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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
DTE ELECTRIC COMPANY) Docket No. 52-033-COL
)
(Fermi Nuclear Power Plant, Unit 3))

PREFILED DIRECT TESTIMONY OF
J. PEYTON DOUB AND DAVID A. WEEKS REGARDING CONTENTION 8

Q1. State your names, occupations, and by whom are you employed.

A1. [DAW] My name is David A. Weeks. I am employed as an Environmental Scientist by Ecology and Environment, Inc. (E & E). I have been employed at E & E for 6 years and by the USDA Natural Resources Conservation Service for the 23 previous years. A statement of my professional qualifications is attached hereto as Exhibit NRC E3.

[JPD] My name is J. Peyton Doub. I am employed as an Environmental Scientist by the U.S. Nuclear Regulatory Commission (NRC) in the Division of Site Safety and Environmental Analysis (DSEA), Office of New Reactors (NRO). I have been employed with the NRC performing environmental reviews for 5 years and as an environmental scientist by commercial consulting firms for the preceding 19 years. A statement of my professional qualifications is attached as Exhibit NRC E4.

Q2. Describe your job duties and responsibilities.

A2. [DAW] I am a chief environmental scientist in the Biological Services Group at the Ecology and Environment, Inc (E & E) Lancaster, New York headquarters. In that role I am responsible for contributing to ecological sciences sections of environmental impact statements (EISs) and environmental assessments (EAs), biological assessments, and other environmental documents. Issues that I address in those documents include terrestrial ecology, threatened and endangered species, soils, and geology. I also manage production of EISs and EAs of infrastructure projects such as interstate gas pipelines and wind and solar energy projects and manage wetlands delineations for wind energy projects.

[JPD] As an environmental scientist with the Water and Ecology Team (RWET), Environmental Technical Support Branch (RENV) of DSEA, NRO, I am routinely assigned to direct and oversee contractor personnel assigned to terrestrial ecology, wetlands, and land use issues in environmental reviews of applications for combined licenses (COLs) and early site permits (ESPs) for proposed new reactors. I have performed this technical oversight role since 2008 for four applications for which the NRC has issued final EISs (FEISs) and four additional applications for which the NRC is currently preparing EISs. I also served in 2012 as an expert witness on wetland-related issues at a hearing before the Atomic Safety and Licensing Board (ASLB) on a contention regarding a COL application for new reactors in Levy County, Florida.

I routinely contribute terrestrial ecology and wetlands expertise to preparation and update of guidance documents. I recently authored Revision 2 to Regulatory Guide 4.11, *Terrestrial Environmental Studies for Nuclear Power Stations*. I serve as a

technical point of contact concerning terrestrial ecology and wetland issues for NRO staff and contractors. I presented in November 2008 a one-day technical orientation session to Pacific Northwest National Laboratory (PNNL) staff on addressing wetland issues in NRC documents. I delivered additional guidance on addressing wetland hydrology issues in NRC documents as part of a one-day orientation session given by RWET staff to PNNL in March 2012.

Q3. Describe your professional qualifications including education, training, work experience, and publications, as they relate to this review.

A3. [DAW] I received a B.S. in Resources Management from the State University of New York College of Environmental Science and Forestry and an M.S. in Forestry from the University of Massachusetts. I have been employed by E & E from 2007 to the present in my current capacity. Prior to joining E & E, I was employed by the USDA Natural Resources Conservation Service from 1984 to 2007, serving in several capacities including five years as assistant state conservationist for water resources. While employed by USDA, I conducted an assessment of the Republic of Macedonia's watershed management and biological diversity policies and programs as an Embassy Science Fellow; the report was presented to the Minister of the Environment. Prior to USDA, I was employed by International Paper Company as a project forester/soil surveyor and by the USEPA as an ecologist.

Addressing my qualifications specific to terrestrial ecology, I have supervised preparation of EISs and EAs, including the impacts on terrestrial ecological resources; I have also supervised preparation of biological assessments under the Endangered Species Act. Several of the EIS and EA projects involved potential impacts on federal-

and state-protected animal and plant species. I have managed or contributed to production of EISs, EAs, and other environmental documents in 12 states, including Michigan.

[JPD] I earned a B.S. in Plant Science from the Cornell University School of Agriculture and Life Sciences in 1982 and an M.S. in Plant Physiology from the University of California at Davis in 1984. I was certified as a Professional Wetland Scientist (PWS) in 1995 and as a Certified Environmental Professional (CEP) in 1996. From 2000 to 2011, I served as a voluntary member of the Certification Review Board of the Academy of Board Certified Environmental Professionals (ABCEP), which administers the CEP credential, and since 2011 I have served as a voluntary elected member of ABCEP's Board of Trustees.

After miscellaneous prior employment, I was employed from 1989 to 2008 as an environmental scientist (later senior environmental scientist) with the NUS Corporation and its successor companies, including Halliburton NUS Corporation, Brown and Root Environmental, and Tetra Tech NUS. My work there primarily involved wetland delineations, functional assessments, and mitigation design in the context of the National Environmental Policy Act and Comprehensive Environmental Response, Compensation, and Liability Act; ecological field studies; ecological risk assessment; and Phase I environmental site assessments and environmental baseline surveys. From 2006 to 2008, I performed wetland delineations on two sites for proposed new reactors, and I authored the terrestrial ecology sections of the applicant's environmental report and completed terrestrial flora and fauna studies for the proposed Calvert Cliffs Unit 3. Since 2008, I have worked as an environmental scientist specializing in terrestrial ecology and wetlands for the NRC, as described in A2.

Q4. Describe your involvement and responsibilities regarding the NRC Staff's preparation of the EIS for the COL for Enrico Fermi Unit 3.

A4. [DAW] For the Fermi 3 COL review, I have been responsible for evaluating the potential impacts on terrestrial ecology from construction and operation of the proposed power plant and related facilities. My assessment of terrestrial ecological impacts is contained in Sections 2.4.1, 4.3.1, 5.3.1, 7.3.1, 9.3, and 10 of the FEIS. I began my work on the Fermi 3 project in late 2008. I reviewed technical data submitted by Detroit Edison on terrestrial ecology and wetlands and participated in the February 2009 site audit of the proposed Fermi 3 site and the expected transmission line route. After the site audit I reviewed technical information pertinent to the terrestrial ecology of the project area and the eastern fox snake produced by state and federal agencies and independent organizations. I also reviewed additional technical information provided by the Applicant, including the Applicant's proposed mitigation plan for the eastern fox snake. See Mitigation Plan (Exhibit NRC E5). I worked with J. Peyton Doub (JPD), the NRC terrestrial ecologist, to prepare Requests for Additional Information. I wrote the terrestrial ecology sections of the FEIS, attended public meetings, and prepared the terrestrial species sections of the biological assessment.

