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U.S. Nuclear Regulatory Commission
Environmental Projects Branch 2
Division of New Reactor Licensing
Office of New Reactors
Washington, DC 20555-0001

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Comments Re: FEIS NUREG 2105

These comments will focus on water. Unless otherwise specified, all quotes are from the Final Environmental Impact Statement.

“Significant water use by traditional US energy power generating technologies, including nuclear, coal, natural gas and biomass, are a ‘major hidden cost’ associated with the fuels,” according to a report by Synapse Energy Economics, *The Hidden Costs of Electricity* (9/19/2012). “Too often left out of the equation are a number of important ‘hidden’ costs, also called indirect or externalized costs, associated with each generational technology,” said Geoff Keith, senior associate. “These include costs to society such as depletion of water and other resources, air and water pollution, detrimental impacts on human health and the environment, and contributions to global climate change.” Coal, nuclear, and natural gas-fired generation have the heaviest impact on water supplies, according to the study.

Lake Erie is the shallowest of the Great Lakes, and the warmest. According to an EPA fact sheet, “It is the shallowest of the five lakes and therefore warms rapidly in the spring and summer... The western basin, comprising about one-fifth of the lake, is very shallow with an average depth of 7.4 meters (24 feet).”

The Detroit River provides the vast majority of water to the western basin of Lake Erie, and water levels are down. Lake Huron’s outflow into the St. Clair River

and the outflow from Lake St. Clair into the Detroit River are expected to be below average this spring. Less water will be flowing into the western basin, creating a more shallow lake. "If water levels in Lake Erie were to decline significantly as a result of climate change, water temperatures would also likely rise in the summer, especially in the shallow western basin of Lake Erie." (Page 2-29)

Lake Erie being the shallowest and warmest is more susceptible to water use and temperature changes. The outfall waters of the proposed Fermi 3 would be in but 12-14' of water increasing the impacts of thermal use. In 1999, two Ohio reactors on Lake Erie's shores almost had to shut down when the high temperatures and low water levels brought the lake temperature very close to the 85-degree limit that requires the plants to stop generating electricity. (Lake Erie Heat Wave Threatens Nuclear Plants' Cooling Systems 8/10/1999 Associated Press)

"Lake Erie would serve as the source of cooling water for Fermi 3 and would also receive cooling water discharged from the proposed unit. Consequently, aquatic habitats and organisms in Lake Erie in the vicinity of the Fermi site have the greatest potential for being affected by building and operation of Fermi 3...Because the Fermi site is located on the shoreline of the western basin, this portion of Lake Erie is of the greatest concern relative to building and operation of the Fermi 3 unit." (Page F-43)

The City of Monroe has raised concern and doubt about another 7.6 billion gallons per year going out of the lake (Page 5.8) and 50 million gallons per day of a thermally discharge water heated about ten degrees warmer than the intake waters. Although the city welcomes the added financial gains to be made, they have their doubts about future water quality, as stated in their comments, "Lake Erie is the source of both water systems and due to the site work proximity to the intakes used to draw raw water from the lake, we are concerned that a decrease in raw water quality may result from the project conversely increasing water treatment plant costs to treat the water to safe drinking water standards." (Barry LaRoy, Director of Water & Wastewater Utilities, comment to Fermi3COLEIS comments, 12/11/11) The State of Oregon bans drinking water intakes from being in a mixing zone.

Furthermore, the Monroe shoreline saw the first sizeable algal bloom in 2011 (Limnotech) and 2012 (NOAA) in Lake Erie. This bloom originated in the warmth of Detroit Edison's coal fired plant and extended to the area where the proposed Fermi 3 would be built. The added 50 million gallons per day of warm

water will increase the bloom and have adverse impacts on Lake Erie water quality and habitat.

The FEIS states that Fermi 3 would only use .006 percent of the total volume of water in all of Lake Erie. That is a misleading statement. The plan is to locate Fermi 3 in the shallowest part of Lake Erie, the western basin with the 5% of Lake Erie's volume. Had the number crunchers for the FEIS based the analysis of the western basin's water, the volume of water used would be .1727 percent. (Lake Erie Waterkeeper, Inc.) That added to the 4.8 percent of water used by DTE for their other power facilities on the western basin.

