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Consideration of Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Comment On: NRC-2012-0246-0456

Waste Confidence - Continued Storage of Spent Nuclear Fuel; Extension of Comment Period

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General Comment

The Attorneys General of the States of New York, Vermont, and Connecticut, the Commonwealth of Massachusetts, the Vermont Department of Public Service, and the Prairie Island Indian Community (the “States” and the “Tribe”) appreciate the opportunity to submit the attached comments on the DGEIS and draft rule. Please see attached files.

Attachments

Ex A State Scoping Comments

Ex B States Scoping Petition

Ex C PIIC Scoping Comments ML13010A132

Ex D PIIC Scoping Comments ML13017A008

Ex E IE Report

2013 12 20 Multistate-Tribe Waste Conf Comments

COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES
OF NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND THE PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR
REGULATORY COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC
ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED RULE

EXHIBIT A

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Environmental Impacts of
Temporary Storage of Spent Fuel After Cessation
of Reactor Operation

RIN 3150-AJ20
NRC-2012-0246

COMMENTS SUBMITTED BY THE OFFICE OF THE ATTORNEY GENERAL OF THE
STATE OF VERMONT WITH THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND BY THE OFFICE OF THE ATTORNEY GENERAL OF THE STATE OF NEW YORK
CONCERNING SCOPE OF CONSIDERATION OF ENVIRONMENTAL IMPACTS OF
TEMPORARY STORAGE OF SPENT FUEL AFTER CESSATION OF REACTOR
OPERATION

Submitted: January 2, 2013

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TABLE OF CONTENTS

	Page
Introduction.....	1
NEPA and Nuclear Wastes	5
NRC Has Improperly Limited the Proposed Scope of the EIS.....	9
What Should Be the Scope of the EIS?	14
Proposed Procedures for the EIS Process	18
Convening an Atomic Safety and Licensing Board.....	19
Prompt Disclosure by NRC of All Relevant Documents Within NRC’s Possession or Control and All Documents Reviewed by NRC Staff as Part of Rulemaking.....	20
Substantive Response by NRC Staff to Scoping Comments	21
Conclusion	22

INTRODUCTION

Since the advent of the civilian nuclear power program in 1954, there has been a concern with the decision to allow nuclear wastes to be generated before there was an available, safe, and environmentally benign system for disposal of the highly toxic wastes that would inevitably be produced by civilian nuclear reactors. Those concerns initially peaked in the 1970s when challenges were raised before the Nuclear Regulatory Commission (“NRC” or “Commission”) and federal courts as it became evident that assumed methods for removing nuclear wastes from local reactor sites were not being implemented.¹ That problem continues to this day, as was made clear in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), the ruling that necessitates this renewed rulemaking.

Now in 2013—60 years after the start of the nuclear power program—NRC is once again called upon to address the issues associated with the continued production of nuclear wastes

¹ See e.g., *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519 (1978) (rejecting a challenge, among other things, to the procedures used by NRC to develop the S3 Table’s analysis of the environmental risks of nuclear waste disposal); *NRDC v. NRC*, 582 F.2d 166 (2d Cir. 1978) (rejecting a request to suspend all nuclear power plant licensing pending the establishment of a permanent nuclear waste disposal solution); *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979) (finding NRC violated NEPA by failing to make adequate findings to support the conclusion that there was reasonable assurance that an offsite storage solution will be available when needed, i.e. by the years 2007-2009); *In re Aiken County*, 645 F.3d 428, 430-31 (D.C. Cir. 2011) (“This case once again brings before this court the federal government’s controversial ongoing attempt to devise a permanent solution to the problems of civilian radioactive waste disposal.” (citing *Nevada v. DOE*, 457 F.3d 78 (D.C. Cir. 2006) (challenging the DOE’s Final Environmental Impact Statement and Record of Decision for the Yucca Mountain nuclear waste repository); *Nevada v. DOE*, 400 F.3d 9 (D.C. Cir. 2005) (challenging a DOE order denying Nevada a grant to fund its participation in an NRC proceeding regarding Yucca Mountain); *Nuclear Energy Inst., Inc. v. EPA*, 373 F.3d 1251 (D.C. Cir. 2004) (challenging a congressional joint resolution and the associated federal regulations selecting Yucca Mountain as the site for the federal nuclear repository); *Northern States Power Co. v. DOE*, 128 F.3d 754 (D.C. Cir. 1997) (requesting a writ of mandamus requiring DOE to comply with the Nuclear Waste Policy Act)).

when there is not a permanent, safe, and secure facility for the disposal of such wastes and when, unlike previous efforts to address this issue, NRC does not have confidence that such a facility will be available by any specific date and has not made a supportable finding that such a facility will ever exist. The United States Court of Appeals for the District of Columbia Circuit (“D.C. Circuit”) has ruled, and NRC has agreed, that NRC must address these issues in the context of a NEPA-qualified environmental review, either by preparing a finding of no significant impact (“FONSI”) or an environmental impact statement (“EIS”). NRC has agreed that the review must be conducted as an EIS. NRC has also agreed that the development of the waste confidence rule involves a major federal action within the meaning of the National Environmental Policy Act, 42 U.S.C. § 4332(2)(C) (“NEPA”).

The major federal action for which the EIS is being prepared is to determine whether to allow additional nuclear wastes to be generated when there is no permanent, safe, and secure waste disposal facility, no date certain by which such a facility will exist, and no certainty that it will ever exist, and, if the generation of such further nuclear waste is to be allowed, what alternatives exist to the current practice of allowing nuclear wastes to be stored at individual reactor sites indefinitely and in spent fuel pools for as long as the licensee chooses? As the D.C. Circuit recognized in *New York v. NRC*, the answers to these questions and this rulemaking will play a significant role in, and are a predicate to, NRC’s future licensing proceedings wherein NRC will decide whether or not to issue various operating licenses to regulated facilities that generate nuclear waste and then store that waste on site at those facilities.

The current rulemaking is merely the most recent outgrowth of previous NRC attempts to address the environmental and safety implications of the nuclear waste disposal dilemma. The

most significant difference between the relevant factors for this current rulemaking and all previous rulemakings addressing these issues is that now, for the first time, NRC has acknowledged that it does not have confidence that there will be a solution to the permanent waste disposal problem by any particular date. Rather, for the first time, the best available evidence indicates that storage of spent nuclear fuel at reactor sites will be indefinite—*i.e.* no one can say when those wastes will be removed from the sites or even that they will. There is not even a best estimate of when, much less how or where, such wastes will be moved from the sites. Thus, for the first time it has become essential that in evaluating the environmental and safety implications of allowing further nuclear wastes to be generated, NRC must consider the environmental implications of existing waste storage at reactor sites based on the reasonable assumption that such wastes will remain at the sites forever. This undeniable reality substantially changes the appropriate scope of the analyses that NRC must undertake in order to fully examine the safety and environmental implications of allowing even more spent fuel to be generated.

When NRC previously assumed and predicted that a permanent nuclear waste repository would be available by a date certain—the latest of such dates being 2025—long-term safety and environmental problems associated with spent fuel pool use and onsite spent fuel storage were brushed aside as of minimal relevance.² That is no longer the case because with indefinite spent

² Even those previous analyses were flawed because they were based on an implied assumption that the date of the availability of the permanent repository was the date when the spent fuel would no longer be present at the reactor site. However, NRC estimates that even when the permanent repository is in place, it will take at least 24 additional years to move the wastes generated during the first 40 years of operation from a reactor site to the permanent repository. Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

fuel storage at reactor sites and continued generation of additional spent fuel—essentially the status quo—NRC, for the first time, must include a full range of alternatives to continued spent fuel generation, including disallowing new spent fuel generation, putting all spent fuel into dry casks as soon as it is sufficiently cooled, and shipping all spent fuel to interim spent fuel storage facilities, to mention only a few.

Of equal significance is the fact that with indefinite spent fuel storage at reactor sites comes the need to look at the site-specific implications of such indefinite spent fuel storage because with indefinite storage comes the increased probability that accidents and malevolent acts can cause catastrophic releases of nuclear fission products at individual power plant sites. NRC has previously recognized that the environmental implications of the release of nuclear fission products from a power plant's reactor require a site-specific, and not a generic, analysis. *See* 10 C.F.R. Part 51, Subpart A, Appendix B (finding that the impacts of severe accidents at reactor sites cannot be addressed generically but excluding spent fuel related accidents from consideration due to the now-rejected Waste Confidence Rule (10 C.F.R. § 51.23)). Any new NRC rule or EIS should similarly provide for the site-specific review of severe accidents to a power plant's nuclear spent fuel facilities and site-specific alternatives to mitigate such impacts. In addition, there are important, and site-specific, economic implications of the indefinite storage of spent fuel at reactor sites. Property in the vicinity of the plant will have its potential uses and value impacted by the continued presence in the neighborhood of all the downside risks of a nuclear reactor—enormous quantities of highly toxic nuclear wastes and the risks of accidental

February 2002 DOE/EIS-0250 Final Readers Guide and Summary at S-2. If 20 additional years of spent fuel are generated as a result of license renewal, the time for removal of all spent fuel from a reactor site is likely to expand to 36 years.

or malevolent events causing a release of that waste—without any of the benefits of an operating nuclear reactor generating tax revenue, income, and jobs, all of which are frequently cited by NRC as counterbalances to the adverse impacts of nuclear plants. *See e.g.* Generic Environmental Impact Statement for License Renewal for Nuclear Plants, NUREG-1437 (1996) Volume 1 at 3-11 to 3-14.

The following comments further develop these issues. Also included are comments on the appropriate procedures that NRC should choose to assure that the issues considered in these new analyses are fully examined and that a complete and technically competent record is created as the basis for the final decisions to be reached by the Commission.

NEPA AND NUCLEAR WASTES

By the late 1970s public concern with the ongoing, and expected ramping up, of nuclear waste generation without having a permanent waste disposal solution in place, particularly with President Carter's sound decision to cancel plans to recycle nuclear wastes to create bomb-ready plutonium for use in mixed oxide fuels, resulted in the first direct court challenge to the waste disposal policy:

The crux of the case is current uncertainty about the prospects for developing and implementing safe methods for the ultimate disposal or even long-term storage of the highly toxic radioactive wastes created in the process of nuclear power generation.

Minnesota v. NRC, 602 F.2d 412, 413 (D.C. Cir. 1979). The Court concluded that the case must be remanded to the NRC for a serious consideration of those issues, noting the following:

Cf. NRDC v. NRC, 178 U.S.App.D.C. 336, 361, 547 F.2d 633, 658 (1976) (Tamm, J., concurring in result) (“*NEPA requires the Commission fully to assure itself that safe and adequate storage methods are technologically and economically feasible. It forbids reckless decisions to mortgage the future for the present, glibly*

*assuring critics that technological advancement can be counted upon to save us from the consequences of our decisions”). As appears below, the Supreme Court, in *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 98 S. Ct. 1197, 55 L. Ed. 2d 460 (1978), reversed the ruling of the majority opinion requiring further procedures but remanded for the kind of inquiry called for in Judge Tamm’s concurring opinion.*

Id. at 417 n.6 (emphasis added to identify the portion of Judge Tamm’s concurrence in *NRDC v.*

NRC cited with approval by Commissioner Svinicki at the time of her vote on the now-voided

version of the waste confidence rule (Notation Vote, Response Sheet, Sept. 24, 2009 at 3)). In

the *Minnesota* case Judge Tamm also concurred, concluding that:

if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes. It is undisputed that questions involving storage and disposal of nuclear waste pose serious concerns for health and the environment. *See Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 538-39, 98 S. Ct. 1197, 1208-09, 55 L. Ed. 2d 460, 475-76 (1978).

Our opinion merely remands this case to the Commission for such proceedings as it deems appropriate to determine whether there is reasonable assurance that an offsite storage solution will be available when needed in this case, by the years 2007-2009.

Id. at 419-20 (Tamm, J., concurring) (footnotes omitted).

In short, the Commission was given a clear mandate to use the NEPA process to evaluate the question of when and whether nuclear wastes would be permanently disposed of, including looking into all the environmental implications of those issues. *Minnesota*, 602 F.2d at 417. Although the Commission kept moving the date by which it was confident there would be a permanent and operational nuclear waste disposal facility, it hinged its confidence that there

would be minimal environmental impacts of the spent fuel storage at the plant sites following cessation of plant operations on the existence of such a date and thus a finite date for storage of spent fuel at the site following plant shutdown. With no reasonable possibility of long term, much less indefinite, storage of spent fuel at reactor sites, NRC concluded it never needed to consider alternatives to its plan to continue to authorize generation of more nuclear waste. All this changed when the Commission came to the realization that it was no longer possible to determine a date certain by which a permanent nuclear waste repository would be available. However, NRC sought to avoid the inevitable by finding that a permanent nuclear waste disposal repository would be available “when necessary.” 75 Fed. Reg. 81032 (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation) (December 23, 2010).

This latest version of the waste confidence decision once again involved an attempt by the Commission to avoid the questions that are at the heart of the dispute about nuclear wastes—specifically, what are the environmental impacts that are reasonably possible to occur if nuclear wastes are left at the reactor sites where they were generated for an indefinite period of time; what alternatives exist that would mitigate those impacts, including precluding further generation of nuclear wastes; and what are the relative costs and benefits of the proposed action and each of the alternatives. Instead, the NRC merely extended the period of time during which wastes could be safely stored at the reactor site from 30 years to 60 years, without any analysis to demonstrate that 60 years was an achievable date for the existence of a permanent waste repository and without any analysis of the fact that, as noted above (footnote 2), it would take 36 years once a permanent repository existed to move all the nuclear waste from a reactor site—meaning the

repository had to be in existence 24 years after the plant shutdown.³ The new rule also sought to avoid the evaluation of the environmental impacts associated with indefinite storage of nuclear wastes at reactor sites and alternatives to the current program for such storage, including allowing additional wastes to be generated, by finding that a permanent waste repository would be available “when necessary.”

That rule has now been overturned by the D.C. Circuit in *New York v. NRC* because it was flawed in several respects, many of which flaws are ignored in the now-proposed scope of the EIS. The Court held that:

We hold that the rulemaking at issue here constitutes a major federal action necessitating either an environmental impact statement or a finding of no significant environmental impact. We further hold that the Commission’s evaluation of the risks of spent nuclear fuel is deficient in two ways: First, in concluding that permanent storage will be available “when necessary,” the Commission did not calculate the environmental effects of failing to secure permanent storage—a *possibility that cannot be ignored*. Second, in determining that spent fuel can safely be stored on site at nuclear plants for sixty years after the expiration of a plant’s license, *the Commission failed to properly examine future dangers and key consequences*.

New York, 681 F.3d at 473 (emphasis added).

In order to attempt to remedy the flaws identified by the Court, NRC has determined that it will conduct an EIS. The Commission’s regulations regarding the components of a legally sufficient EIS require consideration of alternatives to the proposed action whenever significant environmental impacts are potentially involved. Part 51, Subpart A, Appendix A, Section 4 and

³ For the 13 nuclear reactors that are already shutdown, their 24 years have long passed or will pass shortly, and the continued safety and environmental impacts of storage of nuclear wastes at those sites were never addressed by the waste confidence rule or any of its findings.

Section 5 emphasize the importance of the examination of alternatives: “[t]his section is the heart of the environmental impact statement. It will present the environmental impacts of the proposal and the alternatives in comparative form.” Appendix A to 10 C.F.R. 51 at Section 5. In its final decision based on an EIS the Commission is obligated by its own regulations to:

State whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted. Summarize any license conditions and monitoring programs adopted in connection with mitigation measures.

10 C.F.R. § 51.103(a)(4).

What is clear is that, for the first time, NRC must address “a possibility that cannot be ignored” *New York v. NRC*, 681 F.3d at 473—it must consider the full range of environmental impacts that can occur as a result of indefinite storage of nuclear wastes at reactor sites and the full range of alternatives to mitigate those environmental impacts.

NRC HAS IMPROPERLY LIMITED THE PROPOSED SCOPE OF THE EIS

Despite the fact that, for the first time, NRC must conduct, and is planning to conduct, a full EIS analysis of the nuclear waste issue as it relates to nuclear wastes stored at individual reactor sites after plant shutdown, the proposed scope of NRC’s analysis falls far short of the legally mandated reach of such an EIS. The premise of the proposed scope of the EIS published by NRC is that the purpose of the EIS is “to support the rulemaking to update the Commission’s Waste Confidence Decision and Rule” (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation, 77 Fed. Reg. 65137 (Oct. 25, 2012)) thus implying an attempt to narrow the scope of the EIS inquiry by essentially assuming that further production of nuclear wastes without a permanent waste repository in existence will be

allowed and attempting to turn the EIS process into a shell of its required purpose. The proposed scope is apparently limited to “include temporary spent fuel storage after cessation of reactor operation until a repository is made available in either the middle of the century or at the end of the century, and storage of spent fuel if no repository is made available by the end of the century.” 77 Fed. Reg. at 65138. Absent from the scoping description is any indication that the NRC will consider alternatives to mitigate the adverse environmental impacts associated with indefinite, or even long-term, storage of spent fuel at the reactor sites. These omissions stem largely from the NRC’s misinterpretation of the major federal action involved in this case, a misinterpretation that was directly rejected by the Court in *New York v. NRC*.

The NRC’s misperception of the major federal action for which the EIS is being prepared is highlighted by a recent letter from the NRC Chair in response to a letter filed by a number of public interest organizations regarding the proper scope of the EIS, wherein NRC asserts:

The update to the Waste Confidence Rule is the federal action; the “no action” alternative is a decision not to prepare the rule and instead to conduct a site-specific analysis of post-licensed life spent fuel storage for each NRC licensing action that relies on Waste Confidence. As the Commission has stated, the Waste Confidence rule is not a licensing action, it does not authorize the initial or continued operation of any nuclear power plant, and it does not authorize storage of spent nuclear fuel. Thus, licensing of specific reactors or storage facilities is not the purpose of this rulemaking, or the proposed action. A separate NRC action is required before a reactor is licensed and before fuel can be stored after the expiration of a reactor’s license at a specific site. The environmental analysis accompanying each of these actions to license or relicense a nuclear power plant would examine site-specific “no action” alternatives.

Letter from Alison M. McFarlane, NRC Chair, to Diane Curran at 2 (Dec. 5, 2012). This view of the scope of the EIS is in direct conflict with the holding of the D.C. Circuit and is likely to

produce a successful challenge to the Commission’s final decision, thus further delaying the resolution of this matter.

The assertions that “the Waste Confidence rule is not a licensing action, it does not authorize the initial or continued operation of any nuclear power plant, and it does not authorize storage of spent nuclear fuel” (Macfarlane Letter at 2) were flatly rejected by the D.C. Circuit in *New York v. NRC*. In that case, Petitioners argued that the “WCD is a major federal action because it is a predicate to every decision to license or relicense a nuclear plant, and the findings made in the WCD are not challengeable at the time a plant seeks licensure.” *New York v. NRC*, 681 F.3d at 476. The D.C. Circuit agreed:

We agree with petitioners that the WCD rulemaking is a major federal action requiring either a FONSI or an EIS. The Commission's contrary argument treating the WCD as separate from the individual licensing decisions it enables fails under controlling precedent.

As we have determined, the WCD is a major federal action because it is used to allow the licensing of nuclear plants.

Id. Attempts by the Commission to avoid this holding by merely reasserting arguments rejected by the D.C. Circuit should be abandoned.⁴

⁴ The NRC cannot delay the current proceeding in the hope of someday having a basis to predict a date by which a permanent waste disposal facility will be available. Rather, the NRC must objectively face the reality that it may not be able to produce a record that would support the current situation in which nuclear wastes continue to be generated in ever-increasing amounts, such wastes remain in spent fuel pools for an indefinite period of time, the use of the far-more reliable dry cask storage option is not mandated, and no effort is made to analyze the implications of, and alternatives to, permanent nuclear waste storage at each nuclear reactor site. See *New York*, 681 F.3d at 474 (“Due to the government’s failure to establish a final resting place for spent fuel, SNF is currently stored on site at nuclear plants. This type of storage, optimistically labeled ‘temporary storage,’ has been used for decades longer than originally anticipated. The delay has required plants to expand storage pools and to pack SNF more densely within them. The lack of progress on a permanent repository has caused considerable

In the past, federal courts have chastised the Commission for using attenuated interpretations of its legal obligations under NEPA. For example, in *Calvert Cliffs' Coordinating Committee v. AEC*, 449 F.2d 1109 (D.C. Cir. 1971), at a time when hearing boards were obligated to review all safety issues in hearings even if the issues were not raised by an intervenor, the agency proposed to preclude the boards from addressing any environmental issues unless they were raised by an intervenor. In response to this attempt to narrow the NEPA review process, the Court concluded:

We believe that the Commission's crabbed interpretation of NEPA makes a mockery of the Act. What possible purpose could there be in the Section 102(2)(c) requirement (that the "detailed statement" accompany proposals through agency review processes) if "accompany" means no more than physical proximity mandating no more than the physical act of passing certain folders and papers, unopened, to reviewing officials along with other folders and papers? What possible purpose could there be in requiring the "detailed statement" to be before hearing boards, if the boards are free to ignore entirely the contents of the statement? NEPA was meant to do more than regulate the flow of papers in the federal bureaucracy.

Id. at 1117.

A few years later in *NRDC v. NRC*, 539 F.2d 824 (2d Cir. 1976), *vacated on grounds of subsequent mootness sub. nom. Allied-General Nuclear Services v. NRDC*, 434 U.S. 1030 (1978), NRC again sought to avoid its NEPA obligations, in that instance with regard to a generic impact statement on the use of mixed oxide fuels. Once again, the federal regulatory agency used purportedly clever legal arguments to create a set of interim criteria that would allow licensing of mixed oxide fuel separation and fabrication even though the generic impact

uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors.”).

statement was not complete. The Court explained the Commission action and its rejection of the tactics as follows:

The interim criteria which will be applied to mixed oxide fuel separation and fabrication require Commission inquiry as to whether the activity will place primary reliance on a favorable final decision in GESMO, whether the activity would foreclose safeguards alternatives by committing resources, and whether delay in the conduct of the activity would adversely effect the “overall public interest.” We find these criteria at best vague and at worst disingenuous. An activity need not place primary reliance on a favorable decision on wide-scale use for the activity to severely prejudice the ultimate decision. Second, we are unable to understand how the Commission will be able to determine that a given activity will not foreclose safeguards when those safeguards have not yet been designed or finalized. Finally, the “delay” criteria injects consideration of non-environmental public interest factors which could have the effect of foreclosing the outcome of the test’s application.

Id. at 843.

In the *New York v. NRC* decision that led to this new EIS, the D.C. Circuit also chastised NRC for its efforts to finesse the obligations of NEPA, holding that:

The Commission apparently has no long-term plan other than hoping for a geologic repository. If the government continues to fail in its quest to establish one, then SNF will seemingly be stored on site at nuclear plants on a permanent basis. The Commission can and must assess the potential environmental effects of such a failure.

Nonetheless, whether the analysis is generic or site-by-site, it must be thorough and comprehensive. Even though the Commission’s application of its technical expertise demands the “most deferential” treatment by the courts, *Baltimore Gas*, 462 U.S. at 103, we conclude that the Commission has failed to conduct a thorough enough analysis here to merit our deference.

New York, 681 F.3d at 479, 480-81.

In light of all these precedents, particularly in light of the remand of this matter to the

Commission, the interpretation that NRC proposes to put on the scope of its EIS is an enormous mistake that will have far-reaching and severe consequences for the Commission's goal of conducting its business in an efficient and lawful manner. By failing to squarely confront these issues now, NRC may well push completion of the EIS process out for several additional years as it awaits an appeal and likely reversal of its decision to restrict the scope of this court-mandated environmental review. It is not too late to make this EIS process be what the D.C. Circuit mandated it must be, but the time to accomplish that metamorphosis is now, and not after another remand from the D.C. Circuit.

WHAT SHOULD BE THE SCOPE OF THE EIS?

The States request that NRC take a fresh look at the elementary question: "What should be the scope of the environmental impact statement and the associated rulemaking?" The States submit that the answer to that question should include the following considerations.

First, the EIS should provide a comprehensive and thorough exploration of all the environmental issues associated with continuing to generate nuclear wastes when the Commission is unable to determine that there is a date by which a permanent, safe, and secure repository will exist for disposing of nuclear wastes. NEPA requires nothing less than a comprehensive look at all the potential environmental impacts of the proposed action,⁵ all the

⁵ NEPA requires that the NRC not limit its evaluation of adverse environmental impacts to humans but that it also evaluate the impact of waste storage on non-human biota in the human environment. *See* 40 C.F.R. § 1508.14 (defining "human environment" to include "the natural and physical environment"). Studies done following the Fukushima disaster have documented widespread damage to non-human biota. *See, e.g.,* "Mutant butterflies a result of Fukushima nuclear disaster, researchers say," *available at* <http://news.blogs.cnn.com/2012/08/14/mutant-butterflies-a-result-of-fukushima-nuclear-disaster-researchers-say>; Rachel Nuwer, "Fukushima vs. Chernobyl: How Have Animals Fared?," *available at* <http://green.blogs.nytimes.com/2012/07/12/fukushima-vs-chernobyl-how-have-animals-fared/>.

alternatives to the proposed action that would eliminate or mitigate those adverse impacts and a quantitative comparison of the proposed action and alternatives to it to assure that the best course of action is identified. 42 U.S.C. § 4332 *et. seq.*; *Calvert Cliffs*, 449 F.2d at 1114 (“all of these [NEPA] Section 102 duties are qualified by the phrase ‘to the fullest extent possible.’ We must stress as forcefully as possible that this language does not provide an escape hatch for footdragging agencies; it does not make NEPA's procedural requirements somehow ‘discretionary.’ Congress did not intend the Act to be such a paper tiger. Indeed, the requirement of environmental consideration ‘to the fullest extent possible’ sets a high standard for the agencies, a standard which must be rigorously enforced by the reviewing courts.”)

Second, the EIS should rigorously explore all of the potential environmental impacts associated with long-term and indefinite storage of nuclear wastes at reactor sites following reactor shutdown, including the risk of fires, earthquakes, flooding (resulting from tidal and storm surges or infrastructure failures), loss of power and cooling capacity, deterioration of the social order (either briefly or for an extended period of time), deterioration of spent fuel pools and dry casks, failure of funding sources to provide sufficient resources to manage and secure nuclear wastes at each reactor site long after the site is no longer a source of any income to its owner, the social and economic impacts on the communities where these nuclear wastes will remain indefinitely at sites where there are no operating reactors, and malevolent acts. Part of this analysis should include consideration of the synergistic impacts created by the storage of nuclear wastes at each reactor site when the site decommissioning is substantially delayed under the so-called SAFESTOR option, as opposed to prompt decommissioning of closed reactors.

Third, the EIS should explore all reasonable alternatives to continued generation of

nuclear wastes and continued storage of nuclear wastes at reactor sites in the manner now allowed, including prohibiting further production of nuclear wastes until the Commission can determine that there is date by which a permanent, safe, and secure repository will exist for disposing of nuclear wastes. *New York*, 681 F.3d at 474 (“The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and the reasonableness of continuing to license and relicense nuclear reactors.”). The EIS should also explore measures that would mitigate the adverse impacts of continued production of nuclear wastes—*i.e.* alternatives to indefinite use of spent fuel pools, such as transfer to dry cask storage at the earliest possible time and establishing off-site permanent nuclear waste storage facilities at secure locations like military bases, to mention only a few.

Fourth, the analysis of the adverse impacts of continued production of nuclear wastes and continued storage of that waste at reactor sites and the analysis of the mitigation alternatives to the status quo should use the procedures already developed for analyzing mitigation alternatives for severe accidents, thus producing objective and quantitative bases for comparing alternatives to the proposed action. The EIS must clearly delineate those issues that will be left to be evaluated on a site-specific basis, identify how these site-specific issues are to be addressed, and make clear that such site-specific consideration is to be explicitly authorized by regulation subject to the normal requirements of 10 C.F.R. § 2.309 on admissibility of contentions but without compelling any party to have to use 10 C.F.R. § 2.335 to seek a waiver of a rule in order to obtain a hearing on the site-specific aspects of post-operation nuclear waste storage at reactor sites. The site-specific issues must be addressed in each pending licensing proceeding before any lifting of the Commission’s current stay on final decisions on all pending and subsequently

filed applications. In addition, the Commission should establish a procedure by which the public will have an opportunity to raise, before an Atomic Safety and Licensing Board, site-specific issues regarding nuclear waste remaining at reactor sites following shutdown, at least for those facilities that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. 75 Fed. Reg. 81032 (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation) (Dec. 23, 2010). This right should exist regardless of whether such issues were sought to be raised at the time of the previous licensing action and should not be limited to contested licenses or previously admitted parties.

During the initial public scoping meeting in Rockville, the State of New York raised this issue and suggested that NRC undertake a site-specific severe accident mitigation alternatives analysis for the continued storage of spent nuclear fuel at the Indian Point nuclear site similar to the Severe Accident Mitigation Alternatives (“SAMA”) analysis that NRC conducts for severe reactor accidents. *See* Oral Comments of New York Assistant Attorney General J. Sipos (Public Scoping Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule November 14, 2012 1:00 P.M. EST) Transcript of Proceedings at 37-40 & NYS Presentation Slides, ML12331A347. Such a spent nuclear fuel SAMA analysis would identify site-specific environmental impacts and site-specific mitigation alternatives to minimize or eliminate those impacts.

NRC should also preserve for site-specific consideration the full extent of the adverse environmental impacts associated with indefinite storage of nuclear wastes at reactor sites to the

extent such an impact depends upon the nature of the local environment, local economy, local land use, and local resources at risk in the event of a catastrophic release of nuclear wastes into the air, soil, water, or groundwater, etc.

Fifth, one commenter suggested that NRC should evaluate the benefits of continued nuclear waste production against the adverse impacts of halting that production. *See* Oral Comments of Norman Meadow with Maryland Conservation Council (Public Scoping Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule November 14, 2012 9:00 P.M. EST) Transcript of Proceedings at 18-21. The States believe that if NRC is going to assume that continued production of nuclear wastes, and thus electricity from nuclear reactors, is a benefit and use that benefit, either implicitly or explicitly to justify adverse environmental impacts from further nuclear wastes production, then it must quantify those alleged benefits and the adverse impacts and take a hard look at both of them.

PROPOSED PROCEDURES FOR THE EIS PROCESS

This is potentially the single most important—certainly in terms of public concern and the impact on the further use of nuclear reactors—rulemaking NRC has undertaken since the rulemakings involving peak clad temperatures for fuel rods in the event of a loss of coolant accident (the so-called ECCS hearings) and adoption of radiation protection standards (the so-called “As Low As Reasonably Achievable” hearings (“ALARA”)). In both instances, the NRC convened a hearing board to evaluate the NRC Staff analyses, to receive testimony from interested parties and to render an initial decision subject to the usual Commission review process. The Commission should be no less diligent in assuring a full airing of the issues involved in this rulemaking and should convene a hearing board to receive the evidence and

conduct examination of witnesses.

Convening an Atomic Safety and Licensing Board

The Commission has provided for the possibility of Informal Hearings for rulemakings in 10 C.F.R. § 2.805 which provides, in pertinent part, that the “Commission may hold informal hearings at which interested persons may be heard, adopting procedures which in its judgment will best serve the purpose of the hearing.” For the following reasons, the States believe that the procedures set forth in Subpart L (Informal Hearing Procedures for NRC Adjudications) would be most appropriate for assuring the Commission that it has developed a complete record sufficient for Commission determination of the important issues involved in this EIS and rulemaking process.

