

Contention 1

***The Environmental Report is unacceptably deficient because it omits an adequate analysis of the significance of Fermi 3 environmental impacts and its contribution to cumulative and additive persistent toxic discharges into Lake Erie and the Great Lakes Basin from the nuclear industry.***

#### ARGUMENT

The Great Lakes Basin is comprised of Lake Michigan, Lake Superior, Lake Huron, Lake Erie and Lake Ontario. The Great Lakes Basin is bordered by eight states; Michigan, Ohio, Minnesota, Wisconsin, Indiana, Illinois, New York and Pennsylvania and two Canadian Provinces; Quebec and Ontario. The Great Lakes Basin forms the largest fresh water system on the Earth. The restoration, protection and sustainability of the Great Lakes Basin is of utmost importance to the region's residents, officials and resource managers in both the United States and Canada.

The Petitioners contend that Detroit Edison has omitted any analysis in its Environmental Report (ER) that would provide reasonable assurance that there is or is not an anticipated cumulative and additive environmental impact on Lake Erie and the Great Lakes Basin from the proposed construction and operation of Fermi 3.

Petitioners contend Detroit Edison's omission seeks to avoid or limit a determination of the significance of the new reactor's cumulative and additive impact on health, safety and environment by breaking its impact down into an unreasonably narrow and unsupported analysis of a smaller component part of the Great Lake Basin; namely, the area of surface water immediately in the vicinity of the Fermi nuclear power plant site on western Lake Erie.

The National Environmental Policy Act (NEPA) seeks to determine whether the requested licensing of the new nuclear power plant is related to other actions with individually insignificant but cumulatively significant impacts. As such, NEPA is clear that the significance of the proposed action exists if it is reasonable to anticipate a cumulatively significant impact to the environment. The Petitioners contend that a "hard look" under NEPA cannot be avoided by terming an action temporary or by breaking it down into small component parts. [10 C.F.R. 1508.27(b) (7)]

The NEPA review process further regards that the "hard look" at collective and cumulative environmental impacts of the proposed federal action should not be determined as a convenience to the applicant. The "rule of reason" is inherent in NEPA to ensure that federal agencies determine whether and to what extent to prepare an EIS is based on the usefulness of any potential new information.<sup>1</sup> [Marsh v. Ore. Natural Res. Council., 490 U.S. 360, 373-374 (1989)]

The Petitioners contend that Detroit Edison's ER constitutes neither a "hard look" nor complies with the "rule of reason" intended in a NEPA review. The Petitioners further contend that limiting by omission the scope of the environment impact analysis to the immediate vicinity of the proposed site on the western basin of Lake Erie is a scientifically unsupported convenience to the applicant.

Detroit Edison identifies at ER Part 3 Subsection 2.3.3.1 Surface-Water Quality "Lake Erie is the smallest of the Great Lakes in volume and is the shallowest of the five lakes." The Applicant identifies that the waters of the five lakes are in communication with Lake Erie having the shortest retention time of the Great Lakes, calculated at 2.6 years. The Applicant identifies that "*The Fermi site is located on the shores of Lake Erie's western basin, which comprises about one-*

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<sup>1</sup><http://supreme.justia.com/us/490/360/case.html>

*fifth of the lake area. The western basin is very shallow with an average depth of 24 feet and a maximum depth of 62 feet. (Reference 2.3-50)*" [Applicant, ER Section 3, 2.3.3.1, Page 99-100]

Detroit Edison's ER describes at Part 3 Section 2.3.1 the surface water bodies and the groundwater aquifers that supply the western basin of Lake Erie that is "*located in the vicinity of the Fermi 3 site.*" [COLA ER Part 3 Section 2.3.1, Page 2-57]

For its quantitative analysis of water impacts, the Applicant provides in the COLA ER Chapter 3 Subsection 2.3.2 a description of the surface-water and groundwater uses that could affect or be affected by the construction or operation of the proposed project. At Table 2.3-28, the Applicant provides "The Nine Sectors of Water Consumption in the Great Lakes Basin" including Self-Supply Thermoelectric Power (nuclear plants). It identifies by State (Michigan, Ohio, Wisconsin, Minnesota, Illinois, Pennsylvania and New York) and Country (including Canada) the reactors that are operating on the Great Lakes and their consumptive water use on the Great Lakes Drainage Basin in reference documents provided by the Great Lakes Commission Annual Report including "Great Lakes Regional Water Use: Database Repository: Representing 2004 Water Use Data in Gallons," <http://www.glc.org/wateruse/database/pdf/2004-gallons.pdf>, Page 100.

Detroit Edison also describes the proposed reactor's quantitative water impacts at Subsection 5.2.1.4 beginning at Page 5-11 which identifies 9 major sources of water consumption, including Self Supply Thermoelectric (Nuclear) power plants. The consumptive use of water for each sector, including the cumulative impact of reactors operating on all of the Great Lakes both on US and Canadian shores is listed in [Table 2.3-29](#). Flow rates and total water use concerning these sectors is provided in [Table 2.3-34](#). Yearly consumptions and water withdrawals for all of Lake Erie are shown on [Table 2.3-30](#) through [Table 2.3-33](#). Projected water-use is described in [Subsection 5.2.2.5](#). [COLA, ER, Part 3, Subsection 5.2.1.4, page 5-11 to 5-12]

The Applicant's ER provides analytical data on the cumulative and additive quantitative water usage and consumption by the nuclear power plants operating on the Great Lakes Drainage Basin. The operation of each and every nuclear power station on the Great Lakes Drainage Basin contributes to the cumulative and additive quantitative analysis of water use and consumption.

Petitioners point out that there are, in fact, 33 reactors licensed to operate and up to 12 additional newly proposed reactor units, including Fermi 3, on the Great Lakes Basin:

The reactor locations on the Great Lakes are:

Lake Michigan

Point Beach 1 & 2 and Kewanee (3 operational units, Wisconsin),  
Cook 1 & 2 and Palisades (3 operational units, Michigan)

Lake Huron

Bruce A & B (8 operational units, Ontario, Canada), proposed new  
Bruce units (up to 4 additional units, Tiverton, Ontario,  
Canada)<sup>2</sup>

Lake Erie

Fermi 2 (1 operational unit, Michigan), the proposed new Fermi 3  
(1 new unit, Michigan), Davis-Besse & Perry (2 operational units,  
Ohio), proposed new units at Nanticoke (up to 2 new units,  
Hammond County, Ontario, Canada)<sup>3</sup>

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<sup>2</sup> Status: Bruce Nuclear Power Plant Project, Canadian Nuclear Safety Commission, February 4, 2009,  
<http://www.nuclearsafety.gc.ca/eng/readingroom/newbuilds/brucepower/index.cfm>

<sup>3</sup> Fact Sheet, Nanticoke Nuclear Power Station, Bruce Power, November 2008  
<http://www.brucepower.com/uc/GetDocument.aspx?docid=2747> and Status, Bruce Power Erie/Nanticoke New Nuclear Power Plant Project, Canadian Nuclear Safety Commission, January 15, 2009,  
<http://www.cnsccsn.gc.ca/eng/readingroom/newbuilds/nanticoke/index.cfm>

Lake Ontario

Ginna, Nine Mile Point 1 & 2, Fitzpatrick (4 operational units, New York), the newly proposed Nine Mile Point 3 (1 new unit, New York), Pickering (8 operational units, Ontario, Canada), Darlington (4 operational units Ontario, Canada), proposed new units at Darlington (up to 4 new units, Bowman, Ontario, Canada)<sup>4</sup>

Detroit Edison Company describes in part its water impact in the ER: *"The existing and proposed site-specific and regional hydrosphere is summarized to provide a full evaluation of impacts on surface-water bodies and groundwater aquifers within the approximately 299,000 square mile area of the Great Lakes Drainage Basin (Reference 2.3-1). Within this basin, the Fermi site is 1260 acres. The site-specific area for the construction and operation of Fermi 3 is approximately 325 acres. Fermi 3 will be located within the same vicinity as Fermi 2, but further inland from the shoreline of Lake Erie. The topography of the site is flat to gently rolling plain and is located in the Swan Creek Watershed, which has an elliptical-shaped basin trending northwest-southeast and contributes a small water flow to the relatively large water capacity of Lake Erie."* [COLA, ER Section 2.3.1 Page 2-58]

The Applicant acknowledges *"Lake Erie is part of the larger network of the five Great Lakes."* [COLA, ER Section 2.3.1.1, Page 2.59]

Detroit Edison's states at Part 3 Subsection 5.4.1 *"Exposure Pathways-Radioactive gases would be discharged to the environment during normal operation of Fermi 3. Fermi 3 is planned to be operated as a zero liquid effluent discharge plant. However, the analyses discussed herein conservatively assume that liquid effluents are discharged as part of normal operation. The released quantities have been estimated*

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<sup>4</sup> Status: Ontario Power Generation Darlington Nuclear Power Plant Project, January 15, 2009, Canadian Nuclear Safety Commission, [http://www.nuclearsafety.gc.ca/eng/readingroom/newbuilds/opg\\_darlington/](http://www.nuclearsafety.gc.ca/eng/readingroom/newbuilds/opg_darlington/)

in DCD Revision 5 Table 12.2-16 (gases) ([Reference 5.4-12](#)) and ESBWR DCD Table 12.2-19b (liquids) ([Reference 5.4-10](#)). The impact of these releases and any direct radiation to individuals, population groups, and biota in the vicinity of Fermi 3 was evaluated by considering the most important pathways from the release to the receptors of interest. The major pathways are those that could yield the highest radiological doses for a given receptor. The relative importance of a pathway is based on the type and amount of radioactivity released, the environmental transport mechanism, and the consumption or usage factors of the receptor.

Detroit Edison further states at ER Chapter 3 Subsection 5.4.1.1, "Liquid Pathways-As noted above, Fermi 3 is designed for zero liquid effluent discharge during normal operation. However, the analyses discussed herein conservatively assume that liquid effluents are discharged as part of normal operation. For this analysis, the liquid effluents would be released through the Circulating Water (CIRC) blowdown line, approximately 1300 feet into Lake Erie. Dilution would occur due to mixing of the liquid effluent with the normal CIRC blowdown. Additional dilution would occur in Lake Erie. The dilution factors in Lake Erie are determined as part of the thermal analysis. The LADTAP II computer program ([Reference 5.4-4](#)) was used to calculate these doses with parameters specific to Lake Erie. This program implements the radiological exposure models described in Regulatory Guide 1.109 for radioactivity releases in liquid effluent. The following exposure pathways are considered in LADTAP II:

- Ingestion of drinking water from Lake Erie
- Ingestion of aquatic organisms as food
- External exposure to contaminated sediments deposited along the shoreline (shoreline exposure)

"Although less important, as determined by LADTAP II calculations, the swimming and boating exposure pathways are also considered in the analysis. The program also considers ingestion of food sources that use the affected water for irrigation. However, as discussed in

*Subsection 2.3.2, water from Lake Erie in the vicinity of Fermi 3 is not used for irrigation. The site-specific input parameters for the liquid pathway are presented in Table 5.4-1."*

Petitioners first assert that the referenced ESBWR Design Control Document (DCD) Chapter 12 Radiation Protection, Table 12.2-19b "Average Annual Liquid Releases" is part and parcel of a still uncertified design and therefore the expressed values have not been validated and verified by NRC. The referenced Table identifies 46 radionuclides in the Fermi 3 discharge path to Lake Erie including tritium, technetium-99m, phosphorus-32, chromium-51, cesium-134, cesium-137, cerium-141, strontium-89, strontium-90, iodine -131 and cobalt-60.<sup>5</sup>

However, with regard to Detroit Edison Company's ER analysis of cumulative and additive qualitative environmental impacts on surface water the Applicant states at Part 3, Subsection 5.11.3 that *"This section focuses on water usage from Lake Erie as the primary surface water body supplying and receiving Fermi water, and as the body of water that provides liquid pathways for both radiological and non-radiological effluents. Groundwater impacts also are discussed. The geographical area for surface water in this analysis is the Lake Erie segment immediately adjacent to Fermi."* [COLA, ER, Part 3, Subsection 5.11.3 Cumulative Impacts Related to Station Operation and Water Use and Quality, Page 5-200]

Petitioners contend that contrary to the example of Applicant's ER quantitative analysis of water usage, Detroit Edison acknowledges that its ER narrowly focuses the cumulative and additive environmental impacts on water quality to the small segment of western Lake Erie "immediately adjacent to Fermi." The Applicant only considers the

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<sup>5</sup> GE Hitachi ESBWR, Design Control Document, Rev. 4, Chapter 12 Radiation Protection, Table 12.2-19b, September 2007, pages 12.2-67 to 12.2-68

cumulative and additive chemical and radiological impacts from the single Fermi Unit 2 site immediately adjacent to the proposed Fermi Unit 3.

However, Detroit Edison provides no analysis in the ER as to how persistent toxic chemical and radiological discharges from Fermi Unit 2 and the proposed Unit 3 can or cannot environmentally cycle in the waters of Lake Erie beyond the suggested "immediate" vicinity of the Fermi nuclear power station.

In fact, the water of the Great Lakes Basin communicates throughout the lake system as it flows west to east toward the Atlantic Ocean.<sup>6</sup>

The Applicant's ER omits any analysis of the proposed action as its cumulative and additive discharges contribute to those discharges from Davis-Besse nuclear power station in Oak Harbor, Ohio into Lake Erie, approximately 31 miles from the proposed Fermi Unit 3 site. Similarly, the ER omits any analysis of the proposed action contributions to cumulative and additive impacts to Lake Erie in addition to the discharges from the Perry nuclear power station also operating on Lake Erie approximately 117 miles away. Similarly, the ER analysis makes no reference to Fermi 3 cumulative and additive contribution in relation to Bruce Power's two proposed Nanticock reactors on the northern shore of Lake Erie.

Detroit Edison's omission treats these environmental impacts on Lake Erie as if these reactors and other units were non-existent and not part of a cumulative and additive environmental impact. The omitted Davis-Besse nuclear power plant is even within the Fermi nuclear power station 50-mile Emergency Planning Zone (EPZ).

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<sup>6</sup> "Great Lakes Flow, Michigan Tech University,  
<http://techalive.mtu.edu/meec/module08/GreatLakesFlow.htm>



However, the Detroit Edison ER goes on to state that the cumulative and additive radiological impact of normal operation "includes the Fermi site during the operational service life of Fermi 2 and 3. The geographical area within 50 miles of the Fermi site was evaluated in accordance with NRC guidelines. The Fermi property is the only noteworthy radioactivity source in the immediate project area to which workers or the public could be potentially exposed." [COLA, ER, Part 3, Subsection 5.11.7, page 5-209] As we point out, the Applicant has omitted the Davis-Besse nuclear power station from its analysis and is inconsistent with the fact that Davis-Besse is within the 50-mile and itself an unanalyzed additional cumulative radiation source routinely discharging into Lake Erie.

Detroit Edison states "The impact of these releases and any direct radiation to individuals, population groups, and biota in the vicinity of Fermi 3 was evaluated by considering the most important pathways from the release to the receptors of interest." [COLA, ER, Part 3, Subsection 5.4 .1 Exposure Pathways, page 5-107]

The Petitioners contend that point source pollution remains a threat to the Great Lakes Basin. The International Joint Commission (IJC) on the Great Lakes has detailed the injury to humans and the environment posed by persistent toxic substances released into the entire Great Lakes community where "The evidence continues to grow."<sup>7</sup> The nuclear industry as a source of persistent toxins into The Great Lakes is addressed by the IJC in an "*Inventory of Radionuclides for the Great*

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<sup>7</sup> The International Joint Commission Canada and the United States created the International Joint Commission out of the recognition that each country is affected by the other's action in lake and river systems along the border and the need to protect and manage these waters wisely.

<http://www.ijc.org/php/publications/html/invrep/index.html>

*Lakes*" conducted by the Nuclear Task Force of the International Joint Commission (IJC) in December 1997.<sup>8</sup>

The Petitioners note that Detroit Edison ER omits the IJC study in its reference documents.

Among the findings of the IJC Task Force relevant to this application are:

1) *"Monitoring meets the needs of the relevant atomic energy acts in the United States and Canada but is not designed to look at environmental cycling of radionuclides."*<sup>9</sup>

2) *"There is a special issue of reporting nuclear data, which applies specifically to the Great Lakes and has the implication of rendering incorrect some dose-assessment factors used in establishing the transfer of radionuclides from biota to humans in the region of interest. The issue relates to the transfer factors which estimate uptake of radionuclides in biota. These transfer factors traditionally have been derived from work done in rivers and oceans, rather than in freshwater lakes. The Task Force is concerned that the factors derived from riverine and oceanic systems are inappropriate for use in the Great Lakes.*

*"In developing the inventory for radionuclides, the Task Force noted that the bioaccumulation, biomagnification, and transfer factors used to describe the cycling of radionuclides and their transfer along exposure pathways to biota, including humans, came from the long history of work done in the marine, estuarine, and river environments. This work stemmed from interests in the deposition of radionuclides in*

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<sup>8</sup> *"Inventory of Radionuclides for the Great Lakes,"* Nuclear Task Force, International Joint Commission, December 1997,  
<http://www.ijc.org/php/publications/html/9br/recome.html>

<sup>9</sup> *"Inventory of Radionuclides for the Great Lakes,"* IJC, Conclusions, 4.1 Adequacy of Monitoring, (1),  
<http://www.ijc.org/php/publications/html/9br/recome.html>

*the oceans and the transport of radionuclides down rivers and estuaries from discharges to the oceans. The comparable studies for lakes were virtually non-existent. Yet for the Great Lakes, the need for transfer factors that describe lake environments is critical.*"<sup>10</sup>

3) The IJC specifically recommended with regard to protecting the public health and Great Lakes water quality from radioactivity that *"There are radionuclides that merit separate studies and further reporting because of the patterns of use and discharge; physical, chemical, and biological properties; and the special monitoring needs of lakes as opposed to estuaries, oceans, and rivers (these include tritium, carbon-14, iodine-129, isotopes of plutonium, and radium-226."*<sup>11</sup> The IJC further recommends that *"There are other radionuclides that could be a potential concern in special situations: technetium 99, -99m; phosphorus-32; chromium-51; cesium-134, -137; cerium-141, -144; strontium-89, -90; iodine-125, -131; and cobalt-60."*<sup>12</sup>

Petitioners submit that many of these IJC identified radionuclides that merit the above cited separated studies, further reporting and potential health and environmental concerns are identified as radionuclides in the liquid effluent release path by the GE Hitachi ESBWR DCD Chapter 12, Radiation Protection. These same radionuclides are discharged as well by the other proposed and operational reactors on the Great Lakes Basin.

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<sup>10</sup> *"Inventory of Radionuclides for the Great Lakes,"* IJC, 4.5 Biological Transfer Factors for Lake Systems, (13), <http://www.ijc.org/php/publications/html/9br/recome.html>

<sup>11</sup> *"Inventory of Radionuclides for the Great Lakes,"* IJC, 4.6 Radionuclides of Concern, (14), <http://www.ijc.org/php/publications/html/9br/recome.html>

<sup>12</sup> *"Inventory of Radionuclides for the Great Lakes,"* IJC, 4.6 Radionuclides of Concern, (15), <http://www.ijc.org/php/publications/html/9br/recome.html>

For example, tritium is one of the identified radionuclides that appear in both the IJC inventory and the ESBWR DCD. Tritium is the radioactive isotopic form of hydrogen. Tritium moves environmentally in the lake system mainly as a tritiated water molecule or HTO. Tritium has a radiological half-life of 12.3 years and decays to the stable isotope helium ( $^3\text{He}$ ), emitting a beta particle (and a neutrino). The beta particle has a maximum energy of 18.6 kilo electron volts (keV) (average energy of 5.7 keV) with a short range—a few centimeters in air, 0.9 micrometers ( $\mu\text{m}$ ) in water, and about 0.6 $\mu\text{m}$  in tissue. While tritium is not known to be dangerous externally, it is a known internal radiation hazard when inhaled, or ingested via food or water, or absorbed through the skin. Tritium is the most commonly encountered and important beta-emitting radionuclide. Of concern to the Petitioners, tritium is recognized as a known persistent radioactive toxin that can cause injury to humans and the environment as most clinic studies demonstrate that tritium inhaled, ingested and absorbed in living creatures can produce typical radiogenic induced harmful effects including cancer, genetic effects, developmental abnormalities and reproductive effects.<sup>13</sup>

Because tritium is isotopic hydrogen, it can take the form of tritiated water or radioactive water that is then discharged by Fermi 2 and the proposed Fermi Unit 3 into the water of Lake Erie and is also the case for the additional identified operational and proposed nuclear reactors on the Great Lakes Basin.

The wide range of permissible radiation protection goals and standards for tritium in drinking water from 400 picocuries per liter (State of California)<sup>14</sup> to 20,000 picocuries per liter (US EPA)<sup>15</sup> to the US NRC

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<sup>13</sup> 16 scientific abstracts on the known toxicity of tritium  
<http://www.nirs.org/radiation/tritium/all16abstracts.pdf>

<sup>14</sup> "Public Health Goals for Chemicals in Drinking Water, Tritium," The State of California, March 2006,  
<http://oehha.ca.gov/water/phg/pdf/phgtritium030306.pdf>

effluent concentration limit of 1,000,000 picocuries per liter as provided in 10 CFR Part 20)<sup>16</sup> underscore an equally wide range of uncertainty and lack of scientific and public health confidence in what constitutes the so called "permissible" radiation exposure levels from tritium.

The Petitioners' concerns for their health, safety and environmental quality are further elevated by the fact that many federal radiation protection standards are based on average lifetime exposure or on "Reference Man" as identified by the Institute for Energy and Environmental Research (IEER). This is a hypothetical middle aged adult "Caucasian" male weighing 154 pounds and five feet seven inches tall and is Western European or North American in habitat and custom. Reference man is widely used to set federal rules and regulations on limits on radiation exposure from drinking water or the ingestion exposure pathway. The problem is accentuated by the fact that different groups are affected differently than adult men when exposed to radiation or toxic materials. According to the National Research Council of the National Academies, cancer mortality risks for women are 37.5% higher than for men for the same radiation exposure. Sometimes the most vulnerable period is not in adulthood but rather in infancy, childhood, puberty, or when the ova are developing in a female fetus. Prenatal exposures to certain toxic chemicals and radiation can increase the risk of certain disorders, like breast

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<sup>15</sup> "Radiation Regulations, Standards and Guidance," US EPA, <http://www.epa.gov/rpdweb00/docs/402-f-01-025.pdf>

<sup>16</sup> Letter from NRC Chairman Dale Klein to Senator Diane Feinstein, October 30, 2006, <http://www.nrc.gov/reading-rm/doc-collections/congress-docs/correspondence/2006/feinstein-10-30-2006.pdf>

cancer, later in life. The combined effects of chemicals and radiation are little understood.<sup>17</sup>

The Petitioners submit that these findings and recommendations support their contention that Detroit Edison's omissions in its ER fails to address NEPA requirements for a "hard look" at the cumulative and additive environmental impacts by the proposed action on a regional scope from its contribution to the addition of numerous operational and proposed new individual reactor sites on Lake Erie and the Great Lakes Basin.

The Petitioners additionally cite from "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis" prepared by the President's Council on Environmental Quality (CEQ).<sup>18</sup> The CEQ memorandum provides guidance to the heads of federal agencies on the extent to which agencies of the Federal government are required to analyze the environmental impacts from past actions when they describe the cumulative environmental impact of a proposed action in accordance with Section 102 of NEPA. While the environmental analysis is forward looking with a focus on the proposed action, the review of past actions is required to the extent that these actions can inform the agency on the proposed action.

The Council on Environmental Quality cites that its regulations are consistent with the Supreme Court decision in *Kleppe v. Sierra Club*, 427 U.S. 390 (1976). In that decision, the Supreme Court held that "unless there is a plan for a regional plan of action, it is not practical to prepare a regional EIS." However, on the subject of the

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<sup>17</sup> "Open Letter to President George Bush on Protecting the Most Vulnerable," Dr. Arjun Makhijani, Institute for Energy and Environmental Research, October 18, 2006, <http://www.ieer.org/campaign/letter.php>

<sup>18</sup> "Guidance on the Consideration of Past Actions in Cumulative Effects Analysis," James Connaughton, Executive Office of the President, Council on Environmental Quality, June 24, 2005, [http://ceq.hss.doe.gov/nepa/regs/Guidance\\_on\\_CE.pdf](http://ceq.hss.doe.gov/nepa/regs/Guidance_on_CE.pdf)

cumulative impact of proposed new projects, the Supreme Court stated in *Kleppe* (at 410) that “when several proposals for . . . actions that will have cumulative or synergistic environmental impact upon a region are pending concurrently before an agency, their environmental consequences must be considered together.”<sup>19</sup>

The Petitioners point out in this case that more than several applications for new nuclear power plants on the Great Lakes Basin are currently being pursued. The Petitioners have identified that together there are the two COLA applications for Fermi 3 and Nine Mile Point 3 submitted to the US Nuclear Regulatory Commission and up to 10 reactor units Canadian reactor units being considered by the Canadian Nuclear Safety Commission, along with the combined 33 US and Canadian operating reactors, all of which constitute more than the mere “contemplation” of major federal actions in the Great Lakes Basin.

The Petitioners contend that these past, present and reasonably foreseeable future actions prompt the need for the Atomic Safety Licensing Board to use its discretion to require a regional environmental impact statement of a larger and broader scope than the “immediate vicinity” of the Fermi nuclear power station on the western basin of Lake Erie as submitted by Detroit Edison.

The Petitioners contend that the Applicant’s ER has therefore failed to provide an adequate analysis of the Fermi Unit 3 cumulative and additive environmental impacts on Lake Erie and the Great Lakes in context of the 33 reactors that are currently operational and up to 12 new proposed reactors on the Great Lakes Drainage Basin.

At this point, the Petitioners submit that should Detroit Edison Company submit an amended application at a future date that includes the omitted cumulative and additive environmental analysis the

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<sup>19</sup> *Kleppe v. Sierra Club*,  
<http://supreme.justia.com/us/427/390/case.html>

Petitioners reserve the opportunity to review the new analysis by expert opinion.

The Petitioners' contention on cumulative and additive environmental impacts should therefore be admitted.



**CONTENTION NO. 2: There is no technical basis for a finding of 'reasonable confidence' that spent fuel can and will be safely disposed of at some time in the future**

**Background**

In recent days, NRC's "Nuclear Waste Confidence Decision" has been clearly shown to be completely false. In 1984, 25 years ago, NRC expressed "confidence" that one or more repositories for irradiated nuclear fuel and high-level radioactive waste would be opened somewhere in the United States by 2007 to 2009. But in 1990, NRC revised its "confidence," stating that at least one such repository would open by 2025. Since even that deadline, to open a single repository, appears unattainable now, NRC is currently re-evaluating its "Nuclear Waste Confidence Decision" yet again.

Since 1987, the nuclear power establishment in industry and government, including NRC itself, has put faith and confidence in the proposed national repository at Yucca Mountain, Nevada. But Yucca has been dogged from the very beginning by unforeseen technical failures, amounting to outright geologic and hydrologic unsuitability of the site. There has been determined resistance against the proposal, from the State of Nevada and its elected officials, to over a thousand environmental organizations across the country. This resistance has not only persisted, but has grown stronger over the course of the past two decades, as evidence of Yucca's scientific unsuitability has mounted.

