Fermi3CEm Resource

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Subject: Fermi 3 comments and attachment
Attachments: algae modis oct 7.jpg; Fermi 3 Comment waterkeeper 01 2012.doc; onroe dte usgs 316 comments.htm

Please acknowledge receipt
Also attached Modis satellite image of Oct 7 Lake Erie showing massive algal bloom including shores of Monroe

Sandy Bihn
Lake Erie Waterkeeper Inc
Lake Erie - the warmest, shallowest, 'fishiest' of all the Great Lakes needs help to reduce phosphorous inputs to reduce algae
3911 N. Summit Building 2 Toledo, Ohio 43611
419-691-3788

Federal Register Notice: 76FR66998
Comment Number: 52

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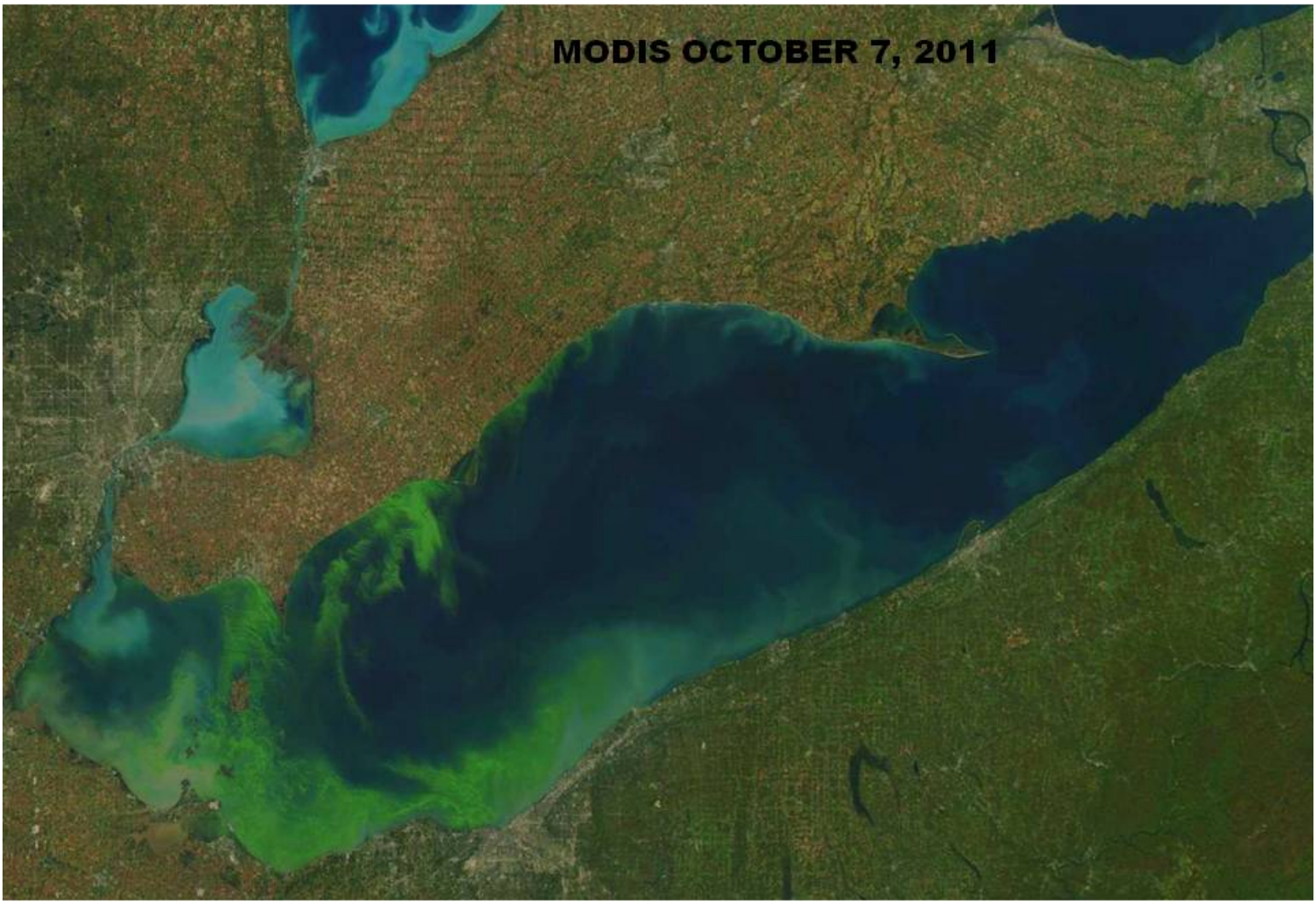
MODIS OCTOBER 7, 2011

