UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

11 MAR 2014

REPLY TO THE ATTENTION OF

Mr. Roger Eberhardt
Acting Deputy Director, Office of the Great Lakes
Michigan Department of Environmental Quality
525 West Allegan
P.O. Box 30473
Lansing, Michigan 48909-7773

Dear Roger:

Thank you for your February 7, 2014 request to remove the "Bird or Animal Deformities or Reproductive Problems" Beneficial Use Impairment (BUI) from the United States side of the St. Marys River binational Area of Concern (AOC) in Michigan. As you know, we share your desire to restore all of the Great Lakes AOCs and to formally delist them.

Based upon a review of your submittal and the supporting data, the U.S. Environmental Protection Agency hereby approves your BUI removal request for the United States side of the St. Marys River AOC. It is our understanding that the Ontario Ministry of the Environment and Environment Canada will undertake a study to determine the status of this BUI on the Canadian side of this AOC and they will remove this BUI for the Canadian side in a separate action.

EPA will notify the International Joint Commission of this significant positive environmental change at this AOC.

We congratulate you and your staff, as well as the many federal, state, and local partners who have worked so hard and been instrumental in achieving this important environmental improvement. Removal of this BUI will benefit not only the people who live and work in the St. Marys River AOC, but all the residents of Michigan and the Great Lakes basin as well. We look forward to the continuation of this important and productive relationship with your agency and the local binational coordinating committee as we work together to fully restore all of Michigan's AOCs. If you have any further questions, please contact me at (312) 353-4891, or your staff may contact John Perrecone, at (312) 353-1149.

Sincerely,

Chris Korleski, Director
Great Lakes National Program Office

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cc: Dan Wyant, Director, MDEQ
Jon W. Allan, MDEQ, Office of Great Lakes
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Bretton Joldersma, MDEQ, Office of Great Lakes
Stephen Locke, IJC
Wendy Carney, EPA, GLNPO
John Perrecone, EPA, GLNPO
Ted Smith, EPA, GLNPO

STATE OF MICHIGAN
OFFICE OF THE GREAT LAKES
LANSING

RICK SNYDER
GOVERNOR

JON W. ALLAN
DIRECTOR

February 7, 2013

Mr. Chris Korleski, Director
Great Lakes National Program Office
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard (G-17J)
Chicago, Illinois 60604-3507

Dear Mr. Korleski:

The purpose of this letter is to request the United States Environmental Protection Agency (USEPA), Great Lakes National Program Office's (GLNPO) concurrence with the removal of the Bird or Animal Deformities or Reproductive Problems Beneficial Use Impairment (BUI) for the St. Marys River Area of Concern (AOC). The Michigan Department of Environmental Quality (MDEQ) has assessed the status of this BUI in accordance with the state's *Guidance for Delisting Michigan's Great Lakes Areas of Concern* and recommends that the BUI be removed from the list of impairments in the St. Marys River AOC.

Enclosed please find documentation to support this recommendation, including the BUI removal Briefing Papers prepared by the MDEQ's technical staff. The St. Marys River Binational Public Advisory Council submitted a letter stating their support for the removal recommendations on September 30, 2013. The proposed BUI removal was public noticed via a listing in the MDEQ Calendar, and supporting documents were posted on the MDEQ's AOC program web page. No written comments were received during the public notice period which ran from September 11, 2013, through October 14, 2013. In addition, the Ontario Ministry of the Environment and Environment Canada were consulted on this proposed action and no objections/concerns were raised.

We value our continuing partnership in the AOC Program and look forward to working with the GLNPO on the removal of BUIs and the delisting of AOCs. If you need further information concerning this request, please contact Mr. Bretton Joldersma, Office of the Great Lakes, at 517-284-5048, or at joldersmab@michigan.gov, or you may contact me.

Sincerely,

Roger Eberhardt
Acting Deputy Director
517-284-5035

Enclosures
cc/enc: Mr. Ted Smith, USEPA
Mr. John Perrecone, USEPA
Mr. Jon W. Allan, MDEQ
Mr. Richard Hobrla, MDEQ
Mr. Bretton Joldersma, MDEQ

Removal Recommendation
Bird or Animal Deformities or Reproductive Problems
Beneficial Use Impairment
St. Marys River Area of Concern