First, there are diametrically opposed views on critical issues regarding environmental impacts and alternatives. Since the NRC Staff has already made clear its position on most of these issues in prior analyses and NUREG documents, it would be patently unreasonable and unfair to allow the Staff to also resolve conflicts between its technical judgments and the technical judgments of others. This is not a situation where the NRC Staff is essentially neutral and undertaking the gathering of information and resolution of issues in an unbiased manner. The States do not suggest that the Staff’s strongly held views reflect poorly on the Staff; we commend them for having worked diligently to develop their views. However, it is unrealistic to believe that once having developed those strong views over so many years that the Staff can provide the kind of even-handed analysis that is required to provide the Commission with a full and fair record for decision.

Second, the Atomic Safety and Licensing Boards have demonstrated over the years that

their management of the process of receiving evidence and processing conflicting evidence will expedite resolution of the issues. Hearing Boards have demonstrated their ability to develop complete records and to do so efficiently through control of the hearing process, including establishment of filing deadlines, setting of limitations on the length of filings, oral presentations and examination of witnesses, passing on the admissibility of evidence, creation of procedures to receive proposed findings of facts and conclusions of law and preparing a cogent and complete final opinion. They are thus best positioned to create a clear, concise, and defensible record. That record and its initial decision will go a long way toward simplifying the work of the Commissioners in reviewing the final decision and controlling the role of the parties who seek review, or defense, of the Board's decision. The structure provided by the Subpart L procedures will, as was intended when the rules were adopted, make for a more orderly record and, in the final analysis, a more defensible final decision by the Commission.

Prompt Disclosure by NRC of All Relevant Documents Within NRC's Possession or Control and All Documents Reviewed by NRC Staff as Part of Rulemaking

In addition to providing for an Informal Hearing, the Commission should assure that all the documents being reviewed by NRC Staff as part of the EIS process are made available to the public no later than when the Draft Supplemental Environmental Impact Statement ("DSEIS") is published. This would include often hard-to-locate documents that were created by NRC contractors, national laboratories,⁶ the Electric Power Research Institute ("EPRI"), the Nuclear Energy Institute ("NEI"), the Department of Energy, National Academies of Science, and foreign

⁶ This would include information from national laboratories, including, but not limited to: Sandia National Laboratories ("SNL"), Pacific Northwest National Laboratories ("PNNL"), Oak Ridge National Laboratories ("ORNL"), and Brookhaven National Laboratories ("BNL").

regulators. It would also include documents within NRC's or the federal government's possession or control that do not support, or are contrary to, NRC Staff's preferred outcome. States play an important role in our federal system, and interested States should have unfettered access to such documents and information. Claims of proprietary status and other impediments to full public disclosure of the documents reviewed by NRC Staff in the course of developing its DSEIS are contrary to the purposes of NEPA and serve only to foreclose a full and fair examination of the relevant considerations. "Publication of an EIS, both in draft and final form, also serves a larger informational role. It gives the public the assurance that the agency has indeed considered environmental concerns in its decision making process, and, perhaps more significantly, provides a springboard for public comment." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348-49 (1989) (internal citations omitted). To serve the informational goals of the EIS process, the NRC Staff needs to disclose *all* of the documents reviewed in developing the DSEIS or Final Supplemental Environmental Impact Statement ("FSEIS") and documents which are relevant to the DSEIS or FSEIS.

Substantive Response by NRC Staff to Scoping Comments

Finally, the States also believe the NRC Staff should expand its planned response to scoping comments. Rather than merely summarize the comments received on the scoping issues when it issues the draft EIS, the Staff should also provide a full discussion of the basis for the Staff's final determination of the scope of the proceeding and its reasons for rejecting any suggested alternate issues to be included in its DSEIS. If this does not occur at the time of the publication of the draft EIS, the Staff will end up with comments on its draft that repeat concerns raised in the scoping process without receiving the benefit of the commenters' reaction to the

Staff's reasoning in choosing to reject scoping suggestions. In addition, if the NRC Staff provides its reasoning in choosing the scoping approach and in rejecting suggestions to the contrary only at the time of publication of the final EIS, it will either deprive the public of a meaningful opportunity to respond to the Staff position—which reasoning is not articulated in the Federal Register Notice of October 25, 2012—or will unnecessarily lengthen the comment period by providing such an opportunity only after issuance of the final EIS.

CONCLUSION

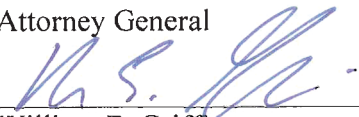
After more than three decades of failing to address the very real and widespread concern with the continued production of nuclear wastes without a permanent, safe, and secure nuclear waste repository NRC now has the opportunity, albeit mandated by a Federal Court, to apply its considerable expertise to address these concerns. It can now fully and completely explore the potential environmental consequences of continuing with the status quo, and can now seriously and thoroughly explore alternatives to the status quo, including not only cessation of further production of nuclear wastes but better ways to store such nuclear wastes than leaving them in spent fuel pools at reactor sites for an indefinite period after reactor shutdown. The proposed scope of the EIS process fails to provide for a meaningful and thorough examination of these concerns and purports to rely on legal arguments expressly rejected by the D.C. Circuit. It is not too late to correct these errors and assure a vigorous, fair, and comprehensive exploration of the very real environmental impacts of nuclear waste storage at reactor sites and viable alternatives to mitigate those impacts.

Dated: January 2, 2013

Respectfully Submitted,

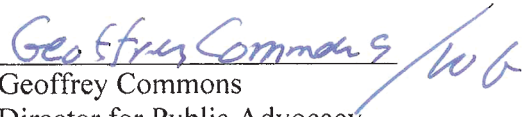
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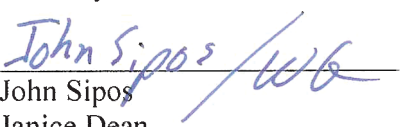
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COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES
OF NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND THE PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR
REGULATORY COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC
ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED RULE

EXHIBIT B

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Environmental Impacts of
Temporary Storage of Spent Nuclear Fuel
After Cessation of Reactor Operation

RIN 3150-AJ20

NRC-2012-0246

PETITION FOR REVIEW OF
NRC STAFF SCOPING DECISION

Submitted: May 22, 2013

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TABLE OF CONTENTS

	Page
Introduction.....	1
Jurisdiction.....	2
I. The Staff Scoping Decision Illegally Narrows the Scope of Alternatives.....	7
A. The Staff Scoping Decision fails to address the alternative of requiring dry cask storage of spent fuel rather than continued use of spent fuel pools for spent fuel that is more than 5 years old.....	12
B. The Staff Scoping Decision fails to address the alternative of not allowing further production of spent fuel until NRC determines that there is a safe and environmentally acceptable permanent waste repository to receive the additional spent fuel.....	17
II. The Staff Scoping Decision Ignores the Limitations in 10 C.F.R. §§ 51.23(b), 51.23(c)(2), and 51.95(c)(2) and Fails to Provide Proposed Criteria for When Issues May Be Raised in Individual Licensing Proceedings.....	19
Conclusion and Proposed Procedures for Review	21

INTRODUCTION

The State of Vermont with the Vermont Department of Public Service, the State of Connecticut, the State of New York, and the Commonwealth of Massachusetts (“Petitioners”) are participants in some or all of the rulemaking proceeding for proposed rule 10 C.F.R. § 51.23(a), the proceeding for proposed waste confidence findings, and the waste confidence generic environmental impact statement (“GEIS”) proceeding. Petitioners request that the Commission review and reverse certain conclusions reached by the Regulatory Staff in the Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report (March 2013) ML13060A128 (“Staff Scoping Decision”). The Commission has inherent supervisory authority over the Staff and should act now in furtherance of the Commission’s stated goal of resolving the pending proceedings expeditiously. In particular, Petitioners request that the Commission reverse the following errors that were made in the Staff Scoping Decision:

1. Refusing to consider the following alternatives:
 - a. the alternative of requiring dry cask storage of spent fuel rather than continued use of spent fuel pools for spent fuel that is more than 5 years old; and
 - b. the alternative of not allowing further production of spent fuel until NRC determines that there is a safe and environmentally acceptable permanent waste repository to receive the additional spent fuel—a consideration that the U.S. Court of Appeals for the D.C. Circuit explicitly recognized to be reasonable in *New York v. NRC*, 681 F.3d 471, 474 (D.C. Cir. 2012);
2. Failing to provide any guidance on which issues will be allowed to be considered on a site-specific basis following issuance of the GEIS, including failure to consider

amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2) to allow consideration of site-specific spent fuel related issues for the period after plant shutdown.

JURISDICTION

The Commission has the legal authority to supervise the activities of the Regulatory Staff (Reorganization Plan No. 1 of 1980, 5 USC App. I, Section 1), including supervision over any rulemaking proceeding. *Private Fuel Storage L.L.C.* (Independent Spent Fuel Storage Installation), CLI-02-11, 55 N.R.C. 260 (2002) (Commission chose to “exercise . . . [its] inherent supervisory authority over adjudications and rulemakings”). Thus, it has the legal authority to review and reverse decisions of the Regulatory Staff, particularly ones related to the ongoing waste confidence and temporary storage rule proceedings and the accompanying GEIS, which have been initiated as a direct result of the Commission’s decisions in Staff Requirements – COMSECY-12-0016 – Approach For Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule (Sept. 6, 2012), ML12250A132 (“Staff Requirements-COMSECY-12-0016”).

In addition, the Commission has set forth standards for when it would consider reviewing an order issued by an Atomic Safety and Licensing Board. The Staff Scoping Decision, although not issued in a licensing proceeding within the meaning of 10 C.F.R. Part 2 and not subject to the rights and obligations of that Part 2, nonetheless meets the standards established for interlocutory review by the Commission under the provisions of 10 C.F.R. § 2.341(f)(2). In addition, the proceedings in which the Staff Scoping Decision was issued should be considered adjudications within the meaning of 5 U.S.C. § 551(7), given that the result of these proceedings will be an Order by the Commission that directly affects ongoing licensing proceedings and future licensing

proceedings. *See Calvert Cliffs Nuclear Project, L.L.C.* (Calvert Cliffs Nuclear Power Plant, Unit 3), *et. al.*, CLI-12-16, __N.R.C.__, slip op. at 4 (Aug. 7, 2012) (“Waste confidence undergirds certain agency licensing decisions, in particular new reactor licensing and reactor license renewal [I]n recognition of our duties under the law, we will not issue licenses dependent upon the Waste Confidence Decision or the Temporary Storage Rule until the court’s remand is appropriately addressed.”).¹

“The Commission may, in its discretion, grant interlocutory review at the request of a party.” *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), CLI-09-06, 69 N.R.C. 128, 132-33 (Mar. 5, 2009). Such petitions are granted under 10 C.F.R. § 2.341(f)(2) when the party demonstrates that the issue:

(i) Threatens the party adversely affected by it with immediate and serious

¹ Although the scoping process is not where the ultimate application of the waste confidence GEIS conclusions and the rulemaking outcomes will be determined, Petitioners believe it is important that modifications to the Commission’s prior conclusions regarding the environmental impacts of spent fuel storage following plant shutdown, particularly previously unexamined impacts associated with long-term storage of spent fuel at reactor sites, and alternatives that can mitigate those impacts, should be applied at least to those facilities that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. 75 Fed. Reg. 81032 (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation) (Dec. 23, 2010). While this right should exist regardless of whether such issues were sought to be raised at the time of the previous licensing action and should not be limited to contested licenses or previously admitted parties, it is notable that at least two of the Commenters in the waste confidence GEIS proceedings, the State of Vermont and the Commonwealth of Massachusetts, attempted to raise similar issues in license renewal proceedings for Vermont Yankee and Pilgrim, but were prevented from doing so by application of the limitations imposed by 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). *See Entergy Nuclear Vt. Yankee, LLC* (Vermont Yankee Nuclear Power Station), LBP-06-20, 64 N.R.C. 131, 170 (Sept. 22, 2006); *Entergy Nuclear Generation Co.* (Pilgrim Nuclear Power Station), LBP-06-23, 64 N.R.C. 257, 280-81 (Oct. 16, 2006); *Commonwealth of Massachusetts v. NRC*, 522 F.3d 115, 124-26 (1st Cir. 2008) (Pilgrim and Vermont Yankee facilities).

irreparable impact which, as a practical matter, could not be alleviated through a petition for review of the presiding officer's final decision; or

(ii) Affects the basic structure of the proceeding in a pervasive or unusual manner.

Id. While the Commission grants such petitions only in “extraordinary circumstances,” *id.*, the situation presented here involves extraordinary circumstances that “[a]ffect[] the basic structure of the proceeding in a pervasive or unusual manner.” *Id.*

These proceedings and the accompanying GEIS have been identified by the Commission as warranting the highest priority for prompt resolution:

I believe that resolving this issue successfully is a Commission priority. As the Commission affirmed, waste confidence plays a core role in many high-visibility licensing actions such as new reactors and license renewals. Issuing licenses is central to the NRC's mission. We also stated that we would not issue final licenses until we appropriately addressed the court's remand. We must act promptly. The staff should begin at once, and should set a goal of publishing a final rule and EIS within 24 months from the date of the Commission's staff requirements memorandum.

Notation Vote, Chair Macfarlane, COMSECY-12-0016 – Approach For Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule (Aug. 10, 2012) ML12250A136; *see also id.* Notation Vote, Commission Ostendorff (Aug. 9, 2012) (“[R]esolution of the waste confidence remand is one of the most important issues currently before the agency.”).

Further, the purpose of the Staff Scoping Decision was to define the parameters of the GEIS, essentially deciding for these proceedings what will be analyzed and what will not be analyzed. The Commission's regulations identify the determination of the scope of a proposed EIS as a central decision point in the EIS process which controls the future EIS analysis:

(a) Scope. The draft environmental impact statement will be prepared in

accordance with the scope decided upon in the scoping process required by §§ 51.26 and 51.29. As appropriate and *to the extent required by the scope*, the draft statement will address the topics in paragraphs (b), (c), (d) and (e) of this section and the matters specified in §§ 51.45, 51.50, 51.51, 51.52, 51.53, 51.54, 51.61 and 51.62.

10 C.F.R. § 51.71(a) (emphasis added). Thus, the Staff Scoping Decision is effectively the final word on that issue and will define the parameters of both the proceeding and draft and final GEIS.

If the Staff has erred in determining the proper scope, as is clearly the case here, the error will infect the entire GEIS process and the two proceedings which will be relying on the GEIS. That error will ultimately result in either review and reversal by the Commission or more federal court review and more delay in the completion of this important process. *See, e.g.*, Notation Vote, Chair Macfarlane (Aug. 10, 2012) (recognizing that serious errors in the initial NEPA process can cause substantial delays in the final resolution of the issues: “Experience has shown that on issues of particular controversy, an environmental assessment will not result in resource or time savings in the end, because of the likelihood of challenges to the finding of no significant impact.”).

The Staff’s overly narrow and erroneous conclusions in the Scoping Decision will, if allowed to stand, “[a]ffect[] the basic structure of the proceeding in a pervasive or unusual manner.” 10 C.F.R. § 2.341(f)(2). The Staff limited the scope of the evaluation of alternatives in the GEIS and failed to identify in the Staff Scoping Decision the criteria to be applied in deciding what issues will be subject to resolution on a site-specific basis. The Staff also failed to propose amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2) to clarify that certain spent fuel issues not addressed in the GEIS may be addressed in individual licensing decisions.

This has placed the GEIS on a path which is substantially narrower than required by law. If these errors are not corrected now, they can only be corrected following completion of the GEIS process and will necessarily require the issuance of a supplemental draft GEIS. *See* 10 C.F.R. § 51.92(a)(2); *Marsh v. Or. Natural Res. Council*, 490 U.S. 360, 372 (1989) (agency shall supplement a final EIS if “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts”). That will add significant time to the resolution of these proceedings.

In *Hydro Resources, Inc.* (2929 Coors Road, Suite 101, Albuquerque, NM 87120), CLI-99-22, 50 N.R.C. 3 (1999), the Commission articulated its test for when a supplemental environmental impact statement is required:

As a general matter, the agency must consider whether the new information is significant enough to require preparation of a supplement. The new information must present a seriously different picture of the environmental impact of the proposed project from what was previously envisioned.

Id. at 14 (footnote and quotation omitted). In the current proceedings, inclusion of major alternatives in the environmental analysis, such as alternatives that can substantially mitigate the potential adverse environmental impacts of long-term or indefinite spent fuel storage at the sites of formerly operating nuclear reactors, will present an entirely different picture of the environmental consequences of long-term or indefinite spent fuel storage at reactor sites. In the case of license renewal proceedings, a grant of the proposed extension would often increase the amount of spent fuel stored by approximately 50%, an increase that would be avoided if the alternative of prohibiting spent fuel generation until an adequate, safe, and permanent repository was in place, and the impacts of which could be substantially mitigated if the spent fuel were

stored in dry casks after 5 years. These alternatives could either eliminate any long-term or indefinite spent fuel stored at the site after plant shutdown by requiring that an available, safe, permanent, and adequate waste disposal facility be in existence before authorizing generation of new spent fuel, or substantially mitigate the environmental consequences of post operation onsite storage by requiring that all spent fuel that is more than 5 years old be placed in dry cask storage.

Thus, absent immediate review of the erroneous Staff Scoping Decision, if it is ultimately determined that exclusion of these alternatives from the GEIS was an error, that error will only be correctable by the issuance of a supplemental draft GEIS. However, by promptly accepting review of the issues raised by Petitioners, the Commission can take corrective steps in a timely manner that will allow the Staff to modify its analyses and incorporate these further analyses into its draft GEIS. Since the draft GEIS is not expected until September, there should be time for the Staff to make the necessary changes to the draft GEIS to meet that deadline.

I. THE STAFF SCOPING DECISION ILLEGALLY NARROWS THE SCOPE OF ALTERNATIVES

During the scoping process, Petitioners and others urged Staff to ensure that the NEPA alternatives analysis would include the alternative of requiring all spent nuclear fuel to be placed in dry cask storage rather than left in spent fuel pools and the alternative of suspending the further creation of spent fuel until such time as there is an available, safe, permanent, and adequate nuclear waste storage facility for the spent fuel to be generated. *See, e.g.*, Comments Submitted by the Office of the Attorney General of the State of Vermont with the State of Vermont Department of Public Service, and by the Office of the Attorney General of the State of New York Concerning Scope of Consideration of Environmental Impacts of Temporary Storage

of Spent Fuel After Cessation of Reactor Operation (Jan. 2, 2013) at 15-16 & Letter from Matthew Brock to Sarah Lopas on behalf of the Commonwealth of Massachusetts joining in the Vermont and New York Comments (Jan. 3, 2013) (collectively, “States’ Written Scoping Comments”).² In the Scoping Decision, Staff rejected both of these alternatives:

Interested parties submitted hundreds of comments that suggested the NRC should consider a cessation of all licensing activities or cessation of all nuclear power plant operations as an alternative. A variety of other scoping comments suggested that the NRC should require the implementation of HOSS [hardened onsite storage] as an alternative. The NRC considered but ultimately dismissed these suggested alternatives for the purposes of this GEIS. Cessation of licensing

² In this regard, Petitioners raise two concerns about the Staff Scoping Decision. First, the Staff Scoping Decision excludes recognition of even the existence of viable mitigation alternatives that the States have identified, such as the transfer of spent nuclear fuel from spent fuel pools to dry cask storage. Second, the Staff Scoping Decision does not explicitly recognize that—given the Staff’s decision to exclude certain mitigation alternatives, such as the transfer of spent fuel from densely packed spent fuel pools to dry storage casks, and given the differences among plants and their siting profiles—those mitigation alternatives should be considered and evaluated as part of a site-specific environmental impact statement. During the initial public scoping meeting at NRC headquarters in Rockville, the State of New York raised this issue and requested that NRC undertake a site-specific severe accident mitigation alternatives analysis for the continued storage of spent nuclear fuel at the Indian Point nuclear site similar to the Severe Accident Mitigation Alternatives (“SAMA”) analysis that NRC conducts for severe reactor accidents. *See* Oral Comments of State of New York Assistant Attorney General J. Sipos at Public Scoping Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule, November 14, 2012 1:00 P.M. EST, Transcript of Proceedings at 37-40 & State of New York November 14, 2012 Presentation Slides, ML12331A347. Such a spent nuclear fuel SAMA analysis would identify site-specific environmental impacts and site-specific mitigation alternatives to minimize or eliminate those impacts. *See* States’ Written Scoping Comments at 16-18. (New York raised this issue again during the recent March 2013 NRC Regulatory Information Conference. *See* 2013 RIC Session TH30, Insights to the Future of High Level Waste Management.) Thus, in addition to identifying the alternative of requiring all spent nuclear fuel to be placed in dry cask storage rather than left in spent fuel pools and the alternative of suspending the further creation of spent fuel until such time as there is an available, safe, permanent, and adequate nuclear waste storage facility for the spent fuel, the scope of the GEIS must be expanded to identify and specifically reserve for further site-specific analysis, all reasonable alternatives to long-term or indefinite spent fuel storage at reactor sites, including alternatives that will mitigate the environmental impacts of that storage such as by placing all spent fuel in dry storage casks at particular sites. *See infra* Part II.

activities and overall reactor operations does not satisfy the purpose and need for the GEIS. With regard to HOSS, the NRC is already considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, Federal Register notice (74 FR 66589), “Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW; Notice of Availability and Solicitation of Public Comments.”

Staff Scoping Decision at 12. The Staff’s conclusions directly conflict with well-established legal precedents and, most importantly, ignore the mandate of the Court of Appeals in *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012).

To begin, the Staff Scoping Decision cannot be reconciled with the history and legal status of the waste confidence issue. This issue was first presented in *Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), where the Court described the central issue: “The crux of the case is current uncertainty about the prospects for developing and implementing safe methods for the ultimate disposal or even long-term storage of the highly toxic radioactive wastes created in the process of nuclear power generation.” *Id.* at 413. The Court concluded that the case must be remanded to the NRC for a serious consideration of those issues, noting the following:

Cf. NRDC v. NRC, 178 U.S.App.D.C. 336, 361, 547 F.2d 633, 658 (1976) (Tamm, J., concurring in result) (“*NEPA requires the Commission fully to assure itself that safe and adequate storage methods are technologically and economically feasible. It forbids reckless decisions to mortgage the future for the present, glibly assuring critics that technological advancement can be counted upon to save us from the consequences of our decisions*”). As appears below, the Supreme Court, in *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, (1978), reversed the ruling of the majority opinion requiring further procedures but remanded for the kind of inquiry called for in Judge Tamm’s concurring opinion.

Id. at 417 n.6 (emphasis added to identify the portion of Judge Tamm’s concurrence in *NRDC v. NRC* cited with approval by Commissioner Svinicki at the time of her vote on the now-voided

version of the waste confidence rule (Notation Vote, Response Sheet, Sept. 24, 2009 at 3)). In the *Minnesota* case, Judge Tamm also concurred, concluding that:

if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes. It is undisputed that questions involving storage and disposal of nuclear waste pose serious concerns for health and the environment. See *Vermont Yankee Nuclear Power Corp. v. NRDC*, 435 U.S. 519, 538-39, 98 S. Ct. 1197, 1208-09, 55 L. Ed. 2d 460, 475-76 (1978).

Our opinion merely remands this case to the Commission for such proceedings as it deems appropriate to determine whether there is reasonable assurance that an offsite storage solution will be available when needed in this case, by the years 2007-2009.

Id. 602 F.2d at 419-20 (Tamm, J., concurring) (footnotes omitted). In short, the Commission was given a clear mandate to use the NEPA process to evaluate the question of when and whether nuclear wastes would be permanently disposed, including looking into all of the environmental implications of those issues. *Id.* at 417 (majority opinion).

Although the Commission kept moving the date by which it was confident there would be a permanent and operational nuclear waste disposal facility, the existence of such a date—and thus a finite date for storage of spent fuel at the site following plant shutdown—was the key component of the Commission’s confidence that there would be minimal environmental impacts of spent fuel storage at plant sites following cessation of plant operations. By concluding that there was no reasonable possibility of long-term, much less indefinite, storage of spent fuel at reactor sites, NRC concluded it never needed to consider alternatives to its plan to continue to authorize generation of more nuclear waste. All this changed when the Commission came to the

realization that it was no longer possible to determine a date certain by which a permanent nuclear waste repository would be available.

Thus, over 30 years after *Minnesota* was decided, the Court in *New York v. NRC* once again directed the Commission to consider the environmental impacts associated with there never being a permanent, safe, and adequate waste disposal facility: “We further hold that the Commission’s evaluation of the risks of spent nuclear fuel is deficient in two ways: First, in concluding that permanent storage will be available ‘when necessary,’ the Commission did not calculate the environmental effects of failing to secure permanent storage—a possibility that cannot be ignored.” *New York*, 681 F.3d at 473 (emphasis added). This holding effectively adopted what Judge Tamm said over 30 years earlier: “[I]f the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses if the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period.” *Minnesota*, 602 F.2d at 419-20 (Tamm, J., concurring) (footnotes omitted). By restricting consideration of alternatives and explicitly excluding the alternative of postponing further spent fuel generation until a permanent, safe, and adequate waste disposal facility exists, and excluding use of dry cask storage in lieu of spent fuel pools after spent fuel is 5 years old, the Staff is failing to provide the full environmental review mandated by the federal court.

The Staff’s failure to include all reasonable alternatives in its Scoping Decision stems initially from its failure to focus more precisely on the underlying reason for the GEIS. According to the Staff Scoping Decision, the GEIS will be used to update the Waste Confidence rule (Staff Scoping Decision at 38), the purpose of which “is to develop and implement a

regulatory approach that efficiently evaluates the environmental impacts of spent nuclear fuel after the licensed life for operation of a commercial nuclear reactor and prior to ultimate disposal” (Staff Scoping Decision at 2). That description tends to obfuscate the true purpose of the GEIS, which is to provide a basis for NRC to determine whether to issue or renew licenses and, if it issues or renews a license, what conditions should be imposed in the license. As the D.C. Circuit recognized, NRC is required to analyze the environmental impacts of the temporary storage of spent fuel before it licenses or relicenses the operation of a nuclear reactor because that operation will generate spent fuel for which there as yet is no permanent repository. *New York*, 681 F.3d at 473 (holding that the fact that permanent storage may never be achieved is “a possibility that cannot be ignored”); *see also id.* at 477 (“It is not only reasonably foreseeable but eminently clear that the WCD will be used to enable licensing decisions based on its findings.”).

If, as the D.C. Circuit held in *New York v. NRC*, the major environmental impacts that must be assessed are the impacts of long-term and indefinite storage of spent fuel at reactor sites, then the focus of the study of alternatives in the GEIS must be the alternatives that will reduce those impacts. And the Commission must look at “*all* reasonable alternatives.” 40 C.F.R. § 1502.14(a) (emphasis added).

A. The Staff Scoping Decision fails to address the alternative of requiring dry cask storage of spent fuel rather than continued use of spent fuel pools for spent fuel that is more than 5 years old.

One obvious and reasonable alternative that must be considered in the GEIS is dry cask storage as an option to storage in spent fuel pools. Although Staff may believe there is no environmental impact difference between spent fuel that is closely packed and stored in pools and spent fuel that is placed in dry cask storage once it is 5 years old, there is ample and

technically competent disagreement with that conclusion. *See, e.g.,* Robert Alvarez, Jan Beyea, Klaus Janberg, Jungmin Kang, Ed Lyman, Allison Macfarlane, Gordon Thompson, Frank N. von Hippel, *Reducing the Hazards from Stored Spent Power-Reactor Fuel in the United States* (Science and Global Security, 11:1–51, 2003)³; Robert Alvarez, *Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage* (Institute for Policy Studies, May 24, 2011). Given the breadth and weight of scientific support for the proposition that there are significant environmental benefits from dry cask storage for all fuel that it is more than 5 years old, this reasonable alternative must be studied in the Commission’s review of “*all* reasonable alternatives.” 40 C.F.R. § 1502.14(a) (emphasis added).

Although the Staff does not directly reject the advantages of dry cask storage, it seeks to avoid consideration of that option by noting that:

NRC is already considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, Federal Register notice (74 FR 66589), “Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW; Notice of Availability and Solicitation of Public Comments.”

Staff Scoping Decision at 12. This attempt to avoid addressing the mitigation potential of the dry cask storage alternative fails for several reasons. First, it is inconsistent with the Commission’s directive in its Staff Requirements-COMSECY-12-0016. Second, it violates NRC’s regulations implementing NEPA. Third, it is contrary to well-established federal law

³ This article was cited in a filing in these proceedings. *See* Comments by Alliance for Nuclear Accountability, et. al. (Jan. 2, 2013), Declaration of 2 January 2013 by Gordon R. Thompson: Recommendations for the US Nuclear Regulatory Commission’s Consideration of Environmental Impacts of Long-Term, Temporary Storage of Spent Nuclear Fuel or Related High-Level Waste, Appendix A.

which has been applied to the NRC in an analogous situation.

The Staff Scoping Decision is inconsistent with Commission directives. In Staff Requirements-COMSECY-12-0016, the Commission directed Staff to be guided by the “Council on Environmental Quality’s Guidance on Improving the Process for Preparing Efficient and Timely Reviews Under NEPA” (“CEQ Guidance”). Staff Requirements-COMSECY-12-0016. In that Guidance, CEQ reminds federal agencies that “NEPA requires Federal agencies to consider the potential environmental consequences of their proposed action, and any reasonable alternatives, before deciding whether and in what form to take an action.” CEQ Guidance, 77 Fed. Reg. 14473, 14475 (Mar. 12, 2012). While the Guidance encourages agencies to incorporate by reference completed analyses from other documents (*see, e.g.*, 77 Fed. Reg. at 14475 (“NEPA reviews should coordinate and take appropriate advantage of existing documents and studies, including through adoption and incorporation by reference”)), nowhere does it authorize Federal agencies to avoid consideration of impacts or alternatives and proceed to a final decision on a major federal action merely because another, yet to be completed, proceeding is evaluating some of those issues. To the contrary, the Guidance makes clear that the NEPA process must be fully completed *before* a decision is made on the major federal action:

Agencies must integrate the NEPA process into their planning at the earliest possible time to ensure that planning and decisions reflect environmental values, avoid delays later in the process, and anticipate and attempt to resolve potential issues. NEPA should not become an after-the-fact process that justifies decisions that have already been made.

[A]n agency shall prepare an EIS so that it can inform the decisionmaking process in a timely manner “and will not be used to rationalize or justify decisions already made.”

CEQ Guidance, 77 Fed. Reg. at 14476-77 (footnotes and citations omitted). Thus, if the Staff

wishes to use any environmental analyses conducted in the “Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW” as part of the GEIS process in these proceedings, it will have to wait for that rulemaking to complete its environmental impact statement analysis, a delay that will substantially interfere with the Commission’s clear goal of completing the GEIS within 24 months of its initiation.