Lake Erie **WATERKEEPER®** ***Inc.***

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Lake Erie Waterkeeper Mission: "To preserve, protect, and improve the waters and fish of Lake Erie, the warmest, shallowest, most biologically productive area in all of the Great Lakes through collaboration, education & advocacy.

January 11, 2011

Email to: Fermi3.COLEIS@nrc.gov
Docket ID NRC-2008-0566

Draft Environmental Impact
Statement for Combined License (COL)
for Enrico Fermi Unit 3
report number: NUREG-2105

Please accept the following comments submitted by Sandy Bihn, Lake Erie Waterkeeper

Fermi 3 Comment

1. Section 5.221 Line 1 after line 16 states that the Great Lakes Compact of 2008 requires that any new water use of more than 5 MGD be subjected to a regional review. Therefore, Fermi 3 would be subject to such a review by the other Great Lakes States and provinces.
   While this statement is correct, the State of Michigan has also adopted a water withdrawal model that should be part of this review.
   The EIS should include the analysis that is required in the Great Lakes Compact and the review required by Michigan DEQ for the 49.3 million gallons per day withdrawal from western Lake Erie. The EIS needs to incorporate these element, not have them determined independently. This information should have been part of the EIS.
2. Section 5.221 line 12 and forward discusses the volume of water that Detroit Edison will use for Fermi 3. The estimate provided is .006 percent of the total volume of water in all of Lake Erie. Fermi 3 is to be located in the shallowest part of Lake Erie – the western basin which holds only 5% of the total volume of Lake Erie water. Rather than .006 percent of the total Lake Erie water volume, the EIS should base the analysis of water in the Western Lake Erie basin. This means that the volume of water used would be .1727 percent of the western Lake Erie volume. This is based on 5% of 116 cubic miles = 5.8 cubic miles, .00006 times 116 equals .00696 cubic miles, .00696/5.8

cubic miles equals .12% of the water use in western Lake Erie where the plant is located, significantly more than .006% in the report.

Furthermore, the total volume of water used by DTE from western Lake Erie in the Monroe, Michigan area adds up to 4.8% of the water in the western basin of Lake Erie. Given the current algae crisis in Lake Erie, especially western Lake Erie the volume of water used in the basin with the increased discharge temperature decrease western Lake Erie water quality and increase algae growth.

3. Section 5.2.3.1 discusses the mixing zone/thermal plume as be about 55,000 square feet. This conflicts with a recent mixing zone/thermal study conducted by BP for Ohio EPA in Maumee Bay in about eight feet of water which is about the same as Fermi 3's estimated depth. That study showed the plume extending in some cases over one mile – significantly more than the Detroit Edison information suggests and from some research it appears that the same model was used. NRC should review the BP thermal report recently completed which includes analysis of fish kills and determine why there are such discrepancies in the mixing zone calculations.

   Also, if the calculations used in the thermal plume model use the entire volume of water in Lake Erie rather than the volume of water in the western basin, then the calculations for the thermal plume are understated.

   In addition there is a 2011 report by Limnotech that shows algae in the area of where Fermi 3 is to be built is not reported or discussed in the EIS. The growing algae problem in Lake Erie decreases water quality and caters to fish that live in lower water quality.
4. NOAA MODIS satellite imagery available for Lake Erie in 2011 shows massive algal blooms along the Monroe shoreline from July through October. Researchers say that the Lake Erie 2011 algal bloom was the largest ever recorded. Detroit Edison in their EIS depicted Lake Erie as being healthier and thriving when in fact the water quality and types of aquatic habitat it can support are declining. USEPA, Ohio EPA and others can verify the growing algae problem in Lake Erie. The Fermi Three plant will heat an estimated additional .12% of the water in western Lake Erie that will contribute to undesirable toxic algae growth which is a threat to human health and the environment. Contribution to algae growth and degradation to the fish population from the additional algae was not evaluated in the EIS.
5. Fish kill estimates are based on Fermi 2 counts. There is no analysis for Fermi Three of the incremental impact of additional fish kills in an already stressed western Lake Erie watershed. How many fish would Fermi 3 have to kill before there was an adverse impact on walleye and yellow perch populations in western Lake Erie either from the species themselves being killed or from the forage fish needed to support the walleye and yellow perch populations.
6. Section 5.2.2.1 line 6 page 5-9 talks about the water quantity withdrawal impacts when considering the Monroe/Frenchtown water intake. There is no discussion of the impact on the water intake waters from the discharged waters of Fermi 3 – both from water quality changes and from temperature changes. The State of Oregon bans drinking water intakes from being in a mixing zone. Given the shallow nature of the water – estimated at 8.5', it is imperative that the EIS include an analysis of impacts on the Monroe drinking water intake for the public health – both from increased temperatures and increased chemicals in the water.