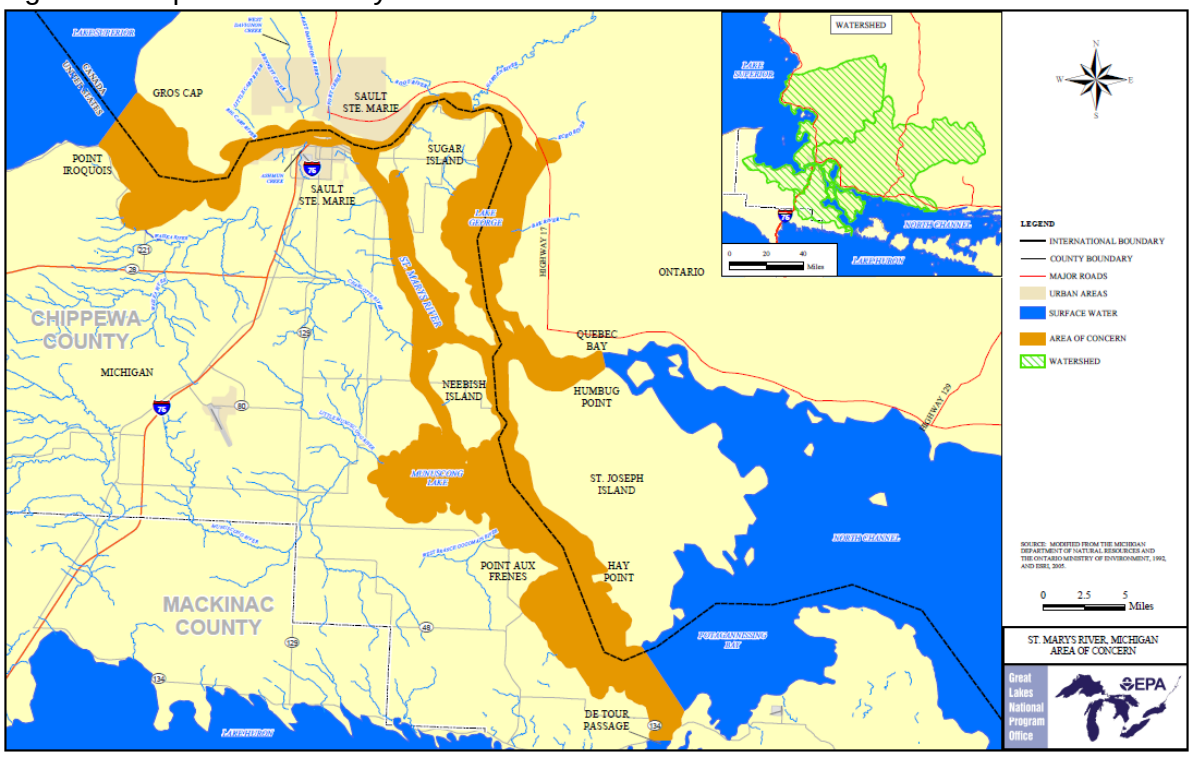
Issue

The Michigan Department of Environmental Quality (MDEQ), Office of the Great Lakes, Areas of Concern (AOCs) program recommends removal of the Bird or Animal Deformities or Reproductive Problems (Deformities/Reproductive) Beneficial Use Impairment (BUI) for the St. Marys River Area of Concern (AOC). The recommendation is made with the support of the St. Marys River Bi-National Public Advisory Council (BPAC), the United States Fish and Wildlife Service, and MDEQ Water Resources Division. This request is made in accordance with the process and criteria set forth in the *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (*Guidance*) (MDEQ, 2008).

Background

The St. Marys River forms the international border between Michigan's eastern Upper Peninsula and the Canadian Province of Ontario and is the connecting channel between Lake Superior and Lake Huron. The geographic extent of the St. Marys River AOC (Figure 1) is defined by the area of the river which extends from Whitefish Bay between Point Iroquois, Michigan and Gros Cap, Ontario; east and downstream between Quebec Bay and Humbug Point, Ontario in the St. Joseph Channel; between the Michigan side of the river and St. Joseph Island, downstream to the De Tour Passage, Michigan (EC et al., 2002). "The St. Marys River was identified as an AOC as a result of problems associated with phosphorus, bacteria, heavy metals, trace organics, contaminated sediments, fish consumption advisories, and impacted biota" (OMOE and MDNR, 1992).

Figure 1: Map of the St. Marys River AOC



Ten BUIs remain in the St. Marys River AOC: Restrictions on Fish and Wildlife Consumption, Fish Tumors or other Deformities, Bird or Animal Deformities or Reproductive Problems, Degradation of Benthos, Restrictions on Dredging Activities, Eutrophication or Undesirable

Algae, Beach Closings, Degradation of Aesthetics, Degradation of Fish and Wildlife Populations, and Loss of Fish and Wildlife Habitat. This removal recommendation only pertains to the Bird or Animal Deformities or Reproductive Problems BUI.

According to the 1992 Remedial Action Plan (RAP) there were limited data on contaminant concentrations in birds or mammals within the AOC. Prior to 1992, concentrations of contaminants (i.e., polychlorinated biphenyls [PCBs], *p,p'*-Dichlorodiphenyldichloroethylene [*p,p'*-DDE], and 2,3,7,8-Tetrachlorodibenzodioxin) in herring gull eggs from Lake George, while elevated, were typical of other areas of the Great Lakes. The highest PCB concentration measured in common tern eggs sampled from the lower portion of the river was in the range that could produce harmful effects in eggs. However, at that time, there were no documented reports of bird or animal deformities or reproductive problems within the St. Marys River AOC. Therefore, the Deformities/Reproductive beneficial use was not listed as impaired (OMOE and MDNR, 1992).

In 1998, researchers from Michigan State University found three (3) common tern chicks with crossed bills out of 120 birds sampled on Lime Island (Figure 2). Because the cause of the crossed bills was unknown, the status of the Deformities/Reproductive beneficial use was changed to "requires further assessment" in the 2002 RAP (EC et al., 2002). During the development of the MDEQ's *Guidance* the state compiled an official list of impaired beneficial uses for all of the AOCs within Michigan, and the Deformities/Reproductive BUI was listed as impaired for the St. Marys River AOC.

In December 2008, the St. Marys River BPAC voted to adopt the statewide restoration criteria outlined in the *Guidance* for all of the BUIs except for Degradation of Benthos (MDEQ, 2009). The specific restoration criteria for the Deformities/Reproductive BUI are detailed in the following section.

Figure 2: Location of Lime Island

Removal Criteria

In accordance with the MDEQ's *Guidance* the restoration criteria for the St. Marys River AOC's Bird or Animal Deformities or Reproduction Problems BUI requires that:

Approach 1: Observational Data and Direct Measurements of Birds and Other Wildlife

- Evaluate observational data of bird and other animal deformities for a minimum of 2 successive monitoring cycles in species identified in the RAP as exhibiting these problems. If deformity or reproductive problem rates are not statistically different than inland background levels (at a 95% confidence interval), or no reproductive or deformity problems are identified during the two successive monitoring cycles, the BUI is restored. If the rates are statistically different, it may indicate a source from either within or from outside the AOC. Therefore, if the rates are statistically different or the amount of data is insufficient for analysis, then:

- Evaluate tissue contaminant levels in egg, young, and/or adult wildlife. If contaminant levels are lower than the Lowest Observable Effect Level (LOEL) for that species or are not statistically different than inland control populations (at a 95% confidence interval), then the BUI is restored.