In addition, it appears from the Federal Register Notice for the Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW (74 Fed. Reg. 66589 (Dec. 16, 2009)) that the scope of that analysis is far narrower than the scope of a proper consideration of dry cask storage as an alternative to the long-term or indefinite use of spent fuel pools. The rulemaking on security revisions is focused only on security issues at Independent Spent Fuel Storage Installations (ISFSI) and Monitored Retrievable Storage Installation (MRS):

The Nuclear Regulatory Commission (Commission or NRC) is seeking input from the public, licensees, certificate holders, and other stakeholders on a draft technical basis for a proposed rulemaking that would revise the NRC’s security requirements for the storage of spent nuclear fuel (SNF) at an Independent Spent Fuel Storage Installation (ISFSI) and the storage of SNF and/or high-level radioactive waste (HLW) at a Monitored Retrievable Storage Installation (MRS).

74 Fed. Reg. at 66589. The scope of that proceeding thus appears to ignore the many environmental impacts at over 100 reactor sites that may occur as a result of accidental releases from spent fuel pools, or fires at spent fuel pools, and it also appears to ignore the environmental and economic impacts of the continued use of a reactor site for waste storage for a long-term or indefinite period after the reactor has shutdown. Whether that rulemaking will even consider requiring dry cask storage at reactor sites remains unresolved:

Petition for rulemaking (PRM-72-6), item number 11, requests that the NRC . . . “require Hardened On-site Storage (HOSS) at all nuclear power plants as well as

away-from-reactor dry cask storage; that all nuclear industry interim on-site or off-site dry cask storage installations or ISFSIs be fortified against attack.” Consequently, item 11’s technical content appears to be relevant to the scope of the proposed rulemaking and it is mentioned in the draft technical basis. Therefore, the NRC may consider this petition in the course of developing the proposed rule. However, the NRC has not yet reached a decision on acceptance of this petition and this notice does not prejudice the agency’s final action on whether to accept the requests in PRM-72-6.

74 Fed. Reg. at 66591. There is also no indication that the rulemaking, if it proceeds, will include an environmental analysis of the impacts of the proposed action and alternatives to mitigate those consequences. In short, the pending potential rulemaking is not a viable substitute for the obligations imposed on NRC to conduct a thorough environmental review, including consideration of all reasonable alternatives, of the proposed action of allowing the generation of spent fuel to continue when there is not in place a permanent, safe, and adequate waste disposal facility.

Proceeding with the GEIS without considering all viable alternatives to mitigate the adverse consequences of the proposed action, also violates long-standing NRC regulations. NRC requires that all reasonable alternatives be explored as part of the NEPA process:

State whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted. Summarize any license conditions and monitoring programs adopted in connection with mitigation measures.

10 C.F.R. § 51.103(a)(4). By never addressing alternatives that could mitigate the adverse impacts of long-term or indefinite spent fuel storage at reactor sites after plant shutdown, the GEIS would not have considered, and NRC would not have taken, “all practicable measures within its jurisdiction to avoid or minimize environmental harm.”

The Staff's limited analysis of reasonable mitigation alternatives also violates federal case law. In *NRDC v. NRC*, 539 F.2d 824 (2d Cir. 1976), *vacated on grounds of subsequent mootness sub. nom. Allied-General Nuclear Services v. NRDC*, 434 U.S. 1030 (1978), NRC sought to rely on a draft generic impact statement on the use of mixed oxide fuels ("GESMO") to grant interim licenses even though the "draft GESMO did not fully address alternatives." 539 F. 2d at 842. NRC argued, as the Staff does here, that the rest of the analysis would be completed as part of an additional analysis at a later time. The Court rejected NRC's reliance on the draft GESMO as a basis for interim licenses, ruling that the draft GESMO was "a legally insufficient environmental impact statement" because "the consideration of alternatives and of special hazards to the public health, safety and welfare are vital to *any* impact statement." *Id.* (emphasis in original). Here, as well, the GEIS will be legally insufficient unless it fully considers all alternatives to the long-term use of spent fuel pools, rather than leaving the analysis of dry cask storage for a later date.

B. The Staff Scoping Decision fails to address the alternative of not allowing further production of spent fuel until NRC determines that there is a safe and environmentally acceptable permanent waste repository to receive the additional spent fuel.

Another obvious and reasonable alternative that must be addressed in the GEIS is the option of not allowing additional spent fuel to be generated until a permanent, safe, and adequate nuclear waste disposal facility exists.⁴ Indeed, the D.C. Circuit has already identified this

⁴ As noted in footnote 1 above, this alternative should be analyzed for all plants that are not yet licensed, that are up for relicensing, or that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. *See* 75 Fed. Reg. 81032.

alternative as a reasonable one by noting that it may be *unreasonable* to do anything else: “The lack of progress on a permanent repository has caused considerable uncertainty regarding the environmental effects of temporary SNF storage and *the reasonableness of continuing to license and relicense nuclear reactors.*” *New York*, 681 F.3d at 474 (emphasis added).

The alternative of ceasing generation of additional spent nuclear fuel until a permanent, safe, and adequate nuclear waste disposal facility exists is not only a “reasonable alternative” that must be analyzed to meet the requirements of 40 C.F.R. § 1502.14(a), but is also required by 40 C.F.R. § 1502.14(d), which states that agencies such as NRC must include in their environmental analysis “the alternative of no action.” The “no action” alternative must be analyzed before NRC can license the generation of additional spent nuclear fuel (and the resulting environmental impacts of such additional generation) at any nuclear facility. Because the GEIS is intended to support the environmental review of licensing actions and license renewal actions regarding environmental impacts of storing spent nuclear fuel, NEPA mandates that NRC examine the cessation of further generation of spent fuel until a permanent, safe, and adequate nuclear waste disposal facility exists.

The sole basis offered in the Staff Scoping Decision for rejecting, as an alternative, cessation of further generation of spent fuel until a permanent, safe, and adequate nuclear waste disposal facility exists, is that “[c]essation of licensing activities and overall reactor operations does not satisfy the purpose and need for the GEIS.” Staff Scoping Decision at 12. However, as already noted, this narrow view of the purpose and need for the GEIS stems from the misperception that it will become the basis for a “regulatory approach” to the temporary storage of spent fuel, rather than a prerequisite to licensing decisions that will result in the continued

generation of spent fuel in the absence of any permanent repository for that fuel. *New York*, 681 F.3d at 473.

II. THE STAFF SCOPING DECISION IGNORES THE LIMITATIONS IN 10 C.F.R. §§ 51.23(b), 51.53(c)(2), AND 51.95(c)(2) AND FAILS TO PROVIDE PROPOSED CRITERIA FOR WHEN ISSUES MAY BE RAISED IN INDIVIDUAL LICENSING PROCEEDINGS

The Staff Scoping Decision fails to include any consideration of any amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), or 51.95(c)(2). This is problematic because those provisions currently preclude parties from raising important site-specific issues in licensing proceedings:

Accordingly, as provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determination in paragraph (a) of this section, no discussion of any environmental impact of spent fuel storage in reactor facility storage pools or independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or initial ISFSI license or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of an initial license for storage of spent fuel at an ISFSI, or any amendment thereto.

10 C.F.R. § 51.23(b); *see also id.* § 51.53(c)(2) (license applicant’s “environmental report need not discuss any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b)”; *id.* § 51.95(c)(2) (“[T]he supplemental environmental impact statement prepared at the license renewal stage need not discuss . . . any aspect of the storage of spent fuel for the facility within the scope of the generic determination in § 51.23(a) and in accordance with § 51.23(b).”).

Indeed, the Staff has consistently taken the position in the past that so long as § 51.23(b)

exists, no effort to discuss any aspect of spent fuel storage after operations have ceased is permitted, regardless of whether the matter was specifically addressed in § 51.23(a). *See, e.g., Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 and 3), NRC Staff's Response to Intervenor (1) Joint Motion For Leave to File a New Contention Concerning the Onsite Storage of Nuclear Waste at Indian Point And (2) Joint Contention NYS-39/RK-EC-9/CW-EC-10, at 8 (Aug. 2, 2012), ML12215A565. In light of the broad language of 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2), and in light of the Staff's past interpretation of these provisions, the Staff Scoping Decision errs by failing to identify the need to amend these provisions to ensure that matters that are clearly site-specific and not appropriate for generic treatment can be raised in individual licensing proceedings.

Numerous participants in the GEIS and rulemaking proceedings publicly expressed their concern about the need for site-specific treatment of certain issues. *See, e.g.,* Staff Scoping Decision at 8-9, 14; States' Written Scoping Comments at 4-5, 16-18; *see also* discussion of New York's comments cited in footnote 2 *supra*. The Staff Scoping Decision recognizes that such issues may exist and states that "[t]he GEIS and Waste Confidence rule will identify those impacts that cannot be analyzed generically and therefore must be analyzed on a site-specific basis." Staff Scoping Decision at 50. But the Staff Scoping Decision says nothing about the need to amend §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2). As noted, without amendments to those provisions, the opportunity to raise site-specific issues will be meaningless and will compel a party to go through the laborious and uncertain process of seeking a waiver of §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2).

Further, the Staff Scoping Decision offers no guidance on what criteria will be used to

determine which issues are for site-specific consideration. Rather it merely states:

The NRC received a comment requesting that the Commission establish a new procedure by which the public would have an opportunity to raise site-specific impacts of continued storage before the ASLB. The GEIS will generically analyze the environmental impacts of continued storage. The GEIS and Waste Confidence rule will identify those impacts that cannot be analyzed generically and therefore must be analyzed on a site-specific basis.

Staff Scoping Decision at 50. Because the Staff Scoping Decision does not include any criteria that are to be applied in determining which issues will receive site-specific consideration, public participation is severely limited by the lack of an opportunity to develop evidence and arguments on issues that should be considered site-specific or should be considered generic. The Staff Scoping Decision should have disclosed NRC's intentions regarding the criteria to be used for deciding whether an issue will be considered site-specific or generic.

Assuming that some impacts will be identified in the GEIS as appropriate for review in site-specific proceedings, the Staff Scoping Decision must be altered to ensure that the scope of the current proceedings and the GEIS will be expanded to include guidance on which issues will be allowed to be considered on a site-specific basis following issuance of the GEIS, and to consider amendments to 10 C.F.R. §§ 51.23(b), 51.53(c)(2), and 51.95(c)(2).

CONCLUSION AND PROPOSED PROCEDURES FOR REVIEW

It is essential that these scoping issues be resolved as quickly as possible. The current GEIS process and rulemaking are part of a saga spanning 35 years. During that time, the Commission has struggled with whether it is environmentally prudent to allow nuclear wastes to be generated before there exists a facility of sufficient size to safely and permanently dispose of that waste. Because such a facility does not yet exist, the Commission has also struggled with

whether there is reasonable assurance that nuclear wastes can be safely stored at reactor sites with acceptable environmental risks that have been mitigated to the fullest extent possible forever. The Commission has already made several important first steps in its efforts to achieve the legally required analysis by: (1) choosing to conduct its review by using the full power of NEPA to develop a comprehensive GEIS; and (2) choosing to suspend the issuance of any new authority to generate nuclear wastes until this review process has been finally completed. But to resolve these matters fully, fairly, and efficiently by the end of 2014, the Commission must act now to review the Staff Scoping Decision before the problems that are inherent in that decision adversely affect the rest of the GEIS process. To that end, Petitioners respectfully request that the Commission establish the following schedule for immediate action on this Petition:

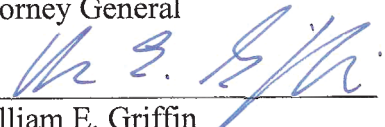
1. May 31, 2013 – Any entity that participated in the scoping process can file a brief supporting or opposing the request for the Commission to hear the Petition on the merits;
2. June 7, 2013 – Commission decides whether it will address the merits of the Petition;
3. June 14, 2013 – Any entity that participated in the scoping process can file a brief on the merits of the Petition;
4. June 21, 2013 – Any entity that filed a pleading on June 14 files any reply;
5. July 2013 – Commission decides the merits of the Petition.

Time is of the essence, and the Commission should act quickly to ensure that the scope of the GEIS complies with NEPA and with the D.C. Circuit's decision in *New York v. NRC*.

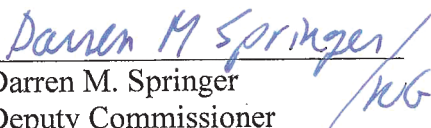
Dated May 22, 2013

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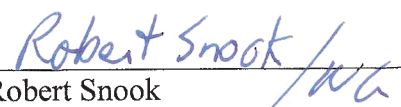
Department of Public Service


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Respectfully Submitted,

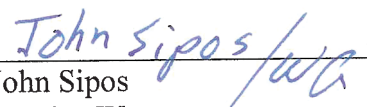
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COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES
OF NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND THE PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR
REGULATORY COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC
ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED RULE

EXHIBIT C

PUBLIC SUBMISSION

As of: January 08, 2013
 Received: January 02, 2013
 Status: Pending Post
 Tracking No. 1jx-82vy-7gg0
 Comments Due: January 02, 2013
 Submission Type: Web

Docket: NRC-2012-0246

Consideration on Environmental Impacts on Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Comment On: NRC-2012-0246-0001

Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation

Document: NRC-2012-0246-DRAFT-0504

Comment on FR Doc # 2012-26295

163
 10/25/2012
 77 FR 65137

Submitter Information

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Submitter's Representative: Peter M. Glass, Assistant General Counsel

Organization: Northern States Power Company d/b/a Xcel Energy Inc.

Government Agency Type: Tribal

Government Agency: Prairie Island Indian Community

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RULES AND DIRECTIVES
 BRANCH
 USNRC

General Comment

Joint Comments of Northern States Power Company d/b/a Xcel Energy Inc. and the Prairie Island Indian Community.

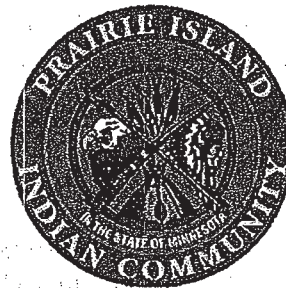
Attachments

Joints Comments of NSPM and PIIC

SUNSI Review Complete
 Template = ADM - 013
 E-RIDS= ADM-03
 Add= S. Lopas (SLL2)



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January 2, 2013

Cindy Bladey
Chief, Rules, Announcements, and Directives Branch
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Re: Docket ID NRC-2012-0246
Comments on the Notice of Intent to Prepare Environmental Impact Statement

Dear Ms. Bladey:

In its October 25, 2012 Federal Register notice, 77 Fed. Reg. 65137, the Nuclear Regulatory Commission ("NRC") announced its intent to prepare an environmental impact statement ("EIS") with regard to the Waste Confidence decision and rule. Northern States Power Company, a Minnesota Corporation d/b/a/ Xcel Energy ("NSPM"), and the Prairie Island Indian Community ("PIIC") submit the following joint comments in response to the NRC's invitation.

NSPM is the owner and operator of the Monticello Nuclear Generating Plant, the Monticello Independent Spent Fuel Storage Installation, the Prairie Island Nuclear Generating Plant ("PINGP"), and the Prairie Island Independent Spent Fuel Storage Installation ("ISFSI"). The PIIC is a federally recognized Indian tribe. The Tribe's Reservation is located on the ancestral homeland of the Mdewakanton Dakota on Prairie Island, which is formed at the confluence of the Vermillion and Mississippi Rivers in southeastern Minnesota (approximately 35 miles southeast of the Twin Cities of Minneapolis and St. Paul, Minnesota). The Mdewakanton, "those who were born of the waters," have lived on Prairie Island for countless generations.

The PINGP and ISFSI are also located on Mdewakanton Dakota ancestral lands and immediately adjacent to the Prairie Island Indian Community Reservation. The PINGP's ISFSI is approximately 600 yards from the nearest Community residences, and is located on the west bank of the Mississippi River in an area that is quite popular for recreational boating and heavily used by barges. With the signing of the Nuclear Waste Policy Act ("NWPA") in 1983, the Federal Government resolved to dispose of spent nuclear fuel generated by this country's nuclear power plants. Even in 1983, the NWPA recognized that "a national problem" had been created by the accumulation of spent nuclear fuel, that previous Federal efforts for its disposal had been inadequate, and that it was the Federal Government's responsibility to provide for its permanent

disposal. At the same time, the NWPA recognized that it was the responsibility of the utilities generating the spent fuel to pay for its disposal, via a one mil per kilowatt-hour of nuclear energy generated fee assessed to nuclear utility customers (i.e., ratepayers).

Since 1983, only the ratepayers' responsibility to pay has been met. American ratepayers have paid in over \$30 Billion (including interest) to the Nuclear Waste Fund with nothing to show for it. The Federal Government, with a statutory and contractual obligation to begin disposing of utilities' spent fuel by 1998, at first acknowledged this responsibility, then later said it would meet the obligation by 2003, then 2010, then 2017, and then finally stopped projecting any dates whatsoever. In 2010, the Federal Government unilaterally cancelled the entire waste program (except for the collection of the Nuclear Waste Fees from the utilities and ultimately their customers).

Since the early days of the Federal Government's nuclear waste program, NSPM and the PIIC have worked cooperatively in attempting to encourage and enforce the Federal Government's obligation. While NSPM and the PIIC have separate and sometimes diverging interests, they both have a common interest in seeing that the Federal Government carries out its responsibility to dispose of the spent fuel from Prairie Island and this nation's other commercial nuclear plants.

With respect to the scoping process for the Waste Confidence EIS, NSPM and the PIIC urge the NRC to recognize that the underlying need for the Waste Confidence decision and rule arises because of the Federal Government's failure to meet its legal responsibilities. Had the Department of Energy ("DOE") performed as required, long-term on-site storage of spent fuel would not have been necessary. Few, if any, commercial nuclear power plants would have had to construct and operate independent spent fuel storage installations ("ISFSI's"). The Prairie Island ISFSI would not have been necessary, let alone its anticipated 40-year license renewal.

One of the key issues for the scoping process identified in the October 25, 2012 Federal Register notice, is determining the potential spent fuel storage scenarios for the NRC to evaluate in the EIS. The notice identifies three possible scenarios – (1) temporary spent fuel storage after reactor operation ceases "until a repository is made available . . . in the middle of the century"; (2) temporary spent fuel storage after reactor operation ceases "until a repository is made available . . . at the end of the century"; and (3) spent fuel storage "if no repository is available by the end of the century." 77 Fed. Reg. at 65138. NSPM and the PIIC do not disagree with the NRC's use of scenarios (1) and (3). The first scenario, assuming that a repository is available in the middle of this century, is a conservative estimate as to when a repository should be available. After all, the 37 years for a repository to become available by the middle of this century is more than twice the time that Congress allowed for an operational repository when it enacted the Nuclear Waste Policy Act in 1982. The third scenario, assuming that no repository will be available, is clearly the most conservative possible scenario, assuming that a repository will not be available.

Joint Comments of Northern States Power Company d/b/a Xcel Energy Inc. and the Prairie Island Indian Community

January 2, 2013

Page 3

It is the second possible scenario identified in the Federal Register notice that NSPM and the PIIC find objectionable and request that it not be used in the EIS analysis. A repository that is not available until the end of this century is a repository that takes the Federal Government more than 85 years to implement. If there is going to be a repository, there is no reason why it should take that long. Including such a scenario in the EIS may encourage the view that it is acceptable for the Federal Government to wait that long to put a repository in place. There is no excuse for such an extended schedule when everyone, regardless of their views on nuclear energy, agrees that permanent disposal of spent fuel and high-level radioactive waste should be developed and implemented with all reasonable speed. Especially where the EIS will analyze the third scenario, i.e., the possibility that there will be "no repository," a scenario that assumes an 85-year schedule for a repository is unnecessary and unreasonable, and potentially counterproductive.

Finally, NSPM and the PIIC urge that the NRC, in scoping the Waste Confidence EIS, acknowledge that the uncertainty as to when the Federal Government will meet its obligation to dispose of the utilities' spent nuclear fuel is the underlying cause of the remand by the U.S. Court of Appeals for the DC Circuit in *New York v. NRC*. The NRC should similarly acknowledge that this uncertainty is due to the Administration's unilateral decision to terminate the Yucca Mountain program and to the failure of the Congress to provide adequate funding for the Yucca Mountain program. The NRC should acknowledge that the DOE and the Administration, having ended the current nuclear waste program, have failed in their obligation to put in place a new program. It has been almost a year since the Blue Ribbon Commission, created to recommend the path forward for handling nuclear waste, published its final report. The DOE was expected to release an implementation plan detailing how it would address the Commission's recommendations by July 2012; as of this date no such plan has been released.

While the EIS is intended to assess the environmental impacts of spent fuel stored at commercial nuclear power plants after cessation of operations, NSPM and the PIIC submit that the EIS must also evaluate the underlying causes of the need to store spent fuel at reactor sites long after reactor operations have ceased. This would provide an explanation and context for why the EIS is needed. It also performs the equally important function of educating the public as to the reasons for the current nuclear waste dilemma.



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COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES
OF NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND THE PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR
REGULATORY COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC
ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED RULE

EXHIBIT D

RULES AND DIRECTIVES
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PRAIRIE ISLAND INDIAN COMMUNITY
LEGAL DEPARTMENT

January 11, 2013

Ms. Cindy Bladey, Chief
Rules, Announcements, and Directives
Office of Administration
Mail Stop: TWB-05-B01M
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

10/25/2012
77 FR 65137
172

RE: Comments on Scope of Environmental Impact Statement Supporting the Rulemaking
to Update the Waste Confidence Decision & Rule (Docket ID: NRC-2012-0246)

Dear Ms. Bladey:

The Prairie Island Indian Community (PIIC, Community or Tribe), a federally recognized Indian tribe, offers the following comments and recommendations to the Nuclear Regulatory Commission (NRC) on the proposed Environmental Impact Statement (EIS) in support of the Commission's Waste Confidence Decision and Rule, as noticed in the Federal Register on October 25, 2012 (77 FR 65137). Please note that these comments are in addition to the comments provided by Tribal Council Secretary Ron Johnson at the November 14, 2012 public meeting in Rockville, MD, and the joint comment letter PIIC submitted with Northern States Power Company d/b/a Xcel Energy on January 2, 2013.

The Tribe's Reservation is located on the ancestral homeland of the Mdewakanton Dakota on Prairie Island, which is formed at the confluence of the Vermillion and Mississippi Rivers in southeastern Minnesota (approximately 35 miles southeast of the Twin Cities of Minneapolis and St. Paul, Minnesota). The Mdewakanton, "those who were born of the waters," have lived on Prairie Island for countless generations. The Tribe's current land base (including both trust and fee lands) has grown through various federal acts beginning in 1891 and direct purchases by the Tribal Council, and now totals over 3,000 acres (including both land and water). *See Figure 1.*

SUNSI Review Complete

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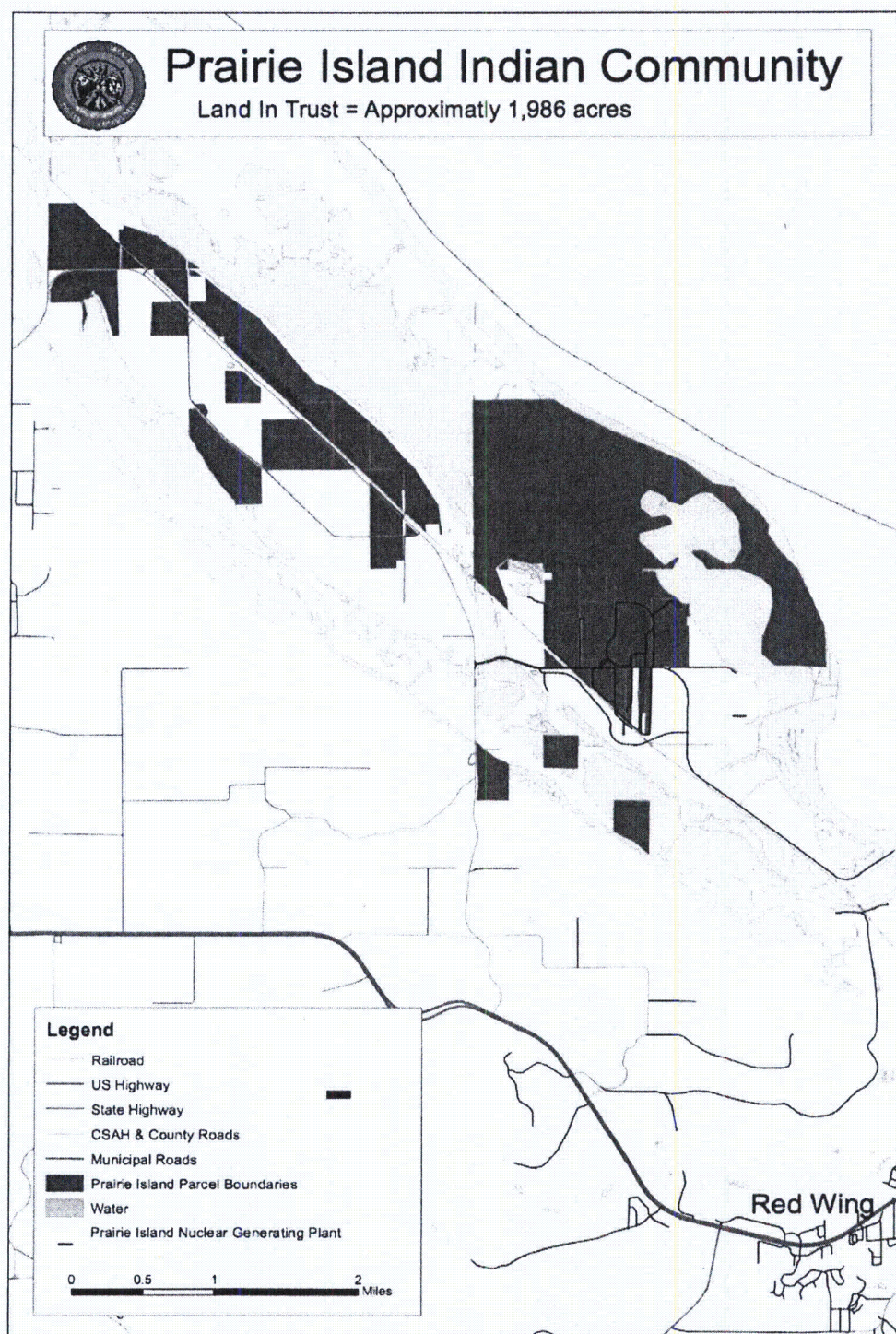


Figure 1. Lands of the Prairie Island Indian Community

January 11, 2013

Page 3

The Prairie Island Nuclear Generating Plant (PINGP), owned by Northern States Power Company d/b/a Xcel Energy (Xcel), is also located on Mdewakanton Dakota ancestral lands and immediately adjacent to the Prairie Island Indian Community Reservation. The PINGP's Independent Spent Fuel Storage Installation (ISFSI) is approximately 600 yards from the nearest Community residences, and is located on the west bank of the Mississippi River in an area that is quite popular for recreational boating and heavily used by barges. *See Figure 2.*

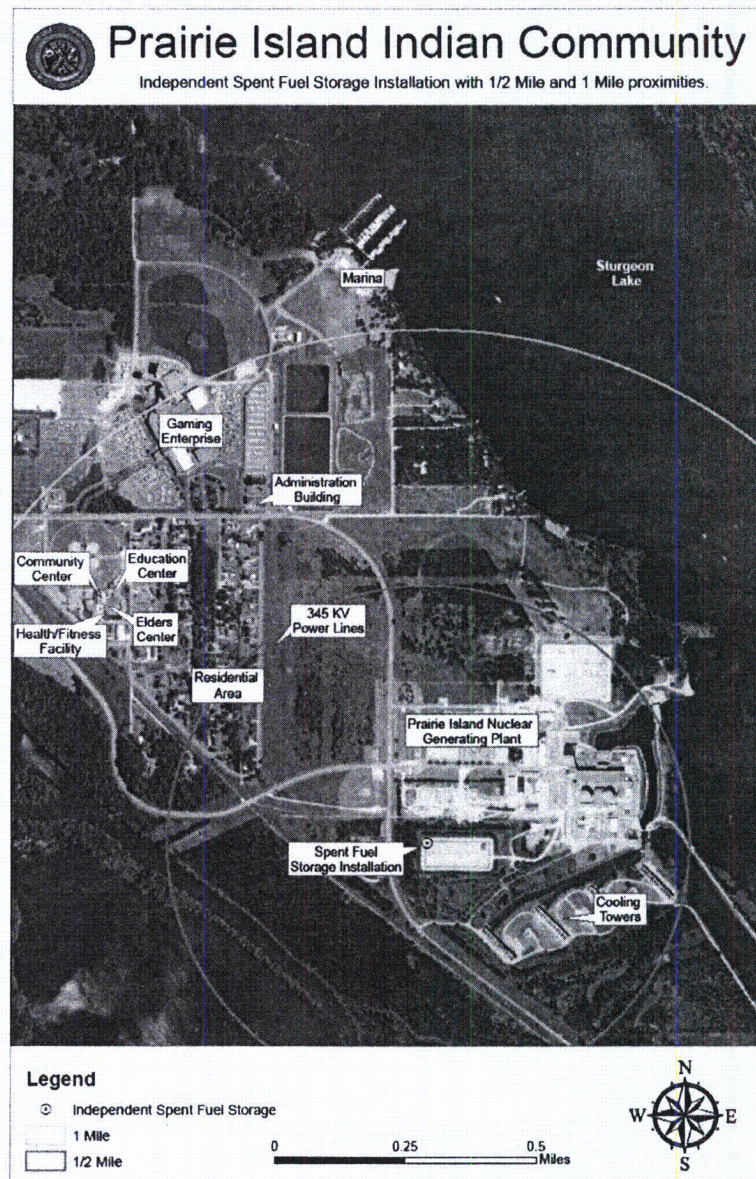


Figure 2. Proximity of the PINGP and ISFSI to the Prairie Island Indian Community

The PINGP has been online since the early 1970s and will operate at least until 2034 (both operating licenses were renewed in June 2011 for an additional 20 years). If the PINGP is decommissioned in 2034, the spent fuel is estimated to require a total of 98 casks – approximately 2500 tons of spent nuclear fuel. Xcel has applied for a 40-year license extension for the ISFSI because its initial 20-year license is set to expire in 2013.

The PINGP and ISFSI are two of the most important issues for the Prairie Island Indian Community. The tribe was a Cooperating Agency for the development of the PINGP Unit 1 and 2 reactor license renewal EIS (license renewal approved by the NRC June 2011) and is currently a Cooperating Agency for the development of an Environmental Assessment (EA) for the pending 40-year ISFSI year license renewal application.

Although we are pleased that the NRC will be evaluating the environmental impacts of on-site nuclear waste storage, we remain concerned that this is just yet another update to the Waste Confidence Decision (WCD) and Temporary Storage Rule (TSR), with a conclusion that brings us no certainty or assurance that waste will ever leave Prairie Island. It bears reminding that when the ISFSI at Prairie Island was initially proposed in the early 1990s, it was to be *temporary* measure to keep the plant running and plant personnel working until Yucca Mountain could be opened. Our Tribe and others expressed concerns about the *long-term* storage of spent fuel in dry casks and the possibility that the waste would never leave Prairie Island. We were assured that the ISFSI was to be an *interim* or *temporary* solution until the national geologic repository at Yucca Mountain could begin accepting waste.