[JPD] I have been assigned as the NRC technical reviewer for terrestrial ecology and land use issues for the Fermi 3 COL since the application was tendered in September 2008. Before receipt of the application, in July 2008, I participated in a pre-application review of the Applicant's data on terrestrial ecology contained in a preliminary draft environmental report (ER). I oversaw contractor staff performing an acceptance review of terrestrial ecology and wetlands data contained in the application in September and

October of 2008. I then reviewed technical data submitted by Detroit Edison on terrestrial ecology, wetlands, and land use and participated in a site audit during February 2009 that included a visit to the Applicant's proposed site and to selected locations on the expected route for the associated transmission line. I worked with NRC contractor staff to develop Requests for Additional Information needed to complete the review of terrestrial ecology and land use issues. I additionally reviewed other pertinent technical data on those issues, including the Applicant's proposed construction mitigation plan for the eastern fox snake. See Mitigation Plan (Exhibit NRC E5). I have also reviewed sections in the draft and final EISs on land use and terrestrial ecology and the biological assessment for Fermi 3. Specific sections of the EIS under my review include Sections 2.2, 2.4.1, 4.1, 4.3.1, 5.1, 5.3.1, 7.1 and 7.3.1, as well as the portions of Sections 9.2 and 9.3 and Chapter 10 concerning land use and terrestrial ecology. In addition to terrestrial ecology sections in the FEIS, I also provided technical oversight for the FEIS sections addressing land use.

I visited the Fermi site in August 2011 for the purpose of meeting with the U.S. Fish and Wildlife Service regarding the biological assessment and with the U.S. Army Corps of Engineers (USACE) regarding the wetland mitigation proposed by the Applicant. This proposed wetland mitigation was subsequently documented in a report to the USACE and is presented in Appendix K of the FEIS and referred to as the Wetland Mitigation Plan in this testimony. See FEIS at Appendix K (Exhibit NRC E1B). As part of that visit, I attended a briefing on the proposed wetland mitigation and visited the proposed site for the wetland mitigation. I documented my observations in a trip report. See Doub Report (Exhibit NRC E 6). I also contributed to a written affidavit supporting the NRC staff's position on the Applicant's motion for summary disposition in 2012.

Q5. What is the purpose of your testimony?

A5. [DAW, JPD] The purpose of our testimony is to explain how we evaluated the potential effects of the proposed Fermi Unit 3 project on resources addressed by Contention 8. Specifically, we will discuss the process we used to consider potential effects from the building of the project on the eastern fox snake and the conclusions drawn from this analysis. The eastern fox snake is listed as threatened by the State of Michigan (although not federally by the U.S. Fish and Wildlife Service) and lies at the heart of Contention 8. We will then discuss how we considered possible mitigation measures for the eastern fox snake and how those measures influenced the FEIS conclusions.

Q6. Are you familiar with Contention 8?

A6. [DAW, JPD] Yes, we are familiar with Contention 8. As originally admitted, Contention 8 challenged the Applicant's ER for failing to adequately assess the impacts of building Fermi 3 on the eastern fox snake and to consider mitigation alternatives to reduce or eliminate those impacts. This challenge now applies to the Staff's analysis in the FEIS. To support their concerns, the Intervenors cite a comment dated February 9, 2009 from the Wildlife Division of the Michigan Department of Natural Resources (MDNR) to NRC, sent during the scoping process for the EIS. See Sargent Letter (Exhibit NRC E7). The letter specifically expressed concerns over potential effects of the project on the eastern fox snake. *Id.* It stated that the MDNR believes 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." *Id.* The MDNR also stated that it would like to see the Applicant prepare a project-specific plan for protecting the eastern fox snake from project activities. *Id.*

Q7. Are you familiar with the supporting documentation and other documents filed by the Intervenors, Applicant, and Staff regarding Contention 8?

A7. [DAW, JPD]. Yes, we have been involved with the environmental review since the initial docketing of the application. We have provided technical review and support on issues raised by Contention 8 since its initial submittal in 2009. We have read the key documents submitted by the Applicant, Intervenors, and Staff regarding Contention 8 and all ASLB Board Orders addressing Contention 8.

Q8. Did you review or rely on any specific documents to prepare your testimony?

A8. [DAW, JPD]. The Staff's assessment of the impacts of Fermi Unit 3 building on the eastern fox snake is presented in the FEIS, primarily in Sections 2.4.1, 4.3.1, and 7.3.1. The overall conclusions and recommendations, including the benefit-cost balancing, is contained in Chapter 10. In preparing this testimony we have also considered and referenced the following specific documents (with NRC Exhibit numbers noted) in the responses for which we are individually responsible, as indicated by our initials:

Exhibits

- NUREG-2105 Environmental Impact Statement for Combined License (COL) for Enrico Fermi Unit 3, Final Report (January 2013) Volumes 1, 2, 3, and 4. (Exhibit NRC E1A and E1B).
- Detroit Edison Fermi 3 Construction Habitat and Species Conservation Plan Eastern Fox Snake (*Elaphe gloydi*), rev. 1 (Mar. 2012). (Exhibit NRC E5).
- Memorandum from Peyton Doub, NRC, to Bruce Olson, NRC, regarding Meeting Notes from the Onsite Meetings on August 8-9, 2011, to Discuss the Fermi 3 Site Layout and Conceptual Aquatic Resource (Wetland) Mitigation Plan (Dec. 5, 2011). (Exhibit NRC E6).

- Letter from Lori Sargent, MDNR, to NRC, dated February 9, 2009, regarding Comments to Environmental Report (Feb. 9, 2009). (Exhibit NRC E7).
- Excerpt from Michigan Natural Resources and Environmental Protection Act, Mich. Comp. Laws § 324.30301 “Definitions; technical wetland delineation standards” (2012). (Exhibit NRC E8).
- Excerpt from Lewis M. Cowardin et al., *Classification of Wetlands and Deepwater Habitats of the United States*, U.S. Fish and Wildlife Service (1979). (Exhibit NRC E9).
- Y. Lee, “Special animal abstract for *Pantherophis gloydi* (eastern fox snake),” Michigan Natural Features Inventory, Lansing, MI (2009). (Exhibit NRC E10).
- Excerpts from Roger Conant, “A New Subspecies of the Fox Snake, *Elaphe Vulpina* Baird and Girard,” *Herpetologica* vol. 2 no.1, The Chicago Academy of Sciences, Chicago, IL (1940). (Exhibit NRC E11).
- Excerpts from Joseph T. Collins & Travis W. Taggart, *Standard Common and Scientific Names for North American Amphibians, Turtles, Reptiles, and Crocodylians*, The Center for North American Herpetology, Lawrence, Kansas (5th ed. 2002). (Exhibit NRC E12).
- NUREG-1555 Standard Review Plans for Environmental Reviews for Nuclear Power Plants (“ESRP”) Rev. 0 (2000) Section 2.4.1 and 4.3.1. (Exhibit NRC E13).
- NUREG-1555 Standard Review Plans for Environmental Reviews for Nuclear Power Plants (“ESRP”) Draft Rev. 1 (2007) Sections 4.7. (Exhibit NRC E14).
- Letter from Lori Sargent, MDNR, to Randall Westmoreland, DTE, regarding Review of Proposed Eastern Fox Snake Mitigation Plan (Apr. 6, 2012). (Exhibit NRC E15).
- Michigan Department of Environmental Quality (MDEQ) Wetland Permit No. 10-58-011-P, issued January 24, 2012. (Exhibit NRC E16).
- Michigan Natural Resources and Environmental Protection Act, Mich. Comp. Laws § 324.36501 “Definitions” and § 324.36505 “Prohibitions, exceptions” (2012). (Exhibit NRC E17).
- MDNR Wildlife Division “Application for a Threatened/Endangered Species Permit.” (available at: http://www.michigan.gov/dnr/0,1607,7-153-10370_12141_12168-30522--,00.html). (Exhibit NRC E18).
- MDNR website “Environmental Review Program Announcement” (available at: http://www.michigan.gov/dnr/0,4570,7-153-10370_12141_12168-30516--,00.html). (Exhibit NRC E19).