Now, significant new information has developed that casts deeply in doubt DTE's ability to dispose of high-level radioactive waste that would be generated by the proposed Fermi 3. Yucca Mountain now appears doomed to be canceled by the Obama administration.

The Obama administration's Fiscal Year 2010 federal budget

outline, released on February 26, 2009, stated: "[The] Yucca Mountain program will be scaled back to those costs necessary to answer inquiries from the Nuclear Regulatory Commission, while the Administration devises a new strategy toward nuclear waste disposal."

As reported by the Las Vegas Review-Journal:

Asked if that means the Department of Energy will pull the license application it submitted for the commission to review, Energy Secretary Steven Chu's press secretary, Stephanie Mueller, wrote in an e-mail that the fate of the license application 'is just one of a set of important issues that need to be resolved thoughtfully, carefully and comprehensively as we develop a responsible long-term approach to nuclear waste management.'

But the bottom line is clear: Yucca Mountain is not an option, and the new administration is starting the process of finding a better solution for management of our nuclear waste.<sup>1</sup>

President Obama's Energy Secretary, Steven Chu, drove the point home during his testimony before the U.S. Senate Energy and Natural Resources Committee on March 5, 2009. Chu affirmed that President Barack Obama's administration does not regard Yucca Mountain as an option for radioactive waste disposal, thus fulfilling a clear and oft-repeated campaign pledge Obama made during the presidential race.<sup>2</sup>

The impending end of the Yucca Mountain dumpsite proposal further calls into question the safety of generating, storing, and ultimately permanently disposing of Fermi 3's irradiated nuclear fuel. After all, the inventory of irradiated nuclear fuel and other high-level radioactive wastes already generated by the current generation of atomic reactors is far greater than what could have ever been accommodated by

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<sup>1</sup>"PRESIDENT'S BUDGET OUTLINE: Plan sounds death knell for Yucca Mountain project; Minimal funding recommended; New options advised," Keith Rogers, Las Vegas Review-Journal, 2/27/09 at <http://www.lvrj.com/news/40412057.html>

<sup>2</sup>"Chu: Yucca no longer option for nuclear waste," H. Josef Hebert, Associated Press, March 5, 2009, [http://www.boston.com/news/nation/washington/articles/2009/03/05/gop\\_assails\\_administration\\_over\\_nuclear\\_waste\\_site/](http://www.boston.com/news/nation/washington/articles/2009/03/05/gop_assails_administration_over_nuclear_waste_site/)

the planned space at Yucca Mountain, which could have accepted only 63,000 metric tons of commercial high-level radioactive waste and irradiated nuclear fuel. This limit was imposed by the Nuclear Waste Policy Act<sup>3</sup> (NWPA) of 1983, as amended, pending construction of a second national repository became operational elsewhere in the United States, specifically, in the eastern part of the country.

U.S. Department of Energy (DOE) policy first established during the Reagan administration that the first 70,000 metric tons of irradiated nuclear fuel and solidified high-level radioactive waste "disposed of" at Yucca Mountain, Nevada would have included 90% commercial nuclear reactor waste, and 10% DOE waste from the nuclear weapons production complex, nuclear energy research activities, and Department of Defense Nuclear Navy propulsion-related wastes. That 90% share of 70,000 metric tons means that only 63,000 metric tons of commercial irradiated nuclear fuel could have been "disposed of" at Yucca Mountain, Nevada pending a second national repository. See DOE's Yucca Mountain Final EIS at A-1, Feb. 2002.

The U.S. Department of Energy has known since at least the mid-1990s that, by the year 2030 or so, well over 80,000 metric tons of irradiated nuclear fuel generated at commercial nuclear reactors will exist in the U.S. See, for example, U.S. Nuclear Waste Technical Review Board (NWTRB), "Disposal and Storage of Spent Nuclear Fuel: Finding the Right Balance," Figure 2 at page 11 (March 1996). This

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<sup>3</sup>As the NWPA states at Section 114(d):

"The [NRC] decision approving the first such application [for a license to open and operate a repository] shall prohibit the emplacement in the first repository of a quantity of spent fuel containing in excess of 70,000 metric tons of heavy metal or a quantity of solidified high-level radioactive waste resulting from the reprocessing of such a quantity of spent fuel until such time as a second repository is in operation..." 42 U.S.C. § 10134(d).

was, of course, significantly in excess of the "disposal" capacity at Yucca Mountain of 63,000 metric tons of commercial irradiated nuclear fuel, absent a second operational repository in the East. Notably, this figure largely excludes the waste anticipated from the next-generation plants such as Fermi 3, which presumably would be holding spent fuel from several refueling cycles onsite in cooling tanks.

By February of 2002, as indicated in its Final Environmental Impact Statement for Yucca Mountain, DOE was already clearly predicting that by 2011 at the latest, 63,000 metric tons of commercial irradiated nuclear fuel would exist in the United States (Tables A-7 and A-8). Clearly, the capacity at Yucca was wholly taken long before it even opened.

In March, 2008, at the U.S. Nuclear Regulatory Commission's Regulatory Information Conference, the director of the DOE's Office of Civilian Radioactive Waste Management, Ward Sproat III, announced that 63,000 metric tons of commercial irradiated nuclear fuel – enough to fill Yucca to its legal limit – would in fact exist in the U.S. by as early as the spring of 2010. Irrefutably, the irradiated nuclear fuel and other high-level radioactive wastes generated at proposed new reactors such as Fermi 3, could not have been "disposed of" at Yucca Mountain, unless and until a second national repository was operational in the eastern U.S.

As noted above, the Commission has backpedaled on its "confidence" that a second repository will open in the foreseeable future (NRC's 1984 "confidence" spoke of one or more repositories by 2009, but in 1990 was revised to at least one repository by 2025). Any irradiated nuclear fuel or other high-level radioactive waste generated after the spring of 2010 (after 63,000 metric tons of

commercial irradiated nuclear fuel has been generated) will have nowhere to go, would lack "disposal" space at even the first repository (which is no longer Yucca), unless and until a second repository is opened and operating in the U.S. elsewhere. Such a process of opening not one, but two repositories could very well take many decades, based on the experience of unsuccessfully trying to open the first repository at Yucca Mountain.

NRC's often routine approval of 20-year license extensions<sup>4</sup> for old commercial atomic reactors has served merely to exacerbate the quantity of high-level radioactive waste in excess of the capacity limits at the now doomed Yucca Mountain, Nevada repository. In its "Final Environmental Impact Statement for a Repository for Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada," (Feb. 2002) (hereinafter "Yucca Mountain EIS"), DOE predicted the generation of over 105,000 metric tons of commercial irradiated nuclear fuel by the year 2046. DOE FEIS, Table A-8, page A-16. While NRC's standard license extension term is 20 years, the DOE had assumed that the term of license extensions would be only 10 years. DOE also assumed no new commercial nuclear reactors in the U.S. Thus, the high-level waste and irradiated fuel generated by the current generation of reactors will far exceed the capacity of the first, single repository that the NRC has identified as feasible and likely in the next several decades in its "Nuclear Waste Confidence Decision," a repository that is now to be cancelled by the Obama administration.

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<sup>4</sup>The first 47 reactor applicants all easily received re-licensing from NRC, despite serious safety concerns raised by environmental groups and concerned citizens.

Likely because of the mounting uncertainties over the years regarding the suitability of the Yucca Mountain repository proposal, the NRC Commissioners in October, 2008 ordered a re-evaluation of the "Nuclear Waste Confidence Decision," after previously rejecting calls for just such a re-evaluation. For instance, on March 1, 2005, attorneys representing the State of Nevada filed a petition for rulemaking to NRC calling on the Commission to amend its Waste Confidence Decision and Rule to avoid prejudging the Yucca Mountain license application (PRM-51-8). But on August 17, 2005 the NRC denied Nevada's petition for rulemaking (70 Federal Register 48329, and NRC Office of Administration "Items of Interest," Week Ending August 19, 2005). And even as recently as early 2008, NRC Chairman Dale Klein was saying that NRC would not be re-evaluating its Nuclear Waste Confidence Decision. In his speech entitled "Waste Confidence and Waste Challenges: Managing Radioactive Materials" at the Waste Management Symposium in Phoenix, Arizona on February 25, 2008, NRC Chairman Dale E. Klein said "I personally do not feel that a new [Waste Confidence] rulemaking is necessary at this time..."

However, Chairman Klein's May 16, 2008 letter to U.S. Senator George Voinovich - Ranking Member of the Subcommittee on Clean Air and Nuclear Safety of the Senate Environment and Public Works Committee - confessed that the NRC had changed course. Klein wrote:

On September 7, 2007, following a public meeting where the Commission was briefed by the Nuclear Energy Institute and other industry representatives, the Commission "agreed with the nuclear industry view that it was appropriate to update the NRC's waste confidence findings in the near term."

Thus, the NRC Commission rejected Nevada's petition for rulemaking to update the NRC Nuclear Waste Confidence Decision, but embraced the

nuclear power industry's call for just such a re-evaluation. In fact, that re-evaluation is currently underway.

Obviously, as worded in the 1999 review of the NRC Nuclear Waste Confidence Decision, "significant and pertinent unexpected events" must have occurred, "raising substantial doubts about the continuing validity of the Waste Confidence finding" (64 Federal Register 68005), for NRC is in fact currently re-evaluating its Waste Confidence finding. Given that the NRC Nuclear Waste Confidence Decision is under re-evaluation, it is inappropriate for NRC staff and Detroit Edison to take credit for a renewed expression of "Confidence" that the waste problem is completely under control, and will remain so for many decades to come. This presumptuous gesture, to take credit for a "Confidence Decision" not yet made, would turn the "Confidence Rule" into a confidence trick or confidence game, also known as a scam, an attempt to defraud a person or group by gaining their confidence.

In December, 2008, DOE published its "Report to the President and the Congress by the Secretary of Energy on the Need for a Second Repository." In it, DOE indicated that -- unless the Yucca dumpsite is opened, and its capacity limits removed -- the State of Michigan itself could serve as the location for a high-level radioactive waste repository, as could the State of Ohio. On page 11 of this report<sup>5</sup>, DOE states that "DOE reference documents ... identify 17 states within which there were granitic bodies believed to be adequate for investigation for siting a repository for the second repository program." This list of 17 states includes Michigan. Figure 3 on page 12 of the same report, entitled "Map of the United States Illustrating

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<sup>5</sup>[http://www.ymp.gov/info\\_library/program\\_docs/Second\\_Repository\\_Rpt\\_120908.pdf](http://www.ymp.gov/info_library/program_docs/Second_Repository_Rpt_120908.pdf)

First Repository Program Sites, Second Repository Program Areas Under Consideration, and Shale Deposits Potentially Suitable for a Repository," shows shale deposits across Michigan and Ohio that DOE is considering as potentially suitable repository locations.

If eventually opened, such granitic or shale repositories in Michigan and/or Ohio could leak over time, risking environmental and public health damage to residents and the Great Lakes ecosystem. Constructing and operating Fermi 3, and thus generating yet more irradiated nuclear fuel at the Fermi nuclear power plant, would increase the risk that Michigan and/or Ohio could be targeted for a national high-level radioactive waste dump.

Regarding DOE's proposal to have removed Yucca's capacity limits, changing the amount of high-level radioactive waste and irradiated nuclear fuel to have been buried at Yucca would have increased the environmental and public health risks and impacts downstream and downwind. Not only would a change in federal law have been required, but new analyses to determine the extent of these increased impacts would have been necessary. Although initial studies by the nuclear industry-funded Electric Power Research Institute (EPRI) and DOE on Yucca's technical ability to contain more than 70,000 metric tons of highly radioactive wastes were published, no objective, independent, unbiased, and rigorous analyses have ever even been begun, much less completed. The Obama administration's clear indication that Yucca is unsuitable for repository development dramatically undermines DOE and EPRI claims that Yucca would have been able to accommodate drastically more than 70,000 metric tons of highly radioactive wastes. Given such unknowns associated with requirements for changes in the law, new technical analyses, and additional regulatory proceedings associated



with the proposal to expand Yucca's waste disposal capacity, NRC's "confidence" in a waste solution for a new generation of reactors has been, and is still, entirely misplaced. The Obama administration's very recent defunding of, and clearly stated opposition against, the Yucca Mountain dumpsite proposal makes any claims of "Nuclear Waste Confidence" by NRC ring all the more hollow.

Moreover, Congress has not given the NRC any basis for assuming that a second repository will be opened. Section 161(a) of the NWPA,<sup>6</sup> as amended, states that: "The Secretary [of Energy] may not conduct site-specific activities with respect to a second repository unless Congress has specifically authorized and appropriated funds for such activities." Although the Department of Energy did report in December 2008 that a second repository will be needed if Yucca is not opened and its capacity limit removed, Congress has not authorized nor appropriated funds, for second repository activities, such as site-specific searches for suitable geological locations.

The Nuclear Regulatory Commission's failure to express confidence that a second repository will be opened any time soon also implicates the proposed new findings of the current Waste Confidence Decision re-evaluation, *i.e.*, that irradiated fuel and other high-level radioactive waste can be safely stored at reactor sites for up to many decades years post permanent shutdown and operating license termination. The risks associated with such *de facto* permanent on-site storage include not only accidents and eventual leakage as waste containers deteriorate and degrade with age and exposure to the elements, but also the specter of terrorist attacks.

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<sup>6</sup>42 U.S.C. §10172a(a).

As a previous Atomic Safety and Licensing Board so eloquently stated in a previous proceeding:

GANE's [Georgians Against Nuclear Energy] contention was filed on August 13, 2001. Regardless of how foreseeable terrorist acts that could cause a beyond basis accident were prior to the terrorist attacks of September 11, 2001, involving the deliberate crash of hijacked jumbo jets into the twin towers of the World Trade Center in New York City and the Pentagon in the Nation's Capitol killing thousands of people, it can no longer be argued that terrorist attacks of heretofore unimagined scope and sophistication against previously unimaginable targets are not reasonably foreseeable. Indeed, the very fact these terrorist attacks occurred demonstrates that massive and destructive terrorist acts can and do occur and closes the door, at least for the immediate future, on qualitative arguments that such terrorist attacks are always remote and speculative and not reasonably foreseeable.

*Duke Cogema Stone and Webster (Savannah River Mixed Oxide Fuel Fabrication Facility)*, LBP-01-35, ASLBP No. 01-790-01-ML, 54 NRC 403, 446 (2001).

The 1998 Aberdeen Proving Ground anti-tank missile test against an irradiated nuclear fuel storage cask, NRC's own February 2001 report on irradiated nuclear fuel storage pool fire risks, Alvarez et al.'s 2003 report on the risks of attacks on waste pools, and the National Academy of Sciences 2005-6 study on densely-packed irradiated nuclear fuel storage pool security vulnerabilities, all confirm that NRC's "confidence" that irradiated nuclear fuel can be stored safely at reactor sites for many decades into the future is without technical merit. The terrorist threat to irradiated nuclear fuel and high-level radioactive waste - whether it is being stored onsite at commercial reactors in storage pools or dry casks; stored in away-from-reactor Independent Spent Fuel Storage Installations; or transported by truck, train, or barge between nuclear plants and off-site interim storage facilities - demands an evaluation of whether (a) it is appropriate to store irradiated nuclear fuel and other highly radioactive waste for

many decades or over a century pending availability of a permanent repository, and (b) whether nuclear power should be phased out as quickly as possible as a matter of environmental protection, national security, public safety, and common defense.

The homeland security risks posed by indefinite temporary storage of irradiated nuclear fuel have been recognized by former Energy Secretary Spencer Abraham:<sup>7</sup>

Yucca Mountain is an important component of homeland security. More than 161 million people live within 75 miles of one or more nuclear waste sites, all of which were intended to be temporary. We believe that today these sites are safe, but prudence demands we consolidate this waste from widely dispersed, aboveground sites into a deep underground location that can be better protected.

It is undisputed that neither fuel storage pools nor dry storage facilities are designed to withstand the type of determined and sophisticated attack that was carried out on September 11, 2001. In fact, the U.S. National Academy of Sciences documented such security vulnerabilities in its report entitled "Safety and Security of Commercial Spent Nuclear Fuel," released on April 6, 2005. Clearly, under NEPA it is appropriate to consider whether the Commission continues to have a basis for expressing confidence that stored irradiated nuclear fuel and other high-level radioactive waste is safe from terrorist attacks.

Petitioners are aware that the Commission has ruled that environmental impacts of terrorist attacks are not cognizable under NEPA.<sup>8</sup>

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<sup>7</sup>Statement of Spencer Abraham, Secretary of Energy, Before the Energy and Natural Resources Committee, U.S. Senate (May 16, 2002) <http://yuccamountain.org/abraham051602.htm>

<sup>8</sup>See, e.g., *Pacific Gas & Electric Co. (Diablo Canyon Independent Spent Fuel Storage Installation)*, CLI-03-01, 57 NRC 1 (2003); *Private Fuel Storage, L.L.C. (Independent Fuel Storage Installation)*, CLI-02-25, 56 NRC 340 (2002).

Petitioners request that the Commission reconsider this policy, in light of (a) the obvious attractiveness and vulnerability of irradiated nuclear fuel to terrorist attack; (b) the Secretary of Energy's recognition of the relationship between homeland security and assured capacity for timely irradiated nuclear fuel disposal; (c) the Commission's explicit statement in the Waste Confidence status review that it would undertake a comprehensive re-evaluation of the Waste Confidence findings if "significant and pertinent unexpected events" occur raising substantial doubt about the continuing validity of the Waste Confidence findings, which appears to be the case since NRC is currently re-evaluating its "Waste Confidence Decision"; and (d) the June 2, 2006 ruling by the U.S. Court of Appeals for the Ninth Circuit in *San Luis Obispo Mothers for Peace (SLOMFP) v. NRC*, 449 F.3d 1016.

The uncertainties concerning irradiated nuclear fuel and high-level radioactive waste management in the U.S., clearly evidenced by the Obama administration's opposition to the Yucca Mountain dumpsite proposal, NRC's current revision of its "Nuclear Waste Confidence Decision," and DOE's December 2008 report on the potential of states such as Michigan and/or Ohio to be targeted for national radioactive waste dumpsites in lieu of Yucca Mountain, all reinforce the rationale for admitting this contention for hearing. If the Commission has no legitimate confidence that a repository will open at some reasonable time in the future, it must be assumed that irradiated fuel may continued to be "temporarily" stored at the proposed new Fermi 3 reactor site for an indefinite period of time. The environmental impacts of such indefinite - de facto permanent -- surface storage at the Fermi 3 reactor site must be evaluated before a Combined Operating License can be granted. Clearly, an ASLB hearing on high-level

radioactive waste management contentions is warranted.

**A. Purpose of Contention**

This contention is based on comments that Beyond Nuclear, Don't Waste Michigan, and Sierra Club submitted on February 6, 2009, regarding the U.S. Nuclear Regulatory Commission's ("NRC's" or "Commission's") proposed Waste Confidence Decision Update, 73 Fed. Reg. 59,551 (October 9, 2008) ("Proposed Waste Confidence Decision"); and its proposed rule entitled: Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 73 Fed. Reg. 59,547 (October 9, 2008) ("Proposed Temporary Storage Rule"). See the attached Comments by Texans for a Sound Energy Policy *et al.* regarding NRC's Proposed Waste Confidence Decision Update and Proposed Rule Regarding Consideration of Environmental Impacts Of Temporary Storage Of Spent Fuel After Cessation Of Reactor Operations (February 6, 2009) ("Comments").

This contention seeks to enforce, in this specific proceeding, the NRC's commitment that "it would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely." Proposed Waste Confidence Decision, 73 Fed. Reg. at 59,552 (citing 42 Fed. Reg. 34,391, 34,393 (July 5, 1977); *Natural Resources Defense Council v. NRC*, 582 F.2d 166 (2d Cir. 1978)). The contention also seeks to enforce the requirement of the National Environmental Policy Act ("NEPA") that generic determinations under NEPA must be applied to individual licensing decisions and must be adequate to justify those individual decisions. As the Supreme Court held in *Baltimore Gas and Electric Co. v. Natural Resources Defense Council*, 462 U.S. 87 (1983):

The key requirement of NEPA . . . is that the agency

consider and disclose the actual environmental effects in a manner that will ensure that the overall process, including both the generic rulemaking *and the individual proceedings*, brings those effects to bear on the decisions to take *particular actions that significantly affect the environment*.

462 U.S. at 96 (emphasis added). See also *State of Minnesota v. U.S. Nuclear Regulatory Commission*, 602 F.2d 412, 416 (D.C. Cir. 1979) (agreeing with the Commission that "it could properly consider the complex issue of nuclear waste disposal in a "generic" proceeding such as rulemaking, *and then apply its determinations in subsequent adjudicatory proceedings*") (emphasis added). Indeed, the Commission itself has stated that it intends to use the Proposed Waste Confidence Decision to "enhance the efficiency of combined license proceedings for applications for nuclear power plants anticipated in the near future" and "assure that [the NRC's] Waste Confidence findings are up to date." 73 Fed. Reg. at 59,551. See also Proposed Temporary Storage Rule, 73 Fed. Reg. at 59,547 ("The proposed revision reflects findings that the Commission has reached in the 'Waste Confidence' decision update . . .") By placing the exact same concerns raised in the aforesaid Comments before the ASLB in this contention, Petitioners therefore seek to ensure, as required by NEPA and *Baltimore Gas and Electric Co.*, that whatever decisions the NRC reaches in response to the aforesaid Comments on the Proposed Waste Confidence Decision and Proposed Temporary Storage Rule will be applied in a timely way to the licensing decision for the proposed Fermi 3 nuclear power plant, *i.e.*, before that plant is licensed. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (holding that environmental concerns must be considered *before* an action is taken).

Beyond Nuclear, Don't Waste Michigan, and Sierra Club recognize that the issues raised by their Comments - and therefore by this

contention -- are generic in nature. Therefore Petitioners do not seek to litigate them in this individual proceeding. Instead, the contention should be admitted and held in abeyance in order to avoid the necessity of a premature judicial appeal if this case should conclude before the NRC has completed the rulemaking proceeding. If the ASLB does not consider that it has the authority to admit the contention because it presents a challenge to a generic rule, we request the ASLB to refer the contention to the Commission.

**B. Statement of the Issue**

Neither the Proposed Waste Confidence Decision nor the Proposed Spent Fuel Storage Rule satisfy the requirements of NEPA or the Atomic Energy Act. Therefore they fail to provide adequate support for the Applicant's Environmental Report or for an Environmental Impact Statement in this particular licensing case. The deficiencies in the Waste Confidence Rule also fatally undermine the adequacy of the NRC's findings in Table S-3 of 10 C.F.R. § 51.51 to satisfy NEPA. Unless and until the NRC remedies the deficiencies in the Waste Confidence Rule, Table S-3, and the Proposed Spent Fuel Storage Rule, the NRC has no lawful basis to issue a license for the proposed Fermi 3 nuclear power plant.

**C. Statement of Issues of Law and Fact to Be Raised**

This contention is intended to be identical to the Comments that Beyond Nuclear, Don't Waste Michigan, Sierra Club, and other groups filed with the NRC on February 6, 2009. The legal and factual issues raised in this contention can be summarized as follows:

The NRC has no technical basis for a finding of reasonable confidence that spent fuel can and will be safely disposed of at some

time in the future. Therefore, under the Commission's own standard that "it would not continue to license reactors if it did not have reasonable confidence that the wastes can and will in due course be disposed of safely," the Commission must refuse to issue new licenses or renew existing licenses for nuclear power plants. 73 Fed. Reg. at 59,552 (citing 42 Fed. Reg. 34,391, 34,393 (July 5, 1977); *Natural Resources Defense Council v. NRC*, 582 F.2d 166 (2d Cir. 1978)).

The NRC's lack of a basis for any finding of confidence in the technical feasibility of a repository also fatally undermines Table S-3 of the NRC's Uranium Fuel Cycle Rule, which depends on the assumption that radioactive releases from a repository will be zero. Final Rule, Licensing and Regulatory Policy and Procedures for Environmental Protection; Uranium Fuel Cycle Impacts From Spent Fuel Reprocessing and Radioactive Waste Management, 44 Fed. Reg. 45,362 (August 12, 1979). Based on its own statement in the 1990 Waste Confidence rulemaking proceeding, the NRC, having arrived at a stage where any basis that it may have had for confidence in the safe disposal of spent fuel has clearly evaporated, must revisit the basis for Table S-3. See Review and Final Revision of Waste Confidence Decision, 55 Fed. Reg. 38,474, 38,491 (September 18, 1990) ("Unless the Commission, in a future review of the Waste Confidence decision, finds that it no longer has confidence in the technical feasibility of disposal in a mined geologic repository, the Commission will not consider it necessary to review the S-3 rule when it reexamines its Waste Confidence findings in the future.") Certainly, the Commission no longer has any basis whatsoever for the principal assumption underlying Table S-3, which is that spent fuel can be safely disposed of in a repository, having repudiated that assumption in the proposed Waste Confidence



Decision. 73 Fed. Reg. at 59,555. See also IEER Comments.

In both the proposed Waste Confidence Decision and the Proposed Temporary Storage Rule, the NRC continues to deny that temporary spent fuel storage poses significant environmental risks, ignoring a wealth of government reports showing that high-density fuel storage pools are vulnerable to catastrophic fires that may be caused by accidents or intentional attacks. Instead of confronting this information in a detailed EIS, the NRC calls it a security matter and shrouds it in an unjustifiably broad mantle of security-related secrecy. But the NRC is not entitled to use security concerns as an excuse for failing to comply with NEPA. *San Luis Obispo Mothers for Peace v. NRC*, 449 F.3d 1016, 1034-35 (9th Cir. 2006).

In making a finding of no significant impact ("FONSI") with respect to spent fuel storage, the NRC has not even attempted to comply with the NRC's procedural requirements for a FONSI, such as preparing an environmental assessment ("EA") that addresses the purpose of and need for the proposed action and evaluates alternatives to the proposed action. The NRC also violates NEPA by failing to identify the documents on which it relies for its decision, and by failing to disclose all portions of its decision-making documents that are non-exempt under the Freedom of Information Act ("FOIA"). *San Luis Obispo Mothers for Peace* (Diablo Canyon Independent Spent Fuel Storage Installation), CLI-08-01, 67 NRC 1, 15-17 (2008) (citing *Weinberger v. Catholic Action of Hawaii*, 454 U.S. 139, 143 (1981)).

Perhaps most importantly, the NRC fails to explain why it is justified in continuing to allow licensees to use dangerous high-density fuel storage pools to store spent fuel under protective measures whose adequacy is suspect but cannot be publicly verified,

when it would be possible to virtually eliminate the danger by using low-density pool storage and hardened dry storage of spent fuel. The NRC's secrecy is unnecessary, corrosive to the NRC's system of accountability through open decision-making, and potentially dangerous because the decision-making process was not only secret but was restricted to the NRC and a limited group of individuals with a vested interest in minimizing the cost of mitigative measures, *i.e.*, reactor licensees.