While we do recognize that the WCD and TSR do not explicitly *authorize* individual licensing actions (i.e., reactor and ISFSI), it is important to note that the WCD and TSR *allow* for *indefinite* on-site storage of spent nuclear fuel. During the process to relicense the PINGP Unit 1 and 2 license renewal, many commenters raised the issue of the environmental impacts of indefinite on-site storage of spent nuclear fuel in the EIS scoping process. The response from the NRC was that on-site storage of spent nuclear was a Category 1 issue (i.e., generic to all nuclear power plants) that would not be evaluated in the EIS for reactor renewal and that the existence of the WCD and TSR meant that waste could safely be stored on-site and that there was *reasonable assurance* that waste would not be stored on-site forever.

Recent events tell us that there is no assurance whatsoever that waste will ever leave Prairie Island or any site (in spite of an updated WCD and TSR). The WCD and TSR have been updated or revised over the last 20 years to reflect changing realities. Each subsequent revision or update changes the date by which a repository will be available or increases the amount of time spent nuclear fuel can “safely” remain on-site beyond the licensed life of a plant. In 2010, after 25 years of study and \$25 Billion spent on Yucca Mountain, the Administration declared that we can do better and we must start over. Toward that end, the Blue Ribbon Commission (BRC) on America’s Nuclear Future was established in 2010 to develop a new path forward. The BRC’s work culminated in a January 2012 report that laid out several recommendations, including the need for a geologic repository. The Department of Energy (DOE) was to have developed an implementation plan (for the BRC’s

recommendations) by July 2012. It has been almost one year since the BRC released its report and recommendations with no implementation plan from the DOE.

This history is relevant because the WCD and TSR are inextricably linked to the development of a national repository. The responsibility for developing the repository, however, rests with a different federal agency, which may or may not receive adequate appropriations. Given this past history, how can anyone reasonably believe that spent nuclear fuel will ever leave reactor sites? What assurances do we have that once we start anew to develop a geologic repository, as the BRC recommends, that future a Congress will fully fund the project or some future President won't scrap that process altogether by claiming we can do better?

Generic EIS versus Site-Specific EIS

According to the FRN, the EIS "will evaluate the environmental impacts of the storage of spent nuclear fuel after cessation of reactor operations." Moreover, the FRN states that the analysis will include three possible scenarios: until a repository is made available at the middle of the century, the end of the century or if no repository is available by the end of the century. And finally, we are told that the EIS will not consider site-specific issues or concerns.

The National Environmental Policy Act (NEPA) requires that federal agencies consider every significant aspect of the environmental impact of an action *before* proceeding with it (i.e., take a hard look at potential environmental impacts). We fail to see how the "hard look" goal can be met by not evaluating site-specific issues or concerns.

The environmental and human health impacts of failing to secure permanent disposal will result from the long-term storage of spent nuclear fuel in either the spent fuel pool or dry casks. These impacts will stem from accidents or releases from casks (which vary from site to site) and pool leaks or fires. Since the environment is unique at each site, how can a generic EIS possibly capture unique site-specific features, such as geology, soil conditions, water features, elevation, population densities around the site, and economic costs and benefits?

In vacating the 2010 decision and rule, the Court of Appeals identified three specific deficiencies in the analysis that will be evaluated as part of the WC EIS. We offer comments on each of the three deficiencies.

1. The Court held that the Commission did not evaluate the environmental effects of failing to secure permanent disposal when the Commission concluded that permanent disposal will be available "when necessary."

The NRC plans to evaluate this possibility by including three scenarios—a mid-century repository, an end of century repository, and no repository—in the EIS. As stated above, the scenarios will evaluate the environmental effects generically.

In our view, "failing to secure permanent disposal," means that the spent nuclear fuel is on-

January 11, 2013

Page 6

site (either in the pool or in dry casks) and that the environmental effects of that failure would be different for each site because the affected environment is different for each site. Each reactor site has distinct environmental characteristics that were evaluated as part of its original licensing basis. Not every dry cask storage site uses the same cask design. The environmental effects of finite (50 or 100 years) or indefinite spent fuel storage therefore must be evaluated on site-specific basis.

In the case of the Prairie Island ISFSI, there will be 98 casks on-site once the PINGP has been decommissioned. Currently 29 casks are filled with low burn-up fuel. Xcel has yet to load a cask with high burn-up fuel, but is scheduled to load six (6) casks in 2013. As we understand it, there are some very serious potential issues associated with the long-term storage of high-burn-up fuel, such as embrittlement, stress corrosion cracking, delayed hydride cracking, metal fatigue and other types of degradation that could compromise cladding integrity and structural integrity of cask components that have yet to be resolved. Will the NRC's generic EIS assume that all pools and casks contain high burn-up fuel?

How will the generic EIS evaluate radiological releases stemming from accidents? What if fuel has be transferred to a second cask? What if there is no pool in which to transfer fuel to a different cask? Will a generic cask, with high or low burn-up fuel, be assumed to be in use? What about the number of casks? What about the health risks to people living nearby? In the case of the Prairie Island ISFSI, our people are 600 yards from the ISFSI. We have no assurance that there will be any type of pool once the plant is decommissioned. There are stand alone spent fuel storage facilities in the county that have no pools. How will these factors be included in the generic EIS?

EISs also must contain an environmental justice analysis, that is, an analysis of impacts to determine any disproportionately high and adverse human health or environmental effects to low-income, minority, and tribal populations as a result of implementing the proposed action. Since an environmental justice analysis is, by its very nature, site-specific, we would like to know how a generic EIS could possibly capture the environmental justice effects of failing to secure a national repository.

A "one size fits all" approach will not work in this case. The environmental effects of failing to establish a repository (i.e., the spent nuclear fuel remains on site) will vary from site to site depending on the affected environment.

2. The Court concluded that the Commission failed to properly examine the risk of spent fuel pool leaks associated with the storage of spent fuel on site for 60 years after the expiration of a plant's operating license in a forward-looking fashion.

We fail to see how pool leaks (resulting from long-term spent fuel storage) can possibly be evaluated generically. The risks and consequences of pool leaks will be different for each site, depending upon a number of factors, including local hydrology, depth to groundwater, proximity to surface waters, and the use of ground or surface waters as a community water

supply (i.e., risk to human health). These very site-specific issues cannot be evaluated generically.

3. The Court concluded that the Commission failed to properly examine the consequences of spent fuel pool fires associated with the post-licensed-life storage of spent fuel.

Again, the consequences of a spent fuel fires will be different for each site, depending on the type of fuel used, whether there are properly trained responders, potential radiological releases, the populations near the plant, and resultant economic impacts from the radiological releases (from the spent fuel fire).

The FRN notice also stated that the EIS scoping process would be used to accomplish a number of milestones (i.e., proposed action, the scope, other resources, etc.). Toward that end, we offer the following comments and recommendations.

Proposed Action and Purpose and Need

According to the FRN, the scoping process for the draft EIS will be used to “define the proposed action that is to be the subject of the EIS.” This seems backward. It is the responsibility of the lead federal agency undertaking the development of the EIS to determine the proposed action. It should not be left up to the loudest voices to determine what the proposed action should be. There are those who will wish to define the proposed action in the narrowest possible terms, while others will seek the broadest interpretation. We understand that the NRC will use NUREG-1748 to some degree in the development of the EIS. According to NUREG-1748, the proposed action section of the EIS should also describe “the desired outcome or goals of the proposal.” It is not clear what the desired outcome or goals are, other than to satisfy the US Court of Appeals’ remand. This WCD EIS presents a real opportunity to the NRC to take a hard look at the very real environmental effects of not having a national repository (a very real possibility given political and societal attitudes towards nuclear waste disposal).

The proposed action is key to all other aspects of the EIS, including the scope, which is usually defined by the proposed action (such as a licensing action) and available NRC guidance to determine what is in or out of scope.

In addition, the purpose and need of the EIS should be defined by the NRC, not stakeholders. Questions such as why the action is needed or how the WCD EIS will be applied in licensing actions are best determined by the lead federal agency.

The approach described in NUREG-1748 also requires a description of the “affected environment” such as land, water resources, ecology, historic and cultural resources, socioeconomics, and environmental justice in the EIS. How will the affected environment be defined or described in the generic WC EIS?

In this case, there appears to be no specific guidance for developing the WC EIS and, to some extent, the comments submitted in response to the FRN will be used to guide the NRC in developing the WC EIS. In our view it doesn't appear that NUREG-1748 really fits in this case. As discussed further below, we recommend that the NRC also evaluate NUREG-1437.

Identify any environmental assessments and other EISs that are being or will be prepared that are related to but are not part of the scope of the EIS being considered

In 2011 the NRC initiated the Long-Term Waste Confidence Update EIS (ML11340A141). The NRC held some public meetings and webinars on the process. Comments on the NRC report were due on February 17, 2012; the NRC should evaluate the public comments and comment letters submitted as part of that EIS process, which is now on hold pending the completion of the WC EIS.

In a related action, in May 2012 the NRC released the report, "Identification and Prioritization of the Technical Information Needs Affecting Potential Regulation of Extended Storage and Transportation of Spent Nuclear Fuel" (ML12130A189). Comments were due on July 2, 2012. This report is important to the WC EIS in that it is a technical evaluation of the long-term use of dry casks, including an analysis of technical needs and knowledge gaps. This is especially important as the risk to the environment and human health would stem from accidents or leaks from the long-term use of dry casks or long-term pool storage. The foundation of assurance (that waste can be safely stored on-site) is the long-term performance of the dry casks. Without a complete technical evaluation of the dry casks, we have no idea whether they will perform as expected for another 50 years, 100 years or an indefinite period of time.

Identify other environmental review and consultation requirements related to the proposed action

The FRN does not mention how the NRC plans to consult with any impacted federally recognized tribes. Federally recognized Indian tribes have an expectation that they will be consulted on a government-to-government basis. Tribes are not the public and should not be treated as such. Please do not publish a notice in the Federal Register and expect tribes to respond.

Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, states: the United States has a unique legal relationship with Indian Tribal governments; the United States recognizes the right of Indian Tribes to self-government and tribal sovereignty; each agency shall have an accountable process to ensure meaningful and timely input by tribal officials in the development of regulatory policies which affect the Tribe.

Simply put, the NRC has an obligation to consult with federally recognized Indian tribes on a government-to-government basis before decisions are made. The Waste Confidence EIS does

have tribal implications — *de facto* approval of indefinite on-site spent nuclear fuel, next to a federally recognized Indian tribe.

Executive Order 13175, signed by Presidents Clinton, Bush, and Obama, applies to all federal agencies, including the NRC. It is our view that the NRC must consult with PIIC regarding the waste confidence EIS (which tacitly approves indefinite on-site spent nuclear fuel storage). We expect a meeting with the Tribal Council and not just an invitation to attend a public meeting.

Indicate the relationship between the timing of the preparation of the environmental analyses and the Commission's tentative planning and decision-making schedule

The US Court of Appeals, in its June 8, 2012 decision vacating the Waste Confidence Decision and remanding for further proceeding, said nothing about a timeframe in which the EIS must be completed. Since the WCD and TSR have widespread licensing implications, we would like to see that the EIS be done carefully and thoroughly and not rushed through to meet some artificial 2-year time period. In our view, a 24-month review limits or constrains a thorough consideration of all possible ideas and options.

The schedule for the long-term update to the Waste Confidence Rule and related EIS indicated that a draft EIS would be available in 2017 and the final EIS and a final decision would be in 2018/2019. Furthermore, COMSECY-12-0016 (Approach for Addressing Policy Issues Resulting from Court Decision to Vacate Waste Confidence Decision and Rule) contemplated completing the EIS in 2017.

A review of recently completed reactor licenses (17) indicates that the review time ranged from 21 months to 76 months, with an average of 32.9 months. Taking out the outliers (45, 62, and 76 months) reduces the review time to 26.9 months. The NRC plans for an average review time of 24 (no hearing) to 30 (hearing) months. Regardless of the length it takes to complete the reactor license renewal, the licensee will still be allowed to operate as long as it is in timely renewal. It does not seem likely that a reactor license renewal will not be granted if the Waste Confidence EIS is not completed within 24 months.

As was stated in COMSECY-12-0016, the Waste Confidence Decision and Rule “undergirds agency licensing decisions on new reactor licensing, reactor license renewal, and ISFSI licensing” (and relicensing), it is crucial that the NRC the necessary time and get it right.

Alternatives to WC EIS

As we have stated above, we fail to see how a generic EIS can adequately evaluate the environmental effects of failing to establish a national repository. This is especially troubling to us as previously, the WCD and TSR have not allowed site-specific analyses of long-term waste storage impacts during licensing proceedings (i.e., reactor renewal and ISFSI renewals). For ISFSI renewals there is an environmental assessment process, although the scope is

January 11, 2013

Page 10

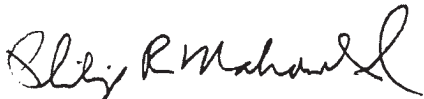
limited. We recommend that the NRC evaluate whether a tiered approach could be used for developing the WC EIS, where some issues might be generic to all pools or sites and other issues would be site specific. This approach is used in reactor renewals, where certain issues have been identified as Category 1 or generic issues (to all plants) that warrant no further evaluation unless new and significant information is identified. Site Specific (or Category 2) issues are evaluated in the Supplemental EIS the NRC prepares as part of the relicensing process (see NUREG-1437).

By using a tiered approach, the NRC could develop a generic WC EIS that would later be supplemented in ISFSI licensing actions or reactor relicensing (in the case of pool storage) to evaluating the site-specific environmental impacts.

Some commenters have suggested that site-specific impacts (of failing to secure a national repository) are evaluated in other NEPA documents and that there is no need to do so in the WC EIS. That just is not true. As mentioned above, there is no analysis of spent fuel storage issues in EIS's for reactor license renewal. As well, the EIS's for ISFSI renewals contain no analysis of long-term spent nuclear fuel storage issues. This is where the WCD and TSR have been the most effective. By stating that there will be a geologic repository, either by date certain or "when necessary" and that spent nuclear fuel can safely be stored on-site for 30 or 60 years beyond the licensed life of the plant, the WCD and TSR have effectively prevented any analysis of the environmental effects of long-term spent fuel storage (i.e., failing to secure a national repository). Without a site-specific WC EIS we will never know that the real environmental effects of failing to secure a repository are. This can change with now. We urge the NRC to consider site-specific environmental effects.

As one of the Petitioners in the challenge to the WCD and TSR, which resulted in the remand to the NRC, we appreciate the opportunity to provide comments on this important issue. We hope you find our comments and suggestions helpful as you proceed with this important endeavor. As the closest community in the United States to a spent fuel storage facility, there is no more important issue to us.

Sincerely,



Philip R. Mahowald
General Counsel
Prairie Island Indian Community

COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES
OF NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE,
AND THE PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR
REGULATORY COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC
ENVIRONMENTAL IMPACT STATEMENT AND PROPOSED RULE

EXHIBIT E

EXPERT REVIEW OF ANALYTIC ASSUMPTIONS AND METHODS APPLIED IN THE NRC'S SEPTEMBER 2013 DRAFT WASTE CONFIDENCE GEIS

Robert E. Unsworth and Maura Flight

Industrial Economics, Incorporated
2067 Massachusetts Avenue
Cambridge, MA 02140

I. AUTHOR QUALIFICATIONS

Robert Unsworth

Mr. Unsworth has 27 years of experience conducting complex cost and benefit analyses of Federal programs that impact our Nation's natural resources and the environment. He is currently a Principal and Director of Industrial Economics, Incorporated, a 135-person consultancy founded in 1981 and located in Cambridge, Massachusetts. He previously served as the firm's COO and President from 2002 to 2011. He holds a M.F.S. from Yale University, where his studies focused on economic analysis of environmental and natural resource problems, and a B.S. in Forestry from the State University of New York.

As a consultant, his clients have included the U.S. Department of Justice, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of the Interior (DOI), the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Energy, other Federal agencies, various U.S. states, tribal governments, the New York State Energy Research and Development Authority (NYSERDA), the Electric Power Research Institute (EPRI), as well as other non-governmental organizations, private companies, and law firms.

Mr. Unsworth has authored several guidance manuals for Federal agencies on the application of environmental cost-benefit analysis, economic benefits assessment, and environmental damage assessment. He has provided economic support and expertise to several major Federal EISs, including an assessment of manatee protection measures, Coast Guard regulations on marine spill response preparedness, regulations on the management of National Park Service lands, and restoration planning in the context of natural resource damage assessment. He recently directed an assessment for the Department of the Interior's Bureau of Ocean Energy Management (BOEM) of the impacts of oil and gas development in Federal waters, including development of a model and information that will be used to support BOEM in its efforts to comply with NEPA. All of these contracts involved issues of considerable public scrutiny.

In 2011 he lead a team that won a competitive award to conduct a \$2 million EIS/Regulatory Impact Analysis for the DOI associated with a proposed rule designed to reduce the environmental impacts of coal mining. This effort included assisting DOI in understanding the requirements of NEPA, including the selection and specification of appropriate alternatives, establishment of the regulatory baseline, and forecasting the potential long-term impacts of the decision. He has analyzed Federal policies and regulations that address low probability, high consequence events, such as assessing the potential consequences of oil well failures in the Gulf of Mexico in support of Federal drilling lease decisions, and served on the National Academies

Transportation Research Board's panel to establish an approach to evaluate the risks of catastrophic oil spills from tanker vessels.

Mr. Unsworth has testified as an economist before the California Energy Commission, the Vermont Public Service Board, and in Federal Court.

Maura Flight

Ms. Flight is a Senior Associate at Industrial Economics, Incorporated with 12 years of experience applying her natural and social science background to challenging economic and environmental problem solving. She applies this expertise on analysis of tradeoffs between economic activities and protection of the environment and human health in the context of natural resource management, water and air quality regulation, and conservation planning. Her current work focuses on issues related to valuing changes in ecological risk. Ms. Flight holds a M.S. in Economics and a B.S. in Environmental Science from Rensselaer Polytechnic Institute. She is a member of the Association of Environmental and Resource Economists.

Ms. Flight has developed economic analyses of many complex and politically-charged Federal rulemakings for a variety of clients, including the USEPA, Department of Homeland Security (DHS), NOAA, and agencies of the Department of Interior. The majority of this work was the result of competitive awards. In addition to providing analytic support, Ms. Flight has advised her clients on Federal guidance and best practices in complying with relevant regulations and Executive Orders for the conduct of economic and environmental analysis, including NEPA. She has authored a number of white papers for Federal agency clients, including appropriate methods for discounting economic costs and benefits of regulatory activities. She has contributed to more than a dozen regulatory analyses that were supported by U.S. Office of Management and Budget (OMB) review.

Ms. Flight has extensive experience developing Environmental Impacts Statements according to NEPA regulations and Council on Environmental Quality (CEQ) guidance. She provided analytic support for a programmatic EIS of the DHS' proposed security program along the northern border with Canada, evaluating impacts of alternatives designed to secure the border on socioeconomic conditions and land use at both site-specific and national scales. As a programmatic EIS, this effort faced similar challenges to the Waste Confidence GEIS in requiring assessment of impacts across a wide variety of socioeconomic and geographic contexts while demonstrating attention to particular sites where the program may generate relatively large impacts on communities.

As part of a Regulatory Assessment for DHS, Customs and Border Protection's (CBP's) proposed Importer Security Filing and Additional Carrier Requirements, Ms. Flight conducted a quantitative uncertainty analysis with respect to the total compliance costs and social welfare losses associated with the rule. This involved developing the range of values and probability distributions of key variables, and implementing a Monte Carlo simulation model to estimate probabilistic estimates of the costs of the rule.

Ms. Flight is also currently providing support for a NEPA EIS to evaluate environmental consequences of national-level coal mining regulations. This effort has included advising the Office of Surface Mining and officials at the DOI on the state-of-the-science for evaluating

environmental impacts, including methods to value effects of large-scale environmental events, such as climate change.

II. BACKGROUND

In December 2010, the Nuclear Regulatory Commission (NRC) published an updated “Waste Confidence” decision rule and accompanying National Environmental Policy Act (NEPA) Environmental Assessment (EA). The “Waste Confidence” decision refers to the NRC’s determination that: (1) spent nuclear fuel can be stored safely and without significant impacts for at least 60 years beyond the licensed life for a reactor; and (2) there is reasonable assurance that sufficient mined geologic repository capacity will be available to dispose of spent fuel when necessary. The NRC codified this determination (10 CFR 51.23), establishing that further discussion of environmental impacts of spent fuel storage is not required for any environmental reports prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor (including environmental documents under NEPA).

In June 2012, the D.C. Circuit Court of Appeals ruled that the 2010 Waste Confidence decision did not satisfy the NRC’s NEPA obligations, in particular citing that NRC: (1) did not calculate the environmental effects of failing to secure permanent storage; and (2) failed to properly examine dangers and consequences of storing spent fuel at nuclear plants for 60 years after the expiration of a plant’s license (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)).

As a result of this ruling, the NRC published a new Proposed Rule and accompanying NEPA Draft Generic Environmental Impact Statement (Draft GEIS) in September 2013 to address the deficiencies identified by the Court (78 FR 56776). Specifically, the NRC proposes to continue to generically address the environmental impacts of continued spent fuel storage by determining, based on the evaluation in the GEIS, that it is feasible to safely store spent nuclear fuel beyond the licensed life for operation of a reactor and to have a mined geologic repository within 60 years following the licensed life.

The objective of the Draft GEIS is to “examine the potential environmental impacts that could occur as a result of the continued storage of spent nuclear fuel (spent fuel) at “at-reactor” and “away-from-reactor” sites until a repository is available (Draft GEIS, September 2013, pg. iii).” Importantly, *the Alternatives contemplated in the Draft GEIS are not focused on differing storage scenarios for spent fuel but instead revolve around the NRC’s approach to complying with NEPA in evaluating environmental impacts*, as follows:

- **Proposed Action:** Issue a rule (10 CFR 51.23) that generically addresses the environmental impact of continued spent fuel storage by incorporating into the rule the conclusions of the GEIS. Site-specific NEPA analyses would then not need to consider environmental impacts of continued storage.
- **Alternative 1. No Action:** Take no action to generically address the environmental impacts of continued storage and, instead, conduct site-specific, individual EAs or EISs of continued storage in licensing reviews.
- **Alternative 2. The GEIS-Only Alternative:** Prepare GEIS to generically analyze environmental impacts of continued storage. There would be no Waste Confidence

Rule, so information from the GEIS would then be used to support site-specific licensing reviews.

- **Alternative 3. Policy Statement Alternative:** NRC would issue a policy statement that expresses intent to either incorporate GEIS findings, or conduct a site-specific evaluation for each licensing action.

The Draft GEIS evaluates environmental impacts under each Alternative under varying scenarios regarding when a repository for spent fuel may be available -- short-term (60 years), long-term (160 years), and indefinitely unavailable. In general, the Draft GEIS concludes that most categories of environmental impacts are “small” across all timeframes considered. The NRC defines “small” impacts as follows: “[E]nvironmental effects are not detectable or are so minor that they will neither destabilize nor noticeably alter any important attribute of the resource (Draft GEIS, pg. 1-23).” Furthermore, *because the analysis makes the assumption that the approach to managing spent fuel does not vary across the Alternatives described above, the Draft GEIS concludes that the environmental consequences do not vary across Alternatives.*

III. FOCUS OF IEC’S REVIEW

The D.C. Circuit Court of Appeals endorsed the NRC’s use of a generic EIS under NEPA, specifying that a generic approach is appropriate “....to examine on-site risks that are essentially common to all plants.” (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), pg. 16) Our review of the Draft GEIS focuses on: a) *whether the Draft GEIS sufficiently demonstrates that risks are essentially common to all plants*, warranting a generic evaluation of continued storage; and b) *whether the Draft GEIS findings are supported by a “hard look at environmental consequences,”* as required under NEPA (*Natural Resources Defense Council v. Morton*, 458 F.2d 827, 838 (D.C. Cir., 1972)). Toward this end, we consider the framework for, and the analytic assumptions and methods employed within, the Draft GEIS to evaluate environmental impacts of continued spent fuel storage. We conclude that the Draft GEIS fails to take a “hard look at environmental consequences” as would be expected of such a decision document. In particular, the document assumes away any site-specific differences in risks associated with continued storage of spent fuel and fails to provide sufficient basis for the conclusion that the environmental impacts are likely to be “small.”

IV. SUMMARY OF KEY CONCLUSIONS

It is our professional opinion that the Draft GEIS fails to adequately support its findings that the environmental impacts of continued storage of spent nuclear fuel at at-reactor and away-from-reactor sites until a repository is available are “small” across all timeframes, and that the environmental consequences do not differ across Alternatives. The NRC structures the Proposed Action and the Alternatives such that they are entirely disassociated from the consideration of environmental consequences in the Draft GEIS. As noted above, the NRC’s Proposed Action is to rely on the information in the GEIS to codify that continued storage is safe until a repository is available. An appropriate framing of Alternatives to the Proposed Action may therefore include different methods of managing spent fuel and mitigating environmental impacts in order to support a conclusion that it is safe. The only variation across the Alternatives, as they are defined

by the NRC, however, is with respect to the level of administrative effort to comply with environmental analysis and reporting requirements (e.g., NEPA).

Even in the case that the NRC's framing of the Alternatives around developing generic or site-specific NEPA documents were meaningful, the evaluation of environmental consequences in the Draft GEIS provides no real analysis of the relative benefits of across these Alternatives. Specifically:

- A. The Draft GEIS fails to demonstrate that site-specific evaluations would not result in different findings than the GEIS with respect to environmental consequences. This demonstration is required to support the decision to follow a GEIS approach with no issues identified as requiring site-specific analysis.
- B. The Draft GEIS does not properly evaluate the cumulative risks of potential low probability but high-consequence events and therefore does not support its conclusions that associated environmental impacts are "small" across all timeframes considered.
- C. The Draft GEIS only considers environmental impacts of limited storage scenarios and does not specify whether, and in what context, additional scenarios may be considered at a given site or in general. In short, while the Draft GEIS appears to conclude that site specific factors can be considered at a later time, the overall conclusion is that no such site specific analyses would be required with respect to environmental impacts of continued storage.

V. DISCUSSION

The remainder of this review details the rationale for each of our key conclusions.

- A. THE DRAFT GEIS FAILS TO DEMONSTRATE THAT SITE-SPECIFIC EVALUATIONS WOULD NOT RESULT IN DIFFERENT FINDINGS THAN THE GEIS WITH RESPECT TO ENVIRONMENTAL CONSEQUENCES. THIS DEMONSTRATION IS REQUIRED TO SUPPORT THE DECISION TO FOLLOW A GEIS APPROACH WITH NO ISSUES IDENTIFIED AS REQUIRING SITE-SPECIFIC ANALYSIS.

As noted above, the D.C. Circuit Court found that the 2010 Waste Confidence decision did not adequately comply with NEPA by not calculating the environmental effects of failing to secure permanent storage, and in not properly examining future dangers and key consequences of continued storage (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012)). As a result, it is incumbent upon the NRC to meaningfully and adequately calculate and examine environmental impacts of continued storage across multiple timeframes in the Draft GEIS.

In response to the Court decision, the NRC incorporated additional timeframes (long-term and indefinite) into its Draft GEIS, and included additional discussion of high-consequence events (e.g., spent fuel pool fires, earthquakes, and acts of terrorism). This additional discussion in the 2013 Draft GEIS is, however, entirely ineffectual and plays no role in any real analysis.

- 1. *The framework for and selection of Alternatives in the Draft GEIS does not provide a legitimate basis for evaluating environmental consequences.*

The Draft GEIS assumes that environmental impacts do not vary across Alternatives. Specifically, the NRC asserts that environmental impacts of continued storage scenarios will be the same regardless of whether the evaluation method is site-specific or generic. The conclusion that is reached in the Draft GEIS follows from this assertion: environmental impacts are not affected by the method of evaluation (i.e., whether generic or site-specific). In other words, the NRC asserts that the extent to which accidents at plants affect people and the environment is not influenced by the way NRC evaluates them. Importantly, however, the NRC's and the public's understanding of the nature and magnitude of impacts at a given site may be influenced by the method of evaluation. By not recognizing and evaluating the potential value of more information (e.g., on relative risk and socioeconomic context), the NRC assumes away any benefits of the Action Alternatives that would call for site-specific analysis. For example, as detailed later in this review, the probability of a seismic event or terrorist attack during the continued storage timeframes is variable by plant site. Site-specific information on the relative probability of such an accident and event, combined with information on the vulnerable population at the site, is required for an adequate evaluation of environmental impacts of such events. Because the Alternatives evaluated in the GEIS revolve simply around the decision to conduct or not to conduct site-specific analyses (as opposed to a real consideration of storage options), and the NRC simply assumes no benefit to integrating site-specific information, the consideration of environmental impacts in the Draft GEIS is rendered irrelevant to the selection of an Alternative.

This flawed framing of Alternatives in the Draft GEIS precludes the GEIS from taking a “hard look” at environmental consequences. There are multiple issues associated with this flawed decision framework of the Draft GEIS:

- First, as noted above, as the NRC frames Alternatives and applies assumptions such that the evaluation of environmental impacts does not vary across Alternatives, the entire discussion of environmental impacts in the report serves no purpose. The D.C. Circuit Court would not have vacated the NRC's 2010 Waste Confidence Decision due to improper analysis of environmental effects if it didn't intend for the NRC to properly consider these potential effects in weighing relative impacts of Alternatives. The evaluation of environmental consequences, and identification of appropriate mitigation strategies are a central purpose of NEPA. As described in the regulation, the evaluation of environmental consequences requires discussion of means to mitigate adverse environmental impacts (40 CFR 1502.17). As it is, the additional information provided in the Draft GEIS to address environmental consequences is entirely symbolic and does not weigh into decision-making regarding the selection of an Alternative or identification of potential mitigation strategies across Alternatives or plant sites.
- Second, if the environmental impacts are assumed to be the same across Alternatives, the level of environmental effect (small, moderate, or large) does not influence selection of an Alternative. Even if the Draft GEIS identified a large or very large environmental impact (e.g., of postulated accidents), there would be no clear implication on NRC decision-making regarding continued storage under the current decision framework. This is because the impacts would be large regardless

of whether they codify the findings of the Draft GEIS (Proposed Action) or undertake a site-specific analysis (No Action and Policy Statement Alternatives). The NRC asserts that, because a GEIS approach is more cost-effective administratively and there is no change in environmental consequences, development of a GEIS is the preferred approach. *This rationale could be applied regardless of the findings with respect to the level of environmental consequences*, makes meaningless the evaluation of environmental consequences and, and circumvents the purpose of evaluating environmental impacts of alternatives under NEPA.

This rationale also calls into question whether the Alternatives evaluated by NRC in the Draft GEIS encompass the full range of reasonable alternatives, given that the benefits under the NRC's Alternatives do not vary. The NEPA regulations require that an EIS examine "all reasonable alternatives" to the proposed action (40 CFR Part 1502.14). "Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant."¹ NRC's structuring of the Alternatives such that environmental consequences of continued storage do not affect decision-making regarding the selection of an Alternative (as the consequences do not vary across Alternatives), indicates that the NRC avoided its responsibility to assess environmental consequences of the proposed action.

