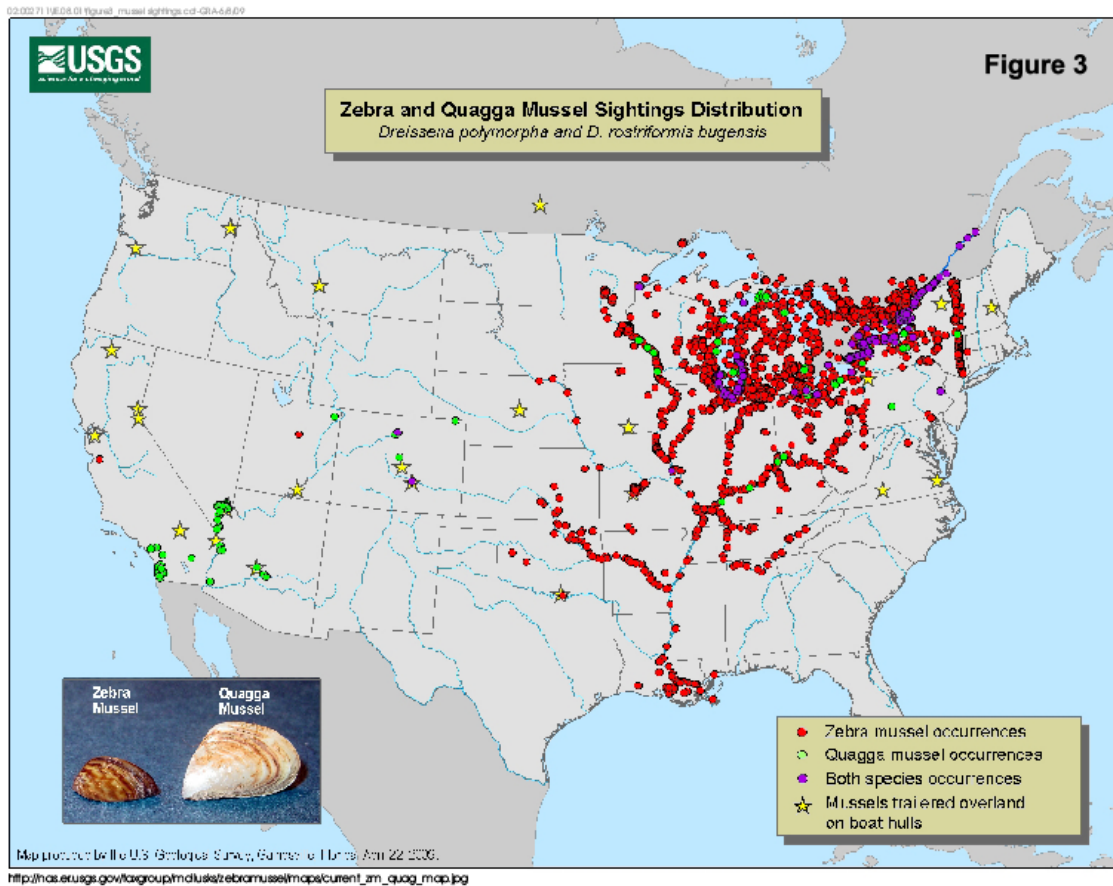


Figure 3: U.S. Distribution of Zebra and Quagga Mussels (United States Geological Survey 2006)

Early in the dreissenid invasion of New York State, when the mussels had become established in Lake Erie, but had not been found in most of Lake Ontario, it was predicted that the mussel would spread by means of the Erie Canal, which is filled with water in the spring from Lake Erie via Tonawanda Creek, and then would be maintained by continual infusion of the Lake proper from the canal and tributaries. While there was evidence that the canal served as a vector in the original introduction, research in tributaries after the establishment of the mussel in the Lake indicated that