The Proposed Waste Confidence Rule and the Proposed Temporary Storage Rule are utterly inadequate to satisfy the requirements of the AEA and NEPA for a generic licensing decision for new nuclear power plants. Any generic decision to allow the creation of additional spent reactor fuel and other radioactive waste associated with the uranium fuel cycle must be accompanied by thorough, supported, and well-documented safety findings; and it must also be accompanied by an environmental impact statement ("EIS") that fully assesses the environmental impacts of the uranium cycle, including health and environmental impacts and costs, and that examines a reasonable array of alternatives, including the alternative of not producing any additional radioactive waste.

**D. Brief Explanation of the Basis for the Contention**

This contention is based on the legal and technical criticisms of the Proposed Waste Confidence Decision and the Proposed Temporary Storage Rule that are contained in the following documents which are attached to the contention:

> the Comments submitted by Beyond Nuclear, Don't Waste Michigan, Sierra Club, and other organizations on February 6, 2009;

> attached to the Comments, the expert declaration of Dr. Arjun Makhijani, President of the Institute for Energy and Environmental Research ("IEER"), to which in turn is attached his *curriculum vitae* and expert report entitled "Comments of the Institute for Energy and Environmental Research on the U.S. Nuclear Regulatory Commission's Proposed Waste Confidence Rule Update and Proposed Rule Regarding Environmental Impacts of Temporary Spent Fuel Storage" (February 6, 2009) ("IEER Comments");

> also attached to the Comments, the expert declaration of Dr. Gordon R. Thompson, Executive Director of the Institute for Resource and Security Studies ("IRSS"), to which in turn is attached his *curriculum vitae* and expert report entitled "Environmental Impacts of Storing Spent Fuel and High-Level Waste from Commercial Nuclear Reactors: A Critique of NRC's Waste Confidence Decision and Environmental Impact Determination" (February 6, 2009) ("Thompson Report").

**E. Demonstration That the Issue Raised by the Contention is Within the Scope of the Proceeding and Material to the Findings the NRC Must Make to Support its Licensing Decision.**

Before licensing the proposed Fermi 3 nuclear power plant, the NRC must make a determination under the Atomic Energy Act that it has a reasonable assurance that spent fuel can be safely stored and disposed of. See Comments at pages 7-8. Under NEPA, the NRC must also evaluate the environmental impacts of spent fuel storage and disposal. *Id.* While the NRC has chosen to make these determinations generically, in the Proposed Waste Confidence Decision and the Proposed Temporary Storage Rule, those generic determinations must be

adequate to support any individual licensing decision. *Id.* Therefore the contention is within the scope of this proceeding and material to the findings the NRC must make to support the requested issuance of a license.

**F. Concise Statement of Facts or Expert Opinion Relied on to Show the Existence of a Genuine Dispute with the Applicant and the NRC Regarding the Adequacy of the License Application**

In support of this contention, Beyond Nuclear, Don't Waste Michigan, and Sierra Club rely on the facts, expert opinion, and documentary resources set forth in the attached IEER Comments and Thompson Report. The IEER Comments and Thompson Report contain sufficient information to show that Beyond Nuclear, Don't Waste Michigan, and Sierra Club have a genuine dispute with the Applicant and with the NRC regarding the safety and environmental impacts of spent fuel storage and disposal, and whether the NRC has complied with the requirements of the Atomic Energy Act and NEPA in the Proposed Waste Confidence Decision and the Proposed Spent Fuel Storage Rule.

**CONTENTION NO. 3: The COLA violates NEPA by failing to address the environmental impacts of the 'low-level' radioactive waste that it will generate in the absence of licensed disposal facilities or capability to isolate the radioactive waste from the environment**

The issue of long-term radioactive waste management and disposal of Class B, C and greater-than-C (" $>C$ "), so-called "low-level" radioactive waste generated at Fermi 3, is not adequately addressed in the COLA.<sup>1</sup> Some of the waste in these classes remains radiologically hazardous for literally millions of years.

According to the FSAR, Fermi will not "utilize any temporary storage facilities to support plant operation."<sup>2</sup> DTE presumes offsite land disposal of low-level radioactive waste in calculating radiation effects in its Environmental Report.<sup>3</sup> The applicant assumes a routine 60-year operating life.<sup>4</sup> DTE describes its radioactive waste handling at the Fermi plant this way:

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<sup>1</sup>A U.S. Government Accountability Office Report provides some background concerning the present situation, about which there is no dispute. U.S. Government Accountability Office, "Low-Level Radioactive Waste: Status of Disposal Availability in the United States and Other Countries," GAO 08-813T (May 20, 2008). The GAO Report explains that a LLRW disposal facility located in Barnwell, South Carolina, formerly received about 99% of the nation's Class B and C waste, but that after June 30, 2008, the Barnwell facility was closed to generators of LLRW except those located in States that are part of the Atlantic Compact (South Carolina, Connecticut, and New Jersey). LLRW generators in Michigan thus cannot send their Class B and C waste to the Barnwell facility. The GAO Report also explains that unless an off-site disposal facility becomes available, Greater-than-Class-C waste, if any, will also have to be managed onsite since DOE has not yet developed a disposal facility for that type of waste.

<sup>2</sup>FSAR, STD COL Subsect. 11.4-4-A, p. 11-10

<sup>3</sup>ER, Rev. 0, p. 5-146, Subsect. 5.7.1.6 ("The quantities of buried radioactive waste material (low-level, high-level, and transuranic wastes) are specified in NRC Table S-3. For low-level waste disposal at land burial facilities, the NRC notes in Table S-3 that there will be no significant radioactive releases to the environment").

<sup>4</sup>ER, Rev. 0, p. 5-142, Subsect. 5.7.1 ("Changes in the UFC and reactor operations have occurred since NRC Table S-3 was promulgated. For example, the estimated quantity of fuel required for a year's operation of a nuclear power plant can now reasonably be calculated assuming a 60 year lifetime (40 years of initial operation plus a 20 year license renewal term))."

Certain amounts of radioactive materials are generated in solid form. The Solid Waste Management System (SWMS) collects, processes, packages, and temporarily stores these solid radioactive wastes for offsite shipment and permanent disposal. The SWMS controls, collects, handles, processes, packages, and temporarily stores solid waste generated by the plant prior to shipping the waste offsite. These wastes include filter backwash sludge, reverse-osmosis concentrates, and bead resins generated by the LWMS, reactor water cleanup/shutdown cooling system, fuel and auxiliary pools cooling system and the condensate purification system. Contaminated solids such as HEPA and cartridge filters, rags, plastic, paper, clothing, tools, and equipment are also disposed of in the SWMS. Liquids generated by the SWMS are processed through the LWMS described in Subsection 3.5.2.1.<sup>5</sup>

Clearly, off-site disposal of waste is part of the plan; but presently, such off-site disposal is not available to waste generators in Michigan. The COLA does not contemplate any but "temporary" onsite storage of Class B, C and greater-than-C wastes, nor is there any indication that the facilities could accommodate such an accumulation. The intent is that the facility will prepare waste for routine shipment to a disposal site throughout Fermi's entire operating life, despite the fact that no such disposal site is currently available, let alone guaranteed available in future decades. The plan for Fermi omits this essential information, despite the reality that the waste involved is potentially hazardous for far more than 60 years. There are no regulations that specifically guide this situation. Reference is made elsewhere to NRC guidance for extended storage but not potentially permanent or very long-term storage.

DTE states that "[t]he radioactive waste management systems are designed to maintain releases of radioactive materials in effluents to 'as low as reasonably achievable' levels in conformance with 10 CFR Parts 20 and 50, including the design objectives of 10 CFR 50 Appendix

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<sup>5</sup>ER, Rev. 0, pp. 3-39/3-40, 3.5.2.3

I."<sup>6</sup> These are the routine release levels and the applicant provides no detail regarding the ongoing onsite management and potential impact from permanent or very long-term storage of all the B, C and >C radioactive waste from operations on the site of generation. No explanation is offered for how the applicant will meet this plan in the absence of a licensed disposal site.

DTE apparently assumes that it will be able to send its Class B, C, and >C radioactive waste offsite. However, no facility in the United States is licensed and able to accept for disposal such radioactive waste from the Fermi 3 nuclear power reactor. And DTE fails to offer a viable plan for disposal of Class B, C and >C - so-called "low-level" radioactive waste - generated in the course of operations, closure and post-closure of Fermi 3. DTE fails to address how so-called "low-level" radioactive waste from the operation, closure/dismantlement and decommissioning of Fermi 3 will be isolated from the environment and permanently disposed of.

The only operating disposal sites that presently accept Classes B and C waste (and possibly >C on a case-by-case basis) are in Richland, Washington and Barnwell, SC. Neither accepts radioactive waste from outside the North-west, Rocky Mountain and Atlantic low-level radioactive waste compacts. The recently-licensed Waste Control Specialists site in Andrews County, Texas, on the New Mexico border, is being challenged in the state regulatory system by the Sierra Club.<sup>7</sup> Even if that site is allowed to open, it can only accept waste from Texas and Vermont, which are members of a compact.

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<sup>6</sup>ER, Rev. 0, pp. 3-37, Sect. 3.5

<sup>7</sup><http://texasvox.org/2009/03/06/andrews-county-a-radioactive-risk-for-west-texas/>

Processors could change the form of the waste, but the radioactivity will remain, requiring isolation and disposal. Although there are experiments at diluting or down-blending higher concentration wastes to lower concentrations, this is not an accepted routine and has not been analyzed nationally to consider the environmental, health and economic effects of making such a practice routine. Given the lack of an offsite repository, once Fermi is operating, it is reasonable to expect that all Class B, C and >C radioactive waste from the proposed Fermi 3 reactor will remain onsite indefinitely.

The environmental impacts of leaving these wastes onsite must be addressed in order for the Nuclear Regulatory Commission to comply with NEPA. It is imperative that the safety and security issues of extended onsite storage, which comprises *de facto* disposal, be addressed prior to generation of the waste. The so-called "low-level" radioactive waste for which there is no disposal available is the hottest, most concentrated<sup>8</sup> waste in the category. The Environmental Report should also address the fact that >C wastes require disposal in an even more protective manner than imposed for Classes B and C, and must be disposed of in a deep geologic repository unless a specific exemption is granted.

The decommissioning planning assumes that the process-generated "low-level" radioactive will not be present onsite at time of closure.<sup>9</sup> And DTE's assumption is that "waste vendors", which Petitioners take

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<sup>8</sup> A GAO report indicates some of this waste can give a lethal dose in 20 minutes if exposed unshielded. GAO-RCED-98-40R Questions on Ward Valley pages 49-52, 1998.

<sup>9</sup>COLA Part 1, Attachment C, "Decommissioning Funding Assurance Report," Appendix A, shows an "LLW Disposal Preference" of "contract with waste vendors" and an "LLW Burial Location" of "South Carolina."



to mean private firms that process and concentrate waste, will somehow render all waste disposable then dispose of it at a licensed facility, will make the low-level waste disappear. This is not accurate. Vendors will almost undoubtedly have no greater access to disposal facilities than DTE, which means that there is a substantial likelihood that DTE will end up having the waste returned to Fermi. In sum, the applicant's Process Control Program, while explaining the methods of temporary storage, does not explain how DTE will comply with the need for permanent disposal of long-lasting radioactive in the absence of licensed disposal facilities for Classes B, C and >C waste. Even waste sent offsite to vendors could be returned for storage in the absence of permanent disposal. And DTE does not address in its NEPA documents any detail regarding the ongoing onsite management and potential impact from storage of all the B, C and >C radioactive waste from operations at the site of generation. This discussion must appear in the COLA.

The decommissioning cost estimate in Part 1 contains no factoring of the cost of Class B, C and >C radioactive waste that may be stored onsite at that point. There is no accounting, either, for the increased costs that may be associated with disposal of a cumulative total of LLRW from operations in addition to the LLRW generated by dismantling the facility. There is no mention in the decommissioning funding section of any plan to maintain records for LLRW in the event that it is retained on-site at Fermi 3 up to the time of decommissioning.

In Section 5.9 of the Environmental Report, which discusses decommissioning, there is no consideration of the potential for an accumulation of operations waste (so-called "LLRW") being present at

the site at the time that stage commences.<sup>10</sup> In fact, decommissioning is viewed positively as a step toward reuse of the land where the reactor is located:

Decommissioning of a nuclear facility that has reached the end of its useful life is in essence an environmental remediation and therefore has an overall positive environmental impact. The main adverse environmental impact, regardless of the specific decommissioning option selected, is the commitment of relatively small amounts of land for waste burial in exchange for the potential re-use of the land where the facility is located.<sup>11</sup>

The lack of permanent disposal for so-called "low-level" Class B, C and >C radioactive waste that would be routinely generated from Fermi 3, and the failure of the COLA to fully address potentially permanent on-site storage for those long-lasting wastes, violates environmental and safety and security requirements. There is no justification provided for producing long-lasting, intensely radio-active wastes for which no disposal exists. There is no realistic plan for isolation of the wastes or permanent disposal of the wastes. Considering the long history of failed so-called "low-level" radio-active waste disposal sites in the country, assumptions that new ones will be available are not justified.

The COL, ER and FSAR indicate that thousands of curies in "low-level" radioactive waste will be generated from operation of Fermi 3 but none provide analysis of the safety and security of Class B, C and >C wastes that will accumulate at the site in absence of final disposal. Although there is discussion of the routine treatment and processing that would and could be carried out onsite, there is not an assessment of the very long-term economic, safety, security and

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<sup>10</sup>ER, Rev. 0, Section 5.9, p. 5-174.

<sup>11</sup>ER, Rev. 0, Subsection 5.9.2, pp. 5-174/5-175.

environmental consequences of storing Class B, C and >C radioactive waste (regardless of form) nor of the routine and potential accidental releases over time. For example, "low-level" radioactive wastes are not intended to be stored in the containment building that houses the reactor, thus they will not be as protected as other parts of the site. No estimates are made for additional emissions and doses from processing and storage of these long-lasting concentrated wastes. Some so-called "low-level" radioactive waste can give high doses of radiation if one is exposed unshielded. According to the Government Accounting Office (GAO/RCED-98-40R Questions on Ward Valley, 5-22-98 pp. 49-52) some so-called 'low-level' radioactive waste can give a lethal dose at one meter, unshielded, in approximately 20 minutes. In addition, so-called 'low-level' radioactive wastes:

. . . [C]ontain every radionuclide found in 'high-level' radioactive waste...low-level radioactive wastes constitute a very broad category containing many different types and concentrations of radionuclides, including the same radionuclides that may be found in high-level radioactive wastes.

These include plutonium-239 (hazardous life 250 to 500 thousand years), iodine-129 (hazardous life 170 to 340 million years), strontium 90 (hazardous life 280-560 years) and cesium-137 (hazardous life 300 to 600 years).

The DTE COL application, FSAR and ER fail to explain or address how safety and security issues of extended on-site storage/*de facto* disposal of radioactive waste will be maintained with increasing amounts of waste without permanent offsite disposal. The Environmental Report simply describes the generation of waste during operations with the expectation of shipment offsite. Reference is made elsewhere to NRC guidance for extended storage, but not potentially permanent or very long-term storage.

Petitioners have here raised a "contention of omission," *i.e.*, a claim, in the words of 10 C.F.R. § 2.309(f)(1)(vi), that "the application fails to contain information on a relevant matter as required by law . . . and the supporting reasons for the petitioner's belief."<sup>12</sup> In *Pa'ina Hawaii, LLC*, the Board found that a contention satisfied the requirement to provide a specific statement of the legal or factual issue sought to be raised by alleging that the application failed to describe the emergency procedures for a prolonged loss of electricity.<sup>13</sup>

Petitioners urge acceptance of this contention for litigation.

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<sup>12</sup>*Pa'ina Hawaii, LLC (Material License Application)*, LBP 06-12, 63 NRC 403, 413 (2006), *pet. for reconsideration denied*, CLI-06-25, 64 NRC 128 (2006) (dis-missing applicant's appeal as untimely).

<sup>13</sup>LBP 06-12, 63 NRC at 414.

**CONTENTION NO. 4: The Commission must suspend the COL adjudication pending completion of the NRC review of the ESBWR reactor design and the obligatory design rulemaking**

There is no complete, accepted and certified design for the Economic Simplified Boiling Water Reactor, the design which DTE has chosen for Fermi 3.<sup>1</sup>

In a letter dated February 18, 2009 from David B. Matthews, NRC Director of the Division of New Reactor Licensing Office of New Reactors, to Mr. Robert E. Brown Senior Vice President, Regulatory Affairs GE Hitachi Nuclear Energy the NRC staff set certain dates in the second half of 2010 by which time the NRC Staff anticipated completion and certification of the ESBWR design.<sup>2</sup>

As a consequence, the pending proceedings to adjudicate a Combined Operating License for Fermi 3 must be suspended until the NRC staff has completed its review of the ESBWR design and the necessary design certification rulemaking proceeding has been concluded by the

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<sup>1</sup>With unwitting irony suggestive of Monty Python, DTE asserts (p. 1 of its "Departures Report") that:

A Departures Report includes deviations identified in the Fermi 3 FSAR from the information in the applicable NRC approved DCD. At the time of application submittal, *an ESBWR standard design certification and rule has not been issued by the NRC, and therefore departures would not be considered to currently exist.* However, for the purposes of identifying changes to Revision 4 of the ESBWR DCD, three DCD Departures were identified. (Emphasis supplied)  
COLA, Departures Report (Part 7), Rev. 0, p. 1.

<sup>2</sup>"NRC issues remaining supplemental RAIs April 30, 2009  
GEH respond to all remaining outstanding RAIs July 31, 2009  
All open items resolved July 31, 2009  
GEH submit DCD Revision 6 incorporating revisions associated with all RAI responses (FSER will be based on this DCD revision) August 31, 2009

FSER complete December 30, 2009  
Two (2)-Month Managed Reserve March 8, 2010  
NRC forwards advance FSER to ACRS for review March 8, 2010  
ACRS Subcommittee/ Full Committee meetings on FSER April 2010.  
FSER Issuance August 16, 2010."  
From letter, "Economic Simplified Boiling Water Reactor (ESBWR) Design Certification Schedule Update", ML090420291.

NRC.

The manner in which the NRC is poised to conduct the licensing proceeding would deprive Petitioners of a fair and meaningful opportunity for a hearing on the Fermi COLA, in violation of the Atomic Energy Act ("AEA"), the Administrative Procedure Act ("APA"), the National Environmental Policy Act ("NEPA"), and the NRC's own regulations.

The AEA is violated because the determination as to whether an application is sufficiently complete for docketing is for the Staff, rather than an adjudicatory board, to make.<sup>3</sup> DTE effectively, but improperly, urges the ASLB to assume the role of the Staff, in violation of the Atomic Energy Act,<sup>4</sup> to erase this bright-line distinction.

Moreover, the Commission's policy statement that removes the COLA's design-related contents from the scope of issues that may be challenged in the COLA adjudication<sup>5</sup> and refers those issues for resolution in a separate rulemaking proceeding (one which has neither been scheduled nor commenced) is not enforceable law or regulation.<sup>6</sup>

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<sup>3</sup>*New England Power Co. (NEP, Units 1 & 2)*, LBP-78-9, 7 NRC 271, 280 (1978).

<sup>4</sup>42 U.S.C. § 2241 of the Act allows for creation of ASLBs "to conduct such hearings as the Commission may direct and make such intermediate or final decisions as the Commission may authorize with respect to the granting, suspending, revoking or amending of any license or authorization under the provisions of this Act, any other provision of law, or any regulation of the Commission issued thereunder."

<sup>5</sup>Policy Statement on the Conduct of New Reactor Licensing Proceedings, 72 Fed. Reg. 20,963 (April 17, 2008) ("2008 Policy Statement").

<sup>6</sup>Petitioners seek admission of this contention in order to protect their right to ensure that any generic resolution of their concerns is made in a timely way and "plugged in" to the licensing decision in this case. *Baltimore Gas and Electric Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 101 (1983). See also *Commonwealth of Massachusetts v. NRC*, 522 F.3d 115, 127 Cir. 2008) (although the NRC may make generic determinations regarding the

It violates § 189a of the Atomic Energy Act ("AEA"), as well as judicial precedent interpreting the AEA, and the NRC's Part 52 regulations for the conduct of licensing proceedings on COLAs. The fixing of policy around convenience cannot be used to supplant regulatory rigor; when an agency applies a policy in a particular situation, "it must be prepared to support the policy just as if the policy statement had never been issued".<sup>7</sup>

The APA is violated because as a matter of law, the COLA is incapable of meeting the Administrative Procedure Act's requirement for an adequate hearing notice. An adequate notice contains the chief "issues of . . . law" that must be included in the hearing notice. That certainly encompasses the content of the ESBWR standard design certification rule, and that content has yet to be established.

Petitioners' rights to raise challenges under NEPA would be impugned by allowing this COL proceeding to move forward with an uncertified design. The Environmental Impact Statement which the Commission has promised will be compiled must contain a "full and fair discussion" of significant environmental impacts that is "supported by evidence that the agency has made the necessary environmental anal-

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significance of environmental impacts and prohibit challenges to those generic determinations in individual proceedings, it nevertheless must "consider any new and significant information regarding environmental impacts before renewing a nuclear power plant's operating license"). While the NRC may steer a challenging party's concerns about the effects of new and significant information on an individual licensing decision into a generic proceeding, the NRC may not refuse to provide "at least one path by which the [challenging party] may establish a connection" between the rulemaking and the licensing proceeding, thereby ensuring that the result of the rulemaking proceeding will be applied in the individual licensing case. *Id.* at 128. To ensure that a "connection" is maintained between any rulemaking determination on the ESBWR reactor design and the Petitioners' right to seek application of new and significant information to this proceeding, the Petitioners request that this contention be admitted and held in abeyance pending the outcome of the generic proceeding.

<sup>7</sup>*Pacific Gas & Electric Co. v. FPC*, 506 F.2d 33, 38-39 (D.C. Cir. 1974).

yses." 40 C.F.R. § 1502.1. To satisfy NEPA, the NRC must demonstrate it has taken a "hard look" at the environmental consequences of the proposed action. "To comply with NEPA's 'hard look' requirement an agency must adequately identify and evaluate environmental concerns." *Friends of the Bow v. Thompson*, 124 F.3d 1210, 1213 (10th Cir. 1997). "NEPA procedures must insure that environmental information is available to public officials and citizens **before decisions are made and before actions are taken** [emphasis supplied]. . . . Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." *Earth Island Inst. v. U.S. Forest Serv.*, 442 F.3d 1147, 1153-54 (9th Cir. 2006); 40 C.F.R. § 1500.1(b). These things are impossible unless the COL is complete, including a certified reactor design that may be analyzed in context. Without a fixed, certified ESBWR design, public commenters in the ongoing NEPA proceeding cannot meaningfully comment concerning operational prospects and associated environmental effects; accident scenarios and such effects; nor is it possible for them to gain, in timely fashion, an understanding of the routine radiation emissions likely to come from Fermi 3.

There is uncertainty, not just as to what the final ESBWR design will be, but whether DTE will ultimately continue in its quest to construct an ESBWR, given the protracted continuum for finalizing the design which the NRC staff has identified. This uncertainty comprises a denial of due process to the Petitioners.

The regulatory scheme embodied in 10 CFR Part 52 leaves the Commission only two choices with respect to the conduct of a licensing proceeding for the proposed Fermi 3: either to hold an adjudication on the entire COLA, including the ESBWR design certification application



that is incorporated by reference into the COLA; or to complete the ESBWR design certification rulemaking before holding an adjudicatory hearing on the Fermi 3 COLA. The Part 52 regulations do not give the NRC the option of removing the COLA's design-related contents from the scope of the adjudication on the COLA and referring them to a separate rulemaking for resolution while the COL proceeding cranks along without a fix on the reactor design.

DTE cannot have matters both ways. The COL adjudication must be suspended pending completion of the ESBWR design rulemaking.

**CONTENTION NO. 5: The Fermi site may have problematic hydrology likely to allow offsite transport of chemical and radiological contaminants**

The relevant part of NRC regulations for this contention is 10 CFR PART 100 REACTOR SITE CRITERIA, Subpart B, Evaluation Factors for Stationary Power Reactor Site Applications on or After January 10, 1997, Sec. 100.20 Factors to be considered when evaluating sites. This regulation states, in relevant part:

The Commission will take the following factors into consideration in determining the acceptability of a site for a stationary power reactor. . .:

(c) Physical characteristics of the site, including seismology, meteorology, geology, and hydrology.

(3) Factors important to hydrological radionuclide transport (such as soil, sediment, and rock characteristics, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface body of water) must be obtained from on-site measurements. The maximum probable flood along with the potential for seismically induced floods discussed in Sec. 100.23 (d)(3) must be estimated using historical data.

Detroit Edison's current hydrological studies are woefully inadequate, currently omitting key data on "Factors important to hydrological radionuclide transport (such as soil, sediment, and rock characteristics, adsorption and retention coefficients, ground water velocity, and distances to the nearest surface body of water)," and lacks key, adequate on-site measurements. This is made abundantly clear by Detroit Edison's own documented admissions, as cited below. In this regard, this contention represents a contention of omission.

On January 14, 2009, NRC's Jerry Hale, Project Manager, ESBWR/ABWR Projects, Branch 1, Division of New Reactor Licensing, Office of New Reactors wrote to Mr. Jack M. Davis, Senior Vice President and Chief Nuclear Officer, DTE Energy, Fermi 2 - 210 NOC, 6400 North Dixie Highway, Newport, MI 48166 regarding "REQUEST FOR ADDITIONAL INFORMATION LETTER NO. 2 RELATED TO THE SRP SECTIONS 02.04.13 FOR THE FERMI 3 COMBINED LICENSE APPLICATION." In this letter, Mr. Hale wrote the

following:

Request for Additional Information No. 1944 Revision 0

Fermi Unit 3  
Detroit Edison  
Docket No. 52-033

SRP Section: 02.04.13 - Accidental Releases of Radioactive Liquid Effluents in Ground and Surface Waters

Application Section: FSAR Chapter 2 Section 2.4

QUESTIONS for Hydrologic Engineering Branch (RHEB)

02.04.13-1

Provide site-specific measured hydrologic parameters necessary to perform radionuclide transport analysis under the assumed release scenario as required in 10 CFR 100.20(c). More specifically, provide data and discussions about the hydrologic characteristics of the bedrock aquifer (Bass Islands Group) and the glacial overburden near Fermi Unit 3, including their thickness, depths to water tables, hydraulic conductivities, distribution coefficients, porosities; bulk mass densities, and retardation factors; the vertical and horizontal groundwater velocities of the overburden; suction heads; and the groundwater velocity of the bedrock aquifer.

02.04.13-2

Provide a description of the screening process used to determine the radioactive constituents in the drain collection tank considered for the failure analysis and how the inventory described in Table 12.2-13a of the ESBWR DCD was used to derive the radionuclide constituents for the subsequent radionuclide transport analysis.

02.04.13-3

Provide a discussion on the presence or absence of chelating agents and other chemical agents that would modify the transport characteristics of radionuclides at the site. The discussion needs to include whether these chemicals are to be used anywhere at the site and not limited to the tanks.

02.04.13-4

Provide a discussion on post-construction groundwater levels and their influence on the radionuclide pathways.

02.04.13-5

Provide an explanation of the "two possible sources" mentioned in the discussion of "Transport Considering Radioactive Decay Only"

portion of the supplemental information.