Where direct observation of wildlife and wildlife tissue data is not available, the following approach will be used:

Approach 2: Fish Tissue Contaminant Levels as an Indicator of Deformities or Reproductive Problems

- If fish tissue concentrations of PCBs, dioxins, dichlorodiphenyltrichloroethane (DDT), or mercury (as determined in the RAP) contaminants of concern in the AOC are at or lower than the LOEL known to cause reproductive or developmental problems in fish-eating birds and mammals, the use impairment is restored.

OR

- If fish tissue concentrations of PCBs, dioxins, DDT, or mercury in the AOC are not statistically different than the associated Great Lake (at 95% confidence interval), then the BUI is restored. In the connecting channel AOCs, either the upstream or downstream Great Lake may be used for comparison.

The attached excerpt from the Guidance (pages 23-27) includes the rationale for the delisting criteria (Attachment A).

Analysis

Due to the existence of both observational data and contaminant levels in wildlife, Approach 1 was used for this BUI assessment in the AOC. A technical committee, consisting of MDEQ, U.S. Fish and Wildlife Service, and Michigan Department of Natural Resources technical staff was assembled for the assessment and analysis of available data.

As previously mentioned, the Deformities/Reproductive beneficial use was listed as impaired because researchers identified three (3) common tern chicks with crossed bills out of 120 sampled. In the last 15 years, the only time crossed bills have been observed in common terns or other birds in the AOC was on Lime Island during the 1998 sampling event, and those results indicated a deformity rate in young that year of 2.5%. In 2012, the MDEQ completed a statewide assessment of the Bird or Animal Deformities or Reproductive Problems BUI and did not find evidence that common terns were adversely impaired in the St. Marys River AOC.

The statewide assessment focused on assessing the impacts of *p,p*'-DDE, PCBs, and dioxin toxic equivalents (TEQs) on bald eagles, common terns, and mink within the AOC. However, any relevant wildlife studies and/or data were also reviewed as part of the assessment. Since the MDEQ does not monitor productivity or contaminant levels in common terns in the St. Marys River, it was necessary to use herring gulls as a surrogate species to assess impacts on terns. Specifically, the herring gull egg contaminant data collected from 2002 to 2006 for the State of Michigan's long term trend monitoring effort was used to assess impacts to terns nesting in the St. Marys River AOC (Bush and Bohr, 2012).

Herring gulls have a lower sensitivity to PCBs, *p,p'*-DDE, and TEQs than common terns. So, in order to use herring gulls as a surrogate, the statewide assessment assumed that if concentrations of these contaminants in herring gull eggs are below the Lowest Observable Adverse Effect Levels (LOAEL) identified for more sensitive species, then adverse impacts would not be expected to occur in these species when they are nesting near the herring gull colony. This assumption is supported by field studies that have shown that PCB, *p,p'*-DDE, and TEQ concentrations in herring gull eggs are similar to, or higher than, contaminant levels in the eggs of more sensitive species of birds like common and Caspian terns, nesting nearby (Bush and Bohr, 2012).

As detailed in the report, data from two herring gull colonies within the AOC (Five Mile Island and West Twin Pipe) were used for the assessment. Concentrations of PCBs in herring gull eggs from the AOC were compared to LOAELs that have been established for common tern and double-crested cormorant eggs. These species were selected for the PCB comparison because they are more sensitive to contaminants than herring gulls and because PCB concentrations in herring gull eggs are normally greater than concentrations found in common tern and double-crested cormorant eggs. The five-year median PCB concentration found in the herring gull colonies within the AOC was 3.1 milligrams per kilogram (mg/kg) which is lower than the established LOAEL for common tern eggs (7.6 mg/kg) and double-crested cormorant eggs (7.3 mg/kg).

Concentrations of *p,p'*-DDE in herring gull eggs were compared to double-crested cormorant eggs because cormorants had the lowest established LOAEL for *p,p'*-DDE. For the colonies within the St. Marys River, the five-year concentrations of *p,p'*-DDE in herring gulls was determined to be 1.0 mg/kg which is lower than the established LOAEL for *p,p'*-DDE in double-crested cormorants (10 mg/kg).

TEQ concentrations in herring gull eggs were compared to the LOAEL found for great blue herons because they had the lowest established effect levels for TEQs. The five-year median TEQ concentration for herring gull eggs from the AOC was determined to be 222 nanograms per kilogram (ng/kg) which is lower than the established LOAEL for great blue herons (360 ng/kg).

As mentioned earlier, the five-year median PCB, *p,p'*-DDE, and TEQs concentration in herring gull eggs was determined to be 3.1 (mg/kg), 1.0 mg/kg, and 222 (ng/kg), respectively. This is significant because when compared to comparison populations, the data for the St. Marys River AOC shows that contaminant levels of PCBs, *p,p'*-DDE, and TEQs are relatively low compared to other herring gull colonies in Michigan (Table 1).

Table 1: Median concentrations of PCBs, *p,p*'-DDE, and TEQs in composite samples of herring gull eggs collected from colonies in Michigan from 2002 to 2006.