Q9. Did you rely on any important regulatory definitions, and, if so, how did you apply them in your review?

A9. Yes. The definitions for the impact level determinations in the FEIS and the NRC's definition of "construction" were important to our review. First, the FEIS uses the terms SMALL, MODERATE, and LARGE to designate impact levels to environmental resources. The terms are discussed in Chapter 1 of the FEIS and are codified in Table B-1 of 10 CFR Part 51, Subpart A, Appendix B. FEIS at 1-4 (Exhibit NRC E1A). They are defined there as follows:

SMALL – Environmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource.

MODERATE – Environmental effects are sufficient to alter noticeably, but not to destabilize, important attributes of the resource.

LARGE – Environmental effects are clearly noticeable and are sufficient to destabilize important attributes of the resource.

Also, with respect to the definition of "construction," as discussed in the introduction to Chapter 4 of the FEIS, the NRC's authority related to building new nuclear units is limited to "construction activities that have a reasonable nexus to radiological health and safety and/or common defense and security." *Id.* at 4-1. The NRC has defined "construction" according to the bounds of its regulatory authority. *Id.* Many of the activities required to build a nuclear power plant do not fall within the NRC's regulatory authority and, therefore, are not construction as defined by the NRC. *Id.* Such activities are referred to as "preconstruction" activities in 10 C.F.R 51.45(c). *Id.* The NRC Staff evaluates the direct, indirect, and cumulative impacts of the construction activities that would be authorized with the issuance of a COL. *Id.* The environmental effects of preconstruction activities (e.g., clearing and grading, excavation, and erection of support

buildings) are generally included as part of this FEIS in the evaluation of cumulative impacts. *Id.*

The USACE was a cooperating agency in the drafting of the FEIS. Because of the collaborative effort between the NRC and the USACE in the Fermi 3 environmental review, the combined impacts of construction activities that would be authorized by the NRC with its issuance of a COL and the preconstruction activities are presented together in the FEIS in Chapter 4. When discussing activities that include both construction and preconstruction activities, the FEIS uses the term “building.” For each resource area, the NRC in the FEIS also provides an impact characterization solely for construction activities that meet the NRC’s definition of construction. *Id.* at 4-3. Thereafter, both the assessment of the impacts of 10 CFR 50.10(a) construction activities and the assessment of the combined impacts of construction and preconstruction are used in the description and assessment of cumulative impacts in Chapter 7. *Id.* For most environmental resource areas (e.g., terrestrial ecology), the impacts are not the result of either solely preconstruction or construction activities. *Id.* Rather, the impacts are attributable to a combination of preconstruction and construction activities. *Id.* Consequently, construction and preconstruction activities are described together in this testimony and the term “building” is used.

Q10. Define the term “wetlands” and the various types of wetlands described in this testimony.

A10. Unless otherwise indicated, the FEIS and our testimony use the federal definition of wetlands established by the USACE for purposes of Section 404 of the Clean Water Act. Under this definition, wetlands are “those areas that are inundated or saturated by

surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” 33 C.F.R. § 328.3b. Although all areas meeting this definition are recognized as wetlands by the USACE, not all wetlands are regulated by Section 404 of the Clean Water Act.

In certain places, the FEIS and our testimony refer to wetlands regulated by the State of Michigan. The State of Michigan defines wetlands as “land characterized by the presence of water at a frequency and duration sufficient to support, and that under normal circumstances does support, wetland vegetation or aquatic life, and is commonly referred to as a bog, swamp, or marsh, and which [meets specific statutory requirements pertaining to size, landscape position, or designation by Michigan Department of Environmental Quality].” Michigan Wetland Definition (Exhibit NRC E8). The Michigan definition is substantially equivalent to the federal definition, except for the fact that it excludes from state regulation certain wetlands not meeting specific criteria pertaining to size, environmental value, or landscape position. *Id.*

The FEIS and this testimony also refer to specific classifications of wetlands, based on a system developed by the U.S. Fish and Wildlife Service. See Cowardin (Exhibit NRC E9). Palustrine wetlands are “nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and [other tidal and non-tidal wetlands meeting other specified parameters]. *Id.* at 10. Emergent plants are erect non-woody plants rooted in a wetland or other surface water area that do not tolerate extended submersion (see definition for “emergent hydrophytes”). *Id.* at 40. Palustrine wetlands may be generally thought of as comprising most non-tidal wetlands not occurring in channels or

lakebeds. Although the exact definition for palustrine wetlands is more complex, the simplified definition provided in the preceding sentence provides a useful definition that applies well to this testimony. See *id.* at 10.

Palustrine wetlands are a “system” of wetlands that may be subclassified into “classes” based on dominant vegetation. *Id.* The FEIS speaks frequently of forested wetlands, scrub-shrub wetlands, and emergent wetlands. Forested wetlands are characterized by woody vegetation greater than 20 feet in height. *Id.* at 20. Scrub-shrub wetlands are characterized by woody vegetation less than 20 feet in height. *Id.* Emergent wetlands are characterized by erect, rooted herbaceous plants. *Id.* at 19.

Q11. Describe your familiarity with the ecology and natural history of the eastern fox snake, especially with respect to its occurrence on and near the proposed site for Enrico Fermi Unit 3.

A11. [DAW, JPD]. The natural history of the eastern fox snake (*Pantherophis gloydi*) (also known as *Elaphe gloydi*) is discussed in Section 2.4.1.3 of the FEIS. FEIS at 2-53 (Exhibit NRC E1A). As noted in the FEIS (at 2-53), little is known regarding the life history of the eastern fox snake. Lee at 2 (Exhibit NRC E10). It is primarily an open wetland species [i.e., a species of palustrine emergent wetlands or shallow waters lacking emergent vegetation] and inhabits emergent wetlands along Great Lakes shorelines and associated drainages where cattails (*Typha* spp.) are common. FEIS at 2-53 (Exhibit NRC E1A). The FEIS states that:

Although primarily an open wetland species, eastern fox snakes also occupy drier habitats such as vegetated dunes and beaches, and they occasionally travel along ditches and into nearby farm fields, pastures,

and woodlots. ... All undeveloped areas of the Fermi site, therefore, can be considered habitat for the eastern fox snake.

Id.

The Michigan Natural Features Inventory (MNFI) indicates that the range of the eastern fox snake is limited to specific areas within the Great Lakes basin. Lee at 1 (Exhibit NRC E10). According to the MNFI, it “is restricted to the shoreline and near shore areas along southern Lake Huron from Saginaw Bay, Michigan and Georgian Bay, Ontario south to the Detroit River and Lake St. Clair, and along western Lake Erie from Monroe and Wayne counties in Michigan [Note: the Fermi site is in Monroe County] to Norfolk County, Ontario and Erie County, Ohio.” *Id.* From its initial identification as a separate taxonomic entity distinct from the more broadly distributed western fox snake, the eastern fox snake’s range has been described as comprising “suitable localities along and near the shores of Lakes Huron and Erie, from Georgian and Saginaw Bays southward to north central Ohio, and eastward along the northern shore of Lake Erie to Long Point and perhaps Buffalo.” Conant at 7 (Exhibit NRC E11). Although this historic range description extends farther east than the more current MNFI description, the map of locality records used to develop the historic range description shows a concentration of sightings along the shores of the western quarter of Lake Erie. *Id.* at 6.