02.04.13-6

Provide a description of the process followed to determine the conceptual models for surface and subsurface pathways and for site characteristics that affect transport of radioactive liquid effluents in ground and surface waters to ensure that the most conservative of plausible conceptual models has been identified pursuant to the guidance provided in SRP 2.4.13. Also provide analysis based on the most conservative of all the plausible models to demonstrate compliance with 10 CFR part 20 Appendix B Table 2 ECL limits. In the supplemental information that contained the analysis of radionuclide transport for an assumed failure, the results show exceedance of the ECL limits for 12 radionuclide isotopes for both assumed receptors (Lake Erie to the east and a receptor well to the west). The applicant also stated that even if the conservatism assumed in the analysis, more specifically the maximum groundwater velocity, dilution, assumption of continuous ingestion were to be relaxed, the resulting concentrations will still be above the ECL limits. Please include in the analysis the basis for the preceding conclusion of the applicant.

NRC RAIs highlight key missing data and measurements that Petitioners need for preparing contentions against Fermi 3. Therefore, Petitioners request the right to modify this contention, once Detroit Edison provides the missing data and analyses, and that they be given adequate time to do so (at a minimum, sixty additional days to modify their contention).

Detroit Edison responded to NRC RAI 2.4.13-1, sent by Jack M. Davis, Senior Vice President and Chief Nuclear Officer, Detroit Edison Company, to U. S. Nuclear Regulatory Commission, Attention: Document Control Desk, Washington DC 20555-0001, on February 16, 2009, stated (emphases below added by petitioners):

As described in Detroit Edison Company Submittal of Fermi 3 FSAR Section 2.4.13 Analysis, dated November 11, 2008, **distribution coefficients and retardation factors were not determined. At the time of the development of FSAR Section 2.4.13, due to fractured nature of the Bass Islands Group, testing methods were considered to be limited in their capability to represent the sub-surface conditions.** Subsequently, Detroit Edison has identified a laboratory that can employ a testing

method to determine distribution coefficients and retardation factors for sub-surface conditions representative of the Fermi site. Based on this contact, Detroit Edison is now able to perform this testing. Using the results from the laboratory testing, **Detroit Edison will update the analysis to credit these factors. The results from the testing and the updated analysis will be provided in a subsequent submittal by September 1, 2009.** (Emphasis supplied)

Such admissions clearly show that Detroit Edison has omitted key data and on-site measurements. Detroit Edison's statement that the Bass Islands Group is "**fractured,**" and that "**testing methods were considered to be limited in their capability to represent the sub-surface conditions,**" raises alarm bells and red flags that not only is the Bass Islands Group sole source aquifer vulnerable to fast moving plumes of radioactive contamination, but that it is also at risk of leaking this contamination into adjacent aquifers which also could flow into Lake Erie or area drinking water supplies.

Petitioners therefore request the right to modify this contention, once Detroit Edison provides the missing data and analyses on September 1, 2009, and that they be given adequate time to do so (at a minimum, sixty additional days to modify their contention).

Later in the same letter, Mr. Davis wrote to NRC:

**As described in Section 2.4.12.3.2, no porosity field data was collected. In lieu of using field data, literature values for porosity were used to determine groundwater velocity.** Velocity calculations were performed using high and low range estimates (10 - 25 percent for glacial till, 25 percent for rock fill, 1 - 20 percent for limestone/dolomite) to bracket the range of possible results. **Based on these values, calculated groundwater velocities and estimated travel times to the closest postulated receptors are reported in Section 2.4.12.3.2.**

That section reported that radioactively contaminated groundwater could reach Lake Erie, less than 1,500 feet away, in just 2.3 years. This is a clear admission by Detroit Edison that key data, on-site

measurement, and analyses - concerning an issue as vital as drinking water protection in a sole source aquifer and the Great Lakes -- have been omitted from its COLA.

Mr. Davis concluded that Detroit Edison's "Proposed COLA Revision" would entail the following: **"A revised COLA markup will be included with the results and the updated analysis upon completion of the laboratory testing."** Presumably, this means by September 1, 2009, as indicated above, but Mr. Davis was not explicit about a date certain in this particular section of his letter.

Detroit Edison's response to NRC RAI 2.4.13-3 stated:

Detroit Edison Company Submittal of Fermi 3 FSAR Section 2.4.13 Analysis, dated November 11, 2008, provides an analysis of a postulated accidental release of radioactive liquid effluents to the groundwater at the Unit 3 site. The analysis is based on the rupture of a liquid radwaste tank outside of containment. **The ESBWR standard plant design does not envision the use of chelating agents in liquid radwaste processing. In addition, based on current operating experience at Fermi 2, Detroit Edison does not currently use chelating agents in liquid radwaste processing. Therefore, based on the above there are no plans to use chelating agents for Fermi 3.** (Emphasis supplied)

Detroit Edison concludes that no proposed revision to its COLA is necessary.

But Detroit Edison's reassurance that chelating agents would not be used at Fermi 3's liquid radwaste processing facilities, nor are they used at Fermi 2's liquid radwaste processing facilities, does not answer the concerns raised. In fact, Detroit Edison's own Fermi 3 COLA contradicts its reassurance. At Part 3, Environmental Report, Section 5.5, "Environmental Impacts of Waste," Detroit Edison states "At the Fermi site these wastes include such non-radioactive sources as **laboratory solvent waste...**" Detroit Edison goes on to state that "Mixed waste contains hazardous waste and a low-level radioactive source,

special nuclear material, or byproduct material. This may include such contaminated items as waste oil, chlorinated fluorocarbons, **organic solvents**, metals and metal-contaminated materials, or **aqueous corrosives**." We are concerned that such laboratory solvent wastes, organic solvents, and aqueous corrosives, not only at Fermi 1 and Fermi 2, but also at Fermi 3, could serve to accelerate the transport of hazardous radioactive substances leaked or spilled onto the soil into the groundwater, including the Bass Islands Group Aquifer, a sole source of drinking water downstream.

At Section 5.5.2.1, "Plant Systems Producing Mixed Waste," in the Fermi 3 COLA's Part 3/Environmental Report, Detroit Edison goes on to state that:

A 1990 survey by the NRC identifies the following types of low-level mixed waste at nuclear power plants which are representative of the types of waste expected at Fermi 3 (Reference 5.5-2):

- Waste oil from pumps and other equipment
- Chlorinated fluorocarbons resulting from cleaning, refrigeration, degreasing, and decontamination activities
- **Organic solvents, reagents, compounds**, and associated materials such as rags and wipes
- Metals such as lead from shielding applications and chromium from **solutions and acids**
- **Metal-contaminated organic sludge and other chemicals**
- **Aqueous corrosives consisting of organic and inorganic acids**".

Petitioners are concerned that such organic solvents, reagents, and compounds, metal dissolving solutions and acids, metal-contaminated organic sludges and other chemicals, and aqueous corrosives consisting of organic and inorganic acids, not only at Fermi 1 and 2 but also at Fermi 3, could serve to accelerate the transport of hazardous radioactive substances leaked or spilled onto the soil into the groundwater, including the Bass Islands Group Aquifer, a sole source of drinking water downstream.

Similarly, Detroit Edison states in its Fermi 3 ER at Section 5.2.2.2.1, "Chemical Impacts," that "Cooling tower water chemistry must be maintained with **anti-scaling compounds** and **corrosion inhibitors** because cooling towers concentrate solids (minerals and salts) and **organics that enter the system in makeup water.**" (Emphasis supplied)

Thus, makeup water from Lake Erie already contains organics, which Petitioners are concerned could cause a chelating effect at Fermi 3.

Detroit Edison states "Chemicals to be added to the liquid effluent streams are listed in Table 3.6-1. Water-treatment chemicals planned for use at Fermi 3 include the following types:

- Biocide/Algaecide
- **Corrosion inhibitor**
- **Scale inhibitor**
- Dehalogenation"

Upon examination of Table 3.6-1, "Chemicals Added to Liquid Effluent Streams," it is revealed that the corrosion inhibitor currently in use at Fermi 2, and assumed by Detroit Edison to also be used at Fermi 3, is phosphoric acid. Fermi 2's NPDES permit allows up to 2,500,000 pounds per year of phosphoric acid to be continuously used in the Fermi 2 "CIRC system" to inhibit corrosion. The Table also reveals that up to 83,000 pounds per year of  $C_2H_3OH(PO(OH)_2)_2$  is continuously used in Fermi 2's "CIRC system" to inhibit scale. In addition to our concerns about these chemicals' harmful impact upon the greater Lake Erie ecosystem's flora, fauna, and human population, including synergistic effects in combination with radioactivity released by Fermi's multiple operating and now permanently shut down



reactors, we are also concerned that such large-scale use of such chemicals could have a chelating effect on hazardous radioactive substances leaked or spilled onto the soil by Fermi 3 operations, accelerating their transport into the groundwater, including the Bass Islands Group Aquifer, a sole source of drinking water downstream.

Also, Detroit Edison's Fermi 3 ER Section 5.11.3.2, "Surface Water Quality," states that "The water quality data review (Subsection 2.3.3.1) identified turbidity, nutrients, ***persistent organics***, metals, and oils as challenges to Lake Erie water quality." (Emphasis supplied). Fermi 3 would be located immediately adjacent to Lake Erie. Whether due to groundwater interaction with Lake Erie itself, flooding from Lake Erie upon the Fermi 3 site, or even deposition of water vapor laced with persistent organic pollutants caused by Lake Erie water flowing through Fermi 2's or Fermi 3's cooling towers, we are concerned about the potential for chelating effects.

Besides such citations in Detroit Edison's own Fermi 3 ER, it should be acknowledged that natural chelating agents are also present in the ecosystem surrounding the Fermi nuclear power plant. Virtually all biochemicals exhibit the ability to dissolve certain metal cations. Thus, proteins, polysaccharides, and polynucleic acids are effective polydentate ligands for many metal ions. In addition to these adventitious chelators, several biomolecules are produced that specifically bind certain metals. Histidine, malate and phytochelatin are typical chelators present in plants.

In biochemistry and microbiology, virtually all metalloenzymes feature metals that are chelated, usually to peptides or cofactors and

prosthetic groups. Such chelating agents include the porphyrin rings in hemoglobin and chlorophyll. Many microbial species produce water-soluble pigments that serve as chelating agents, termed siderophores. For example, species of *Pseudomonas* are known to secrete pyocyanin and pyoverdine that bind iron. Enterobactin, produced by *E. coli*, is the strongest chelating agent known.

Geologically, chemical weathering is attributed to organic chelating agents, e.g. peptides and sugars, that extract metal ions from minerals and rocks. Most metal complexes in the environment and in nature are bound in some form of chelate ring, e.g. with "humic acid" or a protein. Thus, metal chelates are relevant to the mobilization of metals in the soil, the uptake and the accumulation of metals into plants and micro-organisms. Selective chelation of heavy metals is relevant to bioremediation, e.g. removal of Cesium-137 from radioactive waste.

Also, chelates are used in many human applications, from chemical analysis, water softening, ingredients in soaps, shampoos, food preservatives, laundry detergents, and even water treatment and boiler water treatment systems. Chelation is also used in medical and dental treatments. The following chelants are used in various technological applications: Acetic acid, Acrylic polymers, Ascorbic acid, BayPure CX 100 (tetrasodium iminodisuccinate), Citric acid, Dicarboxymethylglutamic acid, Ethylenediaminedisuccinic acid (EDDS), Ethylenediaminetetraacetic acid (EDTA), Hepta sodium salt of diethylene triamine penta (methylene phosphonic acid) (DTPMP•Na<sub>7</sub>), Hydrolysed wool, Malic acid, Nitrilotriacetic acid (NTA), Nonpolar amino acids, such as methionine, Oxalic acid, Phosphoric acid, Polar amino acids,

including: arginine, asparagine, aspartic acid, glutamic acid, glutamine, lysine, and ornithine, Siderophores such as Desferrioxamine B, and Succinic acid. Such chelates could find their way into the waters of Lake Erie via water pollution, and thus could interact with radionuclides at the Fermi nuclear power plant site.

Petitioners are concerned that such naturally and artificially occurring chelates as listed above, present in the flora, fauna, and Lake Erie waters surrounding Fermi nuclear power plant, could accelerate the release of hazardous radioactive substances leaked or spilled onto the soil by Fermi 3 operations, worsening their transport into the groundwater, including the Bass Islands Group Aquifer, a sole source of drinking water downstream, as well as into Lake Erie.

Petitioners' concerns are not limited to the 40, 60, or 80 years that Fermi 3 would operate by NRC permit. We are also concerned about persistent radioactive contamination that would linger at the Fermi 3 site, even long after decommissioning activities that failed to clean it up. Of the dozen radionuclide isotopes that would exceed ECL limits for "both assumed receptors (Lake Erie to the east and a receptor well to the west)," we are not only concerned about relatively short-term hazards (measured in the decades), but also about the long-term hazards (measured in the centuries, millennia, and beyond) for radionuclides with correspondingly long half-lives, and thus hazardous persistence.

Petitioners are also concerned that Fermi 3's decommissioning activities could involve chelating agents now currently being acknowledged by Detroit Edison. For example, during the precedent-setting decommissioning of Consumers Power's Big Rock Point General

Electric boiling water reactor nuclear power plant in northern Michigan between 1997 and 2006, chelating agents were used to dissolve radioactive metallic crusts from within pipes. Use of such chelating agents on former nuclear power plant sites such as Fermi raises grave concerns about accelerated releases of radioactive contamination into adjacent surface and ground waters.

Petitioners' concern stems from the fact that Lake Erie is a vital source of drinking water for millions of people downstream, including in Canada, and to whom the U.S. federal government has century-old Boundary Water Treaty legal obligations. Lake Erie is also a biologically rich fishery, providing food to countless numbers of persons, including First Nations who subsist on fish and retain fishing rights to Lake Erie, as recognized by treaties signed by the U.S. government. Chelates accelerating radioactive contamination of Lake Erie risk bio-accumulation in such species as fish, which are then consumed by humans, worsening the health risks from the radioactive contamination by delivering a more concentrated radiation dose.

Also, long-standing U.S. Environmental Protection Agency policy and practice, as embodied in the Safe Drinking Water Act and Clean Water Act, holds that drinking water supplies, most especially sole source aquifers such as the Bass Islands Group, should be protected against toxicological and radiological contamination, especially contamination that exceeds ECL limits.

Detroit Edison's Environmental Report, at Table 2.3-19, lists EPA Region 5 Sole Source Aquifers, and reports that the Bass Islands Aquifer at Catawba Island is just 34 Miles away from the proposed

location of Fermi 3. We are concerned that Fermi 3's radiological, and even toxicological, releases could endanger this precious sole source aquifer.

At Section 2.3.1.2.1.2, "Site Aquifers, Formations, Sources, and Sinks," Detroit Edison's ER states:

The zone of shallow overburden characterized by unconsolidated deposits at Fermi 3 average 28 ft in thickness (FSAR Subsection 2.5.1.2.3), which is consistent with conditions in much of Monroe County (Reference 2.3-79). The local bedrock formation subcropping beneath the overburden is the Bass Islands Group. As previously stated this unit is part of the bedrock aquifer that exists throughout Monroe County.

Thus Petitioners are concerned about radiological and toxicological risks not only regarding the Bass Islands Aquifer at Catawba Island, but also by hydrological interactions between the Bass Islands Aquifer and other aquifers throughout the area, which supply drinking water via wells or even municipal systems to area residents.

In its response to NRC RAI 2.4.13-4, Detroit Edison stated:

FSAR, Section 2.4.12, discusses groundwater conditions at the Fermi 3 site. Section 2.4.12.2.5 describes that **current groundwater flow conditions are influenced by the quarry operations in the vicinity**. As described, due to the quarry operations, the present flow pattern is reversed from the pre-quarry development flow pattern. If the quarries were to stop operating, water levels in the county could potentially recover to the point that the flow direction beneath the site might revert to the natural pre-development patterns.

**As further discussed in Section 2.4.12.2.5, construction of Fermi 3 includes excavation into the Bass Islands Group to build foundations. This activity will require temporary dewatering of the excavation site to levels approximately 45 to 50 feet below the present groundwater elevation. This will alter groundwater flow locally near the site.** As described in Section 2.4.12.2.5.1, this temporary condition was evaluated, including construction techniques to minimize the impacts.

**There will be localized altered groundwater flows, around newly constructed buildings, postconstruction,** however these altered groundwater flows are not expected to have an effect on the overall groundwater flow for the area. (Emphasis supplied)

Fermi 3 operations do not rely on groundwater. Thus, groundwater conditions would be expected to return to the present day conditions following construction and there would be no influence to radionuclide pathways other than those evaluated in the Detroit Edison Company Submittal of Fermi 3 FSAR Section 2.4.13 Analysis, dated November 11, 2008.

Subsection 2.4.12.4 discusses post-construction groundwater monitoring. One of the purposes of the post-construction groundwater monitoring is to ensure that any construction impacts are identified and evaluated. If necessary, the analysis would be updated to reflect any postconstruction changes to the local groundwater flow." Detroit Edison then proposed no COLA revision.

Petitioners are concerned that Detroit Edison lacks an adequate understanding of hydrology in the surrounding area, and that various quarries in Monroe County will serve to draw radioactively and toxicologically contaminated groundwater in various aquifers under the Fermi nuclear power plant site outwards into surrounding areas, where individual families and even entire communities will then draw upon that contaminated groundwater for drinking water supply.

In its response to NRC RAI 2.4.13-5, Detroit Edison clarifies that:

The referenced discussion in the section titled "Transport Considering Radioactive Decay Only" should have read "two possible receptors" in lieu of "two possible sources" and will be corrected in Revision 1 of the Fermi 3 FSAR. As described in this section ***the two possible receptors are the shoreline of Lake Erie (to the East) and a groundwater well (to the West). There is only one source of radioactive water that is postulated to be released and that is the Equipment Drain Collection Tank*** as stated in Section 2.4.13. (Emphasis supplied)

It should be noted that Detroit Edison's Design Control Document for the ESBWR lists the following radionuclides in Table 12.2-13a, "Liquid Waste Management System Equipment Drain Collection Tank Activity," as having various levels of radioactivity: I-131,-132,-133,-134,-135; Rb-189; Cs-134,-136,-137,-138; Ba-137m; H-3 (tritium); Na-24; P-32; Cr-51; Mn-54,-56; Fe-55,-59; Co-58,-60; Ni-63; Cu-64; Zn-65; Sr-89,-90; Y-90; Sr-91,-92; Y-91,-92-93; Zr-95; Nb-95; Mo-99; Tc-99m; Ru-103; Rh-103m; Ru-106; Rh-106; Ag-110m; Te-129m,-131m,132; Ba-140; La-140; Ce-141,-144; Pr-144; W-187; Np-239. Of these, NRC identifies a dozen that exceed Effluent Concentration Limits (ECLs).

Given Detroit Edison's lack of data, and admitted limitations in understanding of local hydrology, including regarding the Bass Islands Aquifer, we challenge Detroit Edison's assumption that contaminated groundwater is limited to only two possible receptors, the shoreline of Lake Erie to the east, and a groundwater well to the west. Catawba Island's draw on the Bass Islands Aquifer, Catawba Island's sole source aquifer, is just 34 miles to the east, and must be considered as well, given the risk of radioactive contaminant concentration in that sole source aquifer.

NRC RAI 2.4.13-6 states that **"...the results show exceedance of the ECL limits for 12 radionuclide isotopes for both assumed receptors' (Lake Erie to the east and a receptor well to the west). The applicant also stated that even if the conservatism assumed in the analysis, more specifically the maximum groundwater velocity, dilution, assumption of continuous ingestion were to be relaxed, the resulting concentrations will still be above the ECL limits."**

In its response, Detroit Edison admits that "As described in Section 2.4.12.3.2, **no porosity field data was collected. In lieu of using field data, literature values for porosity were used to determine groundwater velocity.**" (Emphasis supplied)

Disconcertingly, at Section 2.4.12.3.2 of Detroit Edison's FSAR, it admits that contaminated groundwater could travel from the Fermi 3 site to Lake Erie, just 1,476 feet to the east, in as little as 2.3 years, during which time many of the radionuclides listed above in Table 12.2-13a are still hazardous. Even if the contaminated plume takes as long as 368 years to travel to Lake Erie, many of the radionuclides would likewise still be hazardous, given their long half-lives.

Detroit Edison responds:

The analysis concluded that **even with relaxation of conservatisms the results would be expected to exceed the Effluent Concentration Limits (ECL).** The basis for this conclusion is that **the concentration of several of the radionuclides were well above the ECL; and one of the radionuclides exceeds the ECL by a factor of more than 5E+03 [that is, 5,000 times].** As noted in the responses above, Detroit Edison is now able to perform laboratory testing to determine site specific values for **distribution coefficients and retardation factors. Using these factors, coupled with relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release),** Detroit Edison expects the subsequent results to be less than the ECL. Using the results from the laboratory testing, Detroit Edison will update the analysis to credit these factors. The results from the testing and **the updated analysis will be provided in a subsequent submittal to the NRC by September 1, 2009.** (Emphasis supplied)

Petitioners emphasize that their deadline for filing intervention contentions is March 9, 2009. Detroit Edison is indicating that its field testing data results and updated analysis will not be available until September 1, 2009 - nearly six months after the present deadline for intervening. Petitioners therefore request that the ASLB allow



them to revisit these issues when Detroit Edison finally publishes its data and revised analysis, so that they may timely modify their contention. Petitioners request that they be given adequate time to analyze Detroit Edison's findings, at a minimum, sixty days.

Detroit Edison, finally, lists the following "Commitments" to NRC:

"1. The following **commitment** was made in this letter. Detroit Edison will perform laboratory testing to determine site specific values for distribution coefficients and retardation factors. Using these factors, coupled with **relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release), Detroit Edison expects the results to be less than the ECL.** Using the results from the laboratory testing, Detroit Edison will update the analysis to credit these factors. The results from the testing and the updated analysis will be provided in a subsequent submittal to the NRC by September 1."

Petitioners are very troubled by Detroit Edison's "commitment" to relax conservatisms when it comes to radiological contamination of the Great Lakes and surrounding groundwater, including the Sole Source Aquifer known as the Bass Islands Group. Lake Erie is a precious, irreplaceable resource - drinking water supply to millions downstream, and its shallow western basin the most biologically productive fishery in the entire Great Lakes basin. The Bass Islands Group Aquifer is a the sole source aquifer for Catawba Island, Ohio, and thus also precious and irreplaceable. It is entirely inappropriate and outrageous for Detroit Edison to propose "pencil-whipping" its radiological contamination analyses into compliance with NRC environmental protection regulations. "Crediting dilution in the Radwaste Building prior to release" does not seem to us to be an acceptable method of protecting the Great Lakes and a sole source aquifer from hazardous radiological contamination. We are also concerned that Detroit Edison

seeks to manipulate its "distribution coefficients and retardation factors" in order to achieve a pre-determined outcome: compliance with NRC regulations, at least on pencil-whipped paper.

Such a commitment to relax conservatisms by Detroit Edison is all the more troubling given its report that the Bass Islands Group Sole Source Aquifer is "**fractured,**" and that "**testing methods were considered to be limited in their capability to represent the sub-surface conditions...**" Detroit Edison is thus admitting that it doesn't understand the hydrology beneath Fermi nuclear power plant, which means that Lake Erie and area drinking water supplies immediately downstream are at significant risk.

Petitioners therefore reserve the right to renew and reactivate this contention at such time as DTE finally publishes its currently omitted data and analyses, so that they may modify their contention. Petitioners further request that they be given adequate time to do so, at a minimum sixty days.

**CONTENTION NO. 6: The COLA omits critical information disclosing  
environmental impacts to Lake Erie's Western Basin and Maumee  
River/Maumee Bay**

While in a separate contention, petitioners have addressed the cumulative and additive impacts to Lake Erie, and the Great Lakes as a whole, which Detroit Edison has ignored and should analyze, the following contention focuses on the disproportionate impacts Fermi 3 would have on Lake Erie's biologically-rich, but remarkably shallow, and thus vulnerable, western basin, as well as the shallow, vulnerable, and intensely biologically productive estuary system formed by Maumee Bay and the Maumee River downstream from the proposed Fermi 3 atomic reactor.

These contentions reference the sections of the Fermi 3 Combined License Application, Part 3 "Environmental Report," Section 2.3 "Water." They point out the need for significant corrections and additional information. Therefore, these contentions represent contentions of omission which Detroit Edison must rectify. Once Detroit Edison has provided the omitted information, data, and analyses, we request the right to review and critique the new information, with the assistance of appropriate experts, and an ample amount of time in which to do so.

**Western Basin of Lake Erie Effects Information Omitted**

In Section 2.3.1.1, "Surface Water Resources," Detroit Edison states "Fermi 3 is located on the Western Basin of Lake Erie. Thus Lake Erie is the primary surface water body to be considered for potential impact to Fermi 3." In Section 2.3.1.1.1, "Lake Erie Drainage Basin," Detroit Edison states "The western Lake Erie basin is a very shallow basin with an average depth of 24 feet. The western basin is partially restricted from the rest of Lake Erie by a chain of barrier beaches and islands."

Fermi 3 would be in western Lake Erie, which is far more vulnerable than the whole of Lake Erie to this proposed project's negative impacts. The Detroit Edison Environment Report (ER) at times acknowledges the western basin of Lake Erie, but then goes on to assess the proposed new reactor's projected impacts on the whole of Lake Erie, rather than the western basin of Lake Erie in particular. Given the greater vulnerability of Lake Erie's shallow western basin to Fermi 3's negative impacts, a western basin-specific analysis should be performed, rather than "watering down" Fermi 3's negative impacts by averaging them out over the entire expanse of Lake Erie, as Detroit Edison has done in its ER.

Detroit Edison's own statements made in the COL application acknowledge that the western basin of Lake Erie is distinct from the rest of Lake Erie. The western basin's shallowness not only helps account for its intense biological productivity, such as in its various fisheries, but also places the western basin and its biota at significant risk from Fermi 3. The COL application should address particular disproportionate impacts from Fermi 3 upon the western

basin of Lake Erie and its biota, rather than exclusively extending the impact analysis across the whole of Lake Erie.

Detroit Edison's ER acknowledges that the western Lake Erie basin is the first to form and to lose ice in all of Lake Erie. This is further reason that Detroit Edison's COL application should address the specific impacts from the Fermi 3 facility on the western Lake Erie's unique waters, rather than just upon all of Lake Erie as a whole.

Also regarding Section 2.3.1.1.3, "Lake Erie Western Basin," the highest water levels in the referenced charts occurred between 1997 and 1999. The lowest water levels generally occurred between 2000 and 2007, which demonstrates a downward trend in the recorded water levels for Lake Erie. From the late 1990s to the present day, Lake Erie's water level has dropped about 10 inches. This is significant, for the water bodies in the area of have an average depth of only 24 feet. Thus, a 10 inch water level drop represents about a 3.5% decrease in water levels in Lake Erie's western basin.

Climate change is predicted to continue this lowering of water levels in Lake Erie by as much as 3 to 6.5 feet over the next 70 years.<sup>1</sup> Such dramatic lake level drops should be taken into consideration by Detroit Edison in its Fermi 3 COL application. Its omission is significant.