		Median Concentration		
	N†	**PCB (mg/kg)**	***p,p'*-DDE (mg/kg)**	**TEQ (ng/kg)**
Lake Michigan				
Grand Traverse Bay (Bellows I.)	5	3.1	2.2	739
Straits of Mackinac (Green I.)	5	3.0	1.6	228
Lake Huron				
Thunder Bay (Scarecrow I.)	5	4.1	1.5	183
Saginaw Bay/River AOC* (L. Charity I.)	3	6.0	1.3	739
St. Marys River AOC* (5-Mile I. and W. Twin Pipe I.)	9	3.1	1.0	222
Lake Superior				
Whitefish Bay (Tahquamenon I.)	4	3.3	1.5	185
Huron National Wildlife Refuge (Huron I.)	2	3.0	1.5	397
Isle Royale (Net I.)	4	3.6	1.9	217
Lake Erie				
River Raisin AOC* (Detroit Edison)	5	10.8	1.1	686
All non-AOC Sites Combined	25	3.4	1.6	210

† - Number of composite samples analyzed over the five-year period; a composite consisted of 1 egg from each of 13 separate nests from each colony
*- AOC with the Deformities/Reproductive BUI

Source: Bush and Bohr, 2012

Tissue contaminant data from herring gull eggs indicate that contaminant levels in the AOC's herring gull colonies are lower than LOAELs that have been established for species that are more sensitive to contaminants then herring gulls (i.e., common terns, double-crested cormorants, and great blue herons). Further, contaminant concentration levels in the AOC's herring gull colonies are relatively low compared to other herring gull colonies in Michigan. Based on this information, the AOC's herring gull colonies are meeting the restoration criteria detailed under Approach 1.

This is an important finding because, as stated earlier, field studies have shown that PCB, *p,p'*-DDE, and TEQ concentrations in herring gull eggs are similar to, or higher than, contaminant levels in the eggs of more sensitive species of birds, including common terns, nesting nearby. Therefore, based on the herring gull data, it can be concluded that the common terns nesting within the AOC are not being adversely affected by exposure to *p,p*'-DDE, PCBs, and TEQs.

As detailed in the *Guidance*, the restoration criteria for the Deformities/Reproductive BUI is linked to the specie(s) identified in the RAP as exhibiting deformities or reproductive problems. In the case of the St. Marys River AOC, this beneficial use was listed as impaired because of the identification of three (3) common terns with crossed-bills. Based on the data presented in the statewide assessment, it can be concluded that common terns nesting within the AOC are meeting the restoration criteria. Therefore, this BUI is ready to be removed in the St. Marys River AOC.

Supporting Lines of Evidence

The conclusions of this assessment are supported by the preliminary findings from a 2011 and 2012 Environment Canada (EC) study that examined the reproduction and development of herring gulls and common terns nesting within the St. Marys River AOC. The preliminary findings from EC's study indicate that "based on the current available data, concentrations of PCBs, other organochlorine compounds, PBDEs, and mercury were not sufficiently elevated to adversely impact the reproductive success and development of herring gulls and common terns foraging in the St. Marys River AOC" (Hughes *et al*. 2013). Further the preliminary data "…suggest that there is little evidence of impaired reproduction or deformities in colonial waterbirds attributable to local contamination effects within the St. Marys River AOC (Ontario)" (Hughes *et al*. 2013). Therefore, EC's preliminary findings support the conclusion that the Deformities/Reproductive BUI meets criteria in the *Guidance* and is ready to be removed.

In addition, this removal recommendation is also supported by bald eagle data for the AOC. As detailed in the statewide assessment, the overall productivity and overall success rates of bald eagles nesting in the St. Marys River AOC were higher than observed in all of the comparison populations (see Table 2). The productivity of bald eagles in the St. Marys River was determined to be 1.2 fledged nestlings per occupied nest which is indicative of a healthy population (a healthy population is considered anything ≥ 1.0 fledged nestling per occupied nest) (Bush and Bohr, 2012).

Therefore, the AOC's herring gull data, the preliminary data from EC's study, and the AOC's bald eagle data provide multiple lines of evidence that the Deformities/Reproductive beneficial use is not impaired. These multiple lines of evidence support the finding that this BUI is ready to be removed in the St. Marys AOC.

Table 2: Bald eagle productivity, brood size, and success rates in the St. Marys River AOC territories compared to territories with access to Lake Huron fish, Lake Superior fish, and all territories statewide. Estimates are averages over the five-year period from 2006 to 2010.

Population Metric[1]	SMR AOC	Lake Huron[2]	Lake Superior[3]	Great Lakes Statewide[3]	Inland Upper Peninsula[3]	Inland Statewide[3]
Productivity	1.20	0.90	0.99	1.09	0.98	1.03
Brood Size	1.54	1.38	1.56	1.59	1.49	1.51
Success Rate	0.78	0.65	0.64	0.69	0.66	0.68
Mean # Territories	15.2	13.8	48.0	172.8	120.4	306.2

[1] - definitions for population metrics
- Productivity equals the number of fledged young per occupied nest
- Brood Size equals the number of fledged young per successful nest
- Success Rate equals the percent of nesting attempts producing at least one fledged young
- Mean # Territories equals the average number of active nests per year over the 5-year period

[2] - territories in the upper peninsula (Chippewa and Mackinac Counties) with access to Lake Huron fish, excluding the SMR AOC
[3] - excluding all AOCs

Source: Bush and Bohr, 2012

Recommendation

Based upon the data reviewed, the MDEQ AOC program staff recommends removal of the Bird or Animal Deformities or Reproductive Problems BUI in the St. Marys River AOC. This recommendation is made with consultation and input from the U.S. Fish and Wildlife Service, MDEQ Water Resources Division, and local Michigan Department of Natural Resources Wildlife Division staff. The findings from the statewide assessment were presented to the BPAC during their June 19, 2013, meeting. This removal recommendation was discussed in detail with the St. Marys River BPAC during their September 4, 2013, meeting. At that time, BPAC members voted to support the removal of the BUI. In addition, the BPAC submitted a letter dated September 30, 2013, expressing support for this action (Attachment B).

This proposed action was public noticed for 30 days via a listing in the MDEQ Calendar (Attachment C). Supporting documents were posted on the MDEQ's AOC program web page for public review and comment from September 11, 2013, through October 14, 2013. No written comments were received during the public notice period.

The Ontario Ministry of the Environment (OMOE) and (EC) were consulted on this proposed action. This removal recommendation was discussed during the September 20, 2013, Four Party Managers Meeting. No objections/concerns were raised by OMOE or EC regarding the recommendation to remove the Bird or Animal Deformities or Reproductive Problems BUI from the U.S. side of the St. Marys River AOC.