- Third, while we understand the NRC's point that the actual impact of an activity on the environment or economy does not change based on the method used to evaluate it, this is not the appropriate way to frame the question in comparing alternatives within NEPA. The appropriate framing of that inquiry would be whether the NEPA evaluation method for a particular activity (e.g., site-specific or generic) affects the level and quality of analysis such that it could change decision-making. The Draft GEIS does not address this question, assuming away the need to investigate. For example, more information, as obtained through site-specific evaluations, would support identification and implementation of the best approaches to mitigation. Site-specific information on locations of potentially affected populations, utility structures, and transportation infrastructure could improve mitigation strategies such as preparation and planning for evacuations at a given site in the case of a severe event. The Draft GEIS does not contain or consider such site-specific information that may be used to guide analysis of consequences and mitigation strategies.

In addition, the limited attempt to distinguish Alternatives through comparing costs and benefits in Chapter 7 of the Draft GEIS is meaningless. Because the NRC determines in the Draft GEIS that the environmental consequences are not variable across Alternatives, the costs that do differ are limited to administrative costs (e.g., to develop site-specific NEPA

¹ Executive Office of the President, Council on Environmental Quality. March 1981. Memorandum to Agencies: "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations."

reviews, rulemaking costs, policy statement costs, and costs to develop the GEIS). Such administrative costs are not typically the focus of NEPA analyses. Furthermore, the manner in which these costs were evaluated is inappropriate. While the Draft GEIS states that the costs of each Alternative are projected from fiscal year 2015 through fiscal year 2044 (Draft GEIS, pg. 7-2), the actual calculations of costs also include those incurred in years 2013 and 2014 to develop the GEIS for the three Action Alternatives (this cost is not relevant to the No Action Alternative). These past costs (referred to as “sunk” costs) can no longer be avoided and, therefore, should not be included in the document.

2. *Even if the framework used were correct, the Draft GEIS provides no evidence for the assertion that environmental consequences do not vary across Alternatives.*

The NRC states that environmental impacts of continued storage scenarios will be the same regardless of which of the Alternatives described above is selected. The rationale provided is that because, under each Alternative, the NRC would analyze the environmental impact of continued storage (either site-specific or generically), the Alternatives provide for the same level of environmental protection (Draft GEIS, pg. xxvi, lines 5-11). Limited discussion is offered in the Draft GEIS to support this assertion; in fact, *elements of the document suggest that site-specific information could improve decisions related to continued storage*, as described below.

The NRC’s criteria for determining that a generic analysis is appropriate are, in this case, flawed. The rationale provided by NRC is that continued storage of spent fuel is a generic activity that is similar for all commercial nuclear power plants and storage facilities and, therefore, a generic analysis is an appropriate method of evaluating the environmental impacts of continued storage (Draft GEIS, pg. xxiv). The Court’s standard for a generic evaluation is quite different, however, specifying that a general analysis would be sufficient, “...to examine on-site risks that are essentially common to all plants.” (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), pg. 16) Here, the Court describes that the appropriate comparison across sites to justify a generic analysis is the *risk*, whereas the NRC relies on a comparison of fuel-handling activities.

While the design and regulation of continued storage facilities and activities may be similar across sites, the affected environment, and therefore relative resources at risk due to a severe event, may differ. For example, the setting of a given power plant, including its proximity to people, development, economic activities, and ecological and cultural resources, is an important consideration in evaluating environmental consequences of continued storage. Given this variation across sites, the public will likely raise site-specific issues associated with continued storage during licensing decisions that will need to be addressed. The GEIS does not include sufficient information to address concerns regarding site-specific risks and associated mitigation strategies, thus limiting its usefulness as a generic evaluation.

An unequivocal example of the site-specific nature of environmental consequences considers the effects of postulated accidents or catastrophic events across sites. Environmental consequences of accidents and events in the Draft GEIS are calculated in part based on human health and mortality effects (as described in Appendix F), which are directly related to the magnitude of the population exposed. However, the Draft GEIS includes only limited

discussion of the variability across sites with respect to the number of people residing in proximity to the plants.

The Draft GEIS states that the population density for a 50-mile radius surrounding more than 50 percent of the plants is fewer than 200 persons per square mile. In contrast, the largest population density, surrounding Indian Point Nuclear Generating Station in Westchester County, New York, is an order-of-magnitude greater than this, with 2,138 persons per square mile within the 50-mile radius (Draft GEIS, pg. 2-4). The consequences of a catastrophic event would therefore be measurably greater at the Indian Point site than a rural site due to the size of the population exposed.

The Draft GEIS identifies another example of the site-specific nature of impacts of continued storage. As described further below, following the earthquake and tsunami incident at the Fukushima Dai-ichi nuclear power plant in Japan, the NRC requested that all U.S. plants identify and address vulnerabilities and adequacies of monitoring and maintenance procedures, and re-evaluate the flooding and seismic hazards of the plants (Draft GEIS, pg. 2-11). This example indicates that the NRC does not have all of the information it requires to determine that environmental consequences are small across Alternatives, and that site-specific information is imperative to properly evaluate and address safety concerns and environmental impacts.

According to the NRC's framing of Alternatives, under the No Action Alternative or Policy Statement Alternative, a site-specific evaluation of continued storage would weigh specific issues or vulnerabilities at a given site (such as discussed in these examples); on the other hand, the Proposed Action and GEIS-Only Alternatives would not. Therefore, even under the NRC's framework, the No Action or Policy Statement Alternative may lead to a different conclusion with respect to environmental impacts at a given site (e.g., large or moderate as opposed to small for postulated accidents), and promote consideration of appropriate site-specific management or mitigation needs. In this way, a site-specific approach to NEPA compliance has the potential to lead to improved environmental outcomes.

Because the Draft GEIS has not demonstrated either that: a) consequences, probability of those consequences, are therefore risks, are common to all plant sites; or b) that site-specific analyses would not lead to different outcomes than a generic analysis, the NRC has not supported its proposal to follow a GEIS approach to evaluating impacts of continued storage (with no issues identified as requiring site-specific analysis). While this does not necessarily indicate that all sites would require site-specific analysis, generically codifying that continued storage is equally safe across all sites across all time frames would effectively preclude the need for careful consideration of important site-specific conditions, vulnerabilities, and mitigation needs.

- B. THE DRAFT GEIS DOES NOT PROPERLY EVALUATE THE CUMULATIVE RISKS OF POTENTIAL LOW PROBABILITY BUT HIGH-CONSEQUENCE EVENTS AND THEREFORE DOES NOT SUPPORT ITS CONCLUSIONS THAT ASSOCIATED ENVIRONMENTAL IMPACTS ARE "SMALL" ACROSS ALL TIMEFRAMES CONSIDERED.**

Even if the framework applied in the GEIS were valid, and the conclusion that environmental benefits do not differ across Alternatives were supported, the approach used in the GEIS to describe the cumulative risks of low probability / high consequence events is flawed.

1. *The Draft GEIS provides very limited quantitative information on the probabilities or consequences of severe accidents or events associated with continued storage. Both pieces of information are required to support the NRC's conclusion that risk is "low" and therefore impacts are "small."*

The Draft GEIS states that severe accidents, such as spent fuel pool fires, would generate significant and destabilizing impacts (Draft GEIS, pg. 4-68). In weighing these environmental consequences, the NRC multiplies the expected impacts by the probability of occurrence of an initiating event (e.g., seismic events, loss of offsite power, cask drops, aircraft crashes, or tornado missiles). The Draft GEIS describes multiple types of accidents that may occur over the short-term, long-term, and indefinite time frames, but only includes a quantitative assessment of the risk of spent fuel pool fires from seismic events.²

For all other types of accidents and events (cask drops, earthquakes, floods, high winds, terrorist attacks, etc.), the NRC simply asserts that existing design criteria and safety requirements ensure environmental consequences would be small because licensees must demonstrate that either probabilities or consequences of events are sufficiently low. This Draft GEIS repeatedly points to the NRC's existing safety programs as evidence of low probabilities of accidents despite the following statement in the Court decision with respect to the 2010 Waste Confidence Decision:

"With full credit to the Commission's considerable enforcement and inspection efforts, merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period. This is particularly true when the period of time covered by the Commission's predictions may extend to nearly a century for some facilities." (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), pg. 17)

The evaluation of impacts of accidents and events associated with spent fuel storage should consider *both* the probability and consequences of events, as described by the D.C. Circuit Court:

"As should be clear by this point in our opinion, an agency conducting an EA generally must examine both the probability of a given harm occurring and the consequences of that harm if it does occur. Only if the harm in question is so "remote and speculative" as to reduce the effective probability of its

² The NRC concludes that the probability-weighted impacts from a spent fuel pool fire are small because the probability of an initiating event is extremely remote (Draft GEIS, pg. F-1). The NRC relies on two key pieces of information to support this conclusion. First, to determine the probability of an event, the NRC references the expected frequency of the most likely initiating events (i.e., seismic events or cask drops). The probability of these events occurring in a given year is based on information from previous NRC studies and varies between 5.8×10^{-7} (one chance in 1.7 million) to 2.4×10^{-6} (one chance in 417,000). Second, the NRC estimates the total economic cost per spent fuel pool accident of approximately \$57 billion (Draft GEIS, pg. F-4).

occurrence to zero may the agency dispense with the consequences portion of the analysis.” (*New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012), pg. 18-19)

In fact, the Draft GEIS has not demonstrated that the effective probability of accidents and events is zero. The Draft GEIS makes the assertion regarding low probabilities of all initiating events despite describing significant uncertainties and information gaps:

- With respect to sabotage or terrorist attacks, despite acknowledging that the probabilities are “numerically indeterminable,” the Draft GEIS nevertheless asserts they are “very low” (Draft GEIS, pg. 4-86).
- Following the March 2011 earthquake and tsunami incident at the Fukushima Dai-ichi nuclear power plant in Japan, the NRC requested that all U.S. nuclear power plants identify and address vulnerabilities and adequacies of monitoring and maintenance procedures, as well as re-evaluate the flooding and seismic hazards of the plants. The Draft GEIS states that it has not yet received these responses and so has not decided whether any existing licenses need to be modified, suspended, or revoked (Draft GEIS, pg. 2-11). Here, the Draft GEIS acknowledges that such vulnerabilities are site-specific, and that the NRC requires more information from licensees to better understand them. NRC’s conclusion that they can rely on a GEIS approach and conclude that probabilities are low enough to result in “small” impacts is not consistent with this acknowledgement.
- With respect to the safety of dry transfer systems (DTS) that would be required in the long-term and indefinite timeframes, the Draft GEIS describes that no such systems exist in the U.S. today. For the purposes of the Draft GEIS, however, the NRC references a design for a DTS developed in the 1990s. Based on this reference design, the NRC concludes that future DTSs will be safe to support continued storage with small environmental impacts (Draft GEIS, pg. 2-19). Considering a complete lack of experience developing a DTS in the U.S., the NRC provides limited evidence to support its assumption that such a system will be safe at all sites over indefinite continued storage timeframes. This underscores our findings that codifying continued storage will be safe over the timeframes considered in the Draft GEIS is premature, and that the Draft GEIS does not provide sufficient analysis to support its conclusion.

Despite insufficient information to demonstrate the probability of these events is effectively zero, the NRC dispenses with the need to evaluate consequences of certain types of accidents and events (the only impact estimates presented are for spent fuel fires, as described above). The Draft GEIS acknowledgement of insufficient information regarding the probabilities of particular high-consequence events should have led to the conclusion that codifying that environmental impacts of continued storage are small based on a generic assessment is premature and erroneous. Without information on both the probabilities and consequences of all postulated accidents and severe events, it is unclear how the NRC has the information to generically conclude that the product of the two is “small” across all sites and timeframes.

2. *The Draft GEIS does not evaluate the cumulative risk associated with the potential for multiple types of accidents and severe events over time.*

Furthermore, the Draft GEIS inappropriately evaluates probabilities and consequences on a per-year and per-accident or event type basis, separately concluding that the environmental impacts of each accident or event type are small in a given year. In a given year, however, the expected value of accidents/events would include the cumulative risk of all potential types of events (floods, earthquakes, terrorist attacks, cask drops, etc.). The Draft GEIS does not attempt to sum consequences across risk categories to determine the cumulative risk of multiple types of accidents and events (i.e., the combined probability and consequences of all potential disasters) in a given year.

The Draft GEIS also does not include any acknowledgement that risks are cumulative over time. Even in the case that the environmental impact of severe events in a given year is small, the Draft GEIS considers continued storage over long timeframes (160 years and indefinitely). In short, over longer time frames the cumulative probability of a high consequence event is greater than over shorter timeframes, and such calculations could have been easily performed.

3. *The Draft GEIS does not include discussion of the intergenerational impacts of high consequence events and associated discounting methods over the long-term and indefinite time frames.*

Because the Draft GEIS does not monetize environmental impacts of accidents or events, it does not include discussion of discounting impacts to estimate a present value over time. In the context of economic analysis, discounting is the process of determining the relative worth today of costs incurred in the future (i.e., calculating “present values” of future costs of benefits). In other words, discounting reflects people’s preference for receiving a dollar today over the promise of receiving a dollar ten years from now; the dollar received ten years from now is worth relatively less. In economic analysis, we apply a discount rate to future costs and benefits to reflect this preference.

The cost benefit analysis in section 7 of the Draft GEIS, which evaluates only administrative costs of the Alternatives over 30 years, applies discount rates of three percent and seven percent to evaluate future costs. For these types of costs over this short period of time, this approach is consistent with best practices for Federal agencies as described by the U.S. Office of Management and Budget (OMB).³ However, OMB’s guidance suggests considering lower but positive discount rates (economists commonly assume values as low as one percent) to evaluate costs and benefits over intergenerational timeframes, such as presented in the Draft GEIS for consideration of environmental impacts.⁴ Lower discount rates over long analytic time frames better reflect the public’s view of intergenerational tradeoffs (for example, in trading off current consumption for avoidance of future adverse events), and thus provide a more reliable measure of the present value benefit of such policies.

³ Office of Management and Budget, Circular A-4, September 17, 2003.

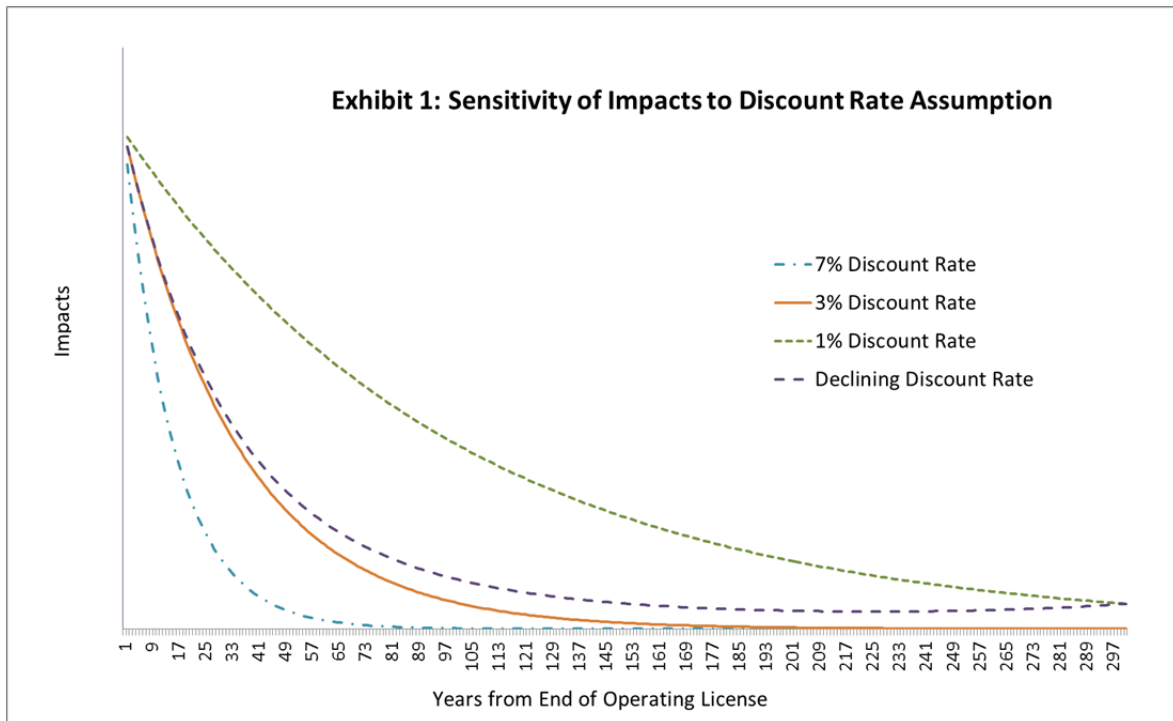
⁴ Ibid.

Specifically, in considering intergenerational costs or benefits, economists generally agree a lower or declining discount rate is appropriate. The lower or declining rate reflects the current population's consideration of the well-being of future generations, as well as increased uncertainty regarding the appropriate discount rate over longer time frames. A recent article by prominent economists highlights the importance of the selection of a discount rate for policies that have implications for centuries. This study specifically cites the relevance of policies related to the disposal of nuclear waste, and establishes the importance of relying on low or declining discount rates.⁵ For example, in the context of severe events, a lower discount rate applied over a long time frame reflects both ethical considerations of the current population with respect to the welfare of future generations, and increasing uncertainty over time about the level of risk for such events.

Exhibit 1 illustrates the significant difference in the cumulative present value costs of high-consequence events over long time frames depending on the discount rate assumption.⁶ That is, the points along the curve represent the present value costs of a future environmental impact each year into the future applying varying discount rate assumptions to reflect declining values of dollars over time. The vertical axis represents the present value impact and the horizontal axis is time. The area under each curve therefore reflects the total present value economic impact (summing across all years) between years 1 and 300. Consistent with the concept of discounting as explained, the present value cost of economic impacts declines in future years but is sensitive to the assumed rate of decline (i.e., discount rate). As suggested by the state-of-the-science, applying a declining discount rate, or a rate of one percent can result in present value impacts more than an order-of-magnitude greater than a seven percent discount rate. The declining and one percent discount rates appropriately incorporate consideration of the potential for distant future severe events in today's decisions.

⁵ Arrow, K., M. Cropper, C. Gollier, B. Groom, G. Heal, R. Newell, W. Nordhaus, R. Pindyck, W. Pizer, P. Portney, T. Sterner, R.S.J. Tol, and M. Weitzman. July 26, 2013. "Determining Benefits and Costs for Future Generations." *Science*: 341. Pg 349-350.

⁶ Absent an estimated magnitude for the risk (probability multiplied by consequence) in each year, as described above, this exhibit can only be illustrative; thus, the vertical axis is unitless. For the purposes of this demonstration, we model a declining discount rate assuming linear decline in the assumed rate between three percent and one percent between years one and 300.



Absent: 1) considering the probability and potential adverse consequences of high-consequence events; 2) a discussion of the cumulative costs of such events across future years in the Draft GEIS; and 3) using an appropriate discounting assumption, it is unclear how NRC concludes that environmental impacts are “small” across all of the Alternatives (No Action and the three Action Alternatives), scenarios (varying time frames for continued storage), and sites.

Overall, a more reasoned and informed approach would be for the NRC to consider site-specific event scenarios (e.g., seismic events, aircraft crashes, tornado missiles, spent fuel fires, cask drops, terrorist attacks, etc.), and describe the consequences of these events. While information on probabilities of these events may be important, the NRC has indicated that they do not have enough information to assess these probabilities across all event types and sites. However, site-specific analysis would allow NRC to gather and consider helpful information, such as site-specific vulnerabilities (as they have recently requested regarding seismic risks), and reference available site-specific information (e.g., locations of populations) in making determinations regarding environmental consequences.

4. *The Draft GEIS excludes any consideration of the effects of people’s perceptions of risk associated with continued storage. Despite historical or statistical data describing risk, risk perceptions drive people’s behavior and can generate real economic impacts.*

In addition to not being supported by available information, a sole focus on statistical risk of high-consequence events, without consideration of people’s perception of risk, is inconsistent with well-accepted risk-perception literature. Factors unrelated to historical or statistical data affect perceptions of risk. Many of these factors are relevant to the management of nuclear waste, including: voluntariness of exposure, dread associated with the hazard, the extent to

which the risk can be controlled, the potential for catastrophe, and the level of uncertainty associated with the hazard.⁷ For high-consequence events, the perception of risk, whether or not data demonstrate the risk is actually present, may generate real impacts. One example is the adverse effect of hazardous waste sites on neighboring property values, despite data demonstrating safety. Because perceptions of risk drive behavior and the public's priorities, and result in real impacts and consequences, these perceptions need to be taken into account in order to appropriately reduce impacts and consequences.⁸

In light of this, the NRC's persistent assurance throughout the Draft GEIS that the probabilities of initiating events are very low is unlikely to reduce public perceptions of risk. In only addressing historical and statistical data describing probabilities of events, the NRC ignores that these data are not indicative of the public's level of concern with respect to management of spent fuel. Despite repeated assurances of low probabilities of severe accidents and events, the public remains significantly concerned as evidenced through the scoping process on the Draft GEIS. Importantly, it is the public's perception of risk that generates some types of environmental consequences (e.g., property values or participation in recreational activities in areas surrounding plants). In addition to reducing property values, in the case that people choose not to recreate within the area of a continued storage site, local economies may suffer from the reduced tourist spending. It is therefore important for NRC to recognize and assess the impacts of these risk perceptions. As opposed to repeated assurances of low probabilities, a more effective analysis would focus on the site-specific consequences of events, and the best approaches to avoid or mitigate events within the context of a given site.

In line with this approach, in response to September 11, the Department of Homeland Security has treated high consequence events differently, effectively doing everything they can to avoid such events. The NRC asserts in the Draft GEIS that it applies a "defense-in-depth philosophy" to identify all safety features, measures, and plans to protect human and environmental health and safety (Draft GEIS, pg 4-68). It follows that this philosophy should include capitalizing on every opportunity to obtain site-specific information on vulnerabilities and risks, and design appropriate management and mitigation strategies accordingly. The decision to rely on a generic evaluation of environmental impacts and codify that no site-specific evaluation of continued storage is required is counter to the NRC's own stated philosophy.

- C. THE DRAFT GEIS ONLY CONSIDERS ENVIRONMENTAL IMPACTS OF LIMITED STORAGE SCENARIOS AND DOES NOT SPECIFY WHETHER AND IN WHAT CONTEXT ADDITIONAL SCENARIOS MAY BE CONSIDERED AT A GIVEN SITE OR IN GENERAL. IN SHORT, WHILE THE DRAFT GEIS APPEARS TO CONCLUDE THAT SITE SPECIFIC FACTORS CAN BE CONSIDERED AT A LATER TIME, THE OVERALL CONCLUSION IS THAT NO SUCH SITE SPECIFIC ANALYSES WOULD

⁷ Jenkin, Clinton M. July 2006. "Risk Perception and Terrorism: Applying the Psychometric Paradigm." *Homeland Security Affairs*. Vol II, No. 2.

⁸ Ibid.

BE REQUIRED WITH RESPECT TO ENVIRONMENTAL IMPACTS OF CONTINUED STORAGE.

Under NEPA, the NRC is required to consider the full range of reasonable alternatives to the Proposed Action, as follows:

- a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.
- b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.
- 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, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.
- f) Include appropriate mitigation measures not already included in the proposed action or alternatives (40 CFR 1502.14).

The Proposed Action is a revision to the Waste Confidence Rule. In addition to the Proposed Action, the Draft GEIS considers three Alternatives, as described above. However, the Alternatives do not consider alternate ways of modifying the Waste Confidence Rule, as one may expect of the scope of reasonable Alternatives. For example, Alternatives could be structured around the best ways to manage storage of spent fuel at given sites in order to support the NRC's decision to codify that continued storage is "safe" over the analytic timeframes. This would allow for a meaningful analysis of relative environmental consequences of the different Alternatives. Instead, the Alternatives (including No Action) center around the NEPA process employed to evaluate environmental consequences without revising the Waste Confidence Rule, with no variation in the approach to managing spent fuel across Alternatives. The result is that the only difference in Alternatives is the administrative effort required to implement the NEPA process. As described above, this framework does not provide a foundation for a purposeful Alternatives analysis of measures to mitigate or eliminate the environmental consequences of continued and increased storage of spent fuel in spent fuel pools over indefinite periods of time.

The Proposed Action incorporates the findings of the GEIS into future licensing decisions for plants in order to codify that continued storage is safe. In this way, the Proposed Action establishes that further discussion of environmental impacts of spent fuel storage is not required in connection with the issuance or amendment of an operating license for a nuclear power reactor. However, the Draft GEIS considers only limited methods of managing spent fuel. For example, it does not consider the potential for transferring the fuel to dry casks within the short-term time frame.

While the NRC leaves open the possibility of evaluating other methods of managing spent fuel outside of the context of the Waste Decision Rule GEIS, codifying that continued storage is safe across indefinite time frames indicates the NRC is disinclined to fully explore the relative merits of different storage scenarios for given sites and in general.

VI. CONCLUSION

Overall, the Draft GEIS does not frame the Alternatives to the Proposed Action in a manner that promotes meaningful analysis of the environmental impacts of continued storage either at a site-specific level or in general. In structuring the Alternatives around the approach to complying with NEPA (i.e., developing a generic or site-specific analyses), and assuming away any benefit of site-specific evaluations, the NRC has reduced the comparison of Alternatives to the relative level of administrative effort required. Furthermore, the Draft GEIS does not sufficiently support the driving assumption in the document that there is no benefit to developing site-specific analyses of continued storage. As described in this review, site-specific evaluations can provide more and better information on relative risk of high-consequence events and appropriate mitigation strategies across sites, thus leading to improved environmental outcomes. Finally, the limited information provided in the Draft GEIS does not support the finding that environmental consequences of continued storage, particularly as relates to postulated accidents and severe events, are “small” across all sites. In conclusion, it is our opinion the Draft GEIS is inadequate to support a finding that continued storage is safe across sites, and that no further analysis of this issue should required at the time of site-specific licensing decisions.

Overview

Mr. Unsworth specializes in the fields of natural resource economics and damage assessment, environmental benefits assessment, and environmental policy analysis. His work has addressed a broad range of environmental and natural resource policy and economics issues.

Education

Master of Forest Science, Yale University.

Bachelor of Science *magna cum laude* in Forestry, State University of New York.

Summary of Qualifications

Mr. Unsworth has 27 years of experience conducting complex cost and benefit analyses of Federal programs that impact our Nation's natural resources and the environment. Much of his work has been on programs and policies that have involved controversial programs or policies eliciting significant public, Administration and Congressional interest and comment. His clients have included the Department of Justice, the National Oceanic and Atmospheric Administration, the Department of the Interior (DOI), the Environmental Protection Agency, the Department of Energy, other Federal agencies, states, tribal governments, the New York State Energy Research and Development Authority (NYSERDA), the Electric Power Research Institute (EPRI), as well as other non-governmental organizations, private companies, and law firms. He has testified as an economist before the California Energy Commission, the Vermont Public Service Board, and in Federal Court. Of relevance to this report:

- Mr. Unsworth has authored several guidance manuals for Federal agencies on the application of environmental cost-benefit analysis, economic benefits assessment, and environmental damage assessment. For example, for the US Department of Transportation he directed the development of a manual for the application of economic tools to assess regulations designed to enhance oil pipeline safety; he contributed to EPA's Guidelines for Preparing Economic Analyses; and he authored guidance on the use of economics in natural resource damage assessment as well as a manual on the application of economics to decision-making under the ESA for the US Fish and Wildlife Service.
- He has provided economic support and expertise to several major Federal EISs, including an assessment of manatee protection measures, Coast Guard regulations on marine spill response preparedness, regulations on the management of National Park Service lands, and environmental restoration planning in the context of natural resource damage assessment. He directed an assessment for the Department of the Interior's Bureau of Ocean Energy Management (BOEM) of the impacts of oil and gas development in Federal waters, including development of a model and information that will be used to support BOEM in its efforts to comply with NEPA. He is currently leading a \$2 million EIS/Regulatory Impact Analysis for the US DOI of a proposed rule designed to reduce the environmental impacts of coal mining. This effort includes assisting DOI in the selection and specification of appropriate alternatives, establishment of the regulatory baseline, and forecasting the potential long-term impacts of the decision.
- He has analyzed Federal policies and regulations that address low probability, high consequence events, such as assessing the potential consequences of oil well failures in the Gulf of Mexico in support of Federal

drilling lease decisions, and served on the National Academies Transportation Research Board's panel to establish an approach to evaluate the risks of catastrophic oil spills from tanker vessels.

Project Experience

Public Policy Analysis

Examples of Mr. Unsworth's work in the field of public policy analysis include:

Conducted a study of the economic benefits that have resulted from the successful restoration of the Atlantic coast striped bass fishery.

Directing an analysis of the regional economic and social impacts of efforts to reintroduce the Mexican wolf to Arizona and New Mexico.

Conducting an economic analysis of piping plover recovery activities on the Atlantic coast, for the **U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE**. The paper that will result from this research will consider regional economic impacts as well as welfare effects at six case study sites.

Conducting a study to assess the likely effect of a change in the departure point for Fort Sumter on Park visitation and the local economy. This study involved a series of in-person surveys with Park visitors and tourists in Charleston, S.C.

Directing a study of the regional welfare economic importance of the horseshoe crab. This study considered the role the crab plays on the pharmaceutical industry, ecotourism, and the commercial fishing industry, and estimated jobs, economic activity, and welfare values associated with each of these uses of the crab.

Assessing the regional economic impact that would result from the proposed Aldo Leopold National Wildlife Refuge, Wisconsin. Considered the likely baseline use of the area that would be included in the extant boundaries of the Refuge, under several scenarios.

Assessing the role the Monomoy National Wildlife Refuge plays in the local economy of Chatham, Massachusetts, and in the entire Cape Cod region. Constructed a set of response functions that describe the change in regional economic conditions (i.e., jobs, revenues, etc.) that would result from various changes in allowed uses of the Refuge.

Assessing the regional economic importance of four National Wildlife Refuges near Bristol Bay, Alaska.

Estimating the value of recreational fishing improvements associated with proposals to increase water temperatures below a dam on the Guadalupe River in Texas. The analysis used benefits transfer techniques and studies of fish populations and fishing activity to estimate increased angler days and related welfare benefits.

Developing estimates of the contribution to the local economy of the Necedah National Wildlife Refuge in central Wisconsin, for the **U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE**.

Developing an analysis of flowage (i.e., flood water) easement valuation, including the role of less-than-fee acquisition in non-structural flood control, for the **U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE**.

Developed a report describing the potential uses of welfare economics in the assessment of hydropower dam projects for the **WORLD COMMISSION ON DAMS, SOUTH AFRICA**.

Reviewing and providing technical comments for the **WORLD BANK** on the environmental and human health

valuation methodologies used in a draft National Environmental Action Plan for Moldova.

Assessing the potential magnitude of market and non-market economic damages from the loss of forest land in the southeastern United States expected to result from climate change.

Managing a screening analysis to determine the degree of financial burden imposed on Massachusetts' cities and towns as a result of existing and proposed state and Federal environmental requirements.

Participating in a review of the characteristics and effectiveness of non-regulatory agricultural non-point source reduction programs run by various state authorities.

Conducting an assessment of historical applications of hazardous substance release events data in environmental policy analysis, as part of an U.S. Environmental Protection Agency effort to assess the needs for a chemical accident prevention database.

Managing a data gathering effort to support an assessment of the marginal impact of federally mandated materials separation requirements on proposed municipal solid waste combustion facilities.

Managing an analysis of consumer purchasing behavior in response to a variety of municipal solid waste management initiatives.