Attachment A Size of thermal plume Bayshore power plant. Note that OEPA suggests that the thermal plume/mixing zone predictive model underestimates the size of the thermal plume. Given the conservative estimate below, Bayshore uses about 750mgd with 'an underestimated' average observed plume size of 216 acres while the model shows 84 acres, which is 2.52 times the model. If this observation would apply to Fermi 3, then the plume size would be 55,000 sq. ft. times 2.57 = 141,350 sq. ft.

This from a 2004 Ohio EPA Update of the Bayshore Power plant.

slightly less than the daily maximum water quality standards while it is possible that south shore temperatures exceed the 30-day average water quality standards during certain months. The 30-day average water quality standard for July is 83° F. and the temperatures recorded near the south shore were 82° F. and 86° F. for July 9th and July 30th, respectively.

- Size of the thermal plume. The largest thermal plume observed during the summer of 2002 was approximately 2,000 acres, or 3.1 square miles. The average plume size observed was 216 acres. The predictive computer model developed in the "Thermal Mixing Zone Study" projects a typical plume size of 84 acres. However, Ohio EPA believes that the predictive model underestimates the size of the thermal plume, especially as the plume size increases.

- Temperatures at the south shore. Assuming that temperatures measured at the water intake structure for the Bayshore Plant are a reasonable measure of background (or ambient) temperatures in Maumee Bay, the "Thermal Mixing Zone Study" showed that the temperature of water reaching the south shore during the summer are roughly 3 to 5° F. higher than ambient temperatures. (See Figures 3 - 9.) For example, temperatures measured near the south shore on July 30th were 86° F. while the intake or ambient temperature for July 30th was 81° F. In addition, the data shows that temperatures at the south shore are

Attachment B USGS comments on DTE 316 fish kills etc. for the coal fired power plant which may be applicable to Fermit 3 - attached

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Evaluation of 316(b) Demonstration Detroit Edison's Monroe Power Plant

Abstract – 1. In response to a request from the U.S. Fish and Wildlife Services (ELFO), the Great Lakes Fishery Laboratory undertook an evaluation of Detroit Edison's 316(b) demonstration for its coal-fired power plant at Monroe, Michigan. The evaluation was to serve (1) as a detailed critique of the Monroe plant 316(b) demonstration, for use by the field staff and other agencies responsible for reviewing that document, and (2) by way of example, as a guide to assist the field staff in their review of 316(b) demonstrations for other Great Lakes region power plants.

2. The 316(b) report states that an estimated 861,000 fish of various species, including 122,000 yellow perch, were impinged on the intake screens of the Monroe plant from June 1975 through May 1976 when the plant was operating at 57% of maximum capacity. These estimates differ substantially from those in the present report, which are based on Detroit Edison dta for the same period of time and show a potential impingement of 4.7 million fish, including 626,000 yellow perch.

The higher estimates given in the present report result mainly from two reasons. First, on most days when impingement data were collected, fish were counted from only a maximum of half of the plant's 16 intake screens. These count data were not expanded correctly to yield an impingement estimate for the whole plant that represents the number of fish impinged on the other screens from which no count data were collected. Secondly, the 316(b) did not consider as impinged any fish removed from the plant intake by the

"fish collectors" (a prototype system for pumping live fish from the screenwells) installed in the front of two of the plant's intake screens. In the present report, the fish removed by the collectors were considered to be impinged, because the 316(b) did not present evidence that these fish were returned unharmed to Lake Erie.