there were low populations of mussels in the streams except for short distances right below outfall streams. Researchers proposed that initial introduction of veligers (the larvae of dreissenids) was followed by establishment of dense colonies of adult mussels in the discharge plumes from the canal to streams. The mussels were unable to survive in most of the stream due to the paucity of phytoplankton associated with fast moving water environments, but thrived in the relatively enriched discharge water from the canal, which more closely resembles a still water environment. Because the veligers are similar in size to the phytoplankton, they are consumed by the filter feeding adult mussels in these small colonies below the discharge points (Haynes 1997, Miller and Haynes 1997). In the 2000 Rotating Integrated Basin Studies (RIBS) conducted by NYS Department of Environmental Conservation, mussels were found in the Genesee River in large numbers just below the Erie Canal junction. Samples collected just below the Route 104 (Veteran's Memorial) Bridge, an area just below the three waterfalls and the riffle section of the lower Genesee River in the City of Rochester, a fast moving water environment, are much lower in mussels. Samples collected at the Charlotte Docks, an area of the river subject to inflow of water from Lake Ontario, and a low flow environment, are again high in mussels. As shown in Table 2, other invertebrates show opposite patterns or similar change but with much lower numbers of organisms (NYSDEC 2004). While all tributaries receiving water from the Canal will be sources of mussels to some extent, the Lake proper is the major vector for maintenance of in-lake populations.

Table 2. Comparison of three lower Genesee River sampling sites for invertebrates that occur at all three locations. (data from *The Genesee River Drainage Basin Sampling Years 1999-2000, Rotating Integrated Basin Studies Water Quality Assessment Program New York Statewide Waters Monitoring Program* New York State Department of Environmental Conservation, February 2004

Phylum	Genus	Species (Common Name)	Below Canal (RIBS 05) #	Below Route 104 (RIBS 06) # (%Change)	Turning Point (RIBS 07) # (%Change)
Oligochaeta	Naididae	Stylaria lacustris (aquatic worm)	2	12 (+84)	1 (-92)
Amphipoda	Gammaridae	Gammurus sp. (scud)	12	4 (-67)	10 (60)
Mollusca	Dreissena	Dreissena polymorpha (zebra mussel)	220	38 (-83)	204 (81)
Diptera	Chironomidae	Ablabesmyia mallochi (midge)	10	5 (-50)	12 (-58)
		Dicrontendipes neomodestus (midge)	37	258 (86)	95 (63)

\*Not all stations were sampled on every sampling day. Maximum of collection is used in the table

There is no evidence that the Rochester Embayment or any other tributary to the Great Lakes is a geographically unique source of zebra or quagga mussels to Lake Ontario. These species are well-

established lake-wide and as a result have impacted water intakes in Rochester Embayment and elsewhere in Lake Ontario and other Great Lakes, making it a misnomer to identify the Rochester Embayment AOC as being impaired for this BUI in some way that is unique in relation to the other AOC's or the remainder of the lakeshore. While the Rochester Embayment AOC has water intake and ecosystem problems that can be directly linked to invasive mussel species abundance, the Embayment is not the cause of these species' proliferation. Additionally, other New York State AOCs do not consider the proliferation of zebra and quagga mussels in the Lake to be a source of added costs to agriculture and industry within their AOCs, even though the obstruction of water intakes is a widely reported impact of invasive mussels, particularly zebra mussels (Benson et al. 2009). St. Lawrence at Massena AOC, Niagara River AOC and Eighteenmile Creek AOCs are all listed as not impaired for this BUI, while Buffalo River has listed this BUI as not applicable (EPA 2008). These AOCs likely attribute issues linked to invasive zebra and quagga mussels to lake-wide impairments. This is further supported through the Lake Ontario Lakewide Management Plan (LaMP) 2008 Update (LaMP 2008a). The literature, including the 2008 LaMP Update, indicate that the spread and proliferation of zebra and quagga mussels are impacting food web dynamics, changing the way that nutrients are cycled and as a result, increasing the growth of *Cladophora* and other bottom growing algae, threatening efforts to restore native fish and promoting blue-green algal blooms. The Binational Cooperative Science and Monitoring Initiative (CSMI) is a data gathering mission initiated by the LaMP to study lake-wide issues, including the role of invasive mussels in nutrient cycling (LaMP 2008, 2008a).