Also, there is no analysis of the fluctuating water levels due to strong winds. Such dynamics are referred to as seiches. Water levels have been observed dropping several feet in a matter of hours during strong winds that push Lake Erie's waters up on one shoreline, away from others. The ER's Table 2.3-12 notes possible storm water level increases. There should also be a chart showing the potential for water level decreases due to strong winds. The western basin of Lake Erie is known for its strong and fluctuating winds.

Detroit Edison should address in the COLA what its plan is for Fermi 3 if there is not enough lake water to supply the plant's needs for cooling and makeup water, whether the decrease in Lake Erie water level is due to chronic global warming or acute wind-driven seiches.

In the ER's discussion of the western basin of Lake Erie, there is inadequate mention of the impacts from the DTE Monroe (Coal) Power Plant, which daily uses 1.9 billion gallons of water and thus has very significant thermal impacts. Because of the proximity of DTE Monroe Coal Power Plant to Fermi 3 (two miles), some of the water in the area of Fermi 3 would already be significantly warmed above natural temperatures, even before human-caused global warming is taken into consideration. Detroit Edison must address how the addition of up to 49 million gallons per day of water usage at Fermi 3 in the summer months, the most vulnerable and critical time for algae growth, would impact algae growth and water quality in the immediate area and broader region.

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<sup>1</sup>[http://www.epa.gov/med/grosseile\\_site/indicators/waterlevels.html](http://www.epa.gov/med/grosseile_site/indicators/waterlevels.html)

Detroit Edison's Section 2.3.1.1.3.4, "Conclusions on Plant Interface with Lake Erie," states "The intake Structure of Fermi 3 will allow the unit to function at full capacity at the historical low water level of the western basin."

Again, Detroit Edison has failed to address the projected three to six and one-half foot reduction of water levels projected for Lake Erie due to global climate change, which will extend the shoreline of the lake up to 2.5 miles into what is currently submerged land.

Detroit Edison thus must address the risk that the waters of the western basin of Lake Erie could very well grow too warm, due to global warming as well as the thermal pollution from multiple thermal electric power plants in the vicinity, to efficiently condense steam in the Fermi 3 reactor's steam condensers, or cool the nuclear power plant as designed. Already in recent years, certain nuclear power plants have been forced to shut down for varying periods due to their cooling water supply in the Great Lakes becoming too warm. Such an instance occurred at Cook nuclear power plant in southwest Michigan in August of 2006, when Lake Michigan's waters became too warm. A similar occurrence took place at upstate New York reactors on Lake Ontario in the late 1990s. While such risks are particularly acute for reactors that depend upon smaller, artificial lakes or rivers for their cooling water supply (such as at Browns Ferry nuclear power plant in Alabama in recent years, which was forced to shut down when the Tennessee River's water became too warm to cool the reactor), even the Great Lakes are vulnerable to such episodes. For that matter, even sea coast reactors have been forced to shut down due to the nearby ocean water growing too warm, as happened in Sweden in recent years. Nuclear power industry public relations campaigns to the contrary, Detroit Edison must address in its COLA the risk that - rather than being a solution to the climate crisis - new atomic power reactors may not even be able to function in a warming world.

In Section 2.3.2.1.2, "Consumptive Surface Water Use," Detroit Edison's references are all for Lake Erie as a whole; an impact analysis specific to the western basin of Lake Erie should also be carried out.

In this section, there is reference to water use in Monroe and Wayne Counties in Michigan. Water usage in Lucas and Ottawa Counties in Ohio has been omitted, but should also be added. The total of the waters used should be looked at with respect to western Lake Erie impacts, rather than just all of Lake Erie as a whole.

When out in a boat by the Toledo Lighthouse, the naked eye can see the stacks and/or cooling towers from five power plants, three coal and two nuclear. Now Detroit Edison proposes to add a third atomic reactor to the shoreline of Lake Erie's western basin, at Fermi 3. It is clear that all of these power plants have an impact on western Lake Erie waters, as well as on the Maumee Bay and River. These distinctive impacts should be addressed in Detroit Edison's COLA, rather than "averaged out" over the entirety of Lake Erie, as Detroit Edison is currently attempting to do in its ER.

Similarly, Detroit Edison's ER looks at water users in all of Michigan for some references, rather than also focusing on the distinctive impacts related to water usage in shallow western Lake Erie. The shallow waters of Maumee Bay turn over every five days - therefore impacts on the waters from sources are swift. Fermi 3, when the winds are right, will impact the Maumee estuary, as elaborated on further below in Maumee Bay and Maumee River-specific contentions.

Detroit Edison's Section 2.3.2.1.3, "Non-Consumptive Water Uses," again compares the non-consumptive uses to all of Lake Erie, rather than to western Lake Erie in particular. While western Lake Erie includes about one-third of Lake Erie's shoreline, it contains only about 5% of the volume of water in the whole of Lake Erie. Therefore, Detroit Edison's reference that Lake Erie has 46,661 billion gallons of water means that 5% of that volume, 2.3 billion gallons of water, is contained in Lake Erie's shallow western basin. Using this figure, and the fact that the existing power plants already present on Lake Erie's western basin use over 3 billion gallons of water a day, the addition of yet another atomic reactor at Fermi 3 certainly warrants further analysis as to impacts on western Lake Erie waters. The report then cites the need for less than a 50% use of the total supply - for western Lake Erie - but from the analysis above, this threshold appears to be as high as 100%.

In its Section 2.3.3.1, "Surface Water Quality," on page 2-102, Detroit Edison indicates that western Lake Erie water quality has improved and that phosphorous concentrations are decreasing. But this simply is not true. The State of Ohio has a Phosphorous Task Force looking into the increasing nutrient levels in Lake Erie and its western basin. The problem now appears to be dissolved phosphorous (see pertinent studies from Heidelberg University), and the amount of algae and microcystis is on the rise (see studies by University of Toledo's Lake Erie Center). The greening of the western basin and the increasing dead zones are widely recognized as growing problems. The Fermi 3 application needs to address these facts. The 2004 Lake Erie LAMP study cited by Detroit Edison is old and outdated for current phosphorous, nutrient and algae issues facing Lake Erie. These issues include a new algae, *Lyngbya Wollei*, which seems to be centered in "Warm Water Bay" at the Monroe DTE coal burning power plant. This concentration of *Lyngbya Wollei* is dislodging from "Warm Water Bay" and is multiplying in the western Lake Erie basin. Detroit Edison must address what will be the impact of Fermi 3 on the proliferation of this new harmful form of algae for Lake Erie's western basin, an issue the applicant has thus far omitted from its ER.

This section also talks about impaired fish, and uses outdated Fermi 2 studies on fish kills. Detroit Edison needs to do updated analyses on the estimated number, and type, of fish that would be killed in the Fermi 3 intakes, including how many fish are already being killed in the intakes at Fermi 2 and DTE Monroe Power Plant, as well as the additional nuclear and coal fired power plants on Lake Erie's western basin, and what the additional kills at Fermi 3 would mean to the overall fish populations.

In its Section 5.2.1.2, "Water Sources," Detroit Edison states "Lake Erie is the makeup water source for the Station Water System (SWS)," and "Due to the vast size and capacity of Lake Erie and due to margins in the design of the intake structure to account for low lake levels, the water supply from Lake Erie is expected to be reliable for the operation of Fermi 3."

However, in Section 5.2.1.1, the report talks about the shallow waters of western Lake Erie, with its average depth of just 24 feet. Several significant factors are absent from this analysis, which are relevant to the environmental impacts of Fermi 3. Fermi 3 is to be located at the western extreme of the western basin of Lake Erie.

Firstly, several miles along the shoreline west of the proposed site is the estuary Maumee Bay, with an average depth of only 5 feet. The impacts of the proposed Fermi 3, combined with the existing water withdrawals in Maumee Bay, from DTE's Monroe Power Plant, Davis-Besse atomic reactor, and additional thermal electric power plants on the western basin of Lake Erie, must be analyzed. The additional projected withdrawal of 49 millions of water a day at Fermi 3, together with First Energy Bayshore (20 miles south of Fermi site), Whiting Consumers (12 miles south), and the aforementioned power plants, which together already use an average of over 3 billion gallons of water per day in the Great Lakes, must be assessed by Detroit Edison. Not doing so represents a serious omission from the ER and COLA.

Secondly, climate change reports for Lake Erie project decreases in water levels from three to six feet in just the next 60 years. This happens to be within the operational timeframe for the projected Fermi 3 atomic reactor. NRC should require in the COL application, and should itself address in the Fermi 3 EIS, "best case" and "worst case" water levels for Maumee Bay and far western Lake Erie. If there were a 6.5 foot reduction in Lake Erie water levels, Maumee Bay would have little to no water, and the two Maumee Bay power plants would no longer have a source of water upon which to draw. In addition, the 1.9 billion gallons of water a day used by Monroe DTE coal burning power plant would exacerbate the thermal impact on the waters and water quality of western Lake Erie is such dramatic lake level drops occur. Add to this the two already existing nuclear plants on extreme western Lake Erie (Davis-Besse and Fermi 2), and the problem is further exacerbated.

The bottom line is that climate change projections for Lake Erie predict lowering lake levels, which would mean not only that the reliable source of water would be diminished, but that 49 million projected gallons of additional water withdrawals each day from Lake Erie at Fermi 3 would very likely simply be too much for western Lake Erie and its ecosystem, including its biota, to handle.

Detroit Edison's Section 5.2.1.3, "Plant Water Withdrawals and Returns," states "During normal power operation, the CIRC requires a maximum of 34,000 gallons per minute (49 million gallons per day) of makeup water during the summer months to replace the evaporation blowdown, and drift that occurs in the natural cooling tower NPHS."

Did the analysis by Michigan DEQ (Department of Environmental Quality) to determine the allowable pollutant levels make an assumption as to what the water levels would be? Would a 1', 2', 3', 4' 5' or 6' drop in water levels require more careful treatment for some pollutants that have no requirements now? Which pollutants would that be? These factors should be considered now by Detroit Edison in its COLA, and by NRC in its EIS.

For water withdrawals over 50 million gallons per day, Clean Water Act 316b regulations require analysis of the fish kills and water withdrawals. Fermi 3 is predicted to produce during normal operations 86 degree water and in case of a serious "blowdown" would produce up to 96 degree water discharges into Lake Erie. This would combine with thermal discharges from the existing Fermi 2 reactor, producing a greater-than 50 million gallons/day thermal discharge, which should warrant a Section 316b Clean Water Act analysis. Since the 49 million gallons projected to be used by Fermi 3 is so close to the 50 million gallon per day threshold, and because the design of this facility is in flux and not yet certified by NRC, and because of the multitude of water quantity and quality issues, including Fermi 3's proximity to Fermi 2, as well as fish kill issues, that exist, Detroit Edison should be required to carry out a full Clean Water Act Section 316b analysis.

Once again, in Detroit Edison's Section 5.2.1.4, "Present and Future Water Uses Potentially Affecting Available Water Supply," the tables referenced are for all of Lake Erie. The references should be for western Lake Erie. The average depth of Lake Erie is 62 feet, and can be more than 200 feet at the eastern end. As previously stated, the western end of Lake Erie averages only 24 feet in depth. The references for use, temperature, etc. should be for western Lake Erie in particular.

Table 2.3-3, "Lake Erie Modeled Surface Waters," references the years 1984-2004. Up until 1995, water levels were rising, but after 1995, water levels have been declining. These tables should reflect data from western Lake Erie, and should use temperatures from 1995 through 2008. These data are available.

This section again states the consumptive uses in terms of all of Lake Erie. Detroit Edison should also be analyzing consumptive uses in western Lake Erie in particular.

The turbidity from dredging needs also to assess nutrient levels in the sediments as well as Best Management Practices to minimize the sediments going into western Lake Erie, issues that Detroit Edison has omitted from its ER.

Detroit Edison's Section 5.2.1.7, "Surface Water and Groundwater Users Affected by Hydrologic Alterations," states that impacts will be minimal because of the large volume of water in Lake Erie. Again, this section should look at volumes of water in western Lake Erie, and particularly the impacts of Fermi 3's use of water on the City of Toledo and the City of Oregon public supply water intakes. Both



cities are reporting increasing challenges for water treatment because of algal blooms and turbidity. The applicant should be required to assess the impacts of the additional water withdrawals on the water quality for the Toledo and Oregon intakes in Ohio.

In Detroit Edison's Section 5.2.2.2.1, "Chemical Impacts," the impacts of the operation and the blowdown discharges should be looked at for western Lake Erie - not all of Lake Erie -- and also for climate change based on projected water level reductions.

In Section 5.2.2.2.2, "Thermal Impacts," the area of the discharge from the pipe is experiencing increases in algal blooms and microcystis. The US EPA, and the Ohio Lake Erie Commission, are currently seeking proposals to reduce the nutrient levels and the algal blooms. Any additional thermal impact at this time, would add to the degradation of water quality and habitat in western Lake Erie which is contributing to the increasing problem of growing dead zones in Lake Erie's Central Basin. Detroit Edison has omitted analysis of such issues in its ER.

In Section 5.2.2.4, "Impacts on Current Water Use," Detroit Edison looks at the use from Fermi 3, and other users, for all of Lake Erie. Again, this analysis needs to look at water use in western Lake Erie, rather than the whole lake. Certainly, it is true that withdrawals from a basin with an estuary with an average depth of only 5 feet, and the western lake basin with an average depth of only 24 feet, would have a far greater impact than for the rest of the lake as a whole with an average depth of 62 feet. This section simply needs to be redone for western Lake Erie in particular, as well as for the impacts on Maumee Bay.

In Section 5.2.2.7, "Discharge Design," the discharge pipe is projected to extend 1,300 feet into the Lake. The application does not discuss the current permitted practice in Ohio of open Lake Erie dumping of 800,000 cubic yards of sediment in the general vicinity of where the discharge pipe would be located. The design of the discharge from the pipe should take into account current open lake dumping practices, and the impacts of this discharge on open lake dumping. The location of the discharge pipe should be such that it minimizes the spread of turbidity from open lake dumping and the overall related water quality issues. Detroit Edison has omitted such analysis in the ER.

#### **Maumee River- and Maumee Bay-Specific Information Omitted**

In Section 2.3.1, "Hydrology," Detroit Edison states "There are no significant impoundments, reservoirs, estuaries, or oceans in this area that need to be considered when analyzing water impacts on the construction and operations of Fermi 3."

To the contrary, Maumee Bay and the Lower Maumee River do constitute an estuary that would be significantly impacted by Fermi 3. The Lower Maumee River, along with Maumee Bay, is considered an estuary because, at certain times, Lake Erie impacts the Maumee River for a distance of

up to 15 miles. The Maumee River is the most biologically productive single river in the entire Great Lakes Basin, and there will be a significant impact on the Maumee River from the operations and water uses at Fermi 3. The impacts on this estuary are important to assess as part of the COL application and the related EIS. NRC should require Detroit Edison to rectify these omitted analyses regarding the Maumee Bay and Lower Maumee River estuary system that would be significantly impacted by Fermi 3's construction and operation.

In Section 2.3.1.1.3, "Lake Erie Western Basin," Detroit Edison states "Thus the majority of water inflow and sediment transfer regarding tributaries closest to the site is primarily from the Detroit River and the River Raisin."

The discussion of tributaries and impacts is limited to the Detroit River and the River Raisin. The omission of the Maumee River and Maumee Bay is significant and must be rectified.

Since the waters from the Detroit River to the west, which include the waters around Fermi 3, significantly impact the very shallow, vulnerable, and intensely biologically-productive waters of the Maumee River and Maumee Bay, these waters should also be included in the analysis.

In the ER's discussion of the River Raisin, there is no mention of the DTE Monroe (Coal) Power Plant, which daily uses 1.9 billion gallons of water and thus has very significant thermal impacts. Because of the DTE Monroe Coal Power Plant, some of the water in the area of Fermi 3 would already be significantly warmed above natural temperatures, even before human caused global warming is taken into consideration. Detroit Edison must address how the addition of up to 49 million gallons per day of water usage at Fermi 3 in the summer months, the most vulnerable and critical time for algae growth, would impact algae growth and water quality in the immediate area and broader region.

Detroit Edison's ER extensively discusses the impacts on ground water at the Bass Islands, which is the subject of another contention brought by Petitioners. However, the Bass Islands are farther from Fermi 3 than is the Maumee Bay and Maumee River. Thus, since there is an extensive (albeit far from adequate) analysis of the impact on the ground water at the Bass Islands, there should certainly also be an analysis of the impacts from Fermi 3 on the surface waters of Maumee Bay and the Maumee River, as well as on the drinking water supply for Toledo and Oregon, Ohio.

To summarize and re-emphasize, the Fermi 3 nuclear power plant is planned to be located in the shallowest waters of Lake Erie and the Great Lakes. Lake Erie has more consumable fish than all the other Great Lakes combined and a majority of Lake Erie's fish are in the Western Basin of Lake Erie (which includes Maumee Bay and the Maumee River). The average depth of Lake Erie in the area of the plant is but 24' and the average depth of the Maumee Bay estuary is only 5'. The proposed Fermi 3 nuclear power plant would draw millions of gallons of water from Lake Erie and Maumee Bay and kill millions more fish. Fermi 3 would be the 6<sup>th</sup> power plant killing fish and heating the water. From Bayshore Road, the naked eye can see Consumer's

Whiting (Coal) Plant, the DTE Monroe (Coal) Plant, Fermi 2 atomic reactor, First Energy Bayshore (Coal) Plant and the steam from the Davis-Besse atomic reactor. Obviously, water use, fish kills and thermal plumes from the power plants impact the ecosystem of the shallow Lake Erie and Maumee Bay waters. Detroit Edison's COLA and NRC's EIS should address the following:

1. Climate change is predicted to decrease water levels in Lake Erie from a little less than 3' to up to 6.5' in the next 60 - 70 years. Predicted decreases in water levels would literally mean that there would be no water in Maumee Bay which is water that would be used by other power plants and Fermi 3. Climate change and projected decreasing Lake Erie water levels should be part of the environmental review and the Fermi 3 COLA.
2. The COL application says there are no estuaries near the plant. This is not true. The shallow fishy Maumee Bay estuary exists east of the plant. This needs to be assessed as part of the environmental impact study and COLA.
3. The cumulative impact of fish kills from the five existing power plants and the additional impacts of adding Fermi 3 should be assessed. There needs to be a determination of the cumulative impacts of the fish kills at the existing five operating power plants in the far Western Basin of Lake Erie and Maumee Bay and then a determination of how many more fish Fermi 3 would kill and what the impacts on the fishery would be.
4. The Environmental Impact analysis and COLA should likewise determine the impact to the ecosystem from heating the billions of gallons of water at the existing operating five power plants. Then a determination should be made on the impacts of the additional heated discharge waters from the proposed Fermi 3.
5. The Environmental Impact analysis and COLA should look at the DTE Monroe's Coal Fired Power Plant, the 4<sup>th</sup> largest power plant in the U.S., water use, fish kills and mercury and other emissions to determine if DTE should be required to install a cooling tower and mercury pollution control equipment at the DTE Monroe (Coal) Power Plant if Fermi 3 is to get a permit.
6. The Environmental Impact Statement and COLA should assess the risk of an attack on the power plants in the area and the resulting consequences on the water and the population. The analyses should address what is a fair level of risk from so many power plants to the water and population of Lake Erie's western basin. The analyses should address how much power this area needs to generate to serve the population and businesses in Southeast Michigan and Northwest Ohio. The analyses should address whether there is a point at which the area is saturated with thermal electric power plants, and whether any additional thermal electric power plants should be located elsewhere.
7. The environmental impact statement and COLA should also assess the impact on sediments and water quality that would result from adding a 6<sup>th</sup> thermal electric power plant, the Fermi 3 atomic reactor, to the existing three coal fired power plants and two nuclear power plants already in the Western Basin of Lake Erie. Sediments and water quality in the areas of the existing coal fired power plants and nuclear plants should be assessed for radiation, mercury and other pollutants and then the estimated additional impacts from the proposed

Fermi 3 to the sediments and the water should be added. The analyses should address what percentage of water in Maumee Bay is currently used by the existing power plants, and how much more would be used by Fermi 3. The assessment should also address the percentage of Maumee Bay water that would be used, given the expected climate change caused water level reductions of 3' to 6' in the next 60 to 70 years.

8. The COL application talks about the influence of the Detroit River on Toledo's water intake and then fails to **include the Toledo water intake in its environmental analysis**. **Detroit Edison must address this omission.**

9. The COL application uses phosphorous data from 1997 - 2003 and says phosphorous(algal blooms) is not a problem. This is simply not true. Research clearly shows that since 1995 dissolved phosphorous and algal blooms and microcyctis in the Maumee River and Western Lake Erie are increasing. Ohio EPA has a Phosphorous Task Force trying to find ways to reduce the increasing green waters. The Lake Erie Protection Fund and the US EPA Great Lakes office are currently seeking grant proposals to find ways to reduce phosphorous and algal blooms in Western Lake Erie. The environmental assessment and COLA needs to include an assessment of **impacts on phosphorous and nutrient growth and algal blooms** that would result from the Fermi 3 atomic reactor.

10. A new form of algae - *Lynbya Wollei* - is in Maumee Bay and Western Lake Erie. This benthic algae is spreading in Maumee Bay and Western Lake Erie. It appears that the *Lyngbya* thrives in what is known as "Warm Water Bay" at DTE's Monroe coal fired power plant, in the 1.9 billion gallons per day of warm water discharge. The warm water, combined with the sewage from the River Raisin, appear to provide the ideal environment for *Lyngbya* to thrive. The COL should address what the **impact of Fermi 3 would be on the spread of Lynbya**. NRC and relevant federal and state agencies should determine whether DTE should be required to take some action because of the *Lyngbya* problem.

11. The COL application uses **old impingement and entrainment data** from Fermi 2. This data is decades old, and a new impingement/entrainment assessment should be made.

12. The application only looks at Monroe County for Surface Water - **the surface water analysis should include Lucas County (Ohio), Ottawa County (Ohio), Monroe County(Michigan), and Wayne County(Michigan)**.

13. The fish impingement/entrainment discussion does not update estimates from Fermi 2 - and does not look at the cumulative impact of adding one more fish killing source, the proposed Fermi 3 atomic reactor. Detroit Edison's ER also does not address the decreasing yellow perch populations in Lake Erie, nor the increased controls on commercial fishermen in Ohio. The environmental assessment and COLA should address these issues.

**CONTENTION NO. 7: Routine operations of Fermi 3 will endanger workers and the public with radionuclide emissions**

The construction and operation of Fermi 3 will produce radioactive contamination which expose the workforce at the plant, and the general public, to increased risk of negative health effects.

Fermi 3 venting of radioactive gaseous effluents is outlined in Part 7. The Departures Report clearly indicates that the design objective of the Economically Simplified Boiling Water Reactor (ESBWR) is considered acceptable because (FSAR Subsection 12.2.2.1.) it meets the design objective of providing a vent path for the RWVS, TBVS, FBVS, and RBVS (Reactor Building, Fuel Building, Turbine Building, and Radwaste). DTE believes that the changes will not adversely affect any safety-related systems. In discussing the Departure justification from the reference ESBWR, DTE states that: This Departure is acceptable because it meets the design objective of providing a vent path for the RWVS, TBVS, FBVS, and RBVS. The change does not adversely affect any safety-related system.

Petitioners contend that the workers and and the public will, by design, be exposed to radiological gaseous effluents. The ESBWR is by design, intended to vent radiological gaseous effluents. This vent configuration has been evaluated by GEH (General Electric Hitachi) and has been found to be acceptable for inclusion into the ESBWR design.

DTE then concludes: Therefore, this Departure has no safety significance.

Petitioners contend that the very design has safety significance because it aids and abets the release of known carcinogenic agents namely radiological gaseous effluents and liquid effluents. Below is acknowledgement by DTE that Fermi 3 will exceed Effluent Concentration Limits (ELC). "The analysis concluded that even with relaxation of conservatisms the results would be expected to exceed the Effluent Concentration Limits (ECL). The basis for this conclusion is that the concentration of several of the radio nuclides were well above the ECL; and one of the radio nuclides exceeds the ECL by a factor of more than  $5E+03$ ." (FSAR Section 2.4.13 Analysis)

In NRC RAI (2.4.13-6)/ Letter dated 1/14/09 the NRC requested that DTE:

Provide a description of the process followed to determine the conceptual models for surface and subsurface pathways and for site characteristics that affect transport of radioactive liquid effluents in ground and surface waters to ensure that the most conservative of plausible conceptual models has been identified pursuant to the guidance provided in SRP 2.4.13. Also provide analysis based on the most conservative of all the plausible models to demonstrate compliance with 10 CFR part 20 Appendix B Table 2 ECL limits. In the supplemental information that contained the analysis of radionuclide transport for an assumed failure, the results show exceedance of the ECL limits for 12 radionuclide isotopes for both assumed receptors' (Lake Erie to

the east and a receptor well to the west). The applicant also stated that even if the conservatism assumed in the analysis, more specifically the maximum groundwater velocity, dilution, assumption of continuous ingestion were to be relaxed, the resulting concentrations will still be above the ECL limits. Please include in the analysis the basis for the preceding conclusion of the applicant.

Detroit Edison responded (February 16, 2009 and posted to public March 6, 2009):<sup>1</sup>

Section 2.4.12.3.2 describes the transport model for groundwater at the site. As described therein groundwater velocity is locally dependent on hydraulic conductivity, hydraulic gradient, and porosity. Hydraulic gradient was determined based on the water elevation maps described above. Hydraulic conductivity was determined in Section 2.4.12.2.4, as described above. As described in Section 2.4.12.3.2, no porosity field data was collected. In lieu of using field data, literature values for porosity were used to determine groundwater velocity.

Velocity calculations were performed using high and low range estimates (10 - 25 percent for glacial till, 25 percent for rock fill, 1 - 20 percent for limestone/dolomite) to bracket the range of possible results. Based on these values, calculated groundwater velocities and estimated travel times to the closest postulated receptors are reported in Section 2.4.12.3.2. The analysis of the most conservative of the plausible scenarios was provided in Detroit Edison Company Submittal of Fermi 3 FSAR Section 2.4.13 Analysis, dated November 11, 2008; which will also be included in Revision I to the FSAR Section 2.4.13. The analysis concluded that even with relaxation of conservatisms the results would be expected to exceed the Effluent Concentration Limits (ECL). The basis for this conclusion is that the concentration of several of the radio nuclides were well above the ECL; and one of the radio nuclides exceeds the ECL by a factor of more than 5E+03.

As noted in the responses above, Detroit Edison is now able to perform laboratory testing to determine site specific values for distribution coefficients and retardation factors. Using these factors, coupled with relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release), Detroit Edison expects the subsequent results to be less than the ECL. Using the results from the laboratory testing, Detroit Edison will update the analysis to credit these factors. The results from the testing and the updated analysis will be provided in a subsequent submittal to the NRC by September 1,

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<sup>1</sup>Petitioners have made good faith efforts to identify information made available, right down to the excessively-early deadline for the filing of this contention. Petitioners reserve the right to amend this contention to respond to changing information as it becomes available after March 9, 2009.

2009.

Proposed COLA Revision A revised COLA markup will be included with the results and the updated analysis upon completion of the laboratory testing.

Petitioners take issue with "Using these factors, coupled with relaxation of other conservatisms (for example, crediting dilution in the Radwaste Building prior to release), Detroit Edison expects the subsequent results to be less than the ECL."