Managing the development of a computer software package to be used by Local Emergency Planning Committees to set priorities under SARA Title III.

Developing a chemical and fuel input-output model of the U.S. economy, for use in estimating chemical and fuel expenditures by manufacturing and non-manufacturing facilities.

Analyzing the structure of the commercial hazardous waste treatment and disposal industry to support an assessment of the impact of Federal regulations on this industry.

Assisting in the preparation of a long-term forecast of capacity for various commercially available hazardous waste treatment technologies, including an assessment of the impact of proposed regulations on capacity.

Regulatory Economics

Examples of Mr. Unsworth's work in the area of regulatory economics include:

Providing guidance to **U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE** on the legal requirements for, and appropriate economic approach to, analyses of relicensing proposals for hydropower projects.

For the **CALIFORNIA ENERGY COMMISSION**, assessing the state of the science for monetizing the ecological impacts associated with once-through cooling at electricity generating facilities.

Conducting an assessment of potential changes in ecological and human use services within a bay system in California resulting from changes in cooling technology at two large electricity generating facilities.

Conducting an economic assessment of management alternatives for the Environmental Impact Statement on the incidental take of small numbers of Florida manatees resulting from government programs related to watercraft operation and watercraft access in the State of Florida.

Participating in developing a programmatic Environmental Impact Statement of Coast Guard actions under the Oil Pollution Act to enhance oil spill response capabilities.

Overseeing a series of analyses of the economic efficiency (social welfare) and regional economic effect of critical habitat designation under the ESA. Over 115 separate analyses to date, involving habitat throughout

the continental U.S and Hawaii. Many of these studies have been conducted under tight court-ordered deadlines.

Managing a meta analysis of 150 contingent valuation and travel cost-based sport fishing valuation studies in order to provide an analytic tool to be used in damage assessment and policy analyses conducted by **U.S. DEPARTMENT OF THE INTERIOR**.

Supporting the development of an analytical framework for assessing the costs and economic, environmental, and human health benefits associated with regulatory initiatives intended to improve pipeline performance and safety for **U.S. DEPARTMENT OF TRANSPORTATION OFFICE OF PIPELINE SAFETY**.

Providing technical and administrative support to **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION**, including support in selecting methods that could be used to estimate economic damages; determining the strengths and weaknesses of each relevant assessment methodology for the determination of damages to a variety of resource categories; and selecting principal investigators to perform these damage assessments.

Managing efforts to compile, review and apply human health and environmental benefit estimates, models, and data sets to support retrospective and prospective benefits assessment under Section 812 of the Clean Air Act.

Developing and implementing an ecological benefits assessment approach based on probabilistic economic benefit assessment for use in **U.S. ENVIRONMENTAL PROTECTION AGENCY's** chemical risk management review process.

Conducting an analysis for the **U.S. ENVIRONMENTAL PROTECTION AGENCY** of the economic benefits that would result from proposed pharmaceutical industry effluent guidelines.

Estimating the economic benefits associated with environmental quality improvements that could result from reductions in the release of chloroparaffins to three representative aquatic systems.

Managing a series of case studies for the **U.S. ENVIRONMENTAL PROTECTION AGENCY** to assess the extent to which firms have closed operations as a result of the Clean Air Act, and to identify factors that could be used to predict such closures.

Managing an economic analysis for the **U.S. ENVIRONMENTAL PROTECTION AGENCY** of the impact on the integrated U.S. steel industry of proposed regulations limiting emissions of hazardous air pollutants.

Managing an assessment for the **U.S. ENVIRONMENTAL PROTECTION AGENCY** of financial, regulatory, legislative, and market factors facing chlorofluorocarbon producers and users in moving to production and use of non- CFC substitutes.

Managing the assessment of social costs and economic impacts for the Regulatory Impact Analysis of regulations restricting land disposal of hazardous wastes.

Assisting in an analysis of the economic impacts of regulations constraining the burning of hazardous waste-as-fuel in industrial boilers and furnaces for the **U.S. ENVIRONMENTAL PROTECTION AGENCY**.

Providing technical and econometric analysis to support expert testimony for the **AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION** in hearings before the U.S. Postal Rate Commission.

Primary Economic Research

Mr. Unsworth has directed a wide-range of primary research efforts in the field of environmental and resource economics. Examples of this work include:

Directing a random utility analysis of economic losses resulting from contamination of Onondaga Lake, N.Y. This study combines existing data from a 1980s survey of recreational angling behavior with recently collected data to estimate economic welfare losses to the citizens of New York State.

Directing a multi-year study on the economic value of visits to a range of National Park units. Studies include stated preference surveys at two historic forts in Charleston, S.C.; a random utility model of beach visitation, including temporal substitution, in Texas; and a multi-site, revealed preference study in Southern Utah.

Directing a series of surveys to gather data to support a claim for damages to the visitor experience at historic El Morro fort in San Juan, Puerto Rico. Damages in this case resulted from the presence of a grounded Russian cement freighter, which was hard-aground off the Fort for nearly five months.

Managing a series of studies for the **ELECTRIC POWER RESEARCH INSTITUTE** designed to estimate the magnitude of economic damage that could result from long-term climate change. Market sectors analyzed include coastal development, agriculture, recreation, and commercial fishing.

Managing a series of studies to assess the public's perceptions and attitudes toward the potential ecological effects of climate change. This effort involves a team of academic economists, psychologists, survey researchers and physical and biological scientists, and includes a range of research approaches to address this issue.

Assessing the regional economic contribution of beach use on the Texas Gulf Coast. This research effort included development and implementation of a telephone survey to determine the number of trips taken to various beaches in Texas, as well as consumer expenditures associated with those trips.

Natural Resource Damage Assessment

Examples of Mr. Unsworth's experience in natural resource damage assessment is summarized below. Assisting in the resolution of a claim for ecological injury and recreational fishing losses resulting from the release of PCBs to Lake Hartwell, South Carolina/Georgia, and an associated tributary. Provided technical support to a cooperative assessment of damages and in the development of a formal Restoration and Compensation Determination Plan.

Assisting in the development of a preliminary damage estimate and providing technical support to negotiations between Trustees and the responsible party at the Palmerton Zinc Superfund site in Pennsylvania. Categories of loss considered include ecological services associated with injured forested and aquatic ecosystems, as well as recreational fishing, hunting and timber harvest opportunities.

Assisting in a cooperative assessment of damages due to the release of mercury, PCBs, and radionuclides at Oak Ridge in Tennessee. Constructed a habitat equivalency analysis for aquatic injuries, and assessed the scale of ecological and human use restoration credits provided by a large parcel of forested land at the site.

Serving as an expert for the **U.S. DEPARTMENT OF JUSTICE AND THE NAVY** on the economic valuation of injuries to the Allen Harbor clam fishery in Rhode Island, as well as damages associated with contamination of groundwater at the site.

Serving as an expert for **U.S. DEPARTMENT OF JUSTICE AND THE ARMY** on the economic valuation of contamination of groundwater at the Rocky Mountain Arsenal site in Colorado.

Serving as an expert on the economic valuation of injured groundwater resources at the Tutu well field site

on St. Thomas, USVI. Research considered added costs, the public's willingness to pay for a replacement water supply, and the non-use values associated with the contaminated aquifer.

Assessing a proposed set of restoration options offered by Maine Yankee to compensate for injury to groundwater and marine resources at this former Nuclear powered generating station.

Serving as an expert in non-timber (e.g., ecological, recreational, aesthetic) losses to the U.S. Forest Service resulting from the Big Creek and Storrie fires in California.

Assisting the **STATES OF NEW JERSEY AND MASSACHUSETTS** in the development of guidance for natural resource damage assessment associated with injury to groundwater and habitat resources.

Providing technical support to a cooperative assessment of damages associated with a large scale bird kill at Lake Apopka, Florida.

Providing technical support to the **U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE** in the assessment of damages due to an oil spill on the Obed River, Tennessee.

Conducting and managing various damage assessment activities and developing a formal, publicly released plan for the assessment of damages and the development of restoration options associated with injuries to the Grand Calumet River and Indiana Harbor in northwest Indiana.

Directing an assessment of economic damages to Fish Creek in Indiana as a result of a fuel oil pipeline break. This assessment focused on potential damages associated with a Federally listed endangered species in the creek.

Assisting **NEW YORK STATE** in negotiations regarding recreational fishing losses due to the release of mirex to Lake Ontario. Also conducted a source allocation of PCBs, dioxins and mirex in the Niagara River and Lake Ontario, and assessed the likely persistence of these contaminants in Lake Ontario.

Assessing damages to natural resources resulting from the release of PCBs to the Housatonic River in Massachusetts and Connecticut. Assisting the trustees in settlement negotiations. Assisting in the development of a Restoration Project Selection Criteria document and in a Programmatic Environmental Assessment under NEPA for restoration actions at this site.

Developing a guidance manual on the use of economics in natural resource damage assessment, and conducting a series of training sessions on this topic for **U.S. FISH AND WILDLIFE SERVICE**.

Providing technical and managerial support in the Federal effort to estimate economic damages resulting from the *Exxon Valdez* oil spill. This included assisting in the preparation and analysis of results from a nationwide contingent valuation survey designed to estimate changes in the passive-use value of Prince William Sound as a result of this oil spill.

Participating in a cooperative damage assessment at the John C. Heinz National Wildlife Refuge, Philadelphia, Pennsylvania. This effort involves assessment of ecological and human use losses resulting from an oil pipeline spill within the Refuge.

Providing general case management support to Federal and tribal trustees pursuing a claim for natural resource damages associated with mine tailings-related injuries to the Cheyenne River in South Dakota. This support included development of case strategy, participation in settlement negotiations, and preparation for a focused damage assessment.

Providing technical and economic support to the Trustees of Lavaca Bay, Texas. Efforts include estimating economic losses suffered by recreational anglers and losses resulting from increased dredging costs

associated with mercury contaminated sediments; case management support, including direction of a geostatistical analysis of mercury contamination of bay sediments and direction of a detailed review of historical releases from the site; and developing a draft preassessment screening document.

Providing case strategy and technical support to the **U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE** in assessment of damages to Grant-Kohrs National Historical Site, Deer Lodge, Montana, resulting from contamination of portions of the Park with mining-related wastes.

Providing a technical report and affidavit for the **U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE**, regarding economic damages associated with PCB contamination of Valley Creek in Valley Forge National Park.

Developing a guidance document on damage assessment under Section 19(jj) of the Park Service Protection Act, for the **NATIONAL PARK SERVICE'S DAMAGE ASSESSMENT GROUP**.

Providing support to a hedonic property valuation study designed to assess the impact of PCB contamination on housing values in New Bedford, MA.

Preparing a formal preassessment screen and damage assessment plan for the PCB-contaminated Hudson River site for Federal and state trustee agencies.

Providing support to the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** in the development of expedited damage assessment regulations and guidelines under the Oil Pollution Act of 1990.

Assisting in the analysis of settlement components to support trustee claims arising from the January 2, 1990 Arthur Kill, New York Harbor oil spill.

Assisting the **STATE OF FLORIDA** in the development of state guidelines for the conduct of natural resource damage assessments following major oil spills.

Assisting the **STATE OF NEW YORK** in the development of a natural resource damage assessment plan for the Onondaga Lake System.

Providing an Expert Witness Narrative for **U.S. DEPARTMENT OF JUSTICE** and the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** on the application of the habitat equivalency approach to the assessment of natural resource damages resulting from the Blackbird Mine site in Idaho.

Providing technical and expert witness preparation support to **U.S. DEPARTMENT OF THE INTERIOR, U.S. FISH AND WILDLIFE SERVICE**, and the **U.S. DEPARTMENT OF JUSTICE** in natural resource damage claims resulting from the release of asbestos and other hazardous substances in the Great Swamp National Wildlife Refuge, New Jersey.

Providing technical and expert witness preparation support to the **U.S. DEPARTMENT OF JUSTICE** and **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** to support claims arising from the grounding of the freighter *Elpis* in the Key Largo Natural Marine Sanctuary, Florida.

Providing litigation preparation and expert witness support to **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** and **U.S. DEPARTMENT OF JUSTICE** to support claims for injury to marine bird populations resulting from the *Apex Houston* oil spill, California.

Providing technical support to **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION** in the development of a contract management system to facilitate tracking and recovery of costs incurred in the conduct of natural resource damage assessment cases.

In addition to the above cases, providing damage assessment and case strategy support at over 50 other

sites in the U.S. and Caribbean, such as the Bayou Meto ("Vertac") dioxin site in Arkansas; Saginaw Bay in Michigan; Elliott Bay in Seattle; Jamaica Bay in New York; SRS site in Connecticut; White River in Indiana; Union City site in Indiana; Holden Mine, Washington; Midnight Mine, Idaho; Saltville, Virginia; Calf Pasture Point, Rhode Island; Colrain Acid Spill, Massachusetts; Koch Oil site, Minnesota; Christina River in Delaware.

In addition to the above cases, providing technical support in the development of damage claims for tribal resources, such as Clark Fork River Basin of western Montana for the Confederated Salish and Kootenai Tribes of the Flathead Reservation; along the Cheyenne River in South Dakota for the Cheyenne River Sioux Tribe; in Akwesasne for the St. Regis Mohawk Tribe, Massena, New York; for the Penobscot Nation, Penobscot River, Maine; Spokane Tribe of Indians and the Confederated Tribes of the Colville Reservation for the Midnight Mine site, Idaho; and for the Wampanoag on Martha's Vineyard following the *Bouchard* oil spill in Buzzards Bay, Massachusetts.

Private Claims for Damages

Mr. Unsworth provides technical and case strategy support in the context of private claims for damages associated with environmental contamination. Examples of this work include:

Serving as an expert in the valuation of losses suffered by lobstermen impacted by the collapse of the western Long Island Sound lobster fishery.

Serving as an expert in assessing damages to residential property owners associated with air emissions from a meat packing plant.

Providing technical support, in cooperation with Dr. Raymond Kopp, to an assessment of added costs and property value losses associated with groundwater contamination of a residential neighborhood in suburban Chicago.

Assessing the impacts on residential property values resulting from a plume of petroleum products under a residential neighborhood in Indiana.

Estimating the diminution in value of a potential real estate development associated with groundwater contamination at a site in the Caribbean.

Serving as an expert witness in a private claim for property value diminution resulting from the presence of contaminated groundwater at a site in Lakeland, FL. Mr. Unsworth applied hedonic property value techniques as well as benefits transfer to estimate the magnitude of the loss to homeowners at this site. He also provided support in estimation of the size of the class of plaintiffs who would benefit from the settlement.

Selected Reports and Publications

Genova, Leslie, Robert E. Unsworth, and David S. Brookshire. 2012 "Impacts of Endangered Species Protection on Water Management, Allocation and Use in New Mexico." In: Water Policy in New Mexico: Addressing the Challenge of an Uncertain Future. Resources for the Future Press, Washington, DC.

"Environmental Performance of Tanker Designs in Collision and Grounding: Method for Comparison," Committee for Evaluation Double-Hull Tanker Design Alternatives, Marine Board, Transportation Research Board, The National Academies. Washington, DC. 2001.

Bishop, Richard and Robert Unsworth, 1994, "Assessing Natural Resource Damages Using Environmental Annuities," *Ecological Economics* 11:35-41.

Mendelsohn, Robert, Daniel Hellerstein, Michael Huguenin, Richard Brazee, and R. Unsworth, 1992, "Measuring Hazardous Waste Damages with Panel Models," *Journal of Environmental Economics and Management* 22:259-271.

June 2012

Overview

Ms. Flight applies her background in environmental and resource economics in the context of environmental policy analysis and regulatory impact analysis for a wide variety of Federal agency clients, including the U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, Department of Homeland Security, and National Oceanic and Atmospheric Administration. Ms. Flight focuses this expertise on developing and implementing innovative economic analyses that comply with relevant Executive Orders and mandates, as well as Federal agency guidelines describing best practices.

Education

Master of Science in Economics, Rensselaer Polytechnic Institute

Bachelor of Arts in Environmental Science with a concentration in Biology, Rensselaer Polytechnic Institute

Project Experience

For the **U.S. DEPARTMENT OF HOMELAND SECURITY, CUSTOMS AND BORDER PROTECTION**, contributed to a National Environmental Policy Act (NEPA) Programmatic Environmental Impact Statement (PEIS) of security activities along the northern border with Canada. Specifically, Ms. Flight led the analysis of impacts of various activities (including patrols, expanding and modernizing ports of entry, vehicle checkpoints and border fencing) on socioeconomic resources and land use. Ms. Flight also evaluated the environmental justice implications of the regulatory alternatives.

For the **U.S. DEPARTMENT OF THE INTERIOR, OFFICE OF SURFACE MINING**, supporting the development of a Regulatory Impact Analysis (RIA) and NEPA Environmental Impact Statement (EIS) for a Stream Protection Rule. Ms. Flight is managing the evaluation of the benefits of the regulatory alternatives, including expected environmental improvements and reductions in human health risk. Ms. Flight is also forecasting potential employment effects of the alternatives and developing the environmental justice analysis as mandated by Executive Order 12898.

For the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE**, conducted a Regulatory Impact Review (RIR) of vessel traffic regulations under the Endangered Species Act and Marine Mammal Protection Act for the Puget Sound population of southern resident killer whales. Responsibilities included assessing impacts of the regulatory alternatives on a variety of human use activities in the Sound, including whale watching, recreational boating and kayaking, and commercial fishing. Ms. Flight also applied a regional economic model to describe the regional economic contribution of the whale-watching industry, summarized and responded to public comments associated with the proposed regulation, and presented the findings of the analysis at a public meeting.

As part of a cost benefit analysis of the Clean Air Act Amendments for **U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF AIR AND RADIATION**, developed multiple analyses of the effects of air pollutant regulation on ecosystem services. These included an analysis of the ecological effects of ozone in terms of its toxicity to biota, which involved applying a partial equilibrium model to quantify national level economic impacts of the effects of ozone exposure on the commercial agriculture and silviculture industries. Ms. Flight also designed and implemented an analysis to quantify the economic benefits of reduced atmospheric nitrogen deposition

on Adirondack lakes. The case study involves linking two models: an ecological model forecasting the acidification levels of Adirondack lakes under alternative air policy scenarios, and an economic random utility model quantifying the economic welfare benefits of the effects of reduced lake acidification on recreational fishing site choice.

For the **U.S. DEPARTMENT OF THE INTERIOR, FISH AND WILDLIFE SERVICE** and the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE**, conducting economic analyses of critical habitat rules for threatened and endangered species. Responsibilities include identifying and quantifying potential impacts of species conservation efforts on agencies, landowners, and industry. These analyses focus on impacts of species and habitat conservation on a variety of economic activities, including: residential and commercial development, silviculture, ranching, agriculture, hydropower production, and recreational activities. Ms. Flight has managed the development of over 40 analyses in marine, coastal, riverine, wetland, desert, and forest ecosystems. These reports are developed in compliance with Executive Order 12866 and the Regulatory Flexibility Act (RFA) as amended by the Small Business Regulatory Enforcement and Fairness Act (SBREFA). As part of this work, Ms. Flight attended training with the Small Business Administration focused on the development of small business impact analysis compliant with the RFA/SBREFA. Ms. Flight has presented the methods and results of her analyses at public hearings and to the White House Office of Management and Budget (OMB) and officials at the U.S. Departments of Interior and Commerce.

For the **U.S. DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE**, developed an economic analysis in support of a NEPA PEIS of a hunting management program. This effort involved: a) a comprehensive characterization of the affected socioeconomic environment, including a quantitative assessment of the levels of various human use activities (i.e., biking, hunting, beach visitation); and b) analysis of the economic impacts of management alternatives for the NPS' hunting program on the multiple users of the park and on the broader regional economy. NPS decision-makers used the analysis to understand tradeoffs between environmental improvements associated with reduced hunting and potential economic costs in terms of reduced consumer surplus and regional economic activity. This effort involved developing and analyzing a survey of beach users to determine principal concerns, and quantifying direct, indirect and cumulative economic impacts of the hunting management program alternatives. Ms. Flight contributed to the design and analysis of the intercept survey, which involved an Information Collection Request (ICR) approval from the White House Office of Management and Budget (OMB).

For the **NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, NATIONAL MARINE FISHERIES SERVICE**, served as Project Manager in the development of a cost-effectiveness analysis of critical habitat designation for the Gulf of Maine Distinct Population Segment of the Atlantic salmon. The analysis evaluated the impact of alternatives to critical habitat designation on agriculture, aquaculture, forestry, and mining, pier and bridge construction, and dam operations and maintenance. This effort also involved development of a separate Initial Regulatory Flexibility Analysis in accordance with the RFA/SBREFA to evaluate potential impacts of the proposed rule on small entities. Over the course of the three-year contract, Ms. Flight was responsible for: coordinating with multiple biologists at NMFS on the framework for the analysis; designing and implementing methodologies to quantify the economic impacts of salmon habitat conservation measures; supporting the client at stakeholder and public meetings; and presenting methods and results to the Department of Commerce, the White House Office of Management and Budget, and Small Business Administration.

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For the **U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF GROUND WATER AND DRINKING WATER**, revised draft guidance for valuing lost productivity under the 1996 Amendments to the Safe Drinking Water Act. Responsibilities included incorporating current trends in the economic literature into cost of illness valuation methodologies and quantifying lost non-market work time.

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For the **U.S. ENVIRONMENTAL PROTECTION AGENCY, OFFICE OF PESTICIDE PROGRAMS**, researched the value of avian risk reduction to facilitate pesticide regulation. Responsibilities included drafting a methodology to bridge gaps between ecological risk assessment and environmental resource valuation methods. Ms. Flight presented this research at the World Congress of Environmental and Resource Economists in 2002.

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Selected Reports and Publications

Maura Flight, Robert Paterson, Kate Doiron, and Stephen Polasky. "Valuing Wetland Ecosystem Services: A Case Study of Delaware." *National Wetlands Newsletter* 34(5): 16-20. October 2012.

Economic Analysis of Critical Habitat Designation for the Gulf of Maine Distinct Population Segment of Atlantic Salmon: Final Report and Critical Habitat Designation for the Gulf of Maine DPS of Atlantic Salmon: Final Regulatory Flexibility and Energy Impact Analyses, prepared for the Northeast Regional Office of the National Marine Fisheries Service, May 2009.

Environmental Impact Statement for the Cape Cod National Seashore Hunting Program, prepared for the National Park Service, U.S. Department of the Interior in collaboration with Woodlot Alternatives, Inc., June 2004.

The Benefits and Costs of the Clean Air Act from 1990 to 2020, Chapter 6, prepared for Office of Air and Radiation, U.S. Environmental Protection Agency, April 2011.

The Economic Impact of the Clean Air Interstate Rule on Recreational Fishing in the Adirondack Region of New York State, prepared for Clean Air Markets Division, Office of Air and Radiation, U.S. Environmental Protection Agency, June 2008.

Valuing Time Losses due to Illness Under the 1996 Amendments to the Safe Drinking Water Act, prepared for the Office of Ground Water and Drinking Water, U.S. Environmental Protection Agency, March 2004.

Vessel Traffic Regulations to Protect Killer Whales in Puget Sound: Final Regulatory Impact Review, prepared for the Northwest Regional Office of the National Marine Fisheries Service, November 2010.

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of:

Consideration of Environmental Impacts of
Temporary Storage of Spent Fuel After
Cessation of Reactor Operations

RIN 3150-AJ20
NRC-2012-0246

COMMENTS SUBMITTED BY THE ATTORNEYS GENERAL OF THE STATES OF
NEW YORK, VERMONT, CONNECTICUT, AND THE COMMONWEALTH OF
MASSACHUSETTS, THE VERMONT DEPARTMENT OF PUBLIC SERVICE, AND THE
PRAIRIE ISLAND INDIAN COMMUNITY ON THE NUCLEAR REGULATORY
COMMISSION'S DRAFT WASTE CONFIDENCE GENERIC ENVIRONMENTAL IMPACT
STATEMENT AND PROPOSED RULE

Submitted: December 20, 2013

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
The State of New York’s Interest.....	1
The State of Vermont’s Interest.....	2
The Commonwealth of Massachusetts’ Interest	3
The State of Connecticut’s Interest	4
The Prairie Island Indian Community’s Interest	4
SUMMARY.....	6
THE HISTORY OF “WASTE CONFIDENCE” AND SPENT FUEL HANDLING AND STORAGE	7
A. Background on the Waste Confidence Rule	7
1. The 1984 Waste Confidence Findings	9
2. 1990 Revisions to the Waste Confidence Findings.....	10
3. 2010 Revisions to the Waste Confidence Rule	11
4. Challenges to the 2010 Revisions	12
5. Summary of the D.C. Circuit Decision	13
6. New York, Vermont, and the Tribe’s Scoping Comments.....	16
7. NRC Response to Scoping Comments.....	20
8. Multi-State Petition for Review of NRC Scoping Summary	20
9. The Waste Confidence Draft GEIS and Proposed 10 C.F.R. § 51.23.....	22

TABLE OF CONTENTS

	Page
B. Background on Spent Fuel Handling and Storage	23
1. NUREG-0575, Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel	23
2. NUREG-1738, Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (February 2001).....	27
3. NRC's Spent Fuel Consequence Study	28
4. COMSECY-13-0300: Staff Evaluation and Recommendation for Japan Lessons-Learned Tier 3 Issue On Expedited Transfer of Spent Fuel	31
5. Independent Studies of the Hazards of Spent Fuel Pool Storage	34
COMMENTS.....	36
I. NRC HAS MISCAST THE FEDERAL ACTION NECESSITATING THIS ENVIRONMENTAL IMPACT STATEMENT	36
A. The Statement of Purpose and Need Violates NEPA as it is Artificially Limited to Efficiency and Paperwork	37
B. Statement Three of the Statement of Purpose and Need is Too Vague and Fails to Satisfy NEPA's Public Information Purpose	40
C. The DGEIS Should Have A Scope of Issues and Alternatives At Least As Broad as NRC's Previous Generic Analysis in NUREG-0575	42

TABLE OF CONTENTS

	Page
D. Until NRC Completes A Legally Sufficient NEPA Analysis, Its Decisions To Allow Nuclear Reactors to Continue to Store Spent Fuel In Spent Fuel Pools At Reactor Sites and to Continue to Generate Spent Fuel for Which There is No Permanent Waste Repository Violate NEPA.....	47
II. THE DGEIS' ANALYSIS OF IMPACTS IS FLAWED	49
A. NRC's Use of "Small," "Medium," and "Large" Does Not Comport With NEPA.....	49
B. NRC's Characterization of the Probability-Weighted Impacts of Severe Accidents As "Small" Is Inadequate Under NEPA.....	51
III. THE DGEIS DOES NOT ASSESS THE CUMULATIVE OR INDIRECT IMPACT OF A SEVERE ACCIDENT AT A REACTOR SITE.....	54
IV. THE DGEIS INCLUDES NO MITIGATION MEASURES AT ALL, IN VIOLATION OF NEPA AND NRC REGULATIONS	58
V. THE DGEIS ARTIFICIALLY LIMITS ITS ALTERNATIVES ANALYSIS BECAUSE OF ITS FLAWED STATEMENT OF PURPOSE AND NEED	60
VI. THE DGEIS SHOULD HAVE DIRECTLY EXAMINED EXPEDITED FUEL TRANSFER TO DRY CASKS AS A MITIGATION MEASURE OR AN ALTERNATIVE	64
VII. THE DGEIS USES AN INAPPROPRIATE METHODOLOGY	68
VIII. THERE IS NO BASIS FOR THE NRC'S ASSUMPTION THAT ALL WASTE WILL BE MOVED FROM POOLS TO DRY CASK BY THE END OF 60 YEARS AFTER LICENSED LIFE.....	71

TABLE OF CONTENTS

	Page
A. The DGEIS does not meet the D.C. Circuit's mandate that environmental impacts must be analyzed unless their probability is zero	71
B. International experience offers no assistance regarding timing	75
C. The dry transfer system and independent spent fuel storage installation options are hypothetical and require site-specific review	76
1. No dry transfer system currently exists in the United States	76
2. The DGEIS does not establish that independent spent fuel storage installations are a viable possibility at every reactor site such that generic review is appropriate	78
3. The DGEIS does not indicate a funding mechanism for the ISFSI and DTS facility construction or replacement	79
IX. THE DGEIS'S DISCUSSION OF FIRES AND SEVERE ACCIDENTS IS INADEQUATE	80
A. The NRC's treatment of severe accident impacts is internally inconsistent and arbitrary	80
B. NRC's Analysis of Spent Fuel Pool Fires Relies Heavily Upon NUREG-1738 Without Considering NUREG-1738's Limitations	84
C. NRC Failed to Use A Conservative Bounding Analysis In Evaluating the Consequences of Spent Fuel Fires	86
1. The Consequences of a Severe Accident at Indian Point Necessitate Site-Specific Review	87

TABLE OF CONTENTS

	Page
D. The DGEIS Fails to Acknowledge the Liquid Releases That Occur During a Severe Accident	91
E. The DGEIS does not include mitigation analysis for probability-weighted impacts of severe accidents.....	94
X. THE DGEIS FAILS TO EXAMINE THE SPECIAL PROBLEMS CREATED BY THE USE OF HIGH BURNUP FUELS	95
XI. THE DGEIS'S DISCUSSION OF LEAKS IS INADEQUATE	101
A. The DGEIS Fails To Examine Spent Fuel Pool Leaks In The Long-Term And Indefinite Timeframes	101
B. The DGEIS Fails To Examine Short-Term, High-Volume Leaks From Spent Fuel Pools	103
C. The DGEIS Fails to Examine Past Leaks In Detail	105
D. The DGEIS Fails to Employ Conservative Bounding Assumptions for Leaks.....	106
E. Generic Analysis is Not Appropriate for Spent Fuel Pool Leaks	109
XII. THE DGEIS DOES NOT ADEQUATELY ADDRESS NON-HUMAN HEALTH ENVIRONMENTAL AND CULTURAL IMPACTS.....	111
A. The DGEIS does not address impact of a spent fuel pool fire or accident non-human biota at all	111
B. The DGEIS uses vague language and fails to incorporate relevant documents	113
C. NEPA Requires Consideration of the Environmental Impacts of License Renewal or Non-Renewal On Nearby Lands, Including Impacts To Property Values	113

TABLE OF CONTENTS

	Page
D. The DGEIS Fails To Adequately Consider the Long-Term Viability of the Prairie Island Reservation As a Homeland For the Tribe In Light of the Continued, Indefinite Storage Of Spent Nuclear Fuel and the Implications of Long-Term Or Indefinite Storage of Spent Nuclear Fuel On the Preservation of Tribal Life and Culture.....	117
XIII. THE DGEIS ANALYSIS OF CLIMATE CHANGE’S IMPACT ON WASTE STORAGE IS INADEQUATE.....	120
A. The DGEIS Inexplicably Only Discusses Climate Change Impacts As To the Short Term Timeframe, and Only In The Severe Accident Scenario.....	120
B. The DGEIS Cited Outdated Projections for Sea Level Rise	121
C. The DGEIS’s Climate Change Analysis Is Artificially Limited to Design Basis At the Time of Initial Licensing	123
D. The DGEIS Offers No Adaptation Measures to Minimize The Impact of Climate Change on Nuclear Waste Storage Facilities.....	126
E. The DGEIS Improperly Cites to the Vacated 2010 Waste Confidence Decision Update As the Basis for Its Climate Change Analysis	128
XIV. THE PROPOSED 10 C.F.R. § 51.23 FAILS UNDER THE D.C. CIRCUIT’S OPINION BECAUSE IT SEEKS TO FORECLOSE FURTHER REVIEW OF SITE-SPECIFIC IMPACTS AT THE TIME OF A SPECIFIC SITE’S LICENSING	129
XV. COMMENTS REQUESTED BY THE NRC IN THE FEDERAL REGISTER RULEMAKING NOTICE	131
CONCLUSION.....	133

Note about Citations and References Contained in this Document

All citations and references mentioned in this document and its attachments are hereby incorporated by reference. Should NRC Staff have difficulty obtaining any such citations and references, they are requested to contact the Office of the Attorney General for the State of New York for assistance.