At the time of the Stage II RAP, the fact that zebra mussels were present throughout the Great Lakes and tributaries was already widely known and included as an assumption. The delisting criteria was written so that the BUI would be delisted when the literature clearly indicates that the Rochester Embayment is not a cause of the impairment. The literature published to date indicates that tributaries to the Great Lakes Ecosystem do not contribute to zebra or quagga mussel proliferation in a significant way, and that in fact historic introduction of these species and the subsequent spread through drift and boat use are the primary cause for the invasive mussel species impairment throughout the Great Lakes ecosystem (Benson, et al. 2008)

### **C. Criteria, Principles and Guidance Application**

The intent of the RAP process is to remedy the impairment (and cause) when the AOC is the source or an upstream source is contributing to a known impairment in the AOC.

Studies prior to and since the original status determination of this BUI have identified that zebra and quagga mussels are a Lake Ontario- and Great Lakes-wide impairment. Zebra and quagga mussels have been identified as the only source of impairment to added costs to industry in the Rochester Embayment. There is no known literature that identifies the Rochester Embayment AOC as an original source of zebra or quagga mussel infestation. As such, each delisting criteria is met in the following manner:

#### **1. Current scientific literature indicates that zebra mussel is a Great Lakes-wide problem**

As discussed above and shown in Figure 3, the zebra mussel and quagga mussel are widely documented as a Great Lakes-wide invasive species issue.

## **2. The Rochester Embayment watershed does not contribute to the presence of zebra mussel in the Rochester Embayment.**

The cause of zebra and quagga mussel presence in the Rochester Embayment is widely recognized as a lake-wide issue. The contributors to the presence of these species in the Embayment has been identified as an initial introduction into the Great Lakes ecosystem through ballast water, with the rapid spread of the species resulting from larval drift involving all tributaries and boat/ship movements. While in the initial spread of the mussels, the Erie canal; the lower Genesee River, and other streams tributary to the Embayment and receiving water from the canal all were a part of the drift mechanism that moved the mussels from Lake Erie downstream into Lake Ontario, more recent data indicates that in-lake processes are most responsible for maintenance of populations in the Lake, and trailered boats are most responsible for spread to other water bodies, not an issue in this BUI.

Not only have zebra and quagga mussels been identified in all five Great Lakes, they were both first discovered in North America in Lake Erie. The Rochester Embayment AOC has never been attributed as a source of either species. As such, it can be reasonably deduced that the Rochester Embayment AOC is not the source of the Added Costs to Agriculture and Industry BUI and should be delisted.

### **D. Re-designation Statement**

With the full establishment of the aquatic nuisance species Dreissenid mussels (zebra and quagga mussels) in Lake Ontario and the remainder of the Great Lakes as well as numerous inland waterways and lakes, all users of water from these source waters have been faced with the added costs associated with keeping intakes clear enough to maintain necessary flows. While early in the invasion, it was thought that tributaries such as the Genesee River might be major sources for the spread of the mussels, later data analysis revealed that continued input from ballast, in-lake drift of larval mussels, and movement of trailered boats were the more significant vectors for spread of these aquatic nuisance species. As there is no scientific research indicating that the Genesee River, the Rochester Embayment of Lake Ontario, or other tributaries to these, are more significant pathways for the development and spread of the Dreissenids than non-AOC tributaries or areas of the Lake, the Added Costs to Agriculture and Industry Beneficial Use Impairment should be re-designated “Not Impaired” for the Rochester Embayment Area of Concern.

## **IV. BUI Re-designation (Delisting) Steps and Follow-up**

### **A. BUI re-designation steps**

1. ✓ 12/08 Delisting criteria completed and finalized with USEPA
2. ✓ 3/09 Original impaired condition reviewed to identify causes and sources
3. ✓ 4/09 Review of technical information assembled and data synthesis conducted

4. ✓ 5/09 Additional/ related data review and assessment conducted
5. ✓ 6/09 Discussion of re-designation by RAP advisory / oversight committee
6. ✓ 8/09 Collaboration with E+E, EPA and DEC for draft technical report preparation
7. ✓ 9/09 Public meeting held, information, outreach, and comment on re-designation conducted (included a 30-day public comment period)
8. ✓ 08/10 Comments assembled, BUI report redrafted
9. ✓ 12/10 Re-drafted BUI re-designation report prepared to include necessary changes
10. 02/11 Monroe Co. and NYSDEC (in consultation with OC and EPA R2) completes final modifications to the Added Costs to Agriculture and Industry re-designation document.
11. 03/11 Coordinate the formal transmittal of the BUI re-designation (delisting) with USEPA GLNPO. Communicate result with IJC.
12. 04/11 Communicate results to local RAP Coordination for appropriate recognition and follow-up.