Petitioners disagree that dilution can be the solution to radiological pollution. Lake Erie and the surrounding environs will be impacted greatly by this methodology. The practice of dumping radioactive effluents into the air and water is unacceptable. Furthermore, other than to mask the true nature of the radiological contamination levels, dilution is not the solution.

The aforesaid Request for Additional Information pertaining to Radiological Effluents is unresolved and will not be reported back on until September 2009. Since Petitioners had less than three days to review documents responding to RAI dated 1/14/09 responded to by DTE on 2/16/09 and subsequently made public 3/6/09 on NRC Fermi 3 webpage, they request that they be accorded adequate time to review the record and request that the record remain open for all open contentions pertaining to RAI's. These necessary documents were not made available to the public for review until March 6<sup>th</sup> in order to meet the March 9<sup>th</sup>, 2009 filing deadline. The public cannot contest what it cannot review. This amounts to petitioners having to take aim at a moving target, and clearly puts petitioners at a structural disadvantage to bring forward concerns in earnest.

Workers will be exposed to radiation from the existing Fermi 2 as outlined in the following sections:

#### Direct Radiation Sources (4.5.2.1)

A large portion of the radiation dose to construction workers is expected to be due to the "skyshine" (gamma radiation that scatters in the atmosphere and is reflected back to the ground) from the nitrogen-16 (-16) source present in the operating Fermi 2 main turbine steam cycle. Hydrogen Water Chemistry (HWC) is employed at Fermi 2 in order to control the production of corrosion products and thereby mitigate intergranular stress corrosion cracking of susceptible components. The Fermi 2 Updated Final Safety Analysis Report (UFSAR), Table 11.1-5, indicates an -16 specific activity of 100  $\mu\text{Ci/g}$  in the steam for normal water chemistry, and 600  $\mu\text{Ci/g}$  for HWC (Reference 4.5-1 R). The -16 activity present in the main steam lines, turbines, and moisture separators provides an air-scattered radiation dose contribution to locations outside Fermi 2 structures as a result of the high energy gamma rays which -16 emits as it decays. Other sources at the Fermi 2 with the potential for a direct radiation dose contribution to construction workers are the condensate storage tanks and the onsite low level waste storage facility. The minimal activity within the tanks and the concrete

shielding used in the design of the onsite storage facility results in a negligible dose rate at the site boundary (Reference 4.5-1, Section 12.1.1.2). Therefore, these sources of direct radiation are deemed negligible in comparison with the skyshine doses when considering the dose to construction workers.

Depending on the construction schedule undertaken for Fermi 3, a potential source of direct radiation could be an independent spent fuel storage installation (ISFSI). Currently, there is no ISFSI at the Fermi site, but there are plans to construct an ISFSI in the near future using a Holtec HI-STORM system. Radiological data from other boiling water reactor ISFSIs using similar systems indicate dose rates at the fence surrounding the ISFSI range from 0.015 mrem/hr to 0.50 mrem/hr, depending on how many casks are loaded onto the ISFSI pad closest to the fence. The proposed Fermi ISFSI location is approximately 750 feet from the Fermi 3 construction site (TLD T48), which results in an estimated dose rate that is in the range of  $4.5 \times 10^{-4}$  mrem/hr to  $2.2 \times 10^{-3}$  mrem/hr. For a 2080 hour exposure period, the estimated dose would be in the range of 1.0 mrem/yr to 5.0 mrem/yr due to the ISFSI.

#### Radiation from Gaseous Effluents (4.5.2.2)

Fermi 2 is designed with the provision for releasing airborne effluents via three gaseous effluent release points to the environment. These are the radwaste building vent, the reactor building vent, and the turbine building vent (Reference 4.5-1, Section 11.3.7). The reactor building vent is the primary release point and includes exhaust from the offgas system, turbine gland seal system, and the reactor building ventilation. The turbine building vent contains low activity exhaust resulting from small leaks from the turbine, condenser and other components in the turbine building. The radwaste building vent contains low activity exhaust resulting from small leaks from laboratory fume hoods, tank vents, and contaminated cubicles. The expected radiation sources (nuclides and activities) for the primary gaseous effluents are listed in the Fermi 2 UFSAR, Table 11.3-1 (Reference 4.5-1).

#### Radiation from Liquid Effluents (4.5.2.3 )

Fermi 2 releases radioactive liquid effluents via the circulating water reservoir blowdown line. The minimum dilution flow is approximately 10,000 gpm (Reference 4.5-1, Section 11.2.8). The annual expected maximum dose to an individual resulting from Fermi 2 liquid effluents is presented in the Fermi 2 UFSAR (Reference 4.5-1, Appendix 11A). When effluents are released, they discharge directly to Lake Erie via the circulating water reservoir blowdown line. Lake Erie provides further dilution through natural mixing characteristics in the vicinity of the discharge. From Figure 4.5-1, it is clear that construction activities for a new facility would be well removed from the release point for liquid effluents.

#### 4.5.3 Measured and Calculated Radiation Dose Rates

Measured and reported data from Fermi 2 is available for gaseous



and liquid effluents, as well as direct radiation sources. This information is reported annually to the NRC as part of the Radioactive Effluent Release and Radiological Environmental Operating Report. Reports from the years 1999 through 2006 were utilized in the preparation of this section (Reference 4.5-2 through Reference 4.5-9).

#### 4.5.3.1 Dose Rate from Direct Radiation Sources

Fermi 2 measures radiation doses at various locations on the site using thermoluminescent dosimeters (TLDs). As shown on Figure 4.5-2, TLDs T47, T48, T54, and T64 are the TLDs closest to the expected construction areas for the Fermi 3 site. The location of TLD 47 represents the maximum radiation exposure a construction worker is expected to encounter, TLD T48 is representative of the near edge of the Fermi 3 construction site (southwest of the Fermi 2 plant buildings), TLD T54 is representative of the far edge of the Fermi 3 construction site, and TLD T64 is representative of the location of the planned ISFSI construction site due west of Fermi 2. Measurements from these TLDs are used to determine the expected direct radiation dose to construction workers. Table 4.5-1 collects eight years of radiation dose rate data for the four TLDs of interest. As explained in the footnotes of the table, the dose rates from the Radioactive Effluent Release and Radiological Environmental Operating Reports are expressed in units of radiation exposure (Roentgen) and represent one year (365 days x 24 hours/day = 8760 hours) of exposure time. In order to compare the expected dose rates to the dose limits prescribed in 10 CFR 20, conversion of these dose rates into mrem/yr is necessary. The most limiting annual dose rates at the four TLDs of interest was 316.53 milliroentgen/yr, recorded at TLD T47 in 2004 and 162.28 milliroentgen/yr, recorded at TLD T48 in 2004 (Reference 4.5-7). TLD T47 and TLD T48 are approximately 525 ft and 1000 ft from the centerline of the Fermi 2 Turbine Building, respectively (Reference 4.5-9). Conversion of these radiation exposures into a dose equivalent in tissue is accomplished by multiplying by 0.95 (Reference 4.5-10). Conversion results in an annual dose rate of 300.70 mrem/yr at T47 and 154.17 mrem/yr at T48. The annual dose measured at these TLDs was accumulated over an exposure time of 8760 hours. It is assumed that construction workers will work standard 8-hour shifts. Applying this work rate to 5 days per week, 52 weeks per year, yields 2080 hours per year.

Therefore, the annual dose to a construction worker due to direct radiation at the Fermi 3 construction site is approximately 71.4 mrem/yr at TLD T47 and 36.6 mrem/yr at TLD T48. While the dose rate measured at TLD T47 is the most bounding of the four TLD locations, this location overestimates the average dose rate a construction worker would incur on the Fermi 3 construction site. From Figure 4.5-1 and Figure 4.5-2, TLD T47 is located on the Protected Area fence south of the Fermi 2 Turbine Building, well removed from the eventual location of the Fermi 3 building structures. As such, the location of TLD T48 is more representative of the areas where the bulk of the construction activities will occur. TLD T48 provides a more representative

dose rate to a construction worker and is used to calculate the radiological impact to construction workers at the Fermi 3 site.

As a comparison, the most limiting annual dose at TLD T54 was 72.30 milliroentgen/yr in 2000 (Reference 4.5-3). TLD T54 is approximately 1530 ft from the centerline of the Fermi 2 Turbine Building (Reference 4.5-1). The estimated annual dose to a construction worker at TLD T54 is approximately 16.3 mrem/yr. The most limiting annual dose at TLD T64 was 86.85 milliroentgen/yr in 2000 (Reference 4.5-3). TLD T64 is approximately 1340 ft from the centerline of the Fermi 2 Turbine Building (Reference 4.5-1). The estimated annual dose to a construction worker at TLD T64 is approximately 19.6 mrem/yr. The dose measured by these TLDs includes background radiation. Based on remote TLDs background radiation is approximately 50 mrem per year. This corresponds to an annual radiation dose to a construction worker of approximately 12 mrem per year based on a 2080 working hours in a year. Subtracting the background radiation yields a direct dose from Fermi 2 as measured by T48 of 24.6 mrem per year.

#### 4.5.3.2 Dose Rate from Gaseous Effluents

Environmental radiological monitoring data obtained from the Fermi 2 Annual Radioactive Effluent Release and Radiological Environmental Operating Report were used to assess any potential radiological impact on construction workers due to the operation of Fermi 2. The data from these reports is considered representative for the Fermi 3 site dose evaluations.

The Annual Radioactive Effluent Release and Radiological Environmental Operating Reports for 1999 through 2006 (Reference 4.5-2 through Reference 4.5-9) give both the airborne effluent doses for the most highly exposed individual living near the plant, as well as the maximum potential dose to a visitor to Fermi 2 due to all radioactive effluents, including noble gases. The annual doses to the most highly exposed individual living near the site are negligible. TLD T54 is positioned very close to the Fermi 2 Visitor's Center. Due to the proximity of this location to the expected Fermi 3 construction site, the dose rates due to gaseous effluents calculated at the Visitor's Center are representative of the dose rates to which the construction workers would be exposed. The radiological data was collected for the years 1999 through 2006 and is presented in Table 4.5-2 (Reference 4.5-2 through Reference 4.5-9). The annual doses at the Visitor's Center were calculated based on an exposure time of 4 hours/year. Dividing these annual doses by four results in an hourly dose rate which is representative of what a construction worker could expect to receive, and can then be used to extrapolate the dose rate to construction workers on an annual basis (2080 hours) due to gaseous effluent from Fermi 2. This extrapolation is shown in Table 4.5-3 and resulted in a maximally exposed organ (thyroid) dose of 10.4 mrem/yr and a maximum whole body dose of 1.6 mrem/yr for the maximum annual dose from Fermi 2 gaseous releases.

#### 4.5.3.3 Dose Rate from Liquid Effluents

The Annual Radioactive Effluent Release and Radiological

Environmental Operating Reports for 1999 through 2006 (Reference 4.5-2 through Reference 4.5-9) explicitly state that "there were no releases of liquid radioactive effluents," and furthermore that "there has not been a liquid radioactive discharge from Fermi 2 since 1994." As such, the dose rate from liquid effluents is not expected to be a factor in the cumulative dose to construction workers.

#### 4.5.4 Construction Worker Dose Estimates

The overall estimate of dose to construction workers considers an occupational exposure period of 2600 hours per year, and a construction work force of approximately 2,900. All annualized dose estimates developed in this section are based on a 2080-hour year. Contributions from each type of source are developed below and a total estimated dose is provided in the conclusions.

4.5.4.1 Dose Estimate from Direct Radiation Sources As described in Subsection 4.5.3.1, a dose rate of 24.6 mrem/yr for the Fermi 3 construction area is used to estimate the annual dose to construction workers from -16 skyshine radiation. Fermi 2 utilizes hydrogen water chemistry, which results in elevated skyshine doses. As described in Subsection 4.5.2.1, the contribution to the total dose estimate for construction workers from the condensate storage tanks and the onsite storage facility are negligible.

4.5.4.2 Dose Estimate from Gaseous Effluents Table 4.5-3 provides the estimated bounding dose of 10.4 mrem/yr to a maximally exposed organ (thyroid) and whole body dose of 1.6 mrem/yr from gaseous effluents.

#### 4.5.4.3 Dose Estimate from Liquid Effluents

Liquid radioactive effluents from Fermi 2 can be released to Lake Erie via the circulating water reservoir blowdown line. However, there have been no liquid radioactive effluent releases from Fermi 2 since 1994. As such, the dose estimate from liquid effluents is negligible.

#### 4.5.5 Summary and Conclusions

The annual dose to an individual construction worker from all three pathways is summarized in Table 4.5-4 and compared to the public dose criteria in 10 CFR 20.1301 and 40 CFR 190 in Table 4.5-5 and Table 4.5-6, respectively. Because the calculated doses meet the public dose criteria of 10 CFR 20.1301 and 40 CFR 190, the workers would not need to be classified as radiation workers and no shielding or other protective measures are required. Table 4.5-7 shows that the doses also meet the design objectives of 10 CFR 50, Appendix I, for gaseous and liquid effluents. The maximum annual collective dose to the construction work force (2900 workers) is estimated to be 76 person-rem. It is concluded that annual construction worker doses attributable to the operation of Fermi 2 for the Fermi 3 construction areas would be SMALL because it would be a fraction of 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required.

Construction workers will be treated as if they were members of the

general public in unrestricted areas.

#### 4.7.7 Radiological Impacts

This impact analysis is limited to the Fermi site during construction of Fermi 3 and is based on continuing operation of Fermi 2. No other significant radiological sources are present in the region nor are new radiation sources (other than Fermi 3) known as possibly occurring in the region. During construction of Fermi 3, construction workers onsite will be exposed to low-level radiation doses from the continued operation of Fermi 2 (Subsection 4.5.5). Doses were calculated based on exposure to direct radiation, gaseous effluents and liquid effluents likely to occur during ordinary plant operations. The total individual dose received during the construction period from all onsite sources is summarized in Table 4.5-5 relative to public dose criteria. This data indicates that construction workers would not be classified as radiation workers. Based on available data reviewed, dosage levels would be low, averaging 26 percent of the maximum allowable dose (Table 4.5-5). Exposure to construction workers experiencing annual doses attributable to operation of Fermi 2 would be SMALL because exposure would be within 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required. Construction workers will be treated as if they were members of the public in unrestricted areas. Access to restricted areas generally will not be provided to construction workers. Radiological impacts to workers and the public will be SMALL, and no mitigative measures are needed.

DTE acknowledges that construction workers could be exposed to radiation from a range of sources including direct radiation, radiation from gaseous effluents, and radiation from liquid effluents associated with the normal operation of Fermi 2. (4.5.2 Radiation Sources)

Petitioners take issue with the conclusions stated (4.7.7 Radiological Impacts): "It is concluded that annual construction worker doses attributable to the operation of Fermi 2 for the Fermi 3 construction areas would be SMALL because it would be a fraction of 10 CFR 20 and 10 CFR 50 Appendix I limits. Thus, monitoring of individual construction workers will not be required."

Clearly the accumulative doses discussed above with all of the separate pathways of ingestion and from multiple sources indicates that workers will be getting exposed to considerable radiation. Beir VII concludes that no exposure to radiation is without an associated risk. There is no safe level of exposure.

#### **Petitioners' Analysis**

Routine radioactivity releases from Fermi 3 would harm human health. Even new reactors like Fermi 3 will release significant amounts of radioactivity directly into the environment. These would include so-called "planned" and "permitted" releases from the reactor's "routine" operations, as well as unplanned releases from leaks and accidents. Atomic reactors are designed to release radioactive liquids and gases

into the air, water, and soil, which can then bio-concentrate in the ecosystem and human bodies. Liquid releases, which at Fermi are discharged into Lake Erie, include tritium, which can incorporate into the human biological system, even down to the DNA level. Once organically bound, tritium can persist in the human body for long periods, emitting damaging radioactive doses. Tritium can cross the placenta from mother to fetus. Current radiation health standards are not protective of women, children, nor fetuses. The Institute for Energy and Environmental Research has launched a campaign called "Healthy from the Start," which urges NRC, EPA, and other agencies to protect the more vulnerable "Reference Pregnant Woman" from such radioactive hazards as tritium, rather than "Reference Man" as is currently done. The State of Colorado has instituted a tritium regulation 40 times stronger than the federal standard; California has a 50-fold stronger standard. Michiganders deserve equally strong protection.

Large-scale accidental tritium leaks into groundwater in Illinois, that had been covered up for a decade by the nuclear utility and state environmental agency, were uncovered in early 2006 by a concerned mother whose daughter had contracted brain cancer at age 7. A cluster of rare childhood brain cancers were then documented in the community of Morris, Illinois, home to three atomic reactors and a high-level radioactive waste storage facility. The scandal led to the revelation of widespread accidental tritium releases nationwide at almost all atomic reactors. Accidents at atomic reactors can lead to the large-scale release of harmful radioactivity into the environment. For example, the turbine explosion at Fermi 2 reactor on Christmas Day, 1993 led to DTE's release of two million gallons of radioactively contaminated water into Lake Erie. A new reactor at Fermi will effectively double such accident risks: "break in phase" accident risks at the new Fermi 3 reactor, and "break down phase" accident risks at the deteriorated, old Fermi 2 reactor. Incredibly, Fermi 1 experienced an accidental release of thousands of gallons of tritium-contaminated water in 2007, 35 years after the reactor had been permanently shut down! The nearby Davis-Besse reactor also recently admitted tritium leaks into the environment.

Radioactivity releases occur not only at reactors, but at every step of the nuclear fuel chain. Accurate accounting of all radioactive wastes released to the air, water and soil from the entire reactor fuel production system is simply not available. The nuclear fuel chain includes uranium mines and mills (often located near indigenous peoples communities), chemical conversion, enrichment and fuel fabrication plants, reactors, and radioactive waste storage pools, casks, trenches and other dumps. Fermi 3 would increase the risk that new uranium mining in the Great Lakes basin, such as at Eagle Rock near Marquette and the Keweenaw Bay Indian Community in Michigan's Upper Peninsula, would go ahead.

As confirmed for the seventh time by the U.S. National Academy of Sciences in 2006 in its "Biological Effects of Ionizing Radiation" report (BEIR VII), every exposure to radiation increases the risk to human health. Radioactivity can damage tissues, cells, DNA and other vital molecules, potentially causing programmed cell death (apoptosis), genetic mutations, cancers, leukemias, birth defects, and reproductive, immune, cardiovascular and endocrine system disorders.

A new reactor at Fermi would add to the cumulative impact of such "routine releases" already occurring at operating atomic reactors, namely Fermi 2 and Davis-Besse, on Lake Erie's shallow, fish-rich western basin.

Fermi 2's operations are correlated with local increases in cancer rates and other diseases, a radioactive health risk that Fermi 3 would make even worse. Janette Sherman, MD of the Environmental Institute at Western Michigan University published "Childhood Leukaemia Near Nuclear Installations" in a recent edition of the European Journal of Cancer Care. Using mortality statistics from the U.S. Centers for Disease Control and Prevention, Sherman examined data from 1985-2004 and determined that when measured against background levels in the rest of the U.S., leukemia rates have increased for children that live near nuclear reactors. She found an increase of 13.9% near nuclear plants started up between 1957-1970 (oldest plants); an increase of 9.4% near nuclear plants started up between 1971-1981 (newer plants); and a decrease of 5.5% near nuclear plants started up between 1957-1981 and later shut down.

Joseph Mangano of the Radiation and Public Health Project has documented that in the early 1980's, before Fermi 2 began operating in 1988, the Monroe County cancer death rate was 36th highest of 83 Michigan counties. But by the early 2000's, it had moved up to 13th highest. From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S. rate. The energy efficiency and renewable alternatives to Fermi 3 do not involve such radioactive health risks.

The NRC should address the additional radioactivity exposures caused by discharges from the burning of coal at Monroe County's two fossil fuel plants. Radiation monitoring should be installed at those facilities. The cumulative impacts and incremental changes caused by a new reactor should be evaluated.

Petitioners request that an ASTDR Health Consultation be conducted because of the significant increase in cancer and it needs to be evaluated.

Eartha Jane Melzer (11 / 12/08) wrote in the Michigan Messenger: Childhood leukemia rates are higher for kids who live near old nuclear power plants.

Janette Sherman MD of the Environmental Institute at Western Michigan University and Joseph Mangano of the Radiation and Public Health Project are authors of "Childhood Leukaemia Near Nuclear Installations" published in the current edition of the European Journal of Cancer Care. Using mortality statistics from the U.S. Centers for Disease Control and Prevention, Sherman and Mangano examined data from 1985-2004 and determined that when measured against background levels in the rest of the U.S. leukemia rates have grown for kids that live near nuclear reactors.

They found:

- An increase of 13.9% near nuclear plants started 1957-1970 (oldest

plants)

- An increase of 9.4% near nuclear plants started 1971-1981 (newer plants)

- A decrease of 5.5% near nuclear plants started 1957-1981 and later shutdown.

Michigan has four nuclear power reactors: Fermi 2, in Monroe, built in 1985, DC Cook 1, and 2 south of Benton Harbor, built in 1974 and 1977 and Palisades near South Haven, built in 1971.

"While it is feasible that higher emissions of radioisotopes into the environment from older plants may account for the observed trends, caution should be used when interpreting the data," the researchers wrote. "There may be demographic differences between the two groups that can include factors affecting mortality risk such as poverty, proximity to medical facilities and presence of other environmental pollutants." Childhood leukemia rates are higher for kids who live near old nuclear power plants.

Public health expert urges examination of cancer rates around Fermi nuke plant.

By Eartha Jane Melzer (1/21/09) Michigan Messenger

As the Nuclear Regulatory Commission begins a public comment period on the permit application for a new reactor at the DTE Energy's Fermi complex in Monroe, a public health expert is warning that a rise in cancer rates in Monroe County appears to be linked to operations at the existing 1,130 megawatt nuclear reactor.

In a statement submitted to the NRC at a public hearing in Monroe last Joseph Mangano, a public health administrator and researcher with the Radiation and Public Health Project, said that data from the Centers for Disease Control shows an increasing cancer death rate, particularly among children, since Fermi 2 became operational in the late 1980's.

Mangano said:

"Because Monroe County has a low risk population that is well educated, high income, and has few language barriers, rising cancer rates are unexpected, and all potential causes should be investigated by health officials."

Fermi 2 reactor began "operating" June 21, 1985. However, it ran very little after the initial low-power start-up until a warranty run in January of 1988, marking the commercial start-up of the reactor. In the early 1980s, the Monroe County cancer death rate was 36th highest of 83 Michigan counties, but by the early 2000s, it had moved up to 13th highest. From 1979-1988, the cancer death rate among Monroe County residents under age 25 was 21.2% below the U.S. rate. But from 1989-2005, when Fermi 2 was fully operational, the local rate was 45.5% above the U.S.

All nuclear reactors produce electricity by splitting uranium atoms, which creates high energy needed to heat water. This process also creates over 100 radioactive chemicals, not found in nature, including Strontium-90, Cesium-137, and Iodine-131.

While most of these chemicals are retained in reactors and stored as waste, a portion is routinely released into the local air and water. They enter human bodies through breathing and the food chain, and raise cancer risk by killing and injuring cells in various parts of the body. They are especially harmful to children."

Petitioners request

- 1) that an ASTDR Health Consultation be conducted because of the significant increase in cancer and it needs to be evaluated;
- 2) that baseline epidemiological studies be conducted and update annually;
- 3) that workers be monitored for their exposure;
- 4) that the practice at the plant be ordered that workers shall carry two TLD's, one for DTE review and one for Labor Union review;
- 5) that workers be screened bi-annually for cancers of the blood and screened for cancer markers;
- 6) that worker records be kept in a transparent and auditable manner, and that those records be made known to workers individually and to the public collectively;
- 7) that Potassium Iodide be provided to workforce and to the public so that I-131 uptake into thyroid gland can be minimized;
- 8) that Cancer Awareness programs and General Education programs be provided to workforce and to the Community of Monroe;
- 9) that "Dilution as the Solution to Pollution" be recognized as unacceptable practice;
- 10) that effluent limits be adhered to and not methodologically rigged to relax standards;
- 11) that operation of Fermi 3 complies with all radiological standards established, and that the NRC does not grant waiver, relaxation, exemption, and or methodological manipulation to conceal true and accurate radiological reporting.

The International Joint Commission has called for virtual elimination of persistent toxic chemicals and has identified several radio nuclides as such. Virtual Elimination is Zero. Zero discharge is acceptable. The goal is Zero. While the NRC sets permissible levels of radiation expose and discharge and reporting tends toward perfunctory "below permissible levels" the accumulative impact is very significant. Radio nuclides bio-accumulate and the bio-concentrate in the food chain. Virtual Elimination is the standard called for by the International Joint Commission. Petitioners request that both the regulator and the regulated pursue this target.



**CONTENTION NO. 8: Threatened and Endangered Species  
have not been properly mitigated**

There are four endangered and threatened animal species on proposed Fermi 3 site. There are three species of threatened plants. Based on the review by the the Wildlife Division of the Michigan Department of Natural Resources Petitioners have reason to believe that... "going forward with the construction (of Fermi 3) would not only kill snakes but destroy the habitat in which they live and possibly exterminate the species from the area." (Letter from Lori Sargent 2/9/09 to Fermi3 COLEIS appears below).

Petitioners hold that inadequate mitigation has been considered.

Petitioners hold that the EPA has stated: "EPA encourages selection of alternatives with the least impact to wetlands. Therefore, we recommend a complete evaluation of the wetlands impacted by each feasible alternative site. We also encourage facility footprints within the plant site that will avoid minimize wetlands impacts. If there are wetlands impacts, we recommend characterization and mitigation information be included in the EIS and not deferred to the permit stage." (Letter from EPA 2/9/09 to Fermi3 OLEIS Excerpts appear below)

Petitioners assert that: Alternatives have not been given the requisite "hard look" and as a result several species are threatened and endangered. Alternatives must be examined and in the event that Fermi 3 is pursued mitigative measures must be taken.

Supporting documents:

Lori Sargent Wildlife Biologist with The Wildlife Division of the Michigan Department of Natural Resources wrote:

**Sent:** Monday, February 09, 2009 2:02 PM  
**To:** Fermi3COLEIS Resource  
**Subject:** Comments to Environmental Report

Thank you for the Fermi 3 Combined License Application, Part 3: Environmental Report. A response to a threatened/endangered species review of the Fermi 3 proposed project in Wayne County, Michigan was sent from this office to the Black & Veatch Corporation November 28, 2007. In that response four endangered or threatened animal species were listed as being present in the area as were three species of threatened plants. Upon review of this report I noticed some discrepancies and causes for concern in regard to threatened species protection.

One animal species that is of primary concern in the area is the Eastern fox snake (*Pantherophis gloydi*). On page 2-333 of the Environmental Report it states that "nine occurrences were reported in Monroe County...the snake was sighted two times on the Fermi property in June 2008." There is a discrepancy to this statement on page 4-45 where it states "The eastern fox snake (a Michigan threatened species)

has not been observed on the Fermi property, but the potential for its occurrence on the property does exist."

According to our records there is a viable population of Eastern fox snake at the site of the proposed project. We believe that going forward with the construction would not only kill snakes but destroy the habitat in which they live and possibly exterminate the species from the area.

We would like to see a plan for protection of this rare species with regard to this new reactor project.

Please contact me if you have questions or concerns. Thank you.