INTRODUCTION

On September 6, 2013, the NRC released its Waste Confidence Generic Environmental Impact Statement Draft Report for Comment (NUREG-2157) (“DGEIS”) and Draft Rule Concerning the Continued Storage of Spent Nuclear Fuel.¹ The NRC’s DGEIS and draft rule responds to the D.C. Circuit’s decision in *New York v. NRC*, 681 F.3d 471, 472 (D.C. Cir. 2012) which invalidated a similar rule and the Environmental Assessment on which it was based. The Attorneys General of the States of New York, Vermont, and Connecticut, the Commonwealth of Massachusetts, the Vermont Department of Public Service, and the Prairie Island Indian Community (the “States” and the “Tribe”) appreciate the opportunity to submit the below comments on the DGEIS and draft rule.²

The State of New York’s Interest

New York State has six operating reactors – Indian Point Units 2 and 3, FitzPatrick, Nine Mile Point Units 1 and 2, and Ginna – and two decommissioned reactors, Indian Point Unit 1 and Shoreham. The New York State Attorney General has taken the lead in opposing the relicensing of the Indian Point nuclear plants. Currently, Indian Point Unit 2 is in a period of what the NRC calls “timely renewal,” and Indian Point Unit 3’s operating license will expire in 2015. When the

¹ 78 Fed. Reg. 56621 (Sept. 13, 2013) (notice of release of proposed draft waste confidence generic environmental impact statement), 78 Fed. Reg. 56776 (Sept. 13, 2013) (notice of release of proposed regulation concerning waste confidence – continued storage of spent nuclear fuel), 78 Fed. Reg. 66858 (Nov. 2013) (extending time to submit comments due to October 2013 federal government shutdown).

² The State and Tribe submit these timely comments in accordance with the extension of time provided by the NRC on November 1, 2013. *See* 78 Fed. Reg. 65643 (Nov. 1, 2013).

federal government authorized the operation of Indian Point Units 2 and 3, it stated that the spent nuclear fuel generated by the power plants' operation would be promptly removed from the site. Between all of the nuclear power plants in New York State, New York is currently housing more than 3,700 metric tons of spent fuel,³ more than 3,000 tons of which may remain in densely-packed spent fuel pools subject to risk of fire upon loss of coolant.⁴ The groundwater beneath Indian Point is also contaminated with radionuclides stemming from long-undetected leaks from a spent fuel pool and transfer canal.

The State of Vermont's Interest

The State of Vermont has a strong interest in the management of waste from nuclear plants. The Vermont Yankee Nuclear Power Station is in Vermont. When the Vermont Yankee reactor was licensed in 1972, the Atomic Energy Commission stated that the reactor's spent fuel would be promptly transported to an out-of-state reprocessing facility. *Vermont Yankee Nuclear Power Station Final EIS*, ML061880207:93-94 (July 1972). But none of the spent fuel has ever been removed from the reactor property and much of it currently remains in a densely-packed

³ See Nuclear Energy Institute, "US State by State Used Fuel and Payments to the Nuclear Waste Fund," *available at* <http://www.nei.org/Knowledge-Center/Nuclear-Statistics/On-Site-Storage-of-Nuclear-Waste/US-State-by-State-Used-Fuel-and-Payments-to-the-Nu> (last accessed Nov. 18, 2013).

⁴ The NRC does not report the percentage of waste that is stored in pools versus dry storage. See NRC, Spent Fuel Storage in Pools and Dry Casks, Key Points and Questions & Answers, *available at* <http://www.nrc.gov/waste/spent-fuel-storage/faqs.html> (last accessed Nov. 18, 2013) (stating that "[t]he NRC[s] ... database does not distinguish between fresh and irradiated material, and the information is withheld from the public for security reasons."). However, the Union of Concerned Scientists provides an estimate in a May 2012 report. Union of Concerned Scientists, "Nuclear Power Safety in New York," (May 2012), *available at* http://www.ucsusa.org/assets/documents/nuclear_power/nuclear-power-safety-in-new-york.pdf (last accessed Nov. 18, 2013).

elevated spent-fuel pool. When Vermont Yankee applied to renew its license in 2006, Vermont claimed that the plant had failed to provide new and significant information regarding how long spent fuel would be stored on site. The NRC licensing board rejected that claim on the basis of a previous version of the temporary-storage rule. *Entergy Nuclear Vt. Yankee, LLC* (Vermont Yankee Nuclear Power Station), 64 N.R.C. 131, 167-70 (Sept. 22, 2006). In March 2011, NRC renewed Vermont Yankee's license for twenty years. The plant's owner recently announced that Vermont Yankee will be taken offline in 2014, leaving 42 years' worth of spent fuel on site.

The Commonwealth of Massachusetts' Interest

The Commonwealth of Massachusetts ("Commonwealth") has a strong interest and concern regarding the continued storage of spent nuclear fuel at the Pilgrim nuclear power plant located in Plymouth, Massachusetts, about forty miles from Boston, and the Vermont Yankee nuclear power plant located about ten miles from the Massachusetts border. When the NRC originally licensed Pilgrim and Vermont Yankee in 1972, the NRC expected that a relatively small amount of spent fuel would be stored onsite because the fuel would be moved offsite for reprocessing or disposal. Four decades later, the spent fuel continues to accumulate onsite at Pilgrim and Vermont Yankee, posing a risk of catastrophic fire and other adverse environmental impacts. *See Commonwealth of Massachusetts v. NRC*, 522 F. 3d 115 (1st Cir. 2008).

The State of Connecticut's Interest

The State of Connecticut has long maintained a strong interest in protecting its citizens and natural resources from the risks associated with the indefinite storage of highly radioactive spent nuclear fuel within the state. Connecticut currently hosts two operating nuclear power reactors at the Millstone Nuclear Power Station. The reactors have been relicensed to permit their continued use until 2035 and 2045. This alone will ensure that spent fuel will continue to be produced in Connecticut for the foreseeable future. In addition, there is one mothballed older reactor at Millstone that was shut down in 1998 and all of its spent fuel remains in its fuel pool. Finally, there is one fully decommissioned site that was formerly the Connecticut Yankee Nuclear Power Station.

Decommissioning was completed at Connecticut Yankee in 2004 and that site is currently used for nothing other than housing 412 metric tons of spent fuel in an independent spent fuel storage facility. Overall, there is in excess of 1,880 metric tons of spent fuel in Connecticut which is fully the responsibility of the federal government. Connecticut is a small and densely populated state and wholly unsuited for the prolonged storage of nuclear fuel, some of which has been in spent fuel pools for decades.

The Prairie Island Indian Community's Interest

The Prairie Island Indian Community (the "Tribe") is deeply concerned about the management of nuclear waste. The Prairie Island Nuclear Generating Plant ("PINGP") is located on the ancestral homeland of the Mdewakanton Dakota and

immediately adjacent to the Tribe's current reservation. The Mdewakanton Dakota have resided on Prairie Island for countless generations and, since reorganization pursuant to the Indian Reorganization Act of 1934, 25 U.S.C. § 461 *et seq.*, the federal government has held lands at Prairie Island in trust for the benefit of the Tribe. The PINGP's above-ground Independent Spent Fuel Storage Installation is approximately 600 yards from the nearest tribal member residences, and within one mile of the Tribe's clinic, education center, government offices and gaming enterprise. The PINGP's two reactors have been relicensed to operate until 2033 and 2034, respectively, and will generate approximately 2,500 tons of spent fuel during their 60 years of operation.

The federal government's role as trustee imposes "moral obligations of the highest responsibility and trust" and should "be judged by the most exacting fiduciary standards." *Seminole Nation v. United States*, 316 U.S. 286, 297 (1942). "It is fairly clear that *any* Federal government action is subject to the United States' fiduciary responsibilities toward the Indian tribes." *Nance v. EPA*, 645 F.2d 701, 711 (9th Cir. 1981). When the PINGP operator initially sought approval for forty-eight dry-storage casks in the 1990s, the Tribe was assured that dry storage was a temporary solution until a permanent repository was established. But no permanent repository has been established and, as a result of the recent renewal of the reactors' licenses, the PINGP anticipates that it will need to expand dry storage to accommodate ninety-eight casks.

SUMMARY

Through this DGEIS and rulemaking process, the NRC once again seeks to address the issues associated with the continued production of nuclear wastes when there is not a permanent, safe, and secure facility for the disposal of such wastes and when NRC has finally acknowledged that it does not have confidence that such a facility will be available by any specific date, if ever. Consistent with NEPA and the Court's remand, the NRC thus must address in this proceeding foundational questions, including whether the generation of further nuclear waste should be allowed and, if allowed, what mitigation measures are available to reduce environmental impacts, and what alternatives exist to the current practice of permitting nuclear wastes to be stored at individual reactor sites indefinitely and in spent fuel pools never designed for that purpose.

However, the DGEIS and draft rule, as presented, fail to address these core issues as required by NEPA and the Court's remand by, among other means, miscasting the purpose and need for the DGEIS to focus on agency efficiency rather than environmental protection, by failing to consider a reasonable range of alternatives, including dry cask storage, to mitigate environmental impacts, and by failing to provide the States, the Tribe, and the public with a meaningful opportunity for site specific review of these issues in violation of the Court's mandate.

THE HISTORY OF “WASTE CONFIDENCE” AND SPENT FUEL HANDLING AND STORAGE

A. Background on the Waste Confidence Rule

In 1977, an advocacy group filed a petition for rulemaking asking the NRC to refrain from granting licenses for new nuclear facilities unless and until there was a disposal pathway for the waste. The NRC denied that petition, but recognized 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.” 42 Fed. Reg. 34391.

In 1984, the NRC issued a “Waste Confidence Decision” in response to a remand from the United States Court of Appeals for the District of Columbia Circuit in *State of Minnesota v. NRC*, 602 F.2d 412 (D.C. Cir. 1979), which raised the question of whether an offsite storage or disposal facility would be available for the spent nuclear fuel produced at two reactors at the expiration of their licenses or “whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates.” *Minnesota v. NRC*, 602 F.2d at 418. The D.C. Circuit explained that

It was anticipated, when most of the nuclear power plants now in operation in the United States were licensed, that spent fuel would be stored at the reactor site only long enough to allow the fuel assemblies to cool sufficiently to permit safe shipment off-site for reprocessing (the extraction from the rods of usable uranium and plutonium) or permanent disposal [and that] [s]pent fuel storage capacity at these plants is therefore limited.

Minnesota v. NRC, 602 F.2d at 413-14. Two facilities, Vermont Yankee in Vermont and Prairie Island in Minnesota, had applied for license amendments to allow for

expanded on-site spent fuel pool storage in anticipation of filling their spent fuel pools to capacity, which would have happened by 1978 and 1982 respectively. *Id.*

Intervenors argued that approval of expanded on-site storage could only be granted after analysis of environmental and safety implications. Staff in each licensing proceeding found, in part because the modifications would entail no increase in the amount of wastes annually generated by the reactor, “reasonable assurances” that the modifications would not endanger public health and safety, and that they satisfied the standards of the Atomic Energy Act and NRC regulations, and concluded that NEPA did not require the preparation of environmental impact statements because the modifications would not “significantly affect the quality of the human environment”; findings which were affirmed by the Atomic Safety and Licensing Appeal Board. *Id.* at 414-15.⁵ The D.C. Circuit found insufficient the Commission’s “implicit” policy of a “reasonable assurance that methods of safe permanent disposal of high-level wastes can be available when they are needed” and remanded the issue to the Commission to undertake at least a generic rulemaking to establish such a policy. *Id.* at 417. The result was the 1984 Waste Confidence Decision.

⁵ Ironically, radionuclide contamination was subsequently found in Prairie Island’s groundwater. *See* NUREG-1437, Vol. 1, Sec. 4.8.2.

1. The 1984 Waste Confidence Findings

The 1984 Waste Confidence Decision established five findings designed to allow the continued licensing of nuclear power plants in the absence of an existing repository for high level nuclear waste. Those findings were:

- (1) The Commission finds reasonable assurance that safe disposal of HLW [high level nuclear waste] and SNF [spent nuclear fuel] in a mined geologic repository is technically feasible;
- (2) The Commission finds reasonable assurance that one or more mined geologic repositories for commercial HLW and SNF will be available by the years 2007-2009, and that sufficient repository capacity will be available within 30 years beyond the expiration of any reactor operating license to dispose of existing commercial HLW and SNF originating in such reactor and generated up to that time;
- (3) The Commission finds reasonable assurance that HLW and SNF will be managed in a safe manner until sufficient repository capacity is available to assure the safe disposal of all HLW and SNF;
- (4) The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the expiration of that reactor's operating license at that reactor's spent fuel storage basin, or at either onsite or offsite independent spent fuel storage installations ("ISFSIs");
- (5) The Commission finds reasonable assurance that safe independent onsite or offsite spent fuel storage will be made available if such storage capacity is needed.

49 Fed. Reg. 34658 (Aug. 31, 1984). Based on these findings, the Commission amended 10 C.F.R. Part 51 (specifically, it added 10 C.F.R. § 51.23(a)) to say that the environmental impacts of at-reactor storage after the termination of reactor operating licenses need not be considered in Commission proceedings related to issuance or amendment of a reactor operating license.

2. 1990 Revisions to the Waste Confidence Findings

In 1990, the NRC issued a decision affirming in general the findings but revising Findings Two and Four to reflect new dates of availability of the first repository and to clarify that, in Finding Four, the expiration of a reactor's operating license referred to the full 40 year initial license as well as any revised or renewed licensing term. Following these revisions, Finding Two then read:

The Commission finds reasonable assurance that at least one mined geologic repository will be available *within the first quarter of the twenty-first century*, and sufficient repository capacity will be available within 30 years beyond the licensed life for operation (which may include the term of a revised or renewed license) of a reactor to dispose of the commercial HLW and SNF originating in such reactor and generated up to that time.

(Emphasis added to show revisions from the 1984 rule). 55 Fed. Reg. 38474 (Sept. 18, 1990). Thus, the NRC revised the permanent repository opening date from 2007-2009 to 2025. Finding Four was amended to read:

The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely and without significant environmental impacts for at least 30 years beyond the licensed life for operation (*which may include the term of a revised or renewed license*) of that reactor at its spent fuel storage basin, or at either onsite or offsite ISFSIs.

(Emphasis added to show revisions from the 1984 rule). *Id.* The Commission revised 10 C.F.R. § 51.23(a) to conform to these revisions. *See* 55 Fed. Reg. 38472 (Sept. 18, 1990). The Commission, in 1999, again confirmed these findings and stated that it would consider undertaking a reevaluation of the Waste Confidence Decision if, *inter alia*, significant and pertinent unexpected events occur, raising

substantial doubt about the Decision's continued viability. 64 Fed. Reg. 68005 (Dec. 6, 1999).

3. 2010 Revisions to the Waste Confidence Rule

The NRC stated that it was taking a "fresh look" at the Waste Confidence findings in 2009, although it did not reopen the findings pursuant to its 1999 criteria, in anticipation of a significant number of applications for new reactors. 73 Fed. Reg. at 59553. Specifically, the NRC sought to amend Finding Two again, this time to read that

The Commission finds reasonable assurance that sufficient mined geologic repository capacity can reasonably be expected to be available *within 50-60 years beyond the licensed life for operation* (which may include the term of a revised or renewed license) of any reactor to dispose of the commercial high-level nuclear waste and spent fuel originating in such reactor and generated up to that time.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes). The Commission also sought to amend Finding Four again, to read that:

The Commission finds reasonable assurance that, if necessary, spent fuel generated in any reactor can be stored safely without significant environmental impacts *for at least 60 years* beyond the licensed life for operation (which may include the term of a revised or renewed license) of that reactor in a combination of storage in its spent fuel storage basin and either onsite or offsite independent spent fuel storage installations.

73 Fed. Reg. at 59551 (emphasis added to show proposed changes). Along with these changes, the NRC also sought to amend 10 C.F.R. § 51.23 to essentially reflect changes to Finding Four.

4. Challenges to the 2010 Revisions

Among other parties, the Attorneys General of the States of New York and Vermont and the Commonwealth of Massachusetts submitted comments on the draft 2009 temporary waste storage rule and waste confidence revisions.

Comments Submitted by the Offices of the Attorneys General of the States of New York and Vermont and the Commonwealth of Massachusetts Concerning Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation (Feb. 6, 2009); *see also* Supplemental Comments by the Office of the Attorney General of the State of New York Concerning the Nuclear Regulatory Commission's Proposed Waste Confidence Decision Update and Consideration of Environmental Impacts of Temporary Storage of Spent Fuel after Cessation of Reactor Operation (Feb. 9, 2010). Primarily, the States and Commonwealth argued that leaking spent fuel pools at facilities around the country, which have contaminated groundwater and public waterways, call into question the integrity of spent fuel under water storage conditions; that recent events should undermine the NRC's confidence in the potential risks of accidents and acts of sabotage at spent fuel storage facilities; that site-specific environmental review for each reactor site is required; that the proposed rule fails to comply with NEPA and the AEA; and that the NRC's confidence in indefinite storage at reactor sites is unwarranted.

The NRC issued the final rule, amending Finding 2 to remove a predicted date for when a waste repository would be available and substituting the phrase

that “sufficient mined geologic repository capacity will be available to dispose of the commercial high-level radioactive waste and spent nuclear fuel generated by any reactor when necessary.” 75 Fed. Reg. 81037, 81040 (Dec. 23, 2010). Finding 4 was issued in substantially the same form as the draft rule. *Id.* Neither finding altered the final rule to account for the States’ comments. The States filed a Petition for Review in the D.C. Circuit on February 15, 2011, as did a coalition of environmental groups led by the Natural Resources Defense Council. Oral argument was held in March of 2012, and the D.C. Circuit rendered an opinion in the Petitioners’ favor in June of 2012.

5. Summary of the D.C. Circuit Decision

The Court’s decision made two sweeping criticisms of the NRC’s attempt to meet the obligations which it accepted for itself in 1977 and which the Court in *Minnesota v. NRC* imposed. The Court found that:

First, in concluding that permanent storage will be available “when necessary,” the Commission did not calculate the environmental effects of failing to secure permanent storage--a possibility that cannot be ignored. Second, in determining that spent fuel can safely be stored on site at nuclear plants for sixty years after the expiration of a plant's license, the Commission failed to properly examine future dangers and key consequences.

681 F.3d at 473. Thus, the task NRC must accomplish is to conduct a legally adequate evaluation of the environmental effects of “failing to secure permanent storage for spent fuel” and “to properly examine future dangers and key consequences” of spent fuel storage at reactor sites. The Court then examined particular deficiencies in the Commission’s Waste Confidence decision documents, but did not reduce or narrow these broad NEPA mandated obligations.

In support of these principal holdings the D.C. Circuit found that the NRC did not calculate environmental effects of failing to secure permanent storage when stating that “permanent storage would be available when necessary.” The Court also found that the NRC failed to examine potential consequences of pool fires, and ordered the Commission to look not only at the probability of harmful events, but also at the consequences of those harmful events. The Court concluded that only if the probability of a pool fire is zero can NRC avoid discussing consequences, but if there is probability more than zero, the NRC could issue a Finding of No Significant Impact only after discussing consequences. 681 F.3d at 482.

The Court also found that the NRC failed to examine risk of leaks in a forward-looking fashion and ordered it to look at effects of additional time in storage (30 more years) as well as past leaks to rule out the possibility that those leaks were only harmless because of site-specific factors or sheer luck (that is, the NRC needs to say more than that past leaks had “negligible” near-term health effects). *Id.* at 481. The Court also supported the States’ argument that the NRC cannot point to a voluntary compliance program as evidence of no significant impacts. *Id.*

As to the issue of whether generic or site-specific review was warranted, the Court found that a comprehensive general analysis could be sufficient to examine those on-site risks but only if they are essentially common to all plants. 681 F.3d at 480.

Finally, the Court held that although some concerns raised by the States were not properly before the Court, the States would be free to raise these concerns,

and implicitly any other concerns on remand because “we are invalidating the Commission’s conclusions as a whole.” 681 F.3d at 482.

As a result of the remand, NRC is issuing a Waste Confidence Generic Environmental Impact Statement (NUREG-2157) and a proposed revision to 10 § C.F.R. 51.23. The proposed rule, relying on the findings in NUREG-2157, provides that “no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made” is required. 75 Fed. Reg. at 56804. Thus, any possible environmental consequences or alternatives to mitigate those consequences, whether applicable to all plants – *i.e.*, generic – or applicable only to a one or a few plants – *i.e.*, site-specific – that is related to allowing the generation of additional spent fuel by any reactor, or related to the manner in which spent fuel is stored at a reactor site, or related to the duration of the time such storage is allowed at any reactor, may not be considered in deciding whether to allow such spent fuel generation or storage to occur. Rather, based on the findings and analysis of the DGEIS, NRC will merely note in any site-specific environmental impact statement regarding issuance of any license or amendment to a license, that the impacts of spent fuel storage at the plant are “small” and that there are no alternatives to how the applicant/licensee proposes to store the spent fuel at the

reactor site that need to be considered and no alternatives to how long the applicant/licensee proposes to store the spent fuel at the reactor site.

6. New York, Vermont, and the Tribe's Scoping Comments

On November 14, 2012, representatives of the New York State Attorney General's Office and the Tribe appeared at the initial public scoping meeting at NRC's offices in Rockville, Maryland. At that meeting, counsel for the State urged NRC to undertake a site-specific severe accident mitigation alternatives analysis for the continued storage of spent nuclear fuel at the Indian Point nuclear site similar to the Severe Accident Mitigation Alternatives ("SAMA") analysis that NRC conducts for severe reactor accidents and that NRC examine the alternatives to mitigate the environmental impacts resulting from a severe accident at a spent fuel pool. *See* Oral Comments of New York Assistant Attorney General J. Sipos (Public Scoping Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule November 14, 2012 1:00 P.M. EST) Transcript of Proceedings at 37-40 and NYS Presentation Slides, ML12331A347. Counsel for the State also requested that NRC conduct a *site wide* severe accident analysis. *See, e.g.,* NYS Presentation Slides at 3-5. The State provided examples of site specific characteristics of the Indian Point facilities. *See, e.g.,* NYS Presentation Slides at 6-10.

The Tribe stressed the need for the NRC to consult impacted federally-recognized tribes in order for the NRC to fulfill its unique trust obligations to tribes. *See* Oral Comments of PIIC Tribal Council Member Ronald Johnson (Public Scoping

Meeting for the Environmental Impact Statement to Support an Updated Waste Confidence Decision and Rule November 14, 2012 1:00 P.M. EST) Transcript of Proceedings at 32-36 and 94-97 (Written Testimony), ML12331A347. The Tribe also requested that any alternatives analysis include a robust analysis of the environmental impacts of having no spent fuel repository available. *Id.* In addition, the Tribe submitted joint written comments with Northern States Power Company, a Minnesota Corporation d/b/a Xcel Energy (“NSPM”) on January 2, 2013, which, among other things, discussed the NRC’s non-compliance with its obligations under the Nuclear Waste Policy Act. ML13010A132. The Tribe submitted further individual comments on January 11, 2013, which, among other things, requested that any generic EIS include an environmental justice analysis to determine whether there would be any disproportionately high and adverse health or environmental impacts to low-income, minority, and tribal populations as a result of implementing the proposed action, while questioning whether such a necessarily site-specific analysis could be accomplished generically. ML13017A008. Finally, the Tribe expressed its concern during the December 4, 2013 public meeting in Minnetonka, Minnesota, that due to its close proximity to the PINGP and its ISFSI, its reservation homeland could be rendered uninhabitable by a spent fuel accident in the PINGP’s spent fuel pool or dry cask storage installation. *See* Testimony of Tribal Council Member Ronald Johnson during the December 4, 2013 Waste Confidence Public Meeting in Minnetonka, MN December 4, 2013, Transcript of Proceedings at 17-22 (ML13344B149). The Tribe stated that this potential site-

specific impact implicates the NRC's trust responsibility to federally-recognized Indian tribes, and cannot possibly be assessed generically. *Id.*

On January, 2, 2013, the New York Attorney General's Office along with the Office of the Vermont Attorney General, and the Vermont Public Service Commission submitted scoping comments to the NRC.⁶ On January 3, 2013, the Commonwealth joined in these comments.⁷

Among other concerns, New York, Vermont, and the Commonwealth submitted that site-specific review was warranted, because "with indefinite spent fuel storage at reactor sites comes the need to look at the site-specific implications of such indefinite spent fuel storage because with indefinite storage comes the increased probability that accidents and malevolent acts can cause catastrophic releases of nuclear fission products at individual power plant sites." State Scoping Comments at 4. New York, Vermont, and the Commonwealth asked the NRC to reframe its understanding of the federal action at issue, and to consider alternatives to mitigate the adverse environmental impacts associated with indefinite, or even long-term, storage of spent fuel at the reactor sites. State Scoping Comments at 10.

New York, Vermont, and the Commonwealth further argued that

⁶ Comments Submitted By The Office Of The Attorney General Of The State Of Vermont With The Vermont Department Of Public Service, And By The Office Of The Attorney General Of The State Of New York Concerning Scope Of Consideration Of Environmental Impacts Of Temporary Storage Of Spent Fuel After Cessation Of Reactor Operation (Jan. 2, 2013), ML13007A398 ("State Scoping Comments").

⁷ Letter, Massachusetts Attorney General's Office to Ms. Sarah Lopas, NEPA Communications Project Manager, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, (Jan. 3, 2013), ML13011A084.

- the EIS should provide a comprehensive and thorough exploration of all the environmental issues associated with continuing to generate nuclear wastes when the Commission is unable to determine that there is a date by which a permanent, safe, and secure repository will exist for disposing of nuclear wastes;
- the EIS should rigorously explore all of the potential environmental impacts associated with long-term and indefinite storage of nuclear wastes at reactor sites following reactor shutdown, including the risk of fires, earthquakes, flooding (resulting from tidal and storm surges or infrastructure failures), loss of power and cooling capacity, deterioration of the social order (either briefly or for an extended period of time), deterioration of spent fuel pools and dry casks, failure of funding sources to provide sufficient resources to manage and secure nuclear wastes at each reactor site long after the site is no longer a source of any income to its owner, the social and economic impacts on the communities where these nuclear wastes will remain indefinitely at sites where there are no operating reactors, and malevolent acts;
- the EIS should explore all reasonable alternatives to continued generation of nuclear wastes and continued storage of nuclear wastes at reactor sites in the manner now allowed, including prohibiting further production of nuclear wastes until the Commission can determine that there is a date by which a permanent, safe, and secure repository will exist for disposing of nuclear wastes;
- the analysis of the adverse impacts of continued production of nuclear wastes and continued storage of that waste at reactor sites and the analysis of the mitigation alternatives to the status quo should use the procedures already developed for analyzing mitigation alternatives for severe accidents, thus producing objective and quantitative bases for comparing alternatives to the proposed action;
- the EIS must clearly delineate those issues that will be left to be evaluated on a site-specific basis, identify how these site-specific issues are to be addressed, and make clear that such site-specific consideration is to be explicitly authorized by regulation subject to the normal requirements of 10 C.F.R. § 2.309 on admissibility of contentions but without compelling any party to have to use 10 C.F.R. § 2.335 to seek a waiver of a rule in order to obtain a hearing on the site-specific aspects of post-operation nuclear waste storage at reactor sites; and
- the Commission should establish a procedure by which the public will have an opportunity to raise, before an Atomic Safety and Licensing Board, site-specific issues regarding nuclear waste remaining at reactor sites following

shutdown, at least for those facilities that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available.⁸

State Scoping Comments at 14-16.

The States and the Tribe reiterate and incorporate by reference all of their scoping comments, which are attached as Exhibit A.

7. NRC Response to Scoping Comments

On March 4, 2013, the NRC released the Waste Confidence Generic Environmental Impact Statement Scoping Process Summary Report, ML13060A128. The NRC did not propose any changes to the proposed Waste Confidence DGEIS scope based on the State Scoping Comments, nor did it provide a substantive and thorough explanation of the basis for its rejection of these comments.

8. Multi-State Petition for Review of NRC Scoping Summary

On May 22, 2013, counsel for the States of New York, Connecticut, and Vermont, the Vermont Department of Public Service, and the Commonwealth of Massachusetts (“States”) petitioned the Commission to review Staff’s scoping decision. Petition for Review of NRC Staff Scoping Decision (May 22, 2013), available under ML13149A446. The petition argued that the Staff scoping decision

⁸ The Commonwealth submits that the NRC also must supplement the EIS for the Pilgrim nuclear power plant regarding spent fuel storage issues and other matters as raised in these comments, in accordance with NEPA and the final GEIS and rulemaking, including any site specific review and public participation provided thereunder, and as previously requested by the Commonwealth in its 2011 precicensing rulemaking petition which remains pending before the NRC. *See* PRM-51-29 (ML12254A005); 77 Fed. Reg 75065 (Jan. 10, 2013).

illegally narrows the scope of alternatives by failing to address the alternative of requiring dry cask storage of spent fuel rather than continued use of spent fuel pools for spent fuel that is more than five years old, and fails to address the alternative of not allowing further production of spent fuel until NRC determines that there is a safe and environmentally acceptable permanent waste repository to receive the additional spent fuel. *Id.* The petition also argued that the Staff scoping decision ignores the limitations in 10 C.F.R. §§ 51.23(b), 51.23(c)(2), and 51.95(c)(2) and fails to provide proposed criteria for when issues may be raised in individual licensing proceedings. *Id.*

The Petition again emphasized that the Scoping Decision was mischaracterizing the major federal action involved.

The true purpose of the GEIS, which is to provide a basis for NRC to determine whether to issue or renew licenses and, if it issues or renews a license, what conditions should be imposed in the license. As the D.C. Circuit recognized, NRC is required to analyze the environmental impacts of the temporary storage of spent fuel before it licenses or relicenses the operation of a nuclear reactor because that operation will generate spent fuel for which there as yet is no permanent repository. *New York*, 681 F.3d at 473 (holding that the fact that permanent storage may never be achieved is “a possibility that cannot be ignored”); *see also id.* at 477 (“It is not only reasonably foreseeable but eminently clear that the WCD will be used to enable licensing decisions based on its findings.”).

Petition for Review of NRC Staff Scoping Decision at 12.

On July 23, 2013, on behalf of the NRC Commissioners, Chairman Allison Macfarlane responded to the State petitioners, stating that the NRC has determined that the notice-and-comment process, rather than reliance on adjudicatory briefings, is the appropriate means to ensure there is ample

opportunity for public participation in the Waste Confidence matter and that the Commission did not plan to solicit briefs and issue merits decisions on the Staff's scoping report or other specific issues, and no NRC rule or notice contemplates petitions for Commission review of NRC staff scoping documents. Letter, Allison Macfarlane to Vermont Attorney General William Sorrell (July 23, 2013), ML13204A315. The States reiterate and incorporate their scoping petition, which is attached as Exhibit B.