## **B. Post (delisting) Re-designation Responsibilities**

Post-delisting activities are to be conducted by responsibilities identified to implement the actions that are to address the remaining concerns of the BUI re-designation process. Following are identified specific responsible organizations that are to continue ongoing environmental program activities to assure protection of the beneficial uses:

- 1. Monroe County Water Authority** - continue to conduct the annual monitoring and reporting for public on drinking water supply in the Area of Concern and its watershed. Report on contaminants, water characteristics, system conditions and public responses to water services on an annual basis. Provide corrective action and explanations as appropriate. Continue to monitor best available technology for Dreissenid control.
- 2. Monroe County Department of Health** - provide oversight for the RAP Coordination process in the Area of Concern and its watershed. Report to local governments and public organizations on issues and concerns regarding added costs to agriculture and industry as a result of Dreissenid colonization. Support corrective actions to prevent issues if improved technologies become available.
- 3. New York State Department of Environmental Conservation** – provide assistance to the oversight for RAP Coordination and restoration and protection of beneficial uses in the AOC and its watershed. Continue to promote and communicate developing technologies for minimization of effects of aquatic nuisance species.

**4. United States Environmental Protection Agency** – continue to assist and fund RAP Coordination in the Rochester Embayment AOC to achieve the long-term goal of delisting the entire AOC. Assure that provisions of the Clean Water Act and Safe Drinking Water Act are accomplished for the Rochester Embayment area and its watershed. Continue to promote and communicate developing technologies for minimization of effects of aquatic nuisance species.

**5. Lake Ontario Coastal Initiative (LOCI)** – Continue in its goal to restore the ecological integrity of New York’s North Coast—Lake Ontario's 300 miles of southern and eastern shoreline, embayments, river and creek mouths, wetlands and ponds—which is key to the region's economic vitality. Actions are to address public commitment, mitigation measures, land use, habitat protection; and water quality research.

**6. Lake Ontario Lakewide Management Plan (LaMP)** - Report on use impairment indicator monitoring of beneficial uses as developed and documented by the state, provincial, and federal governmental (US and Canada) Workgroup and Management Committee. Continue to develop and implement the workplan for the restoration and protection of beneficial uses for the lake, nearshore areas, and the drainage basin. Continue to promote and communicate developing technologies for minimization of effects of aquatic nuisance species.

**7. Other Local Environmental Protection and Action Organizations:**

**a. Monroe County Soil and Water Conservation District** - Continue implementation projects to protect against erosion and provide stream bank protection and best management practices in Monroe County as resources permit. Assist NYSDEC in monitoring and surveillance activities for improved water quality. Implement SWCD mission to protect, promote, and improve natural resources. Continue to work with land users to educate and encourage actions that mitigate erosion and runoff.

**b. Monroe County Department of Planning and Development** - Implement actions to further the protection and planned development of the lands around the Genesee River. Maintain a healthy balance between environmental and economic interests.

**c. Monroe County Water Quality Coordinating Committee** - Work to maintain and restore the quality of Monroe County’s water resources, through a cooperative, coordinated manner which includes educational and technical efforts. Coordinate activities with Monroe County’s Water Education Collaborative.

**d. Monroe County Environmental Management Council** - Work with citizen support and with county governments to achieve environmental goals of the local community in conjunction with the county government.

**e. Center for Environmental Information (CEI)** - The locally driven Lake Ontario Coastal Initiative (LOCI) is responding to the needs of New York’s North Coast. The initiative, spearheaded by the Center for Environmental Information (CEI), has strategic planning for development and implementation activities. CEI is working with its partners, the Finger Lakes-

Lake Ontario Water Protection Alliance (FL-LOWPA), SUNY Brockport Department of Environmental Sciences and Biology, and the LOCI Steering committee, representing public and private stakeholders. Projects are to remediate, restore, protect and sustain the Lake Ontario, New York Great Lakes Coastal region including the St. Lawrence River.

**f. Finger Lakes-Lake Ontario Watershed Protection Alliance (FL-LOWPA)** – Works to foster and expand a collaborative, watershed based approach to water quality protection and enhancement in the Lake Ontario watershed; assists local counties with funding for projects for watershed protection.