(hard copy sent through mail)

NOTE: An e-mail will get a quicker response from me than voicemail in most cases

Lori Sargent  
Nongame Wildlife Biologist  
Wildlife Division  
Michigan Dept. of Natural Resources  
PO Box 30180  
Lansing, MI 48909

Following the EPA site visit and review of the scoping request, Anna Miller of NEPA (Implementation Office of Enforcement and Compliance Assurance U.S. EPA-Region 5(E-19J)) offered on February 9, 2009 (Fermi3COLEIS) the following recommendations for the scope of the EIS, which are in addition to federal guidance regarding EIS preparation and scope in general.

The ..."EPA encourages selection of alternatives with the least impact to wetlands. Therefore, we recommend a complete evaluation of the wetlands impacted by each feasible alternative site. We also encourage facility footprints within the plant site that will avoid minimize wetlands impacts. If there are wetlands impacts, we recommend characterization and mitigation information be included in the EIS and not deferred to the permit stage."

**CONTENTION NO. 9: The Commission must require completion of an EIS and selection of a 'preferred alternative' prior to authorizing any construction activity of any sort**

**Background**

In 2007 the Nuclear Regulatory Commission promulgated a new, de-regulated definition of "construction" as that term applies to the building of new nuclear power plants. Under the new 10 C.F.R. § 50.10(a)(2), the following activities were relieved of all NRC oversight:

- > Site exploration
- > Procurement
- > Logging, clearing of land, grading
- > Excavation for any structure
- > Fabrication at other than the final onsite, in-place location (modules)

At the same time, the "limited work authorization" - the first point at which NRC "build" authority must be sought - was moved higher/later in the licensing continuum. The "new" LWA list of allowable activities contained in the revised 10 C.F.R. § 50.10(d)(1) includes:

- > Driving of pilings
- > Subsurface preparation
- > Placement of backfill, concrete, or permanent retaining walls
- > Installation of foundation

The drastic alteration of the meaning of "construction" circumvents NEPA. By allowing excavation activity, for example, the utility commences an irretrievable commitment to a large, baseload plant, probably nuclear-fired, long before the completion of an Environmental Impact Statement which seriously considers reasonable alternatives. This manifests an undeniable bias toward central baseload plant construction and precludes substantive consideration of any other decentralized alternatives such as wind, solar, geothermal and energy

conservation. Allowing any construction at the proposed Fermi 3 site cements - figuratively and literally - the *de facto* selection of a central baseload nuclear power plant as the selected project alternative, literally years before completion of an EIS, which is the legal stage at which selection of a preferred alternative is first authorized.

If the Commission were to allow any acts of construction to proceed before the end of the NEPA process, that is illegal because it is contrary to NEPA and would deprive the public of the benefit of the procedural protections of federal law. The NRC's revamping of its definition of "construction" comprises a denial of due process under NEPA and is illegal and unconstitutional as applied.

For all actions "significantly affecting the quality of the human environment," the federal agency must provide a detailed statement on the "environmental impact of the proposed action," alternatives to the proposed actions, and any "irreversible and irretrievable commitments of resources" that would occur with implementation of the action. 42 U.S.C. § 4332(2)(C). The Environmental Impact Statement must contain a "full and fair discussion" of significant environmental impacts that is "supported by evidence that the agency has made the necessary environmental analyses." 40 C.F.R. § 1502.1. The discussion must include an analysis of the direct, indirect, and likely cumulative impacts of the proposed action. See 40 C.F.R. §§ 1508.7, 1508.8, 1508.25.

Federal agencies also must analyze and discuss "significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts." 40 C.F.R. § 1502.9(c). With respect to Fermi 3, "significant new information" could mean the dramatically-changing economic climate in Michigan as it occurs in the

coming months and years before the EIS is completed. It could also include the dramatic shifts in the economics of wind power, conservation, and solar photovoltaic technologies, which literally are becoming less expensive week-by-week.

To satisfy NEPA, the NRC must demonstrate it has taken a "hard look" at the environmental consequences of the proposed action. "To comply with NEPA's 'hard look' requirement an agency must adequately identify and evaluate environmental concerns." *Friends of the Bow v. Thompson*, 124 F.3d 1210, 1213 (10th Cir. 1997). This means that "NEPA procedures must insure that environmental information is available to public officials and citizens **before decisions are made and before actions are taken** [emphasis supplied]. . . . Accurate scientific analysis, expert agency comments, and public scrutiny are essential to implementing NEPA." *Id.* § 1500.1(b). NEPA's emphasis on "the importance of coherent and comprehensive up-front environmental analysis. . . ensure[s] informed decision-making to the end that the agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Blue Mtns. Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998).

If DTE were allowed to irretrievably commit to the project by investing in partial construction of it prior to completion of an EIS, then the NEPA portion of the Combined Operating License process would be rendered meaningless. Congress promulgated NEPA to ensure that federal projects were not initiated until an accurate assessment of the project's impact on the environment was complete. *Vermont Yankee Nuclear Power Corp. v. National Resources Defense Council, Inc.*, 435 U.S. 519, 558 (1978) (finding Congress passed NEPA to ensure that

federal agencies consider the environmental consequences of proposed actions during the decision-making process, thereby insuring "fully informed and well-considered" decisions); *Massachusetts v. Watt*, 716 F.2d 946, 953 (1<sup>st</sup> Cir. 1983) ("[NEPA's] purpose is to require consideration of environmental factors before project momentum is irresistible, before options are closed, and before agency commitments are set in concrete" (quoting W. Rogers, *Environmental Law* § 7.7 at 767 (1977))); *Arlington Coalition on Transp. v. Volpe*, 458 F.2d 1323, 1333 (4<sup>th</sup> Cir.) (stating that the "purpose of NEPA [is] to insure that actions by federal agencies be taken with due consideration of environmental effects"), *cert. denied sub nom. Fugate v. Arlington Coalition on Transp.*, 409 U.S. 1000 (1972).

An agency's failure to follow the procedural requirements of NEPA, in and of itself, constitutes irreparable injury. See *Town of Golden Beach v. Army Corps of Engineers*, 1994 U.S. Dist. LEXIS 15832, \*25-26, 40 Env't Rep. Cas. (BNA) 1094 (S.D. Fla. 1994) ("With regard to the balancing of irreparable injuries, it is clear that where there is a fundamental breakdown in the NEPA process. . . preliminary injunctive relief is appropriate"); *Protect Key West, Inc. v. Cheney*, 795 F.Supp. 1552, 1563 (S.D. Fla. 1992) (granting an injunction based on the inadequacy of the agency's EA because "[i]rreparable harm results where environmental concerns have not been addressed by the NEPA process"); see also *Sierra Club v. Marsh*, 872 F.2d 497, 499-505 (1<sup>st</sup> Cir. 1989) (affirming injunction based on NEPA procedural lapse because "risk implied by violation of NEPA is that real environmental harm will occur through inadequate foresight and deliberation").

To avoid harm to the public's interest in participation in this

very momentous choice of energy alternatives, it is incumbent upon the Commission to ensure that there is no construction activity whatsoever undertaken prior to completion and finalization of the Environmental Impact Statement and selection of a preferred alternative.

**CONTENTION NO. 10: Notification of First Nations bands was insufficient and violative of law and regulation**

**A. Purpose of Contention**

To ensure that all Native American tribes and bands and First Nations have adequate notification by NRC of the Fermi 3 new reactor licensing and environmental review proceedings, as due to them under applicable treaties, laws, and regulations.

**B. Statement of the Issue**

While it appears that the NRC Staff notified a number of Native American tribes across Michigan, and as far away as Wisconsin and even Oklahoma, about the environmental scoping public comment opportunity for the Fermi 3 new reactor proposal, it appears that the Staff did not notify numerous Native American tribes, bands, and First Nations in the area of concern.

Likewise, it is unclear that NRC adequately notified even the aforementioned tribes in Michigan, Wisconsin, and Oklahoma of their rights to intervene with contentions against the licensing of Fermi 3, in addition to their opportunity to provide public comments during the environmental scoping proceeding. Evidently the tribes, bands, and First Nations not notified of their environmental scoping public comment opportunity were also not informed of their right to intervene against Fermi 3.

In fact, like states, sovereign "Indian tribes," Native American and First Nations, are granted automatic standing in NRC new reactor proceedings. However, tribes cannot intervene, despite their automatic standing, if NRC fails to inform them of the proceeding along with their opportunity and right to petition for leave to intervene and submit contentions.



### **C. Statement of Issues of Law and Fact to Be Raised**

NRC did not notify the Walpole Island First Nation, a mere 50 miles from the proposed site of the proposed Fermi 3 atomic reactor, of the opportunity to provide public comments during the environmental scoping proceeding on the proposal. Walpole Island First Nation occupies unceded territory, named the Bkejwanong Territory, located on a series of islands in the St. Clair River between Michigan and Ontario, to the north and east of the proposed site of the Fermi 3 reactor.

Similarly, NRC did not notify a number of additional First Nations in the area, including the following in southwestern Ontario: the Moravian of the Thames, or Delaware of the Thames, First Nation; the Chippewas of the Thames First Nation; the Oneida of the Thames First Nation; the Caldwell (Potawatomi) First Nation; the Aamjiwnaang, or Chippewas of Sarnia First Nation; the Chippewas of Kettle and Stony Point First Nation; and the Munsee-Delaware First Nation.

There are additional First Nations throughout the Great Lakes basin which were not notified by NRC -- including, as but one example, the Serpent River First Nation of Ontario.

The NRC has legal obligations under the National Environmental Policy Act (NEPA) to notify affected Native American tribes of pending significant proposals and actions, such as the Fermi 3 new reactor environmental and licensing proceedings. NRC is required under NEPA to interact with Native American tribes in a sovereign government to sovereign government manner. This is reinforced by Executive Order 12898, which incorporates the concept of "environmental justice" into decisionmaking related to environmentally controversial projects and minority populations. NRC's own regulations, specifically 10 CFR

51.28(a)(5), require the NRC to invite "any affected Indian tribe" to participate in the environmental scoping process for the new Fermi 3 reactor.

**D. Explanation of the Basis for the Contention**

Walpole Island First Nation would be an affected Indian tribe, should Fermi 3 be built. Over a third of the time, the prevailing winds that reach Walpole Island First Nation emanate from the direction of Fermi 3. Thus, any radiological and/or toxic chemical releases from Fermi 3, whether so-called "routine" or "permissible" releases or accidental releases, would likely reach and negatively impact Walpole Island First Nation. Besides the airborne radiological and toxic chemical risks from Fermi 3, the waterborne radiological, toxic chemical, and thermal risks are also of note. Walpole Island First Nation, and many, perhaps all, of the tribes which NRC notified or did not notify that have been mentioned above, likely have hunting and fishing rights, by treaty (Treaty of 1807 cited *infra*) which would be implicated by Fermi 3, both by "routine releases" of radioactivity, toxic chemicals, and thermal pollution, and especially by large-scale releases of radioactivity due to accident or attack at the Fermi 3 reactor.

Given that numerous species of fish, wild game, and migratory bird consumed as food by Walpole Island First Nation spend a part of their life cycle at or near the Fermi 3 site, whether in the surrounding surface waters or on land, Fermi 3's radiological, toxic chemical and thermal pollution negatively impacts the food supply of the Walpole Island First Nation. Such negative impacts certainly require NRC to notify Walpole Island First Nation of its right and opportunity to provide public comment upon the Fermi 3 proposal during

the environmental scoping proceeding. For this reason, Walpole Island First Nation and other affected First Nations not notified by NRC should be granted at least sixty days to submit public comments and to make a determination as to whether or not they wish to seek intervenor status.

**E. Demonstration That the Issue Raised by the Contention is Within the Scope of the Proceeding and Material to the Findings the NRC Must Make to Support its Licensing Decision**

Typically, when a U.S. federal action impacts First Nations associated with the Canadian federal government, the U.S. federal agency will contact its Canadian federal counterpart. The Canadian federal agency will then provide its U.S. counterpart a list of First Nations in the affected area which should receive notification and an explanation of their rights in the proceeding. Such close and careful coordination and collaboration is codified in such U.S. and Canadian binding legal arrangements as the century-old Boundary Waters Treaty, which created the U.S.-Canadian International Joint Commission (IJC) to oversee such shared natural resources as the Great Lakes.

Additionally, the United States federal government has entered into various treaties with Native American tribes over the course of centuries. These treaties recognize such legally binding rights as Native American tribes' rights to hunt and fish in certain territories. See, for example, the United States' "Treaty with the Ottawa, Etc., 1807" (November 17, 1807; 7 Statute, 105; Proclamation, January 27, 1808) which states at Article V:

It is further agreed and stipulated, that the said Indian nations shall enjoy the privilege of hunting and fishing on the lands ceded as aforesaid, as long as they remain the property of the United States.<sup>1</sup>

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<sup>1</sup><http://www.1836cora.org/pdf/1807nov17treaty.pdf>

The NRC routinely recognizes the status of First Nations tribes in fulfilling its NEPA/National Historic Preservation Act responsibilities, viz., this NRC notice to the Little Traverse Bay Bands of Odawa Indians on December 24, 2008:

Pursuant to 10 CFR 51.28 and 36 CFR 800.2(c) [under the National Historic Preservation Act], the NRC wishes to ensure that Indian Tribes that might have an interest in any potential historic properties in the area of potential effect are afforded the opportunity to identify their concerns, provide advice on the identification and evaluation of historic properties, including those of traditional religious and cultural importance, and, if necessary, participate in the resolution of any adverse effects to such properties.

Petitioners maintain that the Commission is obligated to notify the Walpoles and other First Nations in Canada just as it must notify tribes located partly or wholly within the United States when there are transboundary environmental impacts from a project. NEPA is applicable to cases with international environmental impacts. See, e.g., the Council on Environmental Quality's *Guidance on NEPA Analyses for Transboundary Impacts*<sup>2</sup> ("NEPA requires agencies to include analysis of reasonably foreseeable trans-boundary effects of proposed actions in their analysis of proposed actions in the United States"). In *Natural Res. Def. Council Inc. v. U.S. Dep't. of the Navy*,<sup>3</sup> the court held that NEPA applied to sonar testing even though much of the planned activity was to take place outside the territorial waters of the United States. And in *Hirt v. Department of Energy*, 127 F. Supp.2d 833, 849 (W.D. Mich. 1999), the court found that NEPA applied to an agency planning to permit the transport of nuclear materials through the United States to the border of Canada (considering the potential

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<sup>2</sup><http://ceq.eh.does.gov/nepa/regs/transguide.html>

<sup>3</sup>No. CV-01-07781 CAS(RZx), 2002 WL 32095131, at \*21 (C.D. Cal. Sept. 17, 2002)

impact in Canada of an accident).

In light of the cross-boundary effects of a nuclear power plant's operations and of conceivable accident scenarios, plus the fact that a large portion of southern Ontario falls within the 50-mile plume exposure pathway from Fermi (hence potentially according legal standing to intervene to Canadians), and given the treaty rights of the Walpole tribe, which include the waters of Lake Erie only a few hundred yards away from the Fermi 3 site, Petitioners urge that these proceedings must be waylaid the communication pending proper notice and a chance to participate to the Walpole tribe.

In addition, given the negative impacts upon such treaty rights as hunting and fishing near the Fermi nuclear power plant site, especially in Lake Erie, all the affected tribes of Michigan, Wisconsin, Oklahoma, Ontario, and beyond should have been notified by NRC of their opportunity to intervene against the Fermi 3 proposal with relevant contentions. NRC should notify the tribes of their rights and opportunity, and provide them at least sixty days in which to submit petitions to intervene and contentions.

**F. Concise Statement of Facts or Expert Opinion Relied on to Show the Existence of a Genuine Dispute with the Applicant and the NRC Regarding the Adequacy of the License Application**

Beyond Nuclear, Citizens for Alternatives to Chemical Contamination, and Don't Waste Michigan have carefully reviewed NRC correspondence with Native American Tribes, and identified a number of First Nations, including Walpole Island First Nation, that NRC failed to notify. Petitioners reviewed NRC regulations, NEPA, and U.S.-Native American treaties (such as the Treaty of 1807), and determined NRC's lack of notification to numerous First Nations to violate laws and regulations.

Petitioners also communicated with Walpole Island First Nation officials to verify that NRC notification had not taken place. Walpole Island First Nation is well aware of its downwind status in relation to the Fermi Nuclear Power Plant. It is also well aware of the potential impacts upon the fish, wild game, and migratory birds its community fishes and hunts that could come from the construction and operation of the Fermi 3 atomic reactor. Walpole Island First Nation has quality scientific data and legal research that it could bring to bear in NRC proceedings, if NRC had but notified it of its opportunity to participate.

## CONTENTION NO. 11: Spent fuel reprocessing is not an option

"Reprocessing" - referring to the technological reprocessing of spent fuel rods from nuclear power generation - is mentioned several times in Detroit Edison's Fermi 3 COLA, Part 3 "Environmental Report," Chapter 5 "Environmental Impacts of Operation" as an irradiated nuclear fuel management option: at page 5-140, in section 5.7.1, "Uranium Fuel Cycle Impacts," in the context of NRC's Table S-3 regarding uranium fuel chain radioactivity releases to the environment; at page 5-141 in the same section, where is explained that NRC's Table S-3 assumes that reprocessing would involve "uranium only recycle;" and at page 5-144 in section 5.7.1.5, "Radioactive Effluents," which deals with gaseous radiological releases, examines reprocessing releases, and also references Table 5.7-2, Summary, "Table S-3 - Uranium Fuel Cycle Environmental Data," on page 5-149, which also explicitly mentions reprocessing.

Detroit Edison's ER states at page 5-141 "Because the U.S. does not currently reprocess spent fuel, only the "no recycle" option is considered here." However, Detroit Edison is an active member of the Nuclear Energy Institute (NEI), which fully funds the so-called Clean and Safe Energy Coalition (CASE Energy). Both NEI and CASE actively promote reprocessing on an on-going, regular basis. CASE Energy spokespeople have even done so at Fermi 3-related NRC public meetings, such as on August 20, 2008 at Monroe County Community College's La-Z-Boy Center.

In addition, Detroit Edison has a long history of promoting reprocessing, and the fast neutron reactors that go hand in hand with reprocessing. For example, Detroit Edison, in the early 1950s, proposed to the U.S. Atomic Energy Commission that it could generate plutonium in a fast breeder reactor, which then could be separated via reprocessing, and used in U.S. nuclear weapons. After President Eisenhower's "Atoms for Peace" speech at the United Nations in 1953, however, Detroit Edison changed its proposal to generating plutonium in a fast breeder reactor, which would then be separated via reprocessing for supposed re-use in electricity-generating reactor fuel. Detroit Edison in fact did construct and operate the Fermi 1 fast breeder reactor, but it suffered a partial core meltdown on October 6, 1966, and was permanently shut down in 1972, just several years after its initial opening.

For these reasons, Petitioners contend that the risks of nuclear weapons proliferation, environmental devastation, and astronomical cost to taxpayers should lead NRC to reject any future bid by Detroit Edison to reprocess the irradiated nuclear fuel that would be generated at Fermi 3. To this contention is added the risks of sodium fires and even core meltdowns, both of which were experienced at Fermi 1.

First, at page 5-141 of the ER, Detroit Edison states "In developing Table S-3, the NRC considered two fuel cycle options that differed in the treatment of spent fuel removed from a reactor. "No recycle" treats all spent fuel as waste to be stored at a Federal waste repository, **"uranium only recycle" involves reprocessing spent fuel to recover unused uranium and return it to the system. Neither cycle**

***involves the recovery of plutonium.***" (emphasis added) However, NRC's assumption in Table S-3 of "uranium only recycle" is not conservative, since all commercial reprocessing in the world involves plutonium extraction and re-use. Thus, Petitioners challenge NRC's lack of conservatism in Table S-3, as they do on other points in their contention against NRC's Nuclear Waste Confidence Rule.

The following excerpt from Dr. Arjun Makhijani's "***The Technical and Economic Feasibility of a Carbon-Free and Nuclear-Free Energy System in the United States***," 4 March 2009, states Petitioners' case against reprocessing as an irradiated nuclear fuel management option:

"The prospects for new designs of reactors, such as the fast neutron reactors, to play a role in addressing urgent climate change issues are even worse. One hundred billion dollars (1996 dollars) have been spent world wide trying to commercialize such reactors and their associated plutonium separation, fuel fabrication, and fuel use technologies. This effort has been an economic failure. Even the underlying fast neutron reactor technology is not developed enough to be firmly commercialized. For instance, the most recent demonstration reactors, such as the Monju reactor in Japan and the Superphénix in France (by far the largest such reactor ever built), have had severe problems. Monju had a secondary loop sodium fire in 1995; it was commissioned in 1994. It has not yet reopened as of the end of January 2009. Superphénix was closed after 14 years of operation at an average capacity factor of about seven percent.<sup>1</sup>

It should be noted that proposals to pursue the Integral Fast Reactor have not publicly addressed these problems. Why has there not been a clear learning curve to the commercialization of either sodium-cooled fast neutron reactors or the various reprocessing technologies that have been proposed? The PUREX technology in use in France can be called commercial only in the sense that governments are paying for reprocessing services. But it is not commercial, in the sense that it remains far more expensive than using fresh uranium fuel. So far, France only reuses about one percent of the spent fuel as fuel.

The specifics are as follows. About one percent of the spent fuel is plutonium, but not all of it is used as fuel - some is stored as surplus - there are over 80 metric tons of plutonium stored at La Hague, enough to make about 10,000 bombs. The majority is French, but there is also a significant amount owned by others, including the Japanese, who have contracted with la Hague for reprocessing services. The about 85 percent of the uranium (which is 95 percent of the spent fuel) is simply stored and has not been reused. About 15 percent has been sent to Russia for re-enrichment, and most of this then becomes depleted uranium stored in Russia. The 15 to 20 percent of this

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<sup>1</sup> For an analysis of the development of the plutonium fuel cycle, including breeder reactors (the most common design of which is the fast neutron sodium-cooled reactor) see Arjun Makhijani, *Plutonium End Game: Managing Global Stocks of Separated Weapons-Usable Commercial and Surplus Nuclear Weapons Plutonium* (Institute for Energy and Environmental Research, Takoma Park, Maryland, January 2001), at <http://www.ieer.org/reports/pu/peg.pdf>. Hereafter Makhijani 2001.



uranium that becomes fuel has been loaded into reactors (the rest is depleted uranium that is left over from the re-enrichment process).

But then only about five percent of the fuel actually generates electricity (since most of it is U-238, which is not a fuel and just two percent of this is converted to plutonium in the course of reactor operation).<sup>2</sup>

Hence, so far France has used less than one-fifth of one percent of recovered uranium as material that has been fissioned in reactors and actually generated electricity. Overall, it would be fair to say that about one percent or just over one percent of the reprocessed spent fuel has been used as fuel in France. In the context, based on current reality, the term "recycling" for French spent fuel management is 99 percent false - or if one puts it more positively, about one percent true. Further, MOX fuel creates a proliferation risk since it can be chemically separated into a weapons-usable (plutonium) and non-weapons-usable component (depleted uranium) without much sophistication or danger of immediately lethal radiation exposure. It also results in higher costs to the French consumer and the discharge of about a hundred million gallons of radioactively contaminated liquids into the English Channel.<sup>3</sup> Further, French high-level waste (four percent of spent fuel by weight and most of the radioactivity) is piling up on storage at the French reprocessing plant. A geologic repository is needed, and the French have a program to create one, but it has run into problems, including difficulties of public acceptance quite similar to those in the United States.

Ninety five percent of spent fuel consists of contaminated uranium; almost all of it is piling up - some in Russia (where it was sent) and most of it in France. Only a very small portion of French fuel is "recycled" in the strict sense of being used as new fuel that actually produces energy."

Given its nuclear weapons proliferation potential, the environmental devastation it unleashes wherever it is carried out, its ineffectiveness, and its astronomically high costs, reprocessing (and the fast neutron reactors that go hand in hand with reprocessing) should be dismissed as an irradiated nuclear fuel management option. The risks of fast neutron reactor accidents, including core meltdowns and sodium fires, add to the reasons why reprocessing should be prohibited in the United States, a policy first instituted by President Gerald Ford in 1976 as a nuclear weapons non-proliferation policy, and strengthened by President Jimmy Carter in 1977.

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<sup>2</sup> All values are rounded.

<sup>3</sup> For details see Makhijani 2001 and Annie Makhijani, Linda Gunter, Arjun Makhijani, *COGEMA: Above the Law? Concerns about the French Parent Company of a U.S. Corporation Set to Process Plutonium in South Carolina* (Institute for Energy and Environmental Research, Takoma Park, Maryland, May 7, 2002). The latter is on the web at <http://www.ieer.org/reports/cogema/report.html>.

**CONTENTION NO. 12: The Emergency and Radiological Response Plan is deficient**

1. During severe winter weather, current road clearing capabilities are woefully inadequate and must be upgraded in surrounding areas.

This inadequacy is common knowledge in the Community of Monroe as exhibited by the attached letter to the editor of the Monroe Evening News dated January 21, 2009 from John Pipis, Monroe. And from Article published at [MonroeNews.com](http://MonroeNews.com) on Feb 1, 2009 entitled: Road-plowing plan in works.

Both of these documents demonstrate and document the contention above with regard to the Emergency Evacuation and Radiological Emergency Response Plan. They are attached to this document.

2. Emergency planning should extend at least 50 miles, and should include the surrounding major population centers of Detroit/Windsor, Toledo, and Ann Arbor. Current evacuation routes are too narrow, and must be expanded to accommodate a mass exodus in the event of a major accident or attack. While the Emergency Evacuation documents identify staffing needs for an evacuation. The procurement of these resources are dubious. It has not been demonstrated that they actually exist other than on paper. *i.e.* all the funding cuts relating to road work has rippled throughout the all services.

3. Lack of attention in the Environmental Report document to the feasibility of the existing Emergency Evacuation Plan for Fermi II during the construction phase of the proposed Fermi III.

During a construction phase of several years, the report projects a workforce of 2900 workers (4.4.1) who are not expected to re-locate from their current homes, and states that many of these workers will drive 50 miles, and some, up to 70 miles to the work site. In this report there is no mention of the current Evacuation Plan - let alone that it will even work with such a large number of vehicles on the road. Those who live near Fermi during the construction of Fermi II experienced high traffic volume on Dixie Highway at shift change times. When construction related to Fermi 3 coincides with Fermi 2 outage swell of workers, a combined traffic volume of 5,000 vehicles is reported by DTE as possible.

In Chapter 4, "Environmental Impacts of Construction" (DTE Energy, Fermi 3 Combined License Application, Part 3: Environmental Report, Revision 0, September 2008). From 4.4.2.4, referring to the Pijawka study: "Traffic congestion, however, was found to be a serious problem at most sites." No follow-up or response to this statement, which cites a "serious problem" to be expected during the construction phase. This lack of response to the "serious problem" of traffic congestion is a glaring omission in the report.

There are two main routes from the Fermi site to I-75:

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- > Fermi Drive via Dixie Highway to Exit 15, a distance of 5 miles, the first two miles two lanes and the last three miles (nearest to I-75) three lanes;
- 
- > Fermi Drive to Dixie Highway à Post Road à War Road à Nadeau Road à I-75 Exit 18, a distance of 6 miles along two-lane local and primary roads.