Prepared by: Bretton Joldersma, AOC Coordinator
Great Lakes Management Unit
Office of the Great Lakes
Michigan Department of Environmental Quality
November 7, 2013

Attachments

Attachment A: Bird or Animal Deformities or Reproduction Problems; pages 23-27 of the *Guidance for Delisting Michigan's Great Lakes AOCs*

Attachment B: BPAC letter of support, September 30, 2013

Attachment C: MDEQ's September 23, and October 7, 2013, Calendars

References

Bush, D., Bohr, J., 2012. Assessment of the Bird or Animal Deformities or Reproductive Problems Beneficial Use Impairment in Michigan's Great Lakes Areas of Concern. Lansing, Michigan. MI/DEQ/WRD-12/032.

Environment Canada (EC), United States Environmental Protection Agency (USEPA), Ontario Ministry of the Environment (OMOE), Michigan Department of Environmental Quality (MDEQ). 2002. The St. Marys River Area of Concern Remedial Strategies for Ecosystem Restoration.

Hughes, K.D., Crump, D., Williams, K., Martin, P.A.. 2013. DRAFT Assessment of the Wildlife Reproduction and Deformities Beneficial Use Impairment (BUI) in the St. Marys River Area of Concern. Environment Canada.

Michigan Department of Environmental Quality (MDEQ). 2008. Guidance for Delisting Michigan's Great Lakes Areas of Concern. Report MI/DEQ/WB-06/001 www.deq.state.mi.us/documents/deq-wb-aoc-delistguide.pdf.

Michigan Department of Environmental Quality (MDEQ). 2009. The Michigan Department of Environmental Quality Biennial Remedial Action Plan Update for Michigan's Portion of the St. Marys River Area of Concern.

Ontario Ministry of the Environment (OMOE) and Michigan Department of Natural Resources (MDNR). 1992. The St. Marys River Area of Concern Stage 1 Remedial Action Plan, *Environmental Conditions and Problem Definitions.*

Attachment A

2008 Guidance for Delisting Michigan's Great Lakes Areas of Concern: Restoration Criteria for the Bird or Animal Deformities or Reproduction Problems BUI

Bird or Animal Deformities or Reproductive Problems

Significance in Michigan's Areas of Concern

Seven of Michigan's AOCs are listed as either impaired or unknown status for bird and animal deformities (e.g., crossed bills) or reproductive problems (e.g., egg shell thinning), including: River Raisin, St. Clair River, Detroit River, Saginaw River/Bay, St. Marys River, Deer Lake, and Kalamazoo River.

In Saginaw River/Bay, Deer Lake, and Kalamazoo River, past studies have indicated elevated toxic chemical concentrations (e.g., mercury or PCBs) and/or some deformities in birds and other animals. In the other AOCs which list this BUI, the status is either unknown or inconclusive. In most cases, studies on bird and animal deformities have not been done. The species historically impacted are fish eating birds or animals such as bald eagles, herring gulls, common terns, mink, or otter. The contaminants associated with these impacts are primarily the persistent bioaccumulative toxics: PCBs, dioxins, DDT, and mercury.

Michigan Restoration Criteria and Assessment

Restoration of this BUI will be demonstrated using two approaches, depending on availability of data in a particular AOC. The first approach evaluates restoration based on field assessment of birds and/or other wildlife in those AOCs where MDEQ or other State-approved bird and wildlife data are available.

The second approach will be applied in those AOCs where bird and other wildlife data are not available, and uses levels of contaminants in fish tissue known to cause reproductive or developmental problems as an indicator of the likelihood that deformities or reproductive problems may exist in the AOC.

<u>Approach 1 – Observational Data and Direct Measurements of Birds and Other Wildlife</u>

- Evaluate observational data of bird and other animal deformities for a minimum of 2 successive monitoring cycles in species identified in the RAP as exhibiting these problems. If deformity or reproductive problem rates are not statistically different than inland background levels (at a 95% confidence interval), or no reproductive or deformity problems are identified during the two successive monitoring cycles, then the BUI is restored. If the rates are statistically different, it may indicate a source from either within or from outside the AOC. Therefore, if the rates are statistically different or the amount of data is insufficient for analysis, then:

- Evaluate tissue contaminant levels in egg, young, and/or adult wildlife. If contaminant levels are lower than the Lowest Observable Effect Level

(LOEL) for that species or are not statistically different than inland control populations (at a 95% confidence interval), then the BUI is restored.

Data for a comparison study must come from a control site which is agreed to by the MDEQ, in consultation with MDNR. It will be chosen based on physical, chemical, and biological similarity to the AOC and the 2 sites must be within the same U.S. EPA Level III Ecoregions for the Conterminous U.S. (see references).

Where direct observation of wildlife and wildlife tissue data is not available, the following approach will be used:

Approach 2: Fish Tissue Contaminant Levels as an Indicator of Deformities or Reproductive Problems

- If fish tissue concentrations of PCBs, dioxins, DDT, or mercury (as determined in the RAP) contaminants of concern in the AOC are at or lower than the LOEL known to cause reproductive or developmental problems in fish-eating birds and mammals the use impairment is restored.

OR

- If fish tissue concentrations of PCBs, dioxins, DDT, or mercury in the AOC are not statistically different than the associated Great Lake (at 95% confidence interval), then the BUI is restored. In the connecting channel AOCs, either the upstream or downstream Great Lake may be used for comparison.

Fish of a size and species to be prey for the wildlife species under consideration must be used for the tissue data.