## **V. Appendices**

- Appendix **A** - List of Oversight Committee Members
- Appendix **B** - Public Meeting Notes
- Appendix **C** - Responsiveness Summary
- Appendix **D** - References
- Appendix **E** - Power Point presentation from the Public Meeting

### **Appendix A. List of Oversight Committee Members**

Charles Knauf, Coordinator, Monroe County Water Quality Coordinating Committee  
Alinda Drury, Mayor's Office City of Rochester  
Raymond Yacuzzo, New York State Department of Environmental Conservation  
Wayne D. Howard, Great Lakes Committee Chair, Sierra Club  
Brian Slack, Genesee Finger Lakes Regional Planning Council  
Chris Fredette, Rochester Committee for Scientific Information  
Charlie Valeska, Eastman Kodak  
David Klein, The Nature Conservancy  
Gary Neuderfer, Ph. D., NYSDEC retired, SUNY at Brockport, Rochester Institute of Technology.  
George. Thomas,P.E., Center for Environmental Information  
James Haynes, Ph. D., SUNY at Brockport  
John Waud, Ph. D., Rochester Institute of Technology  
L Hartshorn, Monroe County Environmental Management Council  
Mark Gregor, City of Rochester Director of Environmental Quality  
Paul Sawyko, Water Education Collaborative  
Steve Lewendowski, Lake Ontario Coastal Initiative

Barbara Belasco, Project Liaison, USEPA Region 2

Contact Information for the Rochester Embayment Remedial Action Plan Oversight Committee:

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## **Appendix B. Public Meeting Notes**

Delisting Beneficial Use Impairments in the Rochester Embayment Area of Concern

September 22, 2009

Town of Greece Town Hall Meeting Room,

1 Vince Tofany Blvd.

Greece NY 14612

Attendees:

Paul Sawyko, Water Education Collaborative, Rochester Embayment Remedial Action Plan Oversight Committee

Charles Knauf, Monroe County Department of Public Health, Rochester Embayment Remedial Action Plan Oversight Committee, Coordinator

Louise Hartshorn, Monroe County Environmental Management Council, Rochester Embayment Remedial Action Plan Oversight Committee

George Thomas, Center for Environmental Information, Rochester Embayment Remedial Action Plan Oversight Committee

Chris Akios, Ecology and Environment, Inc.

David Weeks, Ecology and Environment, Inc.

Suzanne Albright, Grandview Beach Neighborhood Association

Sue Jackson, Grandview Beach Neighborhood Association

James Nugent, Monroe County Water Authority

John Perrecone, United States Environmental Protection Agency, Great Lakes National Program Office

Barbara Belasco, United States Environmental Protection Agency, Region II

Katrina Korfmacher, University of Rochester Medical Center

**Meeting Notes:** Meeting Notes are assembled from notes taken at the meeting by David Weeks and by Barbara Belasco, edited by Charles Knauf, and reviewed for accuracy by James Nugent.

A public meeting on the Rochester Embayment Remedial Action Plan was held Tuesday, September 22, 2009 from 7 to 9 p.m. at the Greece Town Hall, 1 Vince Tofany Blvd, Greece, New



York. Residents of the AOC and nearby areas as well as agency representatives were invited to attend.

Representatives of the Monroe County Department of Health and the USEPA presented draft delisting documents for Drinking Water Taste and Odor and Added Costs to Agriculture and Industry Use Impairments. The presentation was followed by a question and answer period to solicit comments from the public. Those attending the meeting were given the opportunity to ask questions and make comments during and after each presentation.

Notices of the meeting provided links to the draft documents on Monroe County's website at <http://www.monroecounty.gov/>.

Following the presentation on the two draft delisting documents, a presentation was given on the status and strategy for delisting other impairments including: Restrictions on Fish Consumption; Loss of Fish and Wildlife Habitat; and Eutrophication or Undesirable Algae.

Representatives of U.S. Environmental Protection Agency, the Monroe County Department of Public Health, and the Local Remedial Action Plan Advisory Committee were on hand to answer questions and record public comments.