The overarching worldwide water shortage certainly puts the Great Lakes as a valuable commodity, too valuable to risk with continued nuclear contamination.

Lake level projections based on climate change vary. As of this writing, the Great Lakes are at an all-time low (*Muskegon Index* 02/05/2013). One such projection states that by 2040, Lake Erie will be 3 to 5 feet shallower, due to "reductions in precipitation, an increase in evaporation, and less ice cover..." (Evaluation of Potential Impacts on Great Lakes, *Journal of Great Lakes Research* 2002) which would leave the F3 proposed water intakes an exposed (along with Fermi 2s). "One site was located in water approximately 3-5 feet and has a substrate that consists of mud and sand; this location is near the existing cooling water intake for Fermi 2 and the proposed location for the Fermi 3 intake." (Page F-43) Even if Detroit Edison digs deeper to keep the intakes under water, the consequences have not been established, investigated, or analyzed.

With lower lake levels, shipping channels will required more dredging and shorelines will move out into the lake bottom. That turbidity may very well stir up the blue-green algae nesting in the bottom, or any number of unanticipated scenarios. Again, this lack of specificity is a defect in the FEIS.

Climate change has caused 70% less ice in Lake Erie and increased water temperatures and is a contributor to fluctuating water levels. Fermi 3 will increase the degradation of the waters with the increased thermal contribution. The FEIS states, "The size of the thermal plume created by Fermi 3 discharge would increase slightly if lake levels were to decrease as a result of climate change." (Page 7-14) The thermal plume mixing zone should be added to the thermal discharges of the nearby Detroit Edison coal plant and Fermi 2. There must be a cumulative analysis of the thermal impacts.

The FEIS states, “As temperatures increase under anticipated climate change...could cause increased evaporation rates, which along with greater likelihood of drought, could reduce the extent of wetlands in the area.” (Page 7-18)

Section 5.2.3.1. estimates the mixing zone/thermal plume to be about 55,000 square feet. That conflicts with a study done for the Ohio EPA in Maumee Bay in water with a similar depth as the proposed Fermi 3 which showed the plume extending over one mile. As reported by Lake Erie Waterkeeper, the study also includes analysis of fish kills in the mixing zone.

The EPA allows the MDEQ to oversee their NPDES permits in Michigan (unlike other states). The FEIS infers the EPA may someday be involved at Fermi with another branch. “The EPA’s Great Lakes National Program Office has initiated the Great Lakes restoration Initiative to address environmental issues in five topical areas: cleaning up toxics and areas of concern, combating invasive species, promoting near shore health by protecting water sheds from polluted runoff, restoring wetlands and other habitats, and tracking progress and working with strategic partners. It is expected that this long-term initiative would address some water quality and non-native species concerns that contribute to cumulative impacts of aquatic resources in the area of interest.” (Page F-83)

“The standard practices for operating cooling towers include adding biocides to the water to limit growth of microorganisms inside the towers...” (Page 5-102) And the disclaimer “The NPDES permit for Fermi 3 does not include approval to discharge any treatment additives. Detroit Edison would be required to obtain written approval from the MDEQ...” (Page 5-11) This would allow more dangerous chemicals to be added to the lake with only one agency responsible for oversight. No study has been done to substantiate effect of added chemicals, and the FEIS does not address the issue.

The next area of concern relates to the surface water. “Surface water impacts include sediment loading, and thermal and chemical discharges from the proposed Fermi 3...On the basis of its evaluation, the review team concluded that the cumulative impacts on surface water quality would be MODERATE.” (Page 7-14) Climate change and the cumulative impacts of Detroit Edison Monroe, Fermi 2, and the addition of Fermi 3 need to be evaluated and factored into this assessment. Based on cumulative impacts, the designation as MODERATE

impact is suspect and will be challenged. A MODERATE classification designates serious degradation that cannot be avoided.