The taxonomy of the eastern fox snake is subject to dispute. In 1940, Roger Conant of the Zoological Society of Philadelphia proposed dividing the fox snake (then named *Elaphe vulpina*) into two subspecies: the eastern fox snake (*Elaphe vulpina gloydi*) distributed in southeast Michigan eastward, and the western fox snake (*Elaphe vulpina vulpina*) distributed more broadly to the west. *Id.* at 1-2. He argued that the two snakes should be considered subspecies rather than distinct species due to their similar

morphology, despite their isolated distributions and lack of an intergrading population. *Id.* at 10. However, the Center for North American Herpetology recognizes the eastern fox snake as a separate species, *Elaphe gloydi*. List of Common and Scientific Names at 30 (Exhibit NRC E12). Most recent sources, e.g. the MNFI, now refer to the eastern fox snake as *Pantherophis gloydi*. See Lee (Exhibit NRC E10). In keeping with these recent sources, the FEIS refers to the eastern fox snake as *Pantherophis gloydi*.

The eastern fox snake was sighted on the Fermi site twice in 2008 and 15 other times between 1990 and 2007. FEIS at 2-53 (Exhibit NRC E1A). The snake was also reported in Monroe County nine times in 2007. *Id.*

Q12. Did you evaluate potential impacts from the proposed Enrico Fermi Unit 3 on the eastern fox snake?

A12. [DAW, JPD]. Yes, the FEIS evaluated the potential impacts from building the proposed Fermi Unit 3 on the eastern fox snake.¹ The FEIS notes that because the eastern fox snake has less ability to flee during land-clearing activities compared to more mobile species (such as most mammals), eastern fox snakes inhabiting work areas could be inadvertently killed during land-clearing activities, such as tree felling, grubbing, and grading. *Id.* at 4-26. Increased wildlife mortality in the form of road kill may result from increased traffic volume on nearby roadways during the building of the proposed Fermi Unit 3. *Id.* Detroit Edison substantially reduced the amount of wetland disturbance, including disturbance of the emergent wetlands particularly favored by the eastern fox

¹ Because the Board has ruled that the scope of Contention 8 is limited to construction impacts on the snake, our testimony does not discuss in detail the FEIS analysis of operational impacts or impacts off of the site, such as impacts in transmission line corridors. See *Detroit Edison Co.* (Fermi Nuclear Power Plant, Unit 3), LBP-11-14, 73 NRC 591, 610 (2011).

snake, by re-designing the project layout. *Id.* at 4-38. Nevertheless, approximately 21 ac of emergent wetlands, as well as other potential eastern fox snake habitat, would still be unavoidably disturbed. *Id.* at 4-38.

Q13. What technical guidance did you follow?

A13. [DAW, JPD] We followed technical guidance in ESRP 2.4.1 when characterizing terrestrial habitats, wetlands, and other terrestrial ecological resources affected by Fermi Unit 3, including wetlands and other terrestrial habitats potentially containing eastern fox snakes. See ESRP (2000) at 2.4.1 (Exhibit NRC E13). We followed technical guidance in ESRP 4.3.1 when evaluating potential direct and indirect impacts from the project on terrestrial ecological resources, including the eastern fox snake and its habitats. See *id.* at 4.3.1. We followed technical guidance in ESRP 4.7 when evaluating potential cumulative impacts from the project on terrestrial ecological resources, including the eastern fox snake and its habitats. See ESRP (2007) (Exhibit NRC E14). ESRP 2.4.1 underlies the information presented in Section 2.4.1 of the FEIS, ESRP 4.3.1 underlies the analysis presented in Section 4.3.1 of the FEIS, and ESRP 4.7 underlies the analyses presented in Chapter 7 of the FEIS, including Section 7.3.1.

Because the eastern fox snake is listed by a state as threatened or endangered, it is one of several species meeting the criteria for an “important species” in ESRP 2.4.1. ESRP (2000) at 2.4.1-7 (Exhibit NRC E13). The ESRPs noted in the paragraph above call for specific consideration of those species identified by reviewers as “important species.” Section 4.3.1.3 of the FEIS evaluates the potential direct and indirect impacts of building Fermi Unit 3 on important species, including state and federally-listed threatened and endangered species, and contains a subsection specifically devoted to the eastern fox

snake. FEIS at 4-36 to 4-37 (Exhibit NRC E1A). Section 7.3.1.2 of the FEIS, which evaluates the potential cumulative impacts of Fermi 3 on important species, addresses the eastern fox snake in the first paragraph. *Id.* at 7-20. The eastern fox snake is not a federally-listed species under the Endangered Species Act.

Q14. What technical approach did you follow?

A14. [DAW, JPD] Although the ESRPs noted in A13 provided broad technical direction for considering the direct, indirect, and cumulative impacts of an action on terrestrial ecological resources, we relied on our professional expertise to develop analyses appropriately tailored to the unique circumstances of the Fermi Unit 3 project. We reviewed the terrestrial ecology analyses contained in the Applicant's ER, included as part of the application package. We attended a site audit at the Applicant's offices in February 2009, which included a visit to the proposed project site. We developed multiple requests for additional information (RAIs) asking the Applicant to provide additional technical information we needed to complete our analysis, and we reviewed the Applicant's responses. We wrote letters to the U.S. Fish and Wildlife Service and Michigan Natural Features Inventory requesting information on potential effects to federally-listed and state-listed species, respectively, and we reviewed the responses. FEIS at Appendix F-4 (Exhibit NRC E1B). We reviewed mitigation measures proposed by the Applicant to address impacts to terrestrial ecological resources, including the Applicant's Habitat and Species Conservation Plan for the eastern fox snake during the building phase of Fermi Unit 3 (Exhibit NRC E5),² as well as the Applicant's Wetland

² In response to comments by MDNR, the Applicant also prepared a mitigation plan that addresses activities during Fermi 3 operations. ADAMS Accession No. ML12188A150. However, as described above, impacts to the fox snake during operations are outside the scope of Contention 8. See *Fermi*, LBP-11-14, 73 NRC at 610.

Mitigation Plan (Exhibit NRC E1B at K-3 to K-82). The Wetland Mitigation Plan was relevant to our analysis of eastern fox snake impacts because wetlands, especially emergent wetlands (wetlands dominated by herbaceous rather than woody vegetation) are the eastern fox snake's preferred habitat. The Applicant's Habitat and Species Conservation Plan is referred to in this testimony as the eastern fox snake mitigation plan. The eastern fox snake mitigation plan includes a Habitat Restoration and Enhancement Program that calls for relocation of eastern fox snakes from areas of proposed disturbance to mitigation areas and for enhancement of mitigation areas to improve their favorability to eastern fox snakes. See Mitigation Plan at Appendix C (Exhibit NRC E5). We integrated information from each source into a comprehensive evaluation of potential impacts to terrestrial ecological resources, including the eastern fox snake and its habitats.