Rationale

Practical Application in Michigan

Bird and other animal deformities and reproductive problems have a particular challenge related to criteria for restoration:

- Most of the species involved are only part year residents in an AOC, or have a home range that may include locations outside an AOC. This makes it difficult to attribute deformities or reproductive problems to a specific location. The 2 approaches of the criteria address this.
- There is also a wide variation in how this use impairment was originally determined in Michigan's AOCs. Some AOCs had empirical data and some had anecdotal information.

- Many fish-eating birds and animals such as eagles are long-lived birds. Long after remedial actions have occurred and a site is restored, it is possible for reproductive effects to remain apparent.
- It is very difficult to determine actual prevalence of deformities and reproductive problems. Fox and Bowerman (in press), provide examples of this last point and detail issues with assessments of this BUI.
- In some AOCs with this BUI, the species monitored under MDEQ's wildlife monitoring program do not reside there, so no direct wildlife data are available.

Given the above practical considerations, the statewide criteria for this BUI uses two approaches – one for AOCs where wildlife data are available, and a second approach where direct wildlife information is not available. In the latter case, contaminant levels in fish tissues are used as an indicator of potential deformities or reproductive problems in the fish-eating species which have historically been impacted by contaminants (e.g., eagles, herring gulls, mink, and otter). Even in the absence of direct wildlife data, if contaminant levels in fish tissue are high, it indicates that the possibility for deformities or reproductive problems in fish-eating wildlife may be higher.

The contaminants of concern are PCBs, dioxins, DDT, and mercury and each AOC with this BUI may have one or more contaminants present. Assessment in each AOC will be based on the relevant contaminant(s).

The State will consider restoration of this BUI on a case-by-case basis for AOCs with circumstances that may not fit exactly into the process outlined above.

1991 IJC General Delisting Guideline

When the incidence rates of deformities or reproductive problems in sentinel wildlife species do not exceed background levels in inland control populations.

The IJC general delisting guideline for the BUI is presented here for reference. The Practical Application in Michigan subsection above describes application of specific criteria for restoration based on existing Michigan programs and authorities.

State of Michigan Programs/Authorities for Evaluating Restoration

Michigan assesses water bodies throughout the state on a 5-year basin rotation plan according to the MDEQ's "Strategic Environmental Quality Monitoring Program for Michigan's Surface Waters" (MDEQ, 1997) and "Michigan Water Quality Strategy Update" (MDEQ, 2005). Each year, a set of targeted watersheds is sampled at selected sites defined by the NPDES permitting program for conventional and toxic pollutants, and biological and physical

habitat/morphology indicators. The set of watersheds sampled rotates each year, with each major watershed in the state revisited every 5 years (see Appendix 1 for maps of the basin rotations). One element of the strategy is wildlife contaminant monitoring.

Wildlife play an important role in monitoring water quality and ecosystem health and can be used to monitor for spatial and temporal trends in contaminant concentrations. Specific life stages may be sampled to provide discrete time units for determination of temporal trends. Specific geographic regions or watersheds may be targeted for the determination of spatial trends.

The specific objectives of the wildlife contaminant monitoring are to:

1. Determine contaminant levels in wildlife that may be exposed to contaminants from surface waters of the state.

2. Assess whether contaminant levels in fish are changing with time.

3. Evaluate the overall effectiveness of MDEQ programs in protecting wildlife from toxic contaminants.

4. Determine whether new chemicals are bioaccumulating in wildlife.

The wildlife contaminant monitoring element currently consists of two components that, in combination, provide data necessary to achieve these objectives. These components include bald eagle and herring gull egg monitoring. The bald eagle project began in 1999 and has continued each year since then. Sample collection and analysis of herring gull eggs began in 2002. Wildlife are analyzed for bioaccumulative contaminants of concern, including mercury, PCBs, and chlorinated pesticides (e.g., DDT/DDE/DDD). Data are reviewed each year to determine whether there are additional new parameters of concern for which wildlife should be analyzed.

Another element of the State's monitoring strategy applicable to this BUI is enhanced and improved FCMP. Fish contaminant data are used to determine whether fish from waters of the state are safe for human and wildlife consumption, and as a surrogate measure of bioaccumulative contaminants in surface water. Fish tissues are analyzed for bioaccumulative contaminants of concern. These include mercury, PCBs, chlorinated pesticides (e.g., DDT/DDE/DDD), dioxins, and furans. More recently, some fish tissues have been analyzed for polybrominated biphenyl ethers (PBDEs) and perfluorooctane sulfonate (PFOS).

Fish contaminant studies needed for the assessment of this BUI restoration will be arranged by MDEQ as part of the Michigan FCMP. Timing and study design will be determined by the MDEQ based on available resources.

Some local AOC communities also have programs for monitoring water quality and related parameters which may be applicable to this BUI. If an AOC chooses to use local monitoring data for the assessment of BUI restoration, the data can be submitted to the MDEQ for review. If the MDEQ determines that the data appropriately address the restoration criteria and meet quality assurance and control requirements, they may be used to demonstrate restoration success.

Attachment B

St. Marys River Binational Public Advisory Council
Letter of Support for the Removal of the Deformities/Reproductive Problems BUI
From Michigan's Portion of the AOC

ST. MARYS RIVER

BINATIONAL PUBLIC ADVISORY COUNCIL

Bretton Joldersma
Great Lakes Management Unit
Office of the Great Lakes
Michigan Department of Environmental Quality
525 West Allegan Street
P.O. Box 30473
Lansing, MI 48909-7973

September 30, 2013

Re: Support for BUI Removals –Degradation of Aesthetics and Bird or Animal Deformities.

Dear Mr. Joldersma:

On behalf of the Binational Public Advisory Council (BPAC) for the St. Marys River Remedial Action Plan (RAP), we are writing to convey agreement by BPAC to removal of the Degradation of Aesthetics Beneficial Use Impairment (BUI) and the Bird or Animal Deformities BUI. At a meeting on September 4, 2013, the BPAC unanimously passed a motion supporting the removal of these BUIs.