John Perrecone of the USEPA Great Lakes National Program Office (GLNPO) introduced the topic of Great Lakes Areas of Concern (AOC), Remedial Action Plans (RAP), and Beneficial Use Impairments (BUI). The slides from the Power Point that was used for the meeting are attached as Appendix E.

Charles Knauf, Environmental Health Project Analyst with the Monroe County Department of Public Health, continued by reviewing milestones in the Rochester RAP process, highlighted language from the Guidance document on Delisting developed by the US Policy Committee indicating that AOC's can only be responsible for mitigation of Impairments that originate or are caused within the AOC, and explained how this guidance applied to the BUI's being presented for the Rochester Embayment AOC. His presentation included summaries of draft documents that state the case for delisting two BUIs: Restrictions on Drinking Water Consumption or Taste and Odor Problems; and Added Costs to Agriculture and Industry.

During and after Mr. Knauf's presentation, he addressed questions and comments from members of the public and representatives of other agencies. Various attendees also provided information relative to the subject. A summary of such questions, comments, and responses by Mr. Knauf and others follows.

BUI: Restrictions on Drinking Water Taste and Odor Problems

Mr. Knauf summarized this delisting proposal by saying the taste and odor problems experienced in the AOC have been experienced lakewide and are not a problem specific to or caused by the Rochester AOC.

**Comment 1:** Mr. Jim Nugent of the Monroe County Water Treatment lab described the recent history of taste and odor problems. When taste and odor problems became common several years ago, his agency installed granular activated carbon filter caps which addressed the taste and odor problems experienced in those years. Taste and odor problems have not been significant in the last 5 years, however.

**Question 1:** Ms. Suzanne Albright of the Grand View Beach Association asked what might be the public health implications when taste and odor problems occur.

**Response:** Mr. Nugent said the taste and odor problems were normally attributed to algae growth but the etiology is not clearly defined. Earthy/musty taste and odor problems in surface waters are typically caused by Geosmin and Methyl Isoborneol(MIB), compounds produced by biological metabolic processes in the lake. Blue green algae blooms can produce these compounds but again in larger water bodies the specific causative factor is usually not identifiable. Sensitive individuals can detect these compounds at extremely low concentrations, in the low nanogram per liter range. There are no known health problems from these chemicals at the levels encountered in the AOC.

Mr. Knauf added that blue green algae, one source of geosmin and MIB, have been a Health Department concern at Ontario Beach since they were made aware of the possible problem in the late 1990's. The Health Department has been very vigilant over the years in looking for these algae in samples collected at the beach, but has not found them in these samples. Professor Makarawicz of SUNY Brockport has found phycocyanin, a chemical also released to the water by breakdown of blue greens, in nearshore areas, of the Lake, as illustrated in the presentation slide. Mr. Knauf stressed that delisting for taste and odor will not cause authorities to cease monitoring for related compound and problems.

### **BUI: Added Costs to Agriculture and Industry**

Mr. Knauf summarized this delisting proposal. The Rochester Embayment was listed for added costs due to Zebra mussels in intake pipes for the Water Authority, Rochester Gas and Electric, and Eastman Kodak Company. Mr. Knauf presented indications from the literature that dreissenid mussels are in fact a Great Lakes (and further) problem, and indications that mechanisms for introduction and maintenance of these species are not an AOC phenomenon.

**Comment 2:** Mr. Nugent stated that his department cleans its water intake annually to alleviate clogging by zebra and quagga mussels, but that that accumulations have not been as great as in the early years after those species initially became established. In addition to removing the live mussels, shells of dead mussels also have to be periodically cleaned up.

**Response:** Mr. Knauf reiterated that he is not saying the mussels and associated costs to industry are not a long-term problem, but that the problem is lakewide and not unique to or originating in the Rochester AOC, so under the language of the Guidance, the BUI should be delisted..

Concluding statements about the two BUI delisting documents reviewed at this meeting:

The BUI documents reviewed at this meeting, Restrictions on Drinking Water Consumption or Taste and Odor Problems, and Added Costs to Agriculture and Industry, will be submitted to

NYSDEC along with comments from this public meeting. These BUIs should be delisted in the Rochester AOC because the problems are lakewide and are not caused by or specific to the AOC. Mr. Knauf's office will also accept additional comments from the public for 30 days from this meeting. After DEC comments are received, they will be incorporated in to the documents and submitted to EPA for consideration. The IJC will be informed as to the status of delisting of the BUIs.