Q15. What did you conclude regarding impacts to the eastern fox snake from building Enrico Fermi Unit 3?

A15. [DAW, JPD] We concluded in Section 4.3.1.6 of the FEIS that the potential impacts from building Fermi Unit 3 and related facilities on terrestrial ecological resources, which includes but is not limited to the eastern fox snake and its habitats, would be SMALL to MODERATE. FEIS at 4-47 (Exhibit NRC E1A). The FEIS explains that the potential for MODERATE impacts to terrestrial ecological resources is limited to possible adverse effects on the eastern fox snake. *Id.* The FEIS states that these conclusions are based in part on the Applicant's proposed mitigation measures for the eastern fox snake. Section 4.3.1.6 of the FEIS states "The staff's evaluation of the potential impacts on the eastern fox snake recognizes the potential for mitigation measures proposed by Detroit Edison (Detroit Edison 2012a) [referring to the Applicant's fox snake mitigation plan for

Fermi 3 construction (Exhibit NRC E5)] and approved by the MDNR to significantly reduce impacts on that species, thereby leading to SMALL impacts, but acknowledges the possibility of MODERATE impacts if proposed mitigation is not implemented as described in their plan.” *Id.*

Q16. How did you define the geographic area that you analyzed for terrestrial ecology impacts, including impacts to the eastern fox snake?

A16. [DAW, JPD] The conclusions presented in Section 4.3.1.6 of the FEIS are drawn in the context of terrestrial habitats on the 1260-acre Fermi site and surrounding vicinity (7.5-mile radius) as well on lands traversed by the proposed new transmission line route, as described in Section 2.4.1 of the FEIS. *Id.* at 2-32 to 2-65. The conclusions presented in Section 7.3.1 of the FEIS regarding cumulative impacts are drawn in the context of a geographic area of interest encompassing terrestrial habitats extending outward in a 50-mile radius from the Fermi site. *Id.* at 7-16. The analysis and conclusions regarding possible impacts to the eastern fox snake are focused on the regional population of individuals occurring in the regional landscapes noted above, not on the entire population or any distinct metapopulation (spatially distinct subpopulation). In our professional opinion, the regional landscape scope of analysis used in the FEIS was more conservative than any attempt to generate conclusions in the larger context of the species. Because the analysis presented in the FEIS drew conclusions based upon possible effects of the Fermi 3 project on the regional population of eastern fox snakes living close to the Fermi site, it was more conservative than an analysis that only considered effects on the entire species distributed over the entire range, which extends to geographically distant locales such as the north shores of Lakes Erie and Huron.

Q17. Did you consider possible cumulative effects on the eastern fox snake from the proposed Enrico Fermi Unit 3 and other past, present, and reasonably foreseeable actions potentially affecting the regional population of this species?

A17. [DAW, JPD] Yes. Section 7.3.1 of the FEIS presents our evaluation of potential cumulative impacts on terrestrial ecological resources, including the eastern fox snake. Our cumulative impact assessment for terrestrial ecology considered a geographic area of interest that extended outward from the Fermi site by a 50-mi radius. *Id.* This area of consideration effectively encompasses the entire range of potentially suitable habitat for the eastern fox snake along the western shore of Lake Erie, and it includes most of that area of southeast Michigan recognized as potentially containing eastern fox snakes (see A11). The analysis considers the combined effects of the Fermi project together with those of “other past, present, and reasonably foreseeable future actions that could affect the same terrestrial ecological resources.” *Id.*

Cumulative impacts to the eastern fox snake are discussed specifically in Section 7.3.1.2 of the FEIS. *Id.* at 7-20. The FEIS notes that, although the eastern fox snake, a State-listed species, may be adversely affected by building the Fermi 3 project, the project would not destabilize the regional population. *Id.* The ensuing discussion notes that the combined project impacts on the eastern fox snake could be “regionally noticeable” if no mitigation were performed, but indicates that successful implementation of the mitigation proposed by the Applicant “could reduce these impacts to minimal levels.” *Id.* The analysis then proceeds to state that the Staff “is not aware of any other particular development proposals that may be planned and, consequently, cannot speculate on the locations, regulatory controls, and further effects on the eastern fox snake and its habitats beyond the areas covered by the Plans [referring to the construction and

operations eastern fox snake mitigation plans].” *Id.* The summary in Section 7.3.1 describes how the Staff concluded that the overall cumulative impacts on terrestrial ecology would be SMALL to MODERATE, with the potential for MODERATE impacts limited to effects on the eastern fox snake, and only if the Applicant’s mitigation were not successfully implemented. *Id.* at 7-21.

Q18. Did you consider possible mitigation measures in your evaluation?

A18. [DAW, JPD] Yes. Section 4.3.1.5 of the FEIS discusses the Applicant’s proposed mitigation for eastern fox snake impacts while building Unit 3. See FEIS at 4-46 (Exhibit NRC E1A). The Applicant has prepared an eastern fox snake mitigation plan outlining specific mitigation measures proposed for during building of Unit 3. See Mitigation Plan (Exhibit NRC E5). The FEIS outlines specific mitigation measures during the building of Fermi 3, drawn from the Applicant’s eastern fox snake mitigation plan, including “educating construction workers through use of a site-specific eastern fox snake manual, briefing workers on the possible presence of the snake, relocating snakes from work areas to other suitable habitat, and inspecting undeveloped areas for snakes prior to initiating work” and “walking down work areas to inspect for the eastern fox snake, developing procedures for capturing and relocating eastern fox snakes, instructing workers to halt work in the presence of an eastern fox snake until it can be relocated, and maintaining a log of monitoring efforts and actions taken.” FEIS at 4-37 (Exhibit NRC E1A). According to the Applicant, the plan was developed by a herpetologist with significant experience in designing actions to conserve and protect reptiles in Michigan, including the eastern fox snake. Applicant’s Motion for Summary Disposition of Contention 8 at 7 (June 11, 2012). We independently reviewed the statement of qualifications of the plan’s preparer, which was attached to his affidavit supporting

summary disposition, and agree that he appears highly qualified to prepare such a plan. See Affidavit of David Mifsud in Support of Summary Disposition of Contention 8 (June 11, 2012).