As stated at the meeting, however, it is BPAC's request that, rather than unilaterally removing these BUIs from the U.S. side of the river alone, MDEQ and EPA should work with their Canadian counterparts to concurrently remove these BUIs.

The St. Marys River BPAC looks forward to continued progress in protecting and restoring the river ecosystem. If you have any questions, please do not hesitate to contact us.

Respectfully,

Mike Ripley, U.S. Chair

Lora Premo, Canadian Vice-Chair

Cc: St. Marys River Binational Public Advisory Council

Attachment C

MDEQ's September 23, and October 7, 2013, Calendars

tissue paper. The draft permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The responsible official of the stationary source is Clarence Roznowski, 437 South Main Street, Cheboygan, Michigan 49721. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Rebbecca Radulski, Michigan Department of Environmental Quality, Air Quality Division, Cadillac District Office, Gaylord Field Office, 2100 West M-32, Gaylord, Michigan 49735, or via e-mail to radulskir@michigan.gov by October 9, 2013. The decision-maker for the permit is Janis Denman, Cadillac District Supervisor. If requested in writing by October 9, 2013, a public hearing may be scheduled. Information Contact: ***Rebbecca Radulski***, Air Quality Division, radulskir@michigan.gov or 989-705-3404.

OCTOBER 9, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING CODING PRODUCTS INCORPORATED, KALKASKA, KALKASKA COUNTY (SRN: B6175), for the draft renewal of a Renewable Operating Permit (ROP) for the operation of a solvent base coating operation. The draft permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The responsible official of the stationary source is Mike Rasmussen, 475 North Gary Avenue, Carol Stream, Illinois 60188-4900. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Gloria Torello, Michigan Department of Environmental Quality, Air Quality Division, Cadillac District, Gaylord Field Office, 2100 West M32, Gaylord, Michigan 49735, or via e-mail to torellog@michigan.gov by October 9, 2013. The decision-maker for the permit is Janis Denman, Cadillac District Supervisor. If requested in writing by October 9, 2013, a public hearing may be scheduled. Information Contact: ***Gloria Torello***, Air Quality Division, torellog@michigan.gov or 989-705-3410.

OCTOBER 14, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *LOSS OF FISH AND WILDLIFE HABITAT* BENEFICIAL USE IMPAIRMENT FROM THE SAGINAW RIVER/BAY AREAS OF CONCERN. A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. In addition, a public meeting will be held on October 8, 2013, from 6:30-7:30 p.m. at the Bay County Public Library, 500 Center Avenue, Bay City, MI 48708. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: ***Bretton Joldersma***, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.

OCTOBER 14, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *BIRD OR ANIMAL DEFORMITIES OR REPRODUCTIVE PROBLEMS* BENEFICIAL USE IMPAIRMENT FROM THE ST. MARYS RIVER AREAS OF CONCERN. A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. If requested in writing, a public hearing may be scheduled. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: Bretton Joldersma, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.

OCTOBER 14, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *DEGRADATION OF AESTHETICS* BENEFICIAL USE IMPAIRMENT FROM THE ST. MARYS RIVER AREAS OF CONCERN. A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. If requested in writing, a public hearing may be scheduled. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: Bretton Joldersma, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.

OCTOBER 9, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING FORD MOTOR COMPANY, RESEARCH & ENGINEERING CENTER, DEARBORN, WAYNE COUNTY (SRN: B6230), for the draft renewal of a Renewable Operating Permit (ROP) for the operation of combustion engine test cells with associated dynamometers. Exhaust gas from certain engines are controlled by a thermal oxidizer. The draft permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The responsible official of the stationary source is Nina McIntyre and Joe Vicari, 1701 Village Road, Dearborn, Michigan 48121. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Jorge Acevedo, Michigan Department of Environmental Quality, Air Quality Division, Detroit District Office, 3058 West Grand Boulevard, Suite 2-300, Detroit, Michigan 48202, or via e-mail to acevedoj1@michigan.gov by October 9, 2013. The decision-maker for the permit is Wilhemina McLemore, Detroit District Supervisor. If requested in writing by October 9, 2013, a public hearing may be scheduled. Information Contact: ***Jorge Acevedo***, Air Quality Division acevedoj1@michigan.gov or 313-456-4679.

OCTOBER 9, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING GREAT LAKES TISSUE COMPANY, CHEBOYGAN, CHEBOYGAN COUNTY (SRN: B1563), for the draft renewal of a Renewable Operating Permit (ROP) for the operation of coal and natural gas boilers used in the manufacture of tissue paper. The draft permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The responsible official of the stationary source is Clarence Roznowski, 437 South Main Street, Cheboygan, Michigan 49721. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Rebbecca Radulski, Michigan Department of Environmental Quality, Air Quality Division, Cadillac District Office, Gaylord Field Office, 2100 West M-32, Gaylord, Michigan 49735, or via e-mail to radulskir@michigan.gov by October 9, 2013. The decision-maker for the permit is Janis Denman, Cadillac District Supervisor. If requested in writing by October 9, 2013, a public hearing may be scheduled. Information Contact: ***Rebbecca Radulski***, Air Quality Division, radulskir@michigan.gov or 989-705-3404.

OCTOBER 9, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING CODING PRODUCTS INCORPORATED, KALKASKA, KALKASKA COUNTY (SRN: B6175), for the draft renewal of a Renewable Operating Permit (ROP) for the operation of a solvent base coating operation. The draft permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The responsible official of the stationary source is Mike Rasmussen, 475 North Gary Avenue, Carol Stream, Illinois 60188-4900. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Gloria Torello, Michigan Department of Environmental Quality, Air Quality Division, Cadillac District, Gaylord Field Office, 2100 West M32, Gaylord, Michigan 49735, or via e-mail to torellog@michigan.gov by October 9, 2013. The decision-maker for the permit is Janis Denman, Cadillac District Supervisor. If requested in writing by October 9, 2013, a public hearing may be scheduled. Information Contact: ***Gloria Torello***, Air Quality Division, torellog@michigan.gov or 989-705-3410.