There are other routes extending northeasterly toward the down river communities of Wayne County.

Dixie Highway is the main road into and out of the Fermi site and, in the case of an emergency, would be the main exit route for approximately 10,000 people who live between Dixie Highway and the Lake Erie shoreline as well as several thousand more who live on the opposite side of the highway.

The Jefferson public school system near Fermi lacks an adequate school bus fleet to perform an emergency evacuation. The Jefferson Schools District does not have enough buses and drivers to evacuate the entire student population in a single run. North Elementary School, Jefferson Middle School, Jefferson High School are all less than 3 miles from the Fermi 2 site and from the proposed Fermi 3. Sodt Elementary School 3.5 miles away, and Hurd Road Elementary School within the 5-mile radius. In the absence of Fermi 2 and proposed Fermi 3 Emergency Evacuation preparedness on such a scale would not be necessary.

Potassium iodide tablets, along with instructions for proper usage, should be distributed regularly within the 50 mile emergency planning zone, as should emergency evacuation plan instructions. It is necessary to have immediate access to Potassium iodide in order to prevent thyroid ingestion / uptake. Currently Potassium Iodide tablets are not readily available.

The following mitigation measures are requested to be taken and that full funding be provided to implement them. A thorough study of all measures necessary to protect the public may indicate the need for further mitigation measures.

Mitigation Remedy:

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- > widen to three lanes, upgrade and pave the above-cited access routes from the Fermi site to I-75 as well as other routes to points north;
- provide salt storage in the immediate vicinity for Monroe County Road Commission application during snowy and icy weather;
- provide at least two sets of three extra Monroe County Road Commission snow plows/salt spreaders (total 6) along with operators (12), to be stationed in the immediate vicinity during winter months to keep routes clear during winter weather; DTE must provide the Monroe County Road Commission with Garages with three snow plows each at both ends of the North Dixie Highway. To provide financial resources for 24 hour staffing of those snow plows and garages. This will allow for adequate snow removal,

for North Dixie highway as well as the immediate roads necessary for an Emergency Evacuation.

- provide the Jefferson Schools District with enough buses and drivers to evacuate the entire student population in a single run - North Elementary School, Jefferson Middle School and Jefferson High School (all less than three miles from the Fermi II site), Sordt Elementary School (~3.5 miles), and Hurd Road Elementary School (within the 5-mile radius);
- provide additional full-time staffing for Monroe County Sheriff coverage for traffic and crowd control in the event of an emergency requiring evacuation.
- Build separate road access to service 5,000 plus vehicles related to construction and refueling outages at the Fermi site. Residents should not be forced to compete with workers for access to evacuation routes. Workers should be evacuated on separate additional route designed to mitigate impact of inadequate evacuation routes.
- Provide Potassium Iodide tablets to individual homes within 50 mile radius so that there immediate access to block thyroid uptake. Provide these whether the proposed Fermi 3 goes forward or not. They are needed because of the existence of Fermi 2.
- The financial burden of these upgrades must be borne by Detroit Edison Company as they are the proponent of the proposed Fermi 3. It is the existence of the Fermi 2 and the proposed Fermi 3 which necessitates these resources be made whole.

**CONTENTION NO. 13: The identification, characterization and analysis of need, alternatives to construction, and the mix of conservation and renewable energy sources is wholly inadequate and violates NEPA**

DTE's identification, characterization and analysis of the role and potential displacement of the obviously preferred alternative of a new baseload nuclear power plant reflect carefully-selected (and even more carefully-ignored) data and facts. The upshot is that the Environmental Report is deficient; it does not contain complete data for meaningful understanding of the reasonable alternatives which NEPA enjoins lead agencies to assemble, and discuss within an Environmental Impact Statement.

**A. NEPA standards for consideration of alternatives**

NEPA requires that federal agencies provide a detailed evaluation of alternatives to the proposed action in every environmental impact statement. 42 U.S.C. § 4332(C)(iii); 40 CFR § 1502.14(a). This discussion of alternatives is essential - not merely salutary - to NEPA's statutory scheme and purpose:

The goal of the statute is to ensure 'that federal agencies infuse in project planning a thorough consideration of environmental values.' The consideration of alternatives requirement furthers that goal by guaranteeing that agency decision-makers '[have] before [them] and take into proper account all possible approaches to a particular project (including total abandonment of the project) which would alter the environmental impact and the cost-benefit balance.' NEPA's requirement that alternatives be studied, developed, and described both guides the substance of environmental decision-making and provides evidence that the mandated decision-making process has actually taken place. Informed and meaningful consideration of alternatives -- including the no action alternative -- is thus an integral part of the statutory scheme.

*Bob Marshall Alliance v. Hodel*, 852 F.2d 1223, 1228 (9th Cir. 1988), cert. denied, 489 U.S. 1066 (1989). Accordingly, the regulations and cases set high standards for an agency's consideration of alternatives in a NEPA document and define the range of alternatives that must be

considered. The agency must "[r]igorously explore and objectively evaluate all reasonable alternatives' to a proposed action." 40 CFR § 1502.14(a). The "existence of a viable but unexamined alternative renders an environmental impact statement inadequate" and requires that an agency's action be set aside. *Alaska Wilderness Recreation & Tourism v. Morrison*, 67 F.3d 723, 729 (9th Cir. 1995); *Idaho Cons. League v. Mumma*, 956 F.2d 1508, 1519 (9th Cir. 1992); *Citizens for a Better Henderson v. Hodel*, 768 F.2d 1051, 1057 (9th Cir. 1985).

For an adequate EIS, the range of alternatives considered must be sufficient to permit a reasoned choice. *Methow Valley Citizens Council v. Regional Forester*, 833 F.2d 810, 815 (9th Cir. 1987), *rev'd on other grounds sub nom. Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989). NEPA requires agencies to "study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources." 42 U.S.C. § 4332(E); 40 CFR § 1508.9(b). "An agency must look at every reasonable alternative, with the range dictated by the nature and scope of the proposed action." *Northwest Env'tl Defense Center v. Bonneville Power Admin.*, 117 F.3d 1520, 1538 (9<sup>th</sup> Cir. 1997). To satisfy NEPA, the federal agency must demonstrate it has taken a "hard look" at the environmental consequences of the proposed action. "To comply with NEPA's 'hard look' requirement an agency must adequately identify and evaluate environmental concerns." *Friends of the Bow v. Thompson*, 124 F.3d 1210, 1213 (10<sup>th</sup> Cir. 1997).

As detailed below, the discussion of alternatives contained in DTE's Environmental Report - which the applicant expects to be incorporated as the heart of the EIS - lacks significant information and will require a great deal of improvement before it can be said to meet

the standards set by NEPA. DTE fails adequately to assess the costs of the proposed nuclear plant, especially when compared to the alternatives of meeting the likely need for power through a modular plan which includes demand and energy reduction through demand-side management plus the construction of distributed renewable energy facilities including offshore wind, solar, landfill gas and biomass. The enormous size of the proposed investment, especially relative to the size of the Company, will effectively prevent pursuit of significant sustainable and renewable options for years to come. The Company has systematically exaggerated the risks of alternatives, and has underestimated the potential contribution of such alternatives to meeting resource needs. The Company has not assessed all reasonable options in a comprehensive fashion. The Company's proposal is not subject to confirmation because it represents new and as-yet untried technology whose design is not yet complete.

**B. The grossly lowballed cost of the facility**

DTE is under fire in a pending rate case before the Michigan Public Service Commission for grossly underestimating the probable cost of Fermi 3. The more likely cost scenarios are missing from the Environmental Report and have direct implications for comparing the economics and relative environmental impacts of sustainable alternatives to nuclear.

Geoffrey C. Crandall, former technical staff member of the MPSC and a private utility economist, stated in July 2008 that:

Development and assessment of resource options is a necessary part of the IRP process. These cost estimates are identified in "Michigan's 21st Century Electric Energy Plan". Exhibit MEC-3 (GCC-2) contains "Figure 24: Base Case Technology Screening Curves". Chapter 1 of the Michigan Integrated Resource Plan Report indicates the estimated costs of various resource options. In that graph a wide range of costs per mWh are

identified depending on the resource type and capacity factor. This chart shows the resource screening curves to help assess their potential economic viability. As can be readily seen the costs of the resources identified range from less than 10 cents/kWh to as high as 50 cents/kWh depending on the capacity factor and other variables. MEC/PIRGIM witness Kushler has indicated in his testimony in this proceeding that 608 MW's and over 4,200 GWh's are available to DECO based on the pro-rated share of the base case energy efficiency estimate included in the 21st Century Energy Plan, at an average levelized cost of approximately 3 cents/kWh. These energy efficiency values are many times greater than what DECO has identified as resources they intend to rely on in this planning period.

**Q. What observations can you provide regarding the DECO resource projections?**

**A.** The estimated cost of resources in the 21st Century Energy Plan included the estimated construction costs of various resource options including nuclear power and integrated gasification combined cycle technology, etc. The estimated construction cost of a nuclear unit is \$2352 and the IGCC is \$1785. Based on recent developments in the industry there is little doubt that these costs are grossly understated. For example, Exhibit MEC-4 (GCC-3), an industry article published in October 2007, indicated that nuclear power construction costs were climbing up from \$3,000-\$4,000/kW to \$5,000-\$6,000kW according to Moody's Investor Service. Also according to another industry source, published in April 2008 the construction costs of a new nuclear plant would be as high as \$8,000/kW. This would result in a \$12-\$18 Billion dollar construction cost for a 2,200 MW nuclear unit. The 21st Century Energy Plan identifies a \$2352/kW cost which is far less than currently estimated costs for new construction of nuclear plants. Nuclear power also introduces an element of risk and uncertainty with respect to how to dispose of the nuclear waste by-product which has an extensive life expectancy.

In addition to the inaccurate estimates of the cost of nuclear power, in April 2008 the Virginia State Corporation Commission denied a request from a utility to build an IGCC costing over two billion dollars. ***The proposed construction cost was approximately \$3500/kW or approximately twice the cost estimated in the 21st Century Energy Plan (\$1785). These are examples of grossly underestimated construction costs. Use of inaccurate resource costs will portray an inaccurate resource economic assessment and skew the results of the IRP analysis.*** This cost information needs to be updated to more accurately reflect the potential economic impact of resource selection decisions. (Emphasis supplied)

Direct Testimony in Case No. U-15244, *In re Detroit Edison Company*, p.



**C. Outdated argument of need**

The COLA and its ER do not contain reference information arising since the massive economic "crash" on Wall Street commencing right at the end of September 2008. The COLA was submitted on September 18, 2008, and for understandable reasons, does not acknowledge nor account for the dramatic implications that have beset the Michigan's major U.S. automakers: Chrysler, General Motors, and Ford. Two of the three are considered by their employees to be on "death watch," perhaps at the brink of corporate bankruptcy.

In the chapter "Need for Power," Chapter 8 of the Environmental Report, DTE references the final Workgroup reports of Michigan's 21st Century Electric Energy Plan, a project delegated to the Public Service Commission by Michigan's Governor. This study, which forms the core data projections in the ER supporting endless growth in electrical consumption and consequently the "need" for Fermi 3, is now about 2.5 years old (data gathered in mid-2006), and it has been overtaken by history. The Michigan 21<sup>st</sup> Century Energy Plan ("21CEP") forecast in the ER shows a 1.2% annual growth expectation in electric demand.<sup>2</sup>

However, many factors have come together that indicate electric demand growth in Michigan will be much less than thought 2.5 years ago, including population loss, a structural decline in the Michigan economy, Public Act 295 (integrated resource portfolio) mandates, and strong energy efficiency trends in Michigan and anticipated at the federal level.

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<sup>1</sup><http://efile.mpsc.cis.state.mi.us/efile/docs/15244/0263.pdf>

<sup>2</sup>ER, Rev. 0, Chapter 8, p. 8-2

DTE's most recent rate case application before the Michigan Public Service Commission contradicts its assertions in the Environmental Report which reflect newer (but still somewhat dated) forecast assumptions. DTE now anticipates an actual drop in electric usage thru 2013. The new market realities are that Michigan has lost population for three years in a row. The state is in the grip of a major structural economic decline. Since 2003, cumulative real GDP growth in Michigan has ranked last among all states, declining by 3 percent. Michigan currently has the highest unemployment rate in the country, and the economic outlook is dim because of "Big Three" capacity downsizing, even bankruptcy. Most of this downsizing will take place squarely within DTE's service area.

Notably, the 21CEP "low load growth" scenario, produced in late 2006, approximated Michigan's current dismal electric sales outlook. It indicates no new electric plant is needed until 2021.<sup>3</sup>

The U.S. Energy Information Administration (EIA) recently released its forecast for U.S. electric sales growth from 2007 - 2030, and has revised growth expectations down to 1% a year, with coal generation expected to decline.<sup>4</sup> Since the national forecast is for 1% growth, the forecast for Michigan, with the highest or nearly-highest unemployment rate in the country, is likely lower.

In contrast to the Fermi 3 "Need for Power" section of the ER, DTE's most recent rate case filing (U-15677 of 9/30/2008) reflects current negative trends and forecasts a drop in electric peak demand

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<sup>3</sup>See p. 67 of [http://www.cis.state.mi.us/mpsc/electric/capacity/energyplan/newenergy\\_oct11\\_2006rev.pdf](http://www.cis.state.mi.us/mpsc/electric/capacity/energyplan/newenergy_oct11_2006rev.pdf)

<sup>4</sup>[www.eia.doe.gov/oiaf/aeo/index.html](http://www.eia.doe.gov/oiaf/aeo/index.html)

from 12,364 mW in 2006 to 11,033 mW in 2013.<sup>5</sup> DTE has contradicted its COLA.

The 21CEP and DTE's recent rate case application did not adequately address Public Act 295 legislation, passed in October 2008, after the COLA was filed. Michigan's renewable portfolio statute calls for 10% renewable energy to be included in DTE's arsenal by 2015. The long-term effects and changes which might be wrought by major changes in American manufacturing as a result of the Great Recession are not as yet well understood. However, the Michigan Department of Energy, Labor and Economic Growth noted in its December 2008 "Energy Tidbits" newsletter that:

Unexpected Drop in U.S. electricity consumption has utility companies wondering whether this could reflect a permanent shift in consumption. Sales growth of 1% to 2% annually in the U.S. has been typical. American Electric Power, which owns utilities operating in 11 states, saw total electricity consumption drop 3.3% in the same period from the prior year. Among residential customers, the drop was 7.2%. *DTE has also seen electric use drop during the past months and it may be as much as 2% by the end of the year.*<sup>6</sup> (Emphasis supplied)

More renewable and efficiency mandated and actions are foreseen in the coming years. The Michigan Climate Action Committee (MCAC) calls for up to 2% reduction in energy usage annually. The Midwest Governor's Association (MGA) calls for a 2% annual reduction. Both call for 25% renewable energy deployment in utility portfolios by 2025. President Obama is already talking about major national renewable energy and energy efficiency programs, with major funding in the just-passed Stimulus Bill.

The data have changed, and dramatically so. In less than six (6)

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<sup>5</sup>Exhibit A-11 in <http://efile.mpsc.cis.state.mi.us/efile/docs/15677/0001.pdf>

<sup>6</sup>[http://www.michigan.gov/documents/dleg/December\\_259885\\_7.pdf](http://www.michigan.gov/documents/dleg/December_259885_7.pdf)

months, the economic prognosis for Michigan, and consequent implications for energy usage and need, have shifted sharply. The COLA does not contain the new facts and the necessary new analysis.

**D. Disingenuous discussion of energy efficiency**

In its COLA discussion of conservation and demand-side management, DTE mentions discussion as part of a task force study of state-wide smart meter implementation and smart rate programs. Detroit Edison agrees that after 10 years of program expansion of its air conditioning cycling program, 162 MWe of peak would become available.<sup>7</sup> DTE analyzes this achievement in tandem with construction of additional coal- or natural gas-fired generating capacity, not wind or photovoltaic, and proceeds to the conclusion (ER, Rev. 0, p. 9-7) that "combining the effects from conservation and power purchases are not sufficient to provide the necessary baseload power in order to satisfy target reliability levels and reserve margin requirements."

One utility economics expert criticized DTE's pessimism about the possibilities of improving energy usage in 2008 testimony as a witness in the DTE rate increase request before Michigan's Public Service Commission. Dr. Martin Kushler, Director of the Utilities Program for the American Council for an Energy Efficient Economy ("ACEEE"), a non-profit organization, with headquarters in Washington, D.C., dedicated to research and policy development in the area of energy efficiency, concluded that "Detroit Edison is simply not taking energy efficiency seriously as a resource in their utility system." Direct Testimony in Case No. U-15244, *In re Detroit Edison Company*, p. 4.<sup>8</sup> Dr. Kushler

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<sup>7</sup>COLA ER, Rev. 0 p. 9-6, Subsect. 9.2.1.3.

<sup>8</sup><http://efile.mpsc.cis.state.mi.us/efile/docs/15244/0277.pdf>

stated:

To begin, it is mystifying to me how the Company could assume they would have an energy efficiency program by 2009, yet not propose a program, or any of the cost recovery or operational details of such a program, in a rate case being conducted in mid-2008. That certainly doesn't demonstrate any Company commitment to serious energy efficiency.

Moreover, the presumed impacts of the 'expected' energy efficiency program are miniscule. Witness Colandrea assumes a total effect of only 572 GWh (p.24, line 22) and "at most" 49 MW (p.26, line 20) by 2016. By comparison, Detroit Edison's pro-rated share of the "base case" energy efficiency scenario proposed in the 21st Century Plan would be 4,254 GWh and 608 MW, more than seven times the GWh and twelve times the 1 MW of the energy efficiency that the Company is assuming (from their yet-to-be-proposed energy efficiency programs).

Using another benchmark of comparison, 49 MW after 8 years of programs (2009 through 2016, per witness Colandrea) would only be about 6.5 MW per year --- less than 6.005% of Detroit Edison's 2009 bundled peak demand of 13,044 MW (Colandrea, p. 27, 7 line 15). Similarly, the 572 GWh impact after 8 years would only be about 71.5 GWh per 8 year, or only about 0.1% of their 2006 actual sales of 50,178 GWh (Colandrea p.24, line 9) per year.

***These projected energy efficiency impacts are beyond trivial, they are negligible.*** By comparison, legislation which passed the Michigan House this year, patterned closely after the 21st Century Plan, would require annual savings of 1.0% of total sales per year by 2012. Legislation signed into law in Illinois and Ohio during the past year would require savings ramping up to 2% per year after a decade. These are energy savings levels 10 to 20 times higher than the level Detroit Edison is assuming in this case. (Emphasis supplied)

It seems that when going before the regulators to approve Construction Work in Progress funding for a new nuclear power plant, DTE bespeaks a pessimism which doesn't carry over to its public relations work. In DTE's advertising for a forthcoming March 14, 2009 "energy saving seminar" in Warren, Michigan, DTE proclaims:<sup>9</sup>

Energy expert, Larry Kaufman, and a panel of experts will help show how to cut your bills in half! In this age of rising costs and tough economy he will show you how to reduce your bills up to 50% without giving up comfort!

Other energy experts besides DTE's surprisingly creative ones have been meticulously assembling data on the energy savings achievable

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<sup>9</sup><http://www.wwj.com/WWJ-Energy-Savings-Seminar/3868568>

from inexpensive, off-the-shelf technology. Arjun Makhijani, Ph.D. in electrical engineering and computer science, President of the Institute for Energy and Environmental Research, predicts that "with moderate investment in efficiency and combined heat and power systems, energy use in the residential and commercial sectors can be reduced by 20 percent compared to 2005 even as per person area expands and per person use of appliances is the same as under 'business as usual' assumptions."<sup>10</sup> In his book, Carbon-Free and Nuclear-Free, Dr. Makhijani projects as foregone a 1% per year decline in industrial energy use between 2010 and 2050,<sup>11</sup> which if true within DTE's distribution territory would show a roughly 10% decrease in overall industrial demand by the anticipated operational date of Fermi 3.<sup>12</sup>

The general rule applicable to cases involving differences or changes in demand forecasts is not *whether* the utility will need additional generating capacity but *when*. *Commonwealth Edison Co. (Byron Nuclear Power Station, Units 1 and 2)*, LBP-80-30, 12 NRC 683, 691 (1980). The standard for judging the "need-for-power" is whether a forecast of demand is reasonable and additional or replacement generating capacity is needed to meet that demand. *Carolina Power & Light Co. (Shearon Harris Nuclear Power Plant, Units 1-4)*, ALAB-490, 8 NRC 234, 237 (1978).

The foregoing discussion reveals that the forecasts upon which

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<sup>10</sup>Makhijani, "The Technical and Economic Feasibility of a Carbon-Free and Nuclear-Free Energy System in the United States," paper at [www.ieer.org](http://www.ieer.org)

<sup>11</sup>P. 92. The entire book Carbon-Free and Nuclear-Free is downloadable without charge at <http://www.ieer.org/carbonfree/CarbonFreeNuclearFree.pdf>

<sup>12</sup>This projection is probably rather conservative, as Carbon-Free and Nuclear-Free was published some months before the Wall Street Crash of 2008, which, in the consequent precariousness in Michigan's large auto manufacturing sector, has seen a straight decline in electrical demand over the past year.

DTE relies are severely out-of-date and, given a fast-breaking new trend toward decreased electricity demand in Michigan, the assumptions DTE uses cannot be said to be "reasonable." DTE must be required to provide contemporaneous data and need projections, the informational base which is sorely missing from the ER. It is considerably more likely than it might have been in 2006 that the date by which new baseload capacity is needed in the DTE grid must be moved back.

#### **B. Solar and Wind**

The facts and discussion omitted from the solar-photovoltaic and wind power portions of the Environmental Report are considerable.

Respecting wind, DTE offers this factually unsupportable conclusion:

9.2.2.1.1 While wind technology is expected to improve in capacity factor and, of course, is attractive due to the renewable energy source characteristics, low capacity factors for wind generated power along with excessive cost of energy storage devices make this source unacceptable as an alternative to a baseload electricity generator. As shown in Table 9.2-1, wind capacity factors range from approximately 25 to 30 percent, well below the 90 to 95 percent required for a baseload plant (Reference 9.2-5). On average, wind resources would require 3.5 times as many MWe of installed capacity to provide an average capacity level equivalent to that from baseload nuclear resources with a capacity factor of 90 percent. However, even after adjusting for average available capacity, this capacity is not equivalent to that of a reliable baseload resource, given that in any point in time, generation can range from zero to full capacity. Furthermore, in general, there is a poor correlation between wind output and peak demand. In particular, wind tends to be unavailable on a hot summer day when both baseload and peaking resources are most needed.

As Dr. Makhijani points out in the aforementioned article, renewables can generate in off-peak times of day to accomplish such feats and producing ice, which is allowed to melt for air conditioning source material during those "windless August days" to which DTE refers.

Moreover, DTE actually fictionalizes the comparison it would like

to make, as opposed to the comparison that Michigan's IRP statute, common sense, and the vaunted energy marketplace are forcing DTE to make: the utility attempts to argue a calculated exaggeration, that the only legitimate comparison would be to replace a baseload facility such as Fermi 3 with 100% wind power, instead of the coming mix of conservation, geothermal, wind, solar, and other innovations. This is a wholly invalid comparison, and the ER is lacking in objective, serious consideration of the wind and solar alternatives as a consequence.

As to photovoltaic energy, DTE effectuates a thorough rejection:

9.2.2.1.2 Consideration of solar technologies as an alternative to Fermi 3 must first focus on whether they can be built as baseload capacity. Due to their intermittent nature during the day and lack of economic thermal storage devices at night, solar is not considered a baseload replacement option compared to Fermi 3. Concentrated solar power and photovoltaic distributed generation generally are installed at the end-user location. As shown in Table 9.2-1, average capacity factors for solar range from 15 to 20 percent. Storage capacity is not commercially available to serve as baseload generation. As noted by EPRI (Reference 9.2-4), improved technology for energy storage is necessary to enable deployment of solar as a baseload source, and these advances are not predicted to be achieved in the near term.

. . .[I]t is estimated that 35,000 acres will be needed per 1000 MWe for photovoltaic and 14,000 acres per 1000 MWe for solar systems. This large amount of land use has potential adverse environmental effects. . . .

In summary, solar power is not a reasonable alternative to provide for the baseload need that would be served by Fermi 3 because of the relatively smaller potential for solar in the State of Michigan, solar power's lower capacity factor and high land requirements.

This is a stunning set of exaggerations and fictions. In February 2009, First Solar, one of the most successful photovoltaic firms in the country, announced that it can now produce thin-film collectors



for \$1/kw.<sup>13</sup> And Dow Chemical, a major Michigan manufacturer, plans to sell solar shingles by 2011, such that one's roofing material becomes a photovoltaic transformer.<sup>14</sup>

"In the context of the environmental impact statement drafting process, when a reasonable alternative has been identified it must be objectively considered by the evaluating agency so as not to fall victim to 'the sort of tendentious decisionmaking that NEPA seeks to avoid.'" *Private Fuel Storage, L.L.C. (Independent Spent Fuel Storage Installation)*, LBP-01-34, 54 NRC 293, 302 (2001), citing *I-291 Why? Association v. Burns*, 372 F. Supp. 223, 253 (D. Conn. 1974), aff'd 517 F.2d 1077 (2d Cir. 1975). A hard look for a superior alternative is a condition precedent to a licensing determination that an applicant's proposal is acceptable under NEPA. *Public Service Co. of New Hampshire (Seabrook Station, Units 1 & 2)*, ALAB-471, 7 NRC 477, 513 (1978).

It is precisely a hard, serious look that is missing from the ER discussion of alternatives propounded by DTE. NEPA's implementing regulations recognize that the consideration of alternatives is "the heart of the environmental impact statement." 40 CFR § 1502.14. Council on Environmental Quality regulations emphasize that:

[The alternatives] section is the heart of the environmental impact statement. Based on the information and analysis presented in the sections on the Affected Environment and Environmental Consequences, it should present the environmental impacts of the proposal

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<sup>13</sup><http://greeninc.blogs.nytimes.com/2009/02/24/first-solar-claims-1-a-watt-industry-milestone/>

<sup>14</sup>[www.chicagotribune.com/news/chi-ap-mi-solarshingles,0,2864250.story](http://www.chicagotribune.com/news/chi-ap-mi-solarshingles,0,2864250.story)  
chicagotribune.com

and the alternatives in comparative form, thus sharply defining the issues and providing a clear basis for choice among options by the decision-maker and the public. In this section, agencies shall:

(a) Rigorously explore and objectively evaluate all reasonable alternatives . . . .

(b) Devote substantial treatment to each alternative considered in detail . . . .

(c) Include reasonable alternatives not within the jurisdiction of the lead agency.

(d) Include the alternative of 'no action.'

(e) Identify the agency's preferred alternative or alternatives . . . .

(f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

40 CFR 1502.14.

NEPA's emphasis on "the importance of coherent and comprehensive up-front environmental analysis. . . ensure[s] informed decision-making to the end that the agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Blue Mtns. Biodiversity Project v. Blackwood*, 161 F.3d 1208, 1216 (9th Cir. 1998).

Petitioners urge the NRC to allow this contention to proceed to hearing so that the public might avoid buyer's remorse as a result of gross factual omissions appearing in the current version of DTE's COLA and Environmental Report.