### **Delisting Recommendations in Preparation**

Mr. Knauf reviewed the arguments for delisting three additional BUIs for which delisting recommendations are currently being prepared:  
Restrictions on Fish and Wildlife Consumption  
Eutrophication or Undesirable Algae  
Loss of Fish and Wildlife Habitat

He reviewed the listing and delisting criteria for each BUI and presented data supporting the argument that, in the cases of Restrictions on Fish and Wildlife Consumption, and Eutrophication, the impairments are lakewide problems and not AOC specific. In the case of Loss of Fish and Wildlife Habitat, Mr. Knauf presented data that indicate that some of the criteria are likely now being met and that the status of the remaining criteria are not substantially different from non-AOC areas, or, as in the case of sediment problems, that the impairments originate outside the AOC.

### **Restrictions on Fish and Wildlife Consumption**

No specific comments were received.

### **Eutrophication or Undesirable Algae**

No specific comments were received.

### **Loss of Fish and Wildlife Habitat**

**Question 2:** Ms. Suzanne Albright of the Grand View Beach Association asked if NYSDEC would want to be notified if minks were sighted within the AOC. She said she understood that mink have been spotted in Long Pond channel.

**Response:** Mr. Knauf said NYSDEC might want this information, but he definitely would and that people could contact him directly, and provided his contact information to Ms. Albright.

**Comment 3:** With respect to sedimentation and dredging in the lower Genesee River, Ms. Albright stated that following dredging this year, a terrible odor could be smelled in the Edgemere area. Ms. Sue Jackson, also of the Grand View Beach Association, stated that the wind was out of the East right after dredging was done.

**Response:** Mr. Knauf stated that dredge materials that come from the lower River at this time should be just sediment and not contain materials that would cause a significant odor problem. Also, given the location of the disposal site approved by the Army Corps of Engineers, no odors that might originate with sediments should be evident at Edgemere Drive. The Corps tests sediments every 5 years and sediments have met the criteria for open lake disposal since 1994. The river is dredged every 3 years. Also, the combined sewer overflow abatement program has reduced

overflow events dramatically. That also reduces the likelihood that odor-causing pollutants would be present in those sediments. However, he indicated that he had received no complaints during this period, and if calls were received, investigation of the complaint would have been accomplished.

**Question 3:** Ms. Albright asked if the Corps is done dredging for the year.

**Response:** Mr. Knauf answered that the Corps finished dredging earlier in the summer.

**Question 4:** A resident asked “When Charlotte (Ontario) Beach closes, does Durand Beach also close?”

**Response:** Mr. Knauf responded that there are 2 separate beach closing models, and under many scenarios one beach would be open even though the other would close.

**Question 5:** The resident also asked if there is a “rule of thumb” for staying out of the water in the unregulated areas adjacent to private properties along the lake.

**Response:** Mr. Knauf indicated that a decision could be made based on Rainfall. If there has been ½ inch rain, it is a good idea to avoid swimming for one day if there is a storm sewer outfall or a stream nearby, nearly everywhere along the urban portions of Monroe County’s lakeshore. If there is 1½ inches or more of rain, staying out of the water for 2 days is a good idea.

#### **General comment**

**Comment 4:** Professor Katrina Korfmacher of the University of Rochester Medical Center commented that the arguments for delisting the BUIs appear to take the emphasis away from addressing watershed issues.

**Response:** John Perrecone replied that the new focus will be the Lakewide Management Plan. Also, the Section 319 water quality planning process will be used to address problems that need to be addressed on a watershed basis. EPA does have a watershed perspective and will continue and even increase its efforts to address such problems. Barbara Belasco, of EPA Region 2, added that the EPA under the LaMP process has been working with Canadian agencies and others on biodiversity issues in Lake Ontario. They have developed a list of targets and remedies. EPA is hoping for new funding to work with partners to address lakewide issues, including emerging problems such as chemicals such as pharmaceuticals.

**Comment 5:** Professor Korfmacher noted that keeping community connected to watershed issues will be more difficult than AOC issues due to their being dispersed across wide areas.