“Impacts on aquatic resources from building Fermi 3 would...include (1) building of a new intake structure, (2) building of a cooling water discharge structure, (3) construction of the barge slip, (4) building of a parking structure and a warehouse, (5) dewatering of the Fermi 2 excavation pit, (6) culverting of the south canal, (7) filling of the north and central canals, (8) building a fish return structure. Ground-disturbing activities that lead to soil erosion during site preparation and building of Fermi 3 could result in adverse effects on water quality... (Pages 4-47; F-52)

If the Biological Assessment had been made available for adequate public review before it was published in the Final Environmental Impact Statement, the public might have helped. The FEIS might have avoided such discrepancies as the B.A. assessing the Eastern Massasauga Rattlesnake (which hasn't been seen on the Fermi site) instead of the Fox Snake, which have been observed on site on many occasions (page K-15), including during the wetlands survey. A disclaimer, “No surveys specifically designed to evaluate the federally listed terrestrial species identified by the FWS, including species that are candidates for listing, have been conducted at the Fermi site.” (Page F-38) implies that whatever biological assessment was undertaken remains incomplete.

Neither the BA nor the FEIS mention the rise of beaver population in Monroe County and how their growth and presence may affect the wetlands, those to be impacted and the new ones to be built to replace the proposed destroyed ones. (“Beaver Population on Rise in Monroe County”, Monroe Evening News 12/4/2012) The omission leaves questions about whether other issues did not receive assessment, since beavers were not mentioned.

Detroit River again becoming home to beaver reads the AP story from March 18, 2013. The story as it appears:

"Updated 9:53 am, Monday, March 18, 2013

DETROIT (AP) — There's new evidence that the Detroit River once again is becoming home to the beaver, according to officials working improve the health of the river.

A trail camera set up at [DTE Energy Co.](#)'s River Rouge Power Plant earlier this year recorded images of a beaver dragging a small tree into the river, the [Detroit Free Press](#) reported (<http://on.freep.com/146tqQM>) Monday. It could be part of a sustained comeback.

"They could be expanding their range," said [John Hartig](#), manager of the [Detroit River International Wildlife Refuge](#).

Following a long absence, a beaver sighting was reported in 2009 at DTE's Conners Creek power plant along the Detroit River. He moved on during that summer, but later was spotted having returned with a family. Beaver sightings also have been reported on Belle Isle.

<http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php>

Read more: <http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvanEiJ7>

Read more: <http://www.seattlepi.com/business/energy/article/Detroit-River-again-becoming-home-to-beaver-4362805.php#ixzz2NvaTrFZS> " The FEIS is incomplete.

Beavers have the capability of suddenly and devastatingly altering wetlands, nothing in the FEIS has addressed this beaver concern. We request that a Supplemental FEIS be done to include beaver wetland modification potential at the proposed Fermi 3.

The solution being put forward as stated is inadequate: "Water-related environmental impacts from erosion-related degradation of surface water and the introduction on anthropogenic substances into surface and groundwater would occur, but the impacts would be mitigated through adherence to permit requirements..." (Page 4-96) The same solution is offered for the dredging pollution, and the excess consumption of the water. Construction permit conditions do not constitute mitigation.

"Section 4.3.2.5. "No additional mitigation measures, beyond those that may be identified in the required NPDES stormwater construction permit and in any current or future permits issued by the USACE and MDEQ would be needed to reduce potentials impacts on water quality and aquatic resources." (Page 4-61)

Algae blooms are explained and the FEIS states, "Of particular concern in Lake Erie is *Microcystis* spp., a phytoplanktonic species of blue-green alga that can produce a substance (microcystin) that is toxic to fish and other organisms when concentrations are high enough...*Microcystis* spp. Blooms can affect water quality as well as the health of human and natural resources." (Page 2-73) General consensus is that algae blooms initiate in the western Lake Erie basin.

In 2011 and 2012, the first sizable algae bloom in Lake Erie was in front of the DTE coal fired plant, and extended to the area proposed for the Fermi 3 reactor. That was not discussed in the FEIS; instead, DTE infers that Lake Erie is getting continually healthier. Please see attached files Lake Erie Algae and Lake Erie Satellite Images. From these images it is clear that there is a serious algae bloom problem in the immediate vicinity of the Fermi 2 and proposed Fermi 3.

The update of the Great Lakes Water Quality Agreement Annex 4 is specifically dedicated to the urgent need to address the Lake Erie algae problem, with a draft report from the International Joint Commission due out in May 2013. The State of Ohio has reconvened the Lake Erie Phosphorus Task Force with a report due in June 2013.