The FEIS also considers the Applicant's Wetland Mitigation Plan, presented in Appendix K of the FEIS. See FEIS at Appendix K-3 to K-82 (Exhibit NRC E1B). This plan, which will be enforced by the USACE and MDEQ under applicable federal and state regulations, calls for the establishment of approximately 130 ac of palustrine wetlands similar to those found on the Fermi site on an offsite property containing agricultural lands owned by the Applicant on the western shore of Lake Erie close to the Fermi site, as well as restoration of approximately 21 ac of temporarily disturbed wetlands on the Fermi site. *Id.* at Appendix K-11; see also MDEQ Permit at 2-3, 7-9 (Exhibit NRC E16). Once restored, the approximately 21 ac of temporarily disturbed wetlands would again provide the preferred habitat for eastern fox snakes that could be readily colonized by snakes inhabiting remaining areas of undeveloped habitat remaining on the Fermi site. Although the Applicant's proposed location for offsite wetland mitigation is discontinuous from the Fermi site, it still lies within the published range for the eastern fox snake. Lee at 1 (Exhibit NRC E10). In fact, the proposed offsite mitigation property lies even closer than the Fermi site to a dense cluster of historical (pre-1940) recorded sighting locations for the eastern fox snake. Conant at 6 (Exhibit NRC E11). The proposed mitigation location lies within 2 miles of where the River Raisin meets the western shore of Lake Erie. The River Raisin is one of four river systems specifically noted by MNFI as containing documented occurrences of the eastern fox snake. The MNFI states that eastern fox snakes "have been documented along the shoreline of lakes Erie, St. Clair and Huron, as well as along the *Raisin* [emphasis added], Detroit, Clinton and Shiawassee rivers and their tributaries." Lee at 1 (Exhibit NRC E10). It is therefore our

professional opinion that the naturally vegetated wetlands that the Applicant proposes to create out of agricultural land on the mitigation site would provide new suitable habitat that could be exploited by eastern fox snakes inhabiting the nearby landscape. To summarize, we believe that because the eastern fox snake favors wetland and shoreline habitats and uplands close to wetlands and shorelines, especially in areas close to the western part of Lake Erie, the restoration of wetlands on the Fermi site and the establishment of new wetlands on a nearby site on the Lake Erie coast would contribute substantially to mitigation for loss of eastern fox snake habitat. See FEIS at 2-53 (Exhibit NRC E1A).

Q19. Did you evaluate whether these measures would effectively reduce the potential for adverse effects on the eastern fox snake, if properly implemented?

A19. [DAW, JPD] Yes. We independently reviewed the Applicant's plan for mitigating eastern fox snake impacts during the building phase of Unit 3. See Mitigation Plan (Exhibit NRC E5). We also independently reviewed the Applicant's Wetland Mitigation Plan. See FEIS at Appendix K (Exhibit NRC E1B). Our conclusion of SMALL to MODERATE presented in Section 4.3.1.6 of the FEIS for potential building impacts on the eastern fox snake is based in part on "the staff's independent review of mitigation measures proposed by Detroit Edison, especially the compensatory wetland mitigation required by USACE and MDEQ [FEIS at Appendix K-3 to K-82] ... and Detroit Edison's proposed mitigation measures for the eastern fox snake." FEIS at 4-47 (Exhibit NRC E1A). In other words, we concluded that the potential impacts of building the project would be SMALL if the proposed mitigation were successfully implemented, but MODERATE if not.

In addition to our independent review of the eastern fox snake mitigation plan, the FEIS notes that the MDNR has reviewed the plan and found the proposed mitigation to be acceptable. *Id.* at 4-37.

Q20. Did you consider what the effects on the eastern fox snake would be if the proposed mitigation measures were not properly implemented?

A20. [DAW, JPD] Yes. Section 4.3.1.3 of the FEIS acknowledges that building Unit 3 would affect approximately 197 ac of potential eastern fox snake habitat, including approximately 21 ac of emergent wetland, which is the species' preferred habitat. *Id.* at 4-36. Section 4.3.1.3 also acknowledges that traffic on the Fermi 3 could increase by an increased daily influx of as much as 2900 construction workers, resulting in an increased potential for mortality of eastern fox snakes due to vehicular collision. *Id.* at 4-37. Only after describing these potential impacts does Section 4.3.1.3 proceed to discuss possible mitigation measures. The conclusions in Section 4.3.1.6 of the FEIS acknowledge the possibility of MODERATE impacts on the eastern fox snake if the proposed mitigation is not implemented. *Id.*

Q21. Could the possible impacts on the eastern fox snake be LARGE if mitigation were not implemented?

A21. [DAW, JPD] No. LARGE impacts are defined as environmental effects that are "clearly noticeable and are sufficient to destabilize important attributes of the resource." *Id.* at 1-4. In our professional opinion, impacts capable of destabilizing important attributes of the eastern fox snake would be impacts capable of extirpating the species from a broad geographic area. In the context of Fermi 3, we would expect LARGE impacts to be

impacts capable of extirpating the eastern fox snake from the geographic area of interest used to evaluate terrestrial ecology cumulative impacts in Section 7.3.1 of the FEIS.

This geographic area of interest extends to terrestrial habitats within a 50-mile radius of the Fermi site. *Id.* at 7-16. The geographic area of interest encompasses most of the concentration of eastern fox snake sighting locality records on the western shoreline of Lake Erie identified as the basis for defining the historical range of the species.

Conant at 6 (Exhibit NRC E11).

However, the Fermi 3 project would disturb only about 197 acres of eastern fox snake habitat on the Fermi site. FEIS at 4-36 (Exhibit NRC E1A). Table 2-6 of the FEIS indicates that the Fermi site presently contains a matrix of approximately 833 acres of coastal emergent wetland (emergent wetland in close proximity to one of the Great Lakes), grassland, shrubland, thicket, and forest habitats. *Id.* at 2-35. Such a mixture of emergent wetlands interspersed with other wetland and upland habitats on the western coast of Lake Erie can be expected to provide favorable habitat for the eastern fox snake. Even without mitigation, eliminating only 197 acres from a total of 833 acres leaves approximately 636 acres of remaining favorable eastern fox snake habitat. This remaining block of habitat is in addition to other naturally vegetated lands on the western shore of Lake Erie but off of the Fermi site that are preserved as part of the Detroit River International Wildlife Refuge. In our professional opinion, the available habitat remaining on the western shore of Lake Erie would be adequate to continue to support a regionally viable population of eastern fox snakes, even though that population might be reduced in size. This is true even if the Applicant performed no mitigation.

Q22. What basis did you have for expecting that the mitigation measures proposed by the Applicant would be properly implemented?

A22. [DAW, JPD] The Applicant's eastern fox snake mitigation plan presents specific, prescriptive measures for reducing the potential for inadvertent losses of individuals and for enhancing habitat during the building of Unit 3. See Mitigation Plan (Exhibit NRC E5). The Applicant's Wetland Mitigation Plan is likewise highly detailed and prescriptive. See FEIS at Appendix K (Exhibit NRC E1B). In our professional opinion, the measures in these plans would not only effectively avert the potential for greater than SMALL adverse impacts to the eastern fox snake during the building of Unit 3, but it would be easy for interested parties to determine whether the measures have been successfully implemented. Because the Applicant prepared and made public these plans, and submitted them to the NRC in support of its application, we concluded that it is reasonably foreseeable that the Applicant will carry out the proposed mitigation. We also consider the Applicant's reiteration of these intentions in filings before the Board under penalty of perjury to be an additional indicator of credibility.

Furthermore, the Applicant has identified specific funding sources for implementing the eastern fox snake mitigation plan. The plan states that funding for the mitigation measures while Unit 3 is being built would be provided as part of the Unit 3 construction budget. Mitigation Plan at 9 (Exhibit NRC E5). The USACE would enforce the Wetland Mitigation Plan under Section 404 of the Clean Water Act.

As terrestrial ecologists experienced with major industrial development projects such as Fermi 3, we expect that minor changes to the site layout will inevitably occur during the building phase. The Applicant's proposed eastern fox snake mitigation measures account for possible minor site layout modifications. *Id.* The eastern fox snake mitigation plan calls for informing personnel tasked with surveying for the eastern fox

snake whenever the site layout is changed in a way that could potentially affect eastern fox snakes or their habitats. *Id.* In our professional opinion, this element of the plan is another demonstration of the Applicant's seriousness regarding successful implementation of the proposed mitigation.