**Response:** Mr. Perrecone observed that there is a need to keep the energy moving, but that the question of how to do so is open. Mr. Knauf observed that it will be important to keep community awareness. He also stated that there may be new funding of up to \$475 million per year for 5 years under the Great Lakes Restoration Initiative to address AOC and watershed issues starting in the near future.

The Drinking Water Taste and Odor Beneficial Use Impairment was officially delisted on November 3, 2010.

### **Appendix C. Responsiveness Summary**

## **I. Questions and Answers:**

**Question 1** - What is the background of this Beneficial Use Impairment and why was it designated for the Rochester Embayment?

**Question 1 Answer** - In 1994, the Stage I Remedial Action Plan indicated that added costs to Agriculture and Industry occurred in the AOC and were attributable only to zebra mussels. Costs were indicated to be extra water treatment costs primarily for industrial and municipal water users. Increased costs were mainly cost of treatment of intakes and extra maintenance of water-carrying infrastructure. Listing was based on results of a survey conducted in 1988 by the Rochester Water Bureau and the Industrial Management Council. The Cornell Cooperative Extension reported no additional costs to agriculture at this time.

**Question 2.** What are the implications of the Dreissinids to industrial water users in the AOC?

**Response to Question 2.** Mr. James Nugent of the Monroe County Water Authority stated that his department cleans its water intake annually to alleviate clogging by zebra and quagga mussels, but that the accumulations have not been as great as in the early years after those species initially became established. In addition to removing the live mussels, shells of dead mussels also have to be periodically cleaned up. Mr. Knauf reiterated that he is not saying the mussels and associated costs to industry are not a long-term problem, but that the problem is lakewide and not unique to or originating in the Rochester AOC, so under the language of the Guidance, the BUI should be delisted.

## **II. Agency Comments Received and Incorporated or Answered in the Final Document -**

From Jeff Gratz,  
Branch Chief, Clean Water Regulatory Branch  
Region 2 USEPA

Hi Barbara -

I did a brief read of the report and it looks like the key issue is whether or not the Rochester Embayment AOC is a geographically unique source and or is significantly contributing to the continuing spread and high numbers of zebra and quagga mussels. It acknowledges that industry has borne significant costs to industry to treat intake water within the embayment. However, the delisting document is making the case that mussel species are well-established lake-wide and as a result have impacted water intakes in Rochester Embayment and elsewhere in Great Lakes, suggesting that to identify the Rochester Embayment AOC as being uniquely impaired for this BUI is incorrect.

I'm copying Bruce who may know, from a drinking water utility perspective, if the mussel problem in the Rochester Embayment AOC is any different than anywhere else. If so, then maybe one could try to make

the case that the embayment is a unique case/source, but I doubt it.

Jeff

Barbara,

this is a lakewide problem.

bk

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Bruce Kiselica  
Chief, Drinking Water and Ground Water  
Protection Section  
USEPA - Region 2  
212-637-3879

5/21/2009

John, can you please take a look at this report and provide any comments. Essentially, they are saying since zebra mussels are a lakewide issue, they should not be listed as a local BUI. The logic makes sense....we need to review it in case you have any comments. If we do not have a problem with this rationale, we can then have the AOC start the process for delisting.

They are looking for comments by the end of this week. It is a very short document.

Thanks.

John Perrecone  
RAP/AOC Liaison  
Great Lakes National Program Office  
US EPA, Region 5  
77 West Jackson Blvd.  
Chicago, IL 60604

John: I reviewed the delisting information for "Added Costs to Agriculture and Industry" and agree with the rationale. The costs are basin-wide and not related to the AOC in any unique way. If there were no other historical reasons for the original listing of this BUI, then I believe the logic is reason enough to delist it in this case.

John Haugland, Environmental Protection Specialist  
Policy Coordination & Communications Branch  
Great Lakes National Program Office (G-17J)  
U.S. Environmental Protection Agency  
77 W. Jackson Blvd.  
Chicago, IL 60604

8/14/2009

Joanna and all,

I have reviewed the draft documents: Drinking water taste and odor problems & Added costs to agriculture and Industry. I have no comments or changes to these documents and I have no objections to delisting these two BUIs. Thanks.

I have not received any of the other 3 documents for review.

Betsy

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Betsy Trometer  
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