The recent draft Detroit wastewater permit issued by the Michigan Department of Environmental Quality has provisions which require the wastewater plant to reduce phosphorus outputs because of the algae problem in Lake Erie.

Educational programs for farmers are being provided in order to reduce phosphorus runoff on the 4 R's program which received a special appropriation from the State of Ohio in 2012 of up to \$3 million. The Lake Erie algae bloom problem is a concern and threat to Lake Erie water quality and habitat.

Stated are challenges currently facing the lake. "Two main water quality concerns in Lake Erie are (1) increased phosphorus loading from regional agriculture activities causing toxic algal blooms, and (2) elevated concentrations of the bio accumulative contaminants..." (Page 7-13) The International Joint Commission is holding a series of meetings on Lake Erie algae.

Another assault on Great Lakes water degradation is due to thermal discharges. "Public and occupational health can be compromised by activities at the Fermi site that encourage the growth of disease-causing microorganism (etiologic agents). Thermal discharges from Fermi 2 into the circulating water system and Lake Erie have the potential to increase the growth of thermophilic microorganisms... These microorganisms could give rise to potentially serious human health concerns, particularly at high exposure levels." (Page 2-232) This would endanger the whole bio-region, yet there is no discussion in the FEIS as to how it – the thermal contribution from Fermi 3 – will be mitigated.

Wetlands are water on the land, and DTE proposes a permanent commitment of approximately 155 wetland acres onsite, and 1,069 acres offsite for transmission corridor. (Page 2-38) "Detroit Edison expects that Fermi 3 would require three

345 kilovolt lines in a single 300-ft-wide corridor extending north from the Fermi site and then west to the Milan Substation, for a total distance of about 29.4 miles.” (Page F-45) “ITC transmission has not conducted systematic terrestrial and aquatic surveys for the Fermi 3 lines.” (F-45) In other words, the FEIS reflects a situation of segmentation, where the transmission corridor has been excluded from its scope and is largely unanalyzed and unquantified.

Located on Fermi site is the Detroit River International Wildlife Reserve that would also be impacted by the proposed Fermi 3. “Portions of the Fermi site are managed as part of the DRIWR... These managed areas encompasses approximately 656 acres, including coastal wetlands and Palestrina wetlands, such as freshwater emergent wetlands and small lakes that are semi-permanently or seasonally inundated.” (Page F-42) As an International Wildlife Reserve, it should be protected from another radiological and chemical assault.

To compensate for the wetland and water destruction, and softening up the shock of displacing “several ecological communities, some of which are considered rare and imperiled” (page K-14) wetland species, DTE committed to build new wetlands, a mitigation plan. “To compensate for the wetland impacts, Detroit Edison proposes to restore wetlands offsite to the coastal zone of Western Lake Erie.” (Page K-8) The new wetlands will be several miles away and could take years to construct. How would species coming home to bear young know how to get to the new place? “Over 500 acres of wetlands are present at the Fermi site.” K-9

There is no credible economic analysis demonstrating need for another nuclear reactor on the shores of Lake Erie. There is already over 500,000 tons of high-level, lethal, radioactive waste being stored on the shores of the Great Lakes. After 70 years of high-level waste production industry-wide, there is no solution to the problem. No more should be considered. Legally, it should not be considered because of the US circuit court for District of Columbia’s ruling in the “waste confidence decision” case and the pending NRC rulemaking. (Page xxxviii)

DTE has repeatedly said they are not committed to building Fermi 3. Guy Cerullo, DTE spokesman for nuclear issues said the company has not committed to build, (DTE has until next week to rebut nuclear objections Toledo Blade 3/6/2013) He said the decision would be based on several factors, including appropriate legislation at both state and federal levels that address issues that would make construction reasonable for ratepayers.” Ratepayers pay for their own demise without a demonstrated need for additional energy?

We, the undersigned request the NRC deny the Combined Operating License for Fermi 3, as the FEIS is incomplete and inadequate pertaining to Water and Watershed concerns. We request Supplemental FEIS to address our concerns. We stand prepared to demonstrate why the license should be denied.

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