Q23. Does the State of Michigan have regulatory authority to require the Applicant to implement the proposed eastern fox snake mitigation, and do you expect the State to exert that authority?

A23. [DAW, JPD] Yes. The state's authority derives from the Michigan Natural Resources and Environmental Protection Act of 1995. See Michigan NREPA (Exhibit NRC E17). Part 324.36505 of the Michigan NREPA states that "Except as otherwise provided in this part, a person shall not *take* [emphasis added], possess, transport, import, export, process, sell, offer for sale, buy, or offer to buy, and a common or contract carrier shall not transport or receive for shipment, any species of fish, plants, or wildlife appearing on [the federal or Michigan state lists of threatened or endangered species]." *Id.* The eastern fox snake, although not listed under the Federal Endangered Species Act, is listed as threatened on the State of Michigan list. FEIS at 2-64 (Exhibit NRE E1A). The term "take" is defined under the Michigan law with respect to fish and wildlife as "to harass, harm, pursue, hunt, shoot, wound, kill, capture, collect, or attempt to engage in any such conduct." Michigan NREPA at Part 324.36501(f) (Exhibit NRC E17).

In our professional opinion, the potential impacts described for building Fermi Unit 3 on pages 4-36 and 4-37 of the FEIS fall within the definition of "take" noted above, specifically with respect to harassment or harm. We therefore expect that the Applicant will have to apply for and obtain a permit from the State of Michigan (specifically from

MDNR) authorizing take of eastern fox snake before building activities at the Fermi 3 site may proceed. The Applicant has also acknowledged that its activities may result in a “taking” and, therefore, will need a permit.³ We expect that the MDNR will require the Applicant to implement mitigation corresponding to that outlined in the Applicant’s eastern fox snake mitigation plan as part of this permit. MDEQ has also noted the presence of the eastern fox snake on the Fermi site and reiterated the need for the Applicant to obtain approval from MDNR prior to commencing construction activities. MDEQ Permit at 4 (Exhibit NRC E16). The Applicant has also confirmed this expectation. Applicant’s Motion for Reconsideration at 11-12. We expect, however, that the Applicant will not be in a position to apply for, or the MDNR in a position to issue, the permit until a time closer to actual habitat disturbance due to building activities. MDNR usually issues permits for a period of one year. See MDNR Endangered Species Permit (Exhibit NRC E18). The Applicant does not expect to begin activities that would result in a “take” of eastern fox snakes in the next 12 months. Applicant’s Motion for Reconsideration at 11.

Q24. The Intervenor assert that as of October 1, 2011 the MDNR has “abandoned its regulatory mission of reviewing environmental permit requests” for construction projects in the state due to budgetary shortfalls. Intervenor Response dated November 29, 2012 at 5. Does this assertion affect your confidence that the State will properly enforce its permitting responsibility?

³ Applicant’s Motion for Reconsideration (Nov. 19, 2012) at 11 (“Because fox snakes are present at the site and because construction activities have the potential to result in ‘take’ of fox snakes, Detroit Edison must apply for and obtain a permit from MDNR prior to performing any site construction activities.”).

A24. [DAW, JPD] No. The MDNR website for its Environmental Review Program acknowledges that the Department has not since October 1, 2011 received funding for conducting reviews of how proposed projects could affect threatened or endangered species. MDNR Program Announcement (Exhibit NRC E19). The website instead directs project proponents to the Michigan Natural Features Inventory (MNFI), which will conduct similar reviews for a fee. The website specifically notes that “Endangered species and wetland laws remain in place. Under Part 365 of [the Michigan NREPA] people are not allowed to take or harm any endangered or threatened fish, plants or wildlife. That [sic] DNR still will be responsible for issuing permits and enforcement relative to the take of endangered and threatened species.” *Id.*, see also Michigan NREPA at § 324.36505 (Exhibit NRC E17).

In any event, this change does not affect the Fermi Unit 3 project because the NRC and the Applicant took advantage of the MDNR environmental review process long before the MDNR discontinued the service. During NRC’s scoping process for the EIS, MDNR sent the NRC a comment dated February 9, 2009. Sargent Letter (Exhibit NRC E7). As noted in A6, the response stated that MDNR’s view at the time 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.” *Id.* The MDNR also stated that it would like to see the Applicant prepare a project-specific plan for protecting the eastern fox snake from project activities. *Id.* The Applicant subsequently prepared the eastern fox snake mitigation plan to satisfy this request. See Mitigation Plan (Exhibit NRC E5).

Q25. What basis did you have for expecting that the mitigation measures, once implemented, would be monitored as necessary to ensure ultimate success?

A25. [DAW, JPD] The Applicant's fox snake mitigation plan calls for a comprehensive and specific sequence of monitoring efforts. *Id.* Section 5.4 of the plan for construction states that when "a fox snake is observed while performing a walkthrough, a report will be created [by the Applicant] noting the number of snakes located and removed and where they were relocated to." *Id.* at 9. The plan also states that the Applicant will maintain a monitoring log and prepare yearly reports summarizing mitigation efforts. *Id.* Additionally, the Applicant's Wetland Mitigation Plan outlines a detailed sequence of monitoring procedures for the proposed wetland mitigation efforts involving collection of hydrological, vegetation, and wildlife usage data. FEIS at K-32 to K-34 (Exhibit NRC E1B). In our professional opinion, these proposed monitoring efforts would be capable of identifying those problems requiring corrective action to ensure the ultimate success of the mitigation. We believe that the specificity of the proposed monitoring activities, coupled with the Applicant's definitive identification of a funding source for implementing the eastern fox snake mitigation and monitoring (see A22), indicates that it is reasonably foreseeable that the Applicant would follow through on the proposed monitoring.

Q26. Section 2.4.1.4 of the FEIS states that "no formal monitoring of the terrestrial environment has been conducted or is planned..." (FEIS at 2-65). Section 4.3.1.4 states that "Detroit Edison has not proposed terrestrial monitoring during construction or preconstruction of Fermi 3." FEIS at 4-46. These statements appear to conflict with the proposed monitoring for eastern fox snake impacts discussed in A25. Please clarify.

A26. [DAW, JPD] These statements refer to the fact that the Applicant does not plan or propose to conduct monitoring independent of that specifically proposed as part of the promised mitigation activities outlined in the FEIS. The monitoring discussed in A25 for

possible eastern fox snake impacts and efficacy of eastern fox snake mitigation measures is inherently part of the eastern fox snake mitigation plan, which the Applicant has demonstrated a clear intent to implement.

Q27. Did you or the Applicant consider possible alternative layouts for the project on the Fermi site that might minimize impacts on the eastern fox snake?

A27. [DAW, JPD] Yes. The Staff included in a memorandum, which was later referenced in the FEIS, a description of four sequential revisions to the Fermi Unit 3 site plan that each incrementally reduced encroachment into wetlands and forested areas on the Fermi site. Doub Report at 3 (Exhibit NRC E6). Compared to the original site layout considered by the Applicant, the proposed layout clusters unavoidable land disturbance to a greater extent in previously disturbed areas of the site and in an agricultural field. *Id.* The proposed site layout therefore substantially reduces the loss of eastern fox snake habitat and, by directing development to a greater extent away from suitable habitat, also reduces the probability of inadvertent losses of individual eastern fox snakes to vehicular collisions or other physical harm.