OCTOBER 14, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *DEGRADATION OF AESTHETICS* BENEFICIAL USE IMPAIRMENT FROM THE ST. MARYS RIVER AREAS OF CONCERN. A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. If requested in writing, a public hearing may be scheduled. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: ***Bretton Joldersma***, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.

OCTOBER 14, 2013

DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *BIRD OR ANIMAL DEFORMITIES OR REPRODUCTIVE PROBLEMS* BENEFICIAL USE IMPAIRMENT FROM THE ST. MARYS RIVER AREAS OF CONCERN. A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton

	Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. If requested in writing, a public hearing may be scheduled. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: ***Bretton Joldersma***, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.
OCTOBER 14, 2013	**DEADLINE FOR PUBLIC COMMENT REGARDING THE PROPOSED REMOVAL OF THE *LOSS OF FISH AND WILDLIFE HABITAT* BENEFICIAL USE IMPAIRMENT FROM THE SAGINAW RIVER/BAY AREAS OF CONCERN.** A link to the Removal Recommendation document can be found by clicking on "Progress Toward Restoring Beneficial Uses..." under the "Information" heading at: www.michigan.gov/deqaocprogram. Submit written comments to Bretton Joldersma, Michigan Department of Environmental Quality, Office of the Great Lakes, P.O. Box 30273, Lansing, Michigan 48909-7973, or to joldersmab@michigan.gov by midnight on October 14, 2013. In addition, a public meeting will be held on October 8, 2013, from 6:30-7:30 p.m. at the Bay County Public Library, 500 Center Avenue, Bay City, MI 48708. All comments received by October 14, 2013, will be considered prior to final action. Additional details on this proposed action may be obtained from: ***Bretton Joldersma***, Office of the Great Lakes at 517-284-5048, or at joldersmab@michigan.gov.
OCTOBER 15, 2013 6:30 p.m.	**PUBLIC HEARING ON PERMIT APPLICATION SUBMITTED BY HIDDEN VILLAGE HOMEOWNERS ASSOCIATION.** The Water Resources Division will hold a public hearing at 6:30 p.m. at the Bagley Town Hall, 2946 Old 27 South, Gaylord, Michigan 49735-8436. The hearing will be for Hidden Village Homeowner's Association, 303 Weydon Road, Worthington, Ohio, 43085. The applicant proposes to install a Laminar Flow Aeration System for Kassuba Lake. The system is proposed to consist of one C1144 Inversion System with 14 Micro-Porous Diffusers and 9,800 feet of self-sinking airline. Airline will be trenched form the compression station to the lake. System is proposed to be run during no-ice cover periods (approximately April 11 – November 30). No dredging is proposed. No mitigation is proposed. The project is located in T30N, R3W, Section 12, Bagley Township, Otsego County, Michigan. Information Contact: ***Roxanne Merrick***, Water Resources Division, merrickr@michigan.gov or 989-705-3442,
OCTOBER 16, 2013 10:00 a.m.	**TENTATIVELY SCHEDULED PUBLIC HEARING REGARDING WHITE PINE ELECTRIC POWER, LLC, WHITE PINE, ONTONAGON COUNTY (SRN: B1966),** for the draft renewal of a Renewable Operating Permit (ROP) for the operation of their steam and electricity generating plant. The permit is intended to simplify and clarify the facility's applicable requirements and will not result in any air emission changes at the stationary source. The ROP public notice documents can be viewed on the Web at www.deq.state.mi.us/aps. The responsible official of the stationary source is Steve Walsh, 29639 Willow Road, White Pine, Michigan 49971. Written comments on the draft ROP or a request to hold a public hearing are to be submitted to Thomas Maki, Michigan Department of Environmental Quality, Air Quality Division, Upper Penninsula District Office, 420 Fifth Street, Gwinn, Michigan 49841, or via e-mail to makit@michigan.gov by October 9, 2013. If requested in writing by October 9, 2013, a public hearing will be held at 420 Fifth Street in Gwinn, Michigan on October 16, 2013 at 10:00 am. Those interested may contact Thomas Maki on October 10, 2013 to determine if a hearing was requested and will be held. Information Contact: ***Thomas Maki***, Air Quality Division, makit@michigan.gov or 906-346-8503.
OCTOBER 16, 2013 **5:30 p.m. INFORMATIONAL SESSION 7:00 p.m. PUBLIC HEARING**	**INFORMATIONAL SESSION, PUBLIC HEARING, AND DEADLINE FOR PUBLIC COMMENT REGARDING DETROIT WATER AND SEWERAGE DEPARTMENT, DETROIT, WAYNE COUNTY,** on a proposed draft Permit for proposed upgrades of the Complex II sewage sludge incinerators and construction of a biosolids drying facility. Additionally, the upgrades of the Complex II sewage sludge incinerators and construction of a biosolids drying facility will require revisions to Renewable Operating Permit (ROP) No. 1996 00412. This public comment period meets the public participation requirements for a future administrative amendment to the ROP. The facility is located at 9300 West Jefferson Avenue, Detroit, Michigan. The responsible official for the source is Samuel A. Smalley, Assistant Director, 9300 West Jefferson Avenue, Detroit, Michigan. New Source Review and ROP public notice documents can be viewed at www.deq.state.mi.us/aps. The public hearing will be held on October 16, 2013, at the Delray Neighborhood House, 420 South Leigh Street, Detroit, Michigan. Prior to the hearing, an informational session will be held from 5:30 p.m. to 7:00 p.m., where staff will provide a brief introduction regarding the proposed project and be available to answer questions; the public hearing will immediately follow. Witten comments should be sent to Ms. Mary Ann Dolehanty, Permit Section Supervisor, Michigan Department of