3. The 316(b) estimates that 21.4 million fish larvae (including about 5 million yellow perch larvae) and 13.1 million fish eggs were entrained at the Monroe plant during mid-May 1975 through mid-May 1976. Using Detroit Edison's data, the present report estimates that 20.7 million fish larvae and 27.5 million fish eggs were entrained during that same period. The discrepancy between the two annual fish egg entrainment estimates is apparently due to an error in the 316(b) whereby mean egg density in the cooling water passing through the Monroe plant was calculated by dividing the number of eggs found in samples from stations in the plant intake canal by the combined volume of water passing through the sampling pumps at stations in the intake canal and at stations in the plant discharge canal.

Although the present report verifies the procedures used to calculate the entrainment estimates presented in 316(b) for fish larvae and provides a corrected estimate for egg entrainment at the Monroe plant, the entrainment of eggs and larvae may even have been substantially higher than indicated. This possibility arises because the samples used for estimating the numbers of larvae and eggs entrained were collected only at 1-m and 3-m depths in the 5-7 m deep intake canal and because information not presented in 316(b) indicates most entrainable eggs and larvae would have been more abundant near the bottom of the Monroe plant intake canal than near the surface.

4. The 316(b) presents no estimate of the numbers of biomass of macrozoobenthos or zooplankton entrained annually at the Monroe plant. The present report estimates, on the basis of Detroit Edison data, that 55.6 million macrozoobenthic organisms, most of which (77% by number) were chironomids, were entrained during May 1975 through April 1976. This estimate of the number of macrozoobenthos entrained at the Monroe plant may be low because these organisms would normally be found at highest densities on or near the bottom, and because the Detroit Edison samples on which this estimate is based were collected at depths of 1 m and 3 m in the 5-7 m deep intake canal.

An estimate of zooplankton entrainment was developed using cooling water flow data from the 316(b) and published information on the density of zooplankton at the plant intake. According to this estimate about 159,000 kg (175 tons) of zooplankton were probably entrained during 1975-76. The most abundant zooplankton entrained were probably rotifers (77% of the total by number) and cladocerans (74% of the total by weight).

5. The 316(b) presents several estimates of the impact of impingement and entrainment losses of fish at the Monroe plant on the source populations in western Lake Erie. Impingement impact was assessed on the basis of the simple ratio of the number of fish impinged of a given species to the number of individuals of that species in the source population; a similar assessment was presented for the impact of entrainment of larval fish on the source population of larvae. The impact of larval entrainment was also evaluated by projecting the loss of entrained larvae to an equivalent loss of adults. The impact of fish egg entrainment was evaluated by considering the estimated number of entrained eggs as the equivalent number of adult females required to produce the eggs. The adequacy of these 316(b) impact assessments is subject to the concerns expressed above regarding the accuracy of the 316(b) estimates of the numbers of fish and fish eggs entrained and impinged and to other concerns detailed in the main body of the present report.

No estimate of the impact of macrozoobenthos or zooplankton entrainment at the Monroe plant is given in the 316(b) report. The available information suggests that large numbers of organisms that are food for fishes are entrained and that zooplankton may have a high mortality because most are entrained when condenser discharge temperatures have risen to the acutely lethal level.

6. The 316(b) contains no discussion of the impact of the plant on the Raisin River even though the entire flow of the river is diverted through the Monroe plant for cooling water during most of the year. Although resident fish populations in the upper river would probably be little affected by the plant, those fish populations that required access to both the upper river and to Lake Erie would be denied this access by the Monroe plant.

7. The impact of the combined entrainment and impingement losses of yellow perch at the Monroe plant was estimated by means of a model formulated for the U.S. Environmental Protection Agency by R.L. Patterson. This model projects the annual loss in potential yield of yellow perch to commercial and sport fisheries of western Lake Erie due to impingement and entrainment losses of that species at the Monroe plant. On the basis of the estimated impingement and entrainment losses of yellow perch given in the present report (approximately 626,000 and 5 million fish, respectively) and the assumption of 70% mortality of entrained larvae (as in Patterson's model), the annual loss in potential yield of yellow perch to the fisheries is about 265,000 pounds; if it is assumed, as in the 316(b), that the mortality of entrained larvae is 100%, the loss is approximately 267,000 pounds.

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