Q28. What did the FEIS conclude with respect to benefit-cost balancing for terrestrial ecology resources, and how did impacts to the eastern fox snake factor into that analysis?

A28. [DAW, JPD] The internal and external costs of the Fermi 3 project are presented in Table 10-4 of the FEIS. FEIS at 10-32 to 10-34 (Exhibit NRC E1A). The table describes the ecological costs of the project as “Loss or disturbance of upland, wetland, and aquatic habitat and associated plant and animal species onsite and along the

transmission line corridor. Proposed mitigation would offset some impacts. Operational impacts on most species and habitats are expected to be minor.” *Id.* at 10-33. This description accounts for effects on the eastern fox snake, including habitat loss and possible inadvertent losses of individuals to vehicular collision and other human interactions. It also accounts for the Applicant’s proposed mitigation measures, including the Wetland Mitigation Plan (FEIS at K-3 to K-82 (Exhibit NRC E1B)) and the eastern fox snake mitigation plan (Mitigation Plan (Exhibit NRC E5)). The table also indicates that the ecological costs would be “SMALL to MODERATE” and that the “potential for MODERATE limited to eastern fox snake.” FEIS at 10-33 (Exhibit NRC E1A).

The cost description is at a summary level and is qualitative. We believe that ecological costs are not reliably amenable to monetary characterization. Section 4.3.1.3 of the FEIS quantifies the losses of eastern fox snake habitat at approximately 197 ac, of which approximately 51 ac would be permanent. *Id.* at 4-36. The FEIS notes that the project could “result in the mortality of some eastern fox snake individuals” but does not attempt to quantify the number of individuals. *Id.* at 4-37. In our professional opinion, precise quantification of eastern fox snake mortality would not contribute meaningfully to the FEIS’s analysis, as successful implementation of the Applicant’s proposed mitigation measures would effectively prevent substantial adverse effects. The considerations described earlier in A21 explain why, even without these mitigation measures, anticipated impacts to the fox snake would not have the potential to result in destabilization of the population.

The estimated ecological costs of the project were considered by the NRC Staff in the context of the overall benefit-cost conclusions drawn for the Fermi 3 project in Section

10.6 of the FEIS. *Id.* at 10-37 to 10-38. The Staff concluded that “on the basis of the assessments summarized in this EIS, that the building and operation of the proposed Fermi 3, with mitigation measures identified by the review team, would accrue benefits that most likely would outweigh the economic, environmental, and social costs associated with constructing and operating a new unit at the Fermi site.” *Id.* at 10-38. Among the “environmental” costs noted in this conclusion are the potential impacts to the eastern fox snake and its habitats.

Q29. In its benefit-cost analysis, did the Staff assume that the proposed mitigation measures would be implemented effectively?

A29. [DAW, JPD] Yes. As described in A19 and A22, the Applicant has made public a specific sequence of discrete mitigation actions, proposed rigorous monitoring, identified a specific funding source for the mitigation and monitoring, and addressed how the mitigation and monitoring might have to be adjusted to respond to changing project circumstances. Furthermore, as noted in A23 and A24, the Applicant would have to obtain a permit from MDNR authorizing “take” of the eastern fox snake before disturbing potential eastern fox snake habitat. The need for this permit would empower MDNR to ensure that the mitigation is properly implemented.

Q30. Would the Staff’s recommendation that benefits likely outweigh costs change if mitigation for the eastern fox snake is not implemented effectively?

A30. No, the Staff’s recommendation would not have changed. The Staff’s conclusion regarding the benefit-cost balancing in Section 10.6 of the FEIS reflects the assumption that reasonably foreseeable mitigation will occur. FEIS at 10-38 (Exhibit NRC E1A).

However, as noted in Table 10-4 of the FEIS, we considered the potential for MODERATE, i.e., noticeable but not destabilizing, effects on the eastern fox snake if mitigation was not-undertaken. *Id.* at 10-33. If MODERATE ecological impacts would have changed the overall benefit-cost balancing conclusion, the FEIS would have explicitly discussed the basis for this determination in Section 10.6.

As stated in Sections 4.3.1.6, 7.3.1, and the Table 10-4 summary of impacts, MODERATE impacts on terrestrial ecology could occur without the proposed mitigation benefitting the eastern fox snake. *Id.* at 4-47, 7-21, and 10-34. MODERATE impacts are defined as environmental effects “sufficient to alter noticeably, but not to destabilize, important attributes of the resource.” *Id.* at 1-4. The external costs from MODERATE impacts are substantially lower than those from LARGE impacts, which could result in the regional extirpation of the eastern fox snake. As explained in A21, our range of possible impacts on the eastern fox snake did not extend to LARGE because it is our professional opinion that even without mitigation, sufficient habitat would remain on the Fermi site and elsewhere in the Detroit River International Wildlife Refuge to continue to support a viable but reduced regional population of eastern fox snakes. Thus, because MODERATE building impacts would permit the regional eastern fox snake population to reach a new (post-construction) equilibrium, the increase in environmental costs would likely not be significant relative to the overall costs of the project.

Q31. Overall, can you state that the FEIS’s consideration of potential effects from the proposed Enrico Fermi Unit 3 on the eastern fox snake is accurate and complete?

A31. [DAW, JPD] Yes, the FEIS demonstrates that the Staff took a hard look at the possible effects of building the proposed project on the eastern fox snake and its habitats. The Staff's hard look considered possible effects from Unit 3 on the eastern fox snake both in the anticipated event that the Applicant successfully implements its proposed mitigation measures and in the event that the Applicant were not to successfully implement the mitigation measures. In doing so, we also appropriately considered the reasonably foreseeable actions of other regulatory authorities who would have a future role in imposing or enforcing such measures. *See id.* at 4-45 to 4-47, 4-123.

Section 2.4.1 of the FEIS includes a description of the natural history of the eastern fox snakes, characterizes the habitats potentially used by the eastern fox snake, and notes where on the Fermi site the eastern fox snake has been sited. *Id.* at 2-53. Section 4.3.1 quantifies the losses of potentially suitable habitat for the eastern fox snake expected during construction of Unit 3. *Id.* at 4-36. Section 4.3.1 also describes other possible effects from building Unit 3 on the eastern fox snake, such as losses of individuals incidental to vehicular operation or entry by workers into habitat. *Id.* at 4-36 to 4-37. Section 4.3.1 discusses possible mitigation measures that could minimize adverse effects on the eastern fox snake. *Id.* at 4-45 to 4-46. Section 4.3.1 presents conclusions regarding the possible effects of building Unit 3 if the Applicant implements the mitigation measures it has committed to and discusses how the conclusions might be different should the Applicant not successfully implement the subject mitigation. *Id.* at 4-47.

Q32. Does this conclude your testimony?

A32. [DAW, JPD] Yes.

Q33. Do you declare under penalty of perjury that your statements in this prefiled direct testimony and your statements of professional qualifications are true and correct to the best of your knowledge and belief?

A32. [DAW] Yes, I do.

[JPD] Yes, I do.

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