9. The Waste Confidence Draft GEIS and Proposed 10 C.F.R § 51.23

On September 6, 2013, NRC Staff released the DGEIS and proposed 10 C.F.R § 51.23. NUREG-2157, Waste Confidence Generic Environmental Impact Statement Draft Report for Comment (ML13224A106).⁹ The DGEIS discusses three timeframes: the short-term timeframe, or 60 years beyond licensed life of the reactor; the long-term timeframe, or 100 years beyond the short-term timeframe; and indefinite storage, which assumes no repository is ever available. DGEIS at 1-12. The DGEIS makes a number of assumptions, some of which the States respond to below (DGEIS at 1-13 – 1-17), and some of which are addressed in the expert reports submitted by the States either here or under separate cover.

⁹ This document was released on September 6, 2013, but bears a date of September 30, 2013, which the NRC deemed its effective date. 78 Fed. Reg. 56621 (Sept. 13, 2013) (Notice Of Release Of Proposed Draft Waste Confidence Generic Environmental Impact Statement), 78 Fed. Reg. 56776 (Sept. 13, 2013) (Notice Of Release Of Proposed Regulation Concerning Waste Confidence – Continued Storage Of Spent Nuclear Fuel).

B. Background on Spent Fuel Handling and Storage

1. NUREG-0575, Final Generic Environmental Impact Statement On Handling and Storage of Spent Light Water Power Reactor Fuel¹⁰

The Commission noted in 1975 that the onsite storage of spent fuel was always meant to be temporary:

From the early days of the nuclear power industry in this country . . . [i]t was contemplated by the nuclear industry that spent fuel would be discharged periodically from operating reactors, stored in onsite fuel storage pools for a period of time to permit decay of radioactive materials contained within the fuel and to cool, and periodically shipped offsite for reprocessing.

40 Fed. Reg. 42801, Intent To Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel (Sept. 16, 1975).

The Commission then identified the scope of the inquiry required to prepare a legally adequate generic impact statement on the handling and storage of spent fuel:

The statement will focus on the time period between now and the mid 1980's and will address:

- (1) The magnitude of the possible shortage of spent fuel storage capacity;
- (2) The alternatives for dealing with the problem, including, but not necessarily limited to:
 - (a) Permitting the expansion of spent fuel storage capacity at power reactors;
* * *
 - (c) Licensing of independent spent fuel storage facilities;
 - (d) Storage of spent fuel from one or more reactors at the storage pools of other reactors;

¹⁰ NRC has apparently conducted several studies of the potential for radiation releases from the storage of spent fuel in pools at reactor sites, but many of the studies are not publically available, and the "NRC does not have a mechanism to ensure that it can easily identify and locate all classified studies conducted over the years." Spent Nuclear Fuel, Accumulating Quantities at Commercial Reactors Present Storage and Other Challenges, GAO-12-797 (August 2012) at 36.

- (e) Ordering that generation of spent fuel (reactor operation) be stopped or restricted;
- (3) A cost-benefit analysis of the alternatives listed in (2), along with any -other reasonably feasible alternatives, including:
 - (a) Impacts on public health and safety and the common defense and security;
 - (b) Environmental, social, and economic costs and benefits;
 - (c) Commitments of resources;
 - (d) Implications regarding options available for the intermediate and longterm storage of nuclear waste materials;
 - (e) Relationship between local shortterm uses of the environment and longterm productivity;
- (4) The impacts of possible additional transportation of spent fuel that may be required should one or more of the alternatives be adopted;
- (5) More definitive standards and criteria to govern the licensing of one or more of the alternatives for dealing with the problem; and
- (6) Possible amendments to 10 CFR § 51.20(e).

Id.

In 1979, the Commission issued its generic impact statement which “examine[d] alternative methods of spent fuel storage as well as the possible restriction or termination of the generation of spent fuel through nuclear power plant shutdown.” NUREG-0575, Vol. 1, Final Generic Environmental Impact Statement On Handling and Storage of Spent Light Water Power Reactor Fuel (August 1979)(“NUREG-0575”) at ES-1. The NRC then used this generic impact statement to support the environmental analyses for allowing the re-racking of spent fuel pools. *See e.g.*, Environmental Assessment And Finding of No Significant Impact By The Office of Nuclear Reactor Regulation Relating to the Spent Fuel Pool Facility Operating License No. DPP-28 Vermont Yankee Nuclear Power

Corporation Vermont Yankee Nuclear Power Station Docket No. 50-271, (July 25, 1988) ML011640081, Attachment at 2-4 and Environmental Assessment By The Office Of Nuclear Reactor Regulation Relating To The Expansion Of The Spent Fuel Pool Facility Operating License No. Dpr-64 Power Authority Of The State Of New York Indian Point Nuclear Generating Unit No. 3 Docket No. 50-286, (Oct. 4, 1989) ML003778820, Attachment at 3-5.

NUREG-0575 limited its analysis to “the magnitude of spent fuel storage capacity *through the year 2000*.” NUREG-0575 at 1-1 and 1-2 (emphasis added). And in making that more limited analysis, the Commission recognized that it must look at “the consequences of dealing with this situation by the limitation of the amount of spent fuel generated.” *Id.* Further, although NUREG-0575 was a generic analysis, it recognized that there were important substantive issues related to the storage of spent fuel at reactor sites that had to be addressed on a site-specific basis: “Because there are many variations in storage pool designs and limitations caused by spent fuel already in some pools, the licensing reviews must be done on a case-by-case basis.” *Id.* at 8-1.

The Commission has frequently relied on NUREG-0575, including waste confidence decisions.¹¹ In doing so, the Commission has never recognized that

¹¹ The initial waste confidence decision relied, in part, on NUREG-0575 to conclude that storage of spent fuel at reactor sites is acceptable. “The Commission is confident that the regulations now in place will assure adequate protection of the public health and safety and the environment during the period when the spent fuel is in storage (NUREG-0575, ‘Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel,’ Vol. 1, August 1979, at ES-12, 4-10 to 4-17).” 49 Fed. Reg. 34658.

NUREG-0575 was based on several incorrect assumptions. First, it greatly underestimated the “conservative upper bound” to the length of onsite storage:

The Commission announcement of September 16, 1975, outlining this study stipulated that the Staff was to examine the period through the mid-1980’s. In the absence of a national policy directed to final disposition of spent fuel, the staff extended the time period of this study to year-2000. This extension provided *a conservative upper bound* to the interim spent fuel storage situation at a date that constituted a practical limit to the forecasting that may logically be used as a basis for today’s decisionmaking.

Id. at ES-1 (emphasis added). Further, the analysis dismissed the possibility of “an identifiable threat to nuclear activities” such as terrorism:

Increased storage of aged spent fuel at either reactor or away-from-reactor sites has little relative safeguards significance. This conclusion is based upon the staff’s consideration of:

- (1) *the absence of any information confirming an identifiable threat to nuclear activities,*
- (2) the physical characteristics and conditions of storage (which include specific security provisions) of aged spent fuel, and
- (3) the magnitude of the estimated consequences of certain postulated sabotage events. *Id.* at ES-7

Id. at ES-7 (emphasis added)

NUREG-0575 has never been updated or supplemented.¹²

¹² In *Marsh v. Oregon Natural Resources Counsel*, 490 U.S. 360, 372 (1989) the Court held that NEPA “impose[s] a duty on all federal agencies to prepare supplements to either draft or final EISs if there ‘are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts;’” citing CEQ Regulations. The new and significant information since NUREG-0575 includes, no date for a permanent waste repository, compelling evidence that terrorism is a credible threat to spent fuel stored at nuclear reactors, the accident at Fukushima, the recognition of the greater possibility of more devastating earthquakes for sites in the upper Midwest and the Northeast, the use of high burnup fuel with its special problems for fuel rod integrity and residual heat, to mention only a few.

2. NUREG-1738, Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (February 2001)

NUREG-1738 was a 2001 technical study describing “a modeling approach of a typical decommissioning plant with design assumptions and industry commitments” to address a number of issues including “the risk assessment of spent fuel pool accidents.” NUREG-1738 at iii. The Study concluded that the risk posed by spent fuel pools was “low because of the very low likelihood of a zirconium fire even though the consequences from a zirconium fire could be serious.” *Id.* at 5-1. But the Study explicitly recognized that a zirconium fire in a spent fuel pool was possible and would have long-term consequences that may be “significant.” *Id.* at x. Further, its conclusions about the probability of such a fire were severely limited because, among other things, it excluded terrorism as an initiating cause. *Id.*

NUREG-1738 further concluded that aircraft damage could affect the structural integrity of spent fuel pools – which contain radioactive materials and are located outside the reactor’s protective containment shells – or the availability of nearby support systems. NUREG-1738, at § 3.5.2. The NRC further found that one of two aircraft crashes would damage the spent fuel pool enough to uncover the stored fuel, which could lead to serious consequences from a zirconium cladding fire. *See id.* and p. 3-1. That NRC study found that, if a spent-fuel pool lost enough water to uncover the spent-fuel assemblies, the spent fuel could heat to the point where the fuel’s zirconium cladding might catch fire. NUREG-1738, at pp. x, 2-1. The study found that the time between fuel uncovering and ignition of a zirconium

fire depends on various site specific factors including decay heat rate, fuel burnup, fuel storage configuration and amount of fuel, building ventilation rates, air flow paths, and fuel cladding oxidation rates. *Id.* at p. 2-1, 3-1, 5-1 – 5-3, A3-5. In preparing NUREG-1738, NRC used the MACCS2 codes. *Id.* at A4-7.

3. NRC’s Spent Fuel Pool Consequence Study

On July 2, 2013, NRC issued a draft report for public comment, titled Consequence Study of a Beyond-Design-Basis Earthquake Affecting the Spent Fuel Pool for a U.S. Mark I Boiling Water Reactor (“Draft Spent Fuel Pool Consequence Study”), 78 Fed. Reg. 39781 (July 2, 2013).¹³ NRC has stated that it has already incorporated the results of the draft study into the DGEIS and, if the study is finalized before the final GEIS is published, has stated publicly that it will be added as a reference.¹⁴

The DGEIS, however, does not reference the draft Consequence Study, or explain what results of that study are incorporated into the DGEIS. The draft Consequence Study was prepared as a response to the accidents at the Fukushima nuclear power plants that began in March 2011. In 2011, the NRC Commissioners directed the Office of Reactor Research (RES) to examine the issue of continued dense storage of spent nuclear fuel in spent fuel pools. As the State of New York

¹³ The draft Spent Fuel Pool Consequence Study is available in ADAMS at ML13133A132.

¹⁴ See, e.g., NRC, *Two Separate NRC Efforts Address Spent Fuel Safety*, <http://public-blog.nrc-gateway.gov/2013/06/24/two-separate-nrc-efforts-address-spent-fuel-safety/> (June 24, 2013) (“The draft GEIS [for the Waste Confidence rule] does not explicitly reference the pool study, though the waste confidence staff worked closely with the staff preparing the pool study while developing relevant chapters of the draft GEIS. If a final version of the [Spent Fuel Pool Consequence] study is published before the final waste confidence GEIS, the staff will incorporate a reference to it in the final GEIS.”).

has subsequently learned, NRC's research office spent approximately two years studying the issue and preparing the Draft Spent Fuel Pool Consequence Study. Notably, NRC staff in conjunction with staff at Sandia National Laboratories used a computer code known as the MACCS2 code to analyze the impacts of a severe pool accident. Transcript, NRC Japan Lessons Learned Project Directorate, Public Meeting at 90-110 (Sept. 18, 2013) (ML13277A215).

The Draft Spent Fuel Pool Consequence Study purportedly seeks “to examine if faster removal of older, colder spent reactor fuel from pools to dry cask storage significantly reduces risks to public health and safety.” 78 Fed. Reg. 39781. To that end, the study examined a potential severe accident at one of the two spent fuel pools at Peach Bottom Atomic Power Station as a reference plant. Draft Spent Fuel Pool Consequence Study (June 24, 2013) (ML13133A132) at 5. The draft study further claimed that “past SFP [Spent Fuel Pool] risk studies have shown that high-density spent fuel storage is safe and risk of a release due to an accident is low.” Draft Spent Fuel Pool Consequence Study at xii. NRC found that “spent fuel pools are robust structures that are likely to withstand severe earthquakes without leaking.” *Id.* NRC further found, “[f]or the hypothetical releases studied, no early fatalities attributable to radiation exposure were predicted and individual latent cancer fatality risks are projected to be low, but extensive protective actions may be needed.” *Id.* Ultimately, the study concluded “that expediting movement of spent fuel from the pool does not provide a substantial safety enhancement for the reference plant.” *Id.* In conjunction with staff from Sandia Laboratories, NRC Staff

spent approximately two years internally developing the draft spent fuel pool study; NRC provided the States and others with 30 days to read and comment on the study.

Despite the short 30-day time frame to comment on this study, the State of New York, Attorney General's Office (ADAMS Accession No. ML13217A134) and State of Vermont, Department of Public Service (ADAMS Accession No. ML13217A131) filed comments. New York expressed concerns about NRC's plan to broadly use the study in the future given the differences between the reference plant, Peach Bottom, and Indian Point. New York also expressed concerns regarding the study's failure to perform a benchmarking or bounding analysis, reliance upon assumptions that underestimate the likelihood of a spent fuel pool accident, and use of generic, as opposed to site-specific, data to develop its consequence cost estimates. In short, New York submitted that the study's conclusion—that "expediting movement of spent fuel from the pool does not provide a substantial safety enhancement for the reference plant"—is not adequately supported or explained.

NRC held a public meeting regarding the expedited transfer of spent fuel to dry cask storage on August 22, 2013. Although some participants were provided with the opportunity to offer comments, including a representative of the Commonwealth of Massachusetts Attorney General's Office who commented, NRC ended the call before the State of New York, representatives of which were waiting

on a phone line, was allowed to provide comments. NRC did not prepare a transcript of this meeting.

On September 18, 2013, NRC held another public meeting and provided the State of New York with a brief opportunity to ask questions. *See* Transcript NRC Japan Lessons Learned Project Directorate, Public Meeting at 89-103 (Sept. 18, 2013) (ML13277A215). At the public meeting, the State of New York was able to confirm that the consequence portion of the analysis was performed using a computer code called the MACCS2 code, and requested the input and output files. After repeated follow-up requests, New York received the input and output files in native form on Tuesday, November 28, 2013.

The Consequence Study was not conducted pursuant to the requirements of NEPA and thus did not include a hard look at alternatives to continued storage of spent fuel in spent fuel pools nor did it apply NEPA standards to determining whether alternatives to pool storage would be environmentally preferable. Most importantly, it did not apply NRC's requirement that NRC "has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the alternative selected, and if not, to explain why those measures were not adopted." 10 C.F.R. § 51.103(a)(4).

4. COMSECY-13-0300: Staff Evaluation And Recommendation For Japan Lessons-Learned Tier 3 Issue On Expedited Transfer Of Spent Fuel

In SECY-13-0112 (ML13256A339), dated October 9, 2013, NRC Staff provided the Commissioners with the final Spent Fuel Pool Study, noting Staff's

intention to make the report public and subsequently publish it as a NUREG. Subsequently, NRC issued COMSECY-13-0030 (ML13273A601), dated November 12, 2013. COMSECY-13-0030 “concludes that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit, and that its expected implementation costs would not be warranted.” COMSECY-13-0030 (ML13273A601) at 10. NRC therefore recommends that “no further generic assessments be pursued related to possible regulatory actions to require the expedited transfer of spent fuel.” *Id.* COMSECY-13-0030 relied heavily upon the Spent Fuel Pool Consequence Study and its estimation of the costs and benefits of expedited fuel transfer at the Peach Bottom site. NRC then issued a correction notice for COMSECY-13-0030, dated November 25, 2013 (ML13329A923), which purported to correct editing errors in the original document.

Like the Consequence Study upon which it was primarily based, COMSECY-13-0300 did not address the requirements of NEPA. Rather, it conducted an evaluation of the costs and benefits of expedited spent fuel transfer to dry cask storage using only the restrictive standards imposed under the backfit provision of 10 C.F.R. § 50.109. Using those restrictive standards, COMSECY-13-0300 found “that the expedited transfer of spent fuel to dry cask storage would provide only a minor or limited safety benefit (*i.e.*, less than safety goal screening criteria), and that its expected implementation costs would not be warranted.” *Id.* at 1-2. That conclusion is reached although Staff also found that at least in some evaluations using reasonable conservative assumptions the cost advantage of expedited transfer

of spent fuel to dry cask storage could be hundreds of millions of dollars per reactor.¹⁵

In addition, the analysis in COMSECY-13-0300 and its primary technical document, the Consequence Study, suffer from substantial limitations. First the basis for the study of the consequences of a spent fuel accident was a reactor whose characteristics and surrounding demographics are considerably less likely to produce large accident consequences than many other reactors. For example, Indian Point, located only 35 miles north of New York City has an average population density within 50 miles of over 2,000 persons per square mile (Generic Environmental Impact Statement for License Renewal of Nuclear Plants Supplement 38 Regarding Indian Point Nuclear Generating Unit Nos. 2 and 3, NUREG-1437 (December 2010) at 2-124), while the Consequence Study assumed a population density out to 50 miles of only 722 people per square mile (Consequence Study at D-31) and COMSECY-13-0300 at 99-100, Tables 53 and 55 assumed an average population of only 300 persons per square mile, creating that average by using reactor sites with a maximum population density of 722 and ignoring any mention of the Indian Point site. Second, both studies assumed that the event that would initiate the release was an earthquake or other site-specific event like a cask drop where the configuration of the spent fuel pool could affect the consequences of the cask drop. Consequence Study at 9 and COMSECY-13-0300, Cover

¹⁵ Notably, COMSECY-13-0300 includes a detailed non-concurrence of its analysis and conclusions that expedited spent fuel transfer is not warranted, a critique which is not fully rebutted. The DGEIS ignores all of the critiques contained in that rebuttal. COMSECY-13-0300 at Enclosure 2.

Memorandum at 7. But not included was the risk of a malevolent act, the probability of which cannot be calculated. Third, both studies ignored the many unique, site-specific and as-yet-unevaluated problems created by the use of high burnup fuel in reactors. The use of high burnup fuel causes special problems, including a greater chance of accidents and an increased chance of structural failure of the fuel rods such that transfer to dry casks is more difficult, more dangerous, and more expensive. *See e.g.* NUREG-1738 at ix, 3-1.

5. Independent Studies of the Hazards of Spent Fuel Pool Storage

In 2003, Congress directed the National Academy of Sciences (“NAS”) to conduct a study of spent nuclear fuel storage at commercial reactor sites, including the “safety and security advantages, if any, of dry cask storage versus wet pool storage at reactor sites.” Conference Report to Accompany H.R. 2754, Making Appropriations For Energy And Water Development For The Fiscal Year Ending September 30, 2004, And For Other Purposes, Title IV, 108th Congress 1st Session, H.R. 108–357. NAS produced the report in 2006 in both a public and a non-public version. Only the public version is referenced here. Safety And Security Of Commercial Spent Nuclear Fuel Storage (Public Report), Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage Board on Radioactive Waste Management Division on Earth and Life Studies National Research Council Of The National Academies (2006) (“NAS Study”). The NAS Study concluded that

The probability of terrorist attacks on spent fuel storage cannot be assessed quantitatively or comparatively. Spent fuel storage facilities cannot be dismissed as targets for such attacks because it is not possible to predict the behavior and motivations of terrorists, and

because of the attractiveness of spent fuel as a terrorist target given the well known public dread of radiation.

The committee finds that, under some conditions, a terrorist attack that partially or completely drained a spent fuel pool could lead to a propagating zirconium cladding fire and the release of large quantities of radioactive materials to the environment.

It appears to be feasible to reduce the likelihood of a zirconium cladding fire following a loss-of-pool-coolant event using readily implemented measures. The following measures appear to have particular merit: Reconfiguring the spent fuel in the pools (i.e., redistribution of high decay-heat assemblies so that they are surrounded by low decay-heat assemblies) to more evenly distribute decay-heat loads and enhance radiative heat transfer; limiting the frequency of offloads of full reactor cores into spent fuel pools, requiring longer shutdowns of the reactor before any fuel is offloaded, and providing enhanced security when such offloads must be made; and development of a redundant and diverse response system to mitigate loss-of-pool-coolant events that would be capable of operation even if the pool or overlying building were severely damaged.

The potential vulnerabilities of spent fuel pools to terrorist attacks are plant-design specific. Therefore, specific vulnerabilities can be understood only by examining the characteristics of spent fuel storage at each plant.

Dry cask storage for older, cooler spent fuel has two inherent advantages over pool storage: (1) It is a passive system that relies on natural air circulation for cooling; and (2) it divides the inventory of that spent fuel among a large number of discrete, robust containers. These factors make it more difficult to attack a large amount of spent fuel at one time and also reduce the consequences of such attacks.

NAS Study at 6, 8 and 10.

Another study was done by the General Accounting Office. GAO-12-797, Spent Nuclear Fuel Accumulating Quantities at Commercial Reactors Present Storage and Other Challenges (August 2012) (“GAO Study”). This study concluded that “the key risk of storing spent fuel at reactor sites is radiation exposure from

spent fuel that has caught fire when it is stored in a pool, but it is difficult to quantify the probability of such an event.” *Id.* at 27. The GAO Study also found that “according to the analysis in a February 2001 NRC study [NUREG-1738], assuming a high release of radiation, the release of spent fuel fission products resulting from a pool fire could result in nearly 200 early fatalities, thousands of subsequent cancer fatalities, and widespread land contamination.” *Id.* at 28.

The previous NRC analyses and independent analyses of the safety of spent fuel stored at reactor sites, particularly the safety of such storage in spent fuel pools, is directly relevant to the task NRC should be undertaking here.

COMMENTS

I. NRC HAS MISCAST THE FEDERAL ACTION NECESSITATING THIS ENVIRONMENTAL IMPACT STATEMENT

The NRC states that “[t]he Waste Confidence rulemaking is a major Federal action that requires a NEPA review.” DGEIS at xxiii. While the States and the Tribe do agree that the development, justification, and promulgation of regulations are “federal actions” requiring NEPA review, here, the analysis of the storage of nuclear waste relates back to major federal actions resulting in the generation and storage of nuclear waste: the licensing and/or relicensing of nuclear power plants and waste storage installations, and the ongoing storage of nuclear waste at facilities no longer operational. Because the “waste confidence findings” were in place for so many years, no generic or site-specific EIS since 1984, which relied

substantially on NUREG-0575, has included an analysis of the environmental impacts of nuclear waste generation or storage.¹⁶

A. The Statement of Purpose and Need Violates NEPA as it is Artificially Limited to Efficiency and Paperwork

Under CEQ regulations, the EIS “shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action.” 40 C.F.R. § 1502.13. Given that the NRC has miscast the federal action, it has necessarily also miscast the Statement of Purpose and Need.

The purpose and need relates back to the NRC’s ongoing attempts, for more than three decades now, to address the safety and environmental impacts of nuclear waste storage when it licenses reactors. In 1977, NRC declared, in its denial of a petition filed by NRDC, 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” (42 Fed. Reg. 34391) (July 5, 1977). As Judge Tamm of the D.C. Circuit stated in 1979, “if the Commission determines it is not reasonably probable that an offsite waste disposal solution will be available when the licenses of the plants in question expire, it then must determine whether it is reasonably probable that the spent fuel can be stored safely onsite for an indefinite period. Answers to these

¹⁶ In addition, the Commission should establish a procedure by which the public will have an opportunity to raise, before an Atomic Safety and Licensing Board, site-specific issues regarding nuclear waste remaining at reactor sites following shutdown, at least for those facilities that received operating licenses or license extensions on or after December 23, 2010, when the Commission formally abandoned the position that it could establish a date by which a permanent nuclear waste repository would be available. 75 Fed. Reg. 81032 (Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation) (Dec. 23, 2010). This right should exist regardless of whether such issues were sought to be raised at the time of the previous licensing action and should not be limited to contested licenses or previously admitted parties. *See* n. 8, above.

inquiries are essential for adequate consideration of the safety and environmental standards of the relevant statutes.” *Minnesota v. NRC*, 602 F.2d 412, 419 (D.C. Cir. 1979) (Tamm, J. concurring). Thirty-four years later, the NRC has still not made these determinations; the DGEIS is its latest attempt.

The NRC in the DGEIS states that it is “evaluating the continued storage of commercial spent fuel.” DGEIS at xxiii. The proposed action the DGEIS purports to support is the issuance of a rule, 10 C.F.R. 51.23, that “generically addresses the environmental impacts of continued spent fuel storage by incorporating into rule the conclusions” of the DGEIS. DGEIS at ES.3, xxii. Accordingly, the NRC presents its Statement of Purpose and Need as follows:

1. to improve the efficiency of the NRC’s licensing process by generically addressing the environmental impacts of continued storage;
2. to prepare a single document that reflects the NRC’s current understanding of these environmental impacts;
3. to address the deficiencies in the 2010 Waste Confidence rule identified by the U.S. Court of Appeals for the D.C. Circuit.

DGEIS at xxii.

To begin with, the purpose of the federal action here is not to improve efficiency. Such a purpose and need turns NEPA on its head. It focuses on the impact of the NEPA review process on the agency staff instead of focusing on the environmental impacts of what the agency is authorizing—licensing and relicensing decisions that will result in continued generation and storage of spent fuel in the absence of a permanent repository. While NRC may certainly discuss the

convenience of the federal agency, it cannot be the purpose of the NEPA analysis itself.

The NRC's job here is still to meet the requirements laid out by the D.C. Circuit in 1979 – the DGEIS needs to determine “whether there is reasonable assurance that an off-site solution [for spent fuel] will be available by ... the expiration of the plants’ operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates.” *New York v. NRC*, 681 F.3d at 474-75, quoting *Minnesota* 602 F.2d at 418. Insofar as the D.C. Circuit has ever expressed an opinion about the efficiency of the NRC's process, it has been secondary to the primary question of whether waste can be stored safely:

[A]n agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality.

Friends of Southeast's Future v. Morrison, 153 F.3d 1059, 1066 (9th Cir. 1998) (quoting *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190, 196 (D.C. Cir. 1991)). While it is true that courts afford the NRC and other agencies “considerable discretion” in defining statements of purpose and need (See e.g., *Friends of Southeast's Future*, 153 F.3d at 1066-67), courts have also made clear that an agency's discretion in defining a purpose and need statement is “not unlimited.” See *Westlands Water Dist. v. U. S. Dep't of Interior*, 376 F.3d 853, 866 (9th Cir. 2004);

New York v. U. S. Dep't of Transp., 715 F.2d 732, 742 (2d Cir. 1983) (“An agency’s selection of alternatives . . . is not insulated from review”).

The Waste Confidence DGEIS is required to provide an analysis of waste generation and storage that has been lacking from environmental analyses of proposed NRC actions since 1984, when the original waste confidence findings were issued, blocking any discussion of nuclear waste for the period after the licensed life of a facility.

The States submit that the NRC’s goal in promulgating 10 C.F.R. § 51.23 is to ensure, after considered notice and comment rulemaking, that onsite storage of nuclear waste in the period after the licensed life of a facility is safe and without significant environmental impacts, such that continued generation of spent fuel through the operation of commercial nuclear power facilities is warranted. NRC believes its goal to be precluding consideration of such issues on a site by site basis in the name of administrative efficiency.

Even if promulgation of the regulation was the proper federal action, the statement of purpose and need is still inadequate and unreasonably narrow for the above stated reasons.

B. Statement Three of the Statement of Purpose and Need is Too Vague and Fails to Satisfy NEPA’s Public Information Purpose

In addition to the above, the Statement of Purpose and Need is also impermissibly vague and fails to satisfy NEPA’s public information purpose. In stating that it “address[es] the deficiencies in the 2010 Waste Confidence rule identified by the U.S. Court of Appeals for the D.C. Circuit,” it does not provide

sufficient information such that adequate alternatives can be framed. The Statement of Purpose and Need is critical to the EIS because it frames the range of reasonable alternatives the agency must consider or such that the public can understand the action NRC is undertaking in the DGEIS.

NEPA has twin aims: it “places upon an agency the obligation to consider every significant aspect of the environmental impact of a proposed action,” *Baltimore Gas & Elec. Co. v. Natural Res. Def. Council, Inc.*, 462 U.S. 87, 97 (1983). “[I]t ensures that the agency will inform the public that it has indeed considered environmental concerns in its decisionmaking process.” *Id.* “Grudging, pro forma compliance will not do.” *Lathan v. Brinegar*, 506 F.2d 677, 693 (9th Cir. 1974). Both the CEQ and NRC’s own NEPA regulations underscore that EISs should be written for the public:

Ultimately, of course, it is not better documents but better decisions that count. NEPA’s purpose is not to generate paperwork--even excellent paperwork--but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect, restore, and enhance the environment.

40 C.F.R. § 1500.1(c); *see also* 40 C.F.R. § 1500.2(b) (“Federal agencies shall to the fullest extent possible . . . emphasize real environmental issues and alternatives.”); 10 C.F.R. § 51.70(b):

The draft environmental impact statement will be concise, clear and analytic, will be written in plain language with appropriate graphics, will state how alternatives considered in it and decisions based on it will or will not achieve the requirements of sections 101 and 102(1) of NEPA and of any other relevant and applicable environmental laws and policies, will identify any methodologies used and sources relied

upon, and will be supported by evidence that the necessary environmental analyses have been made.)

In framing the purpose of this DGEIS by referencing a federal appellate court decision, NRC has failed to satisfy NEPA's public information purpose. The Office of the Inspector General recently took NRC to task for its failure to meet its NEPA obligations in a way that is accessible to the public. Office of the Inspector General, Nuclear Regulatory Commission, Audit Report: Audit of NRC's Compliance with 10 CFR Part 51 Relative to Environmental Impact Statements (OIG-13-A-20) (ML13232A192) (Aug. 20, 2013) ("OIG Report"). The OIG report found that NRC's NEPA documentation "does not clearly present, in an accessible way, the proposed action, alternatives, and conclusions to stakeholders" and "undermines its extensive efforts to be clear, open, and transparent." OIG Report at 12. The OIG criticized NRC's EIS documents for being "lengthy and complex" and "overwhelming to the average person." OIG Report at 7, 10-11; *see also id.* at 15. The OIG Report cited suggestions from stakeholders that "NRC ought to break down the information 'in a common sense approach so the average person can do a quick read and learn how they may be impacted by the action.'" *Id.* at 15. The NRC has again failed to produce an EIS here that is easily amenable to public review.

C. The DGEIS Should Have A Scope of Issues and Alternatives At Least As Broad as NRC's Previous Generic Analysis in NUREG-0575

For over 30 years, the NRC has been struggling with whether spent fuel will ever leave reactor sites and the environmental consequences of continued onsite storage. NRC's one generic impact statement addressing these issues (NUREG-

0575) is out of date and relies on assumptions that are no longer valid. Further, it fails to include new and significant information that demonstrates that its conclusions are ill-founded.

That waste confidence decision and its predecessors relied on NUREG-0575 and its findings in reaching conclusions about whether spent fuel could be safely stored at reactor sites for 30 or even 60 years after plant shutdown. As already noted, the need for the generic analysis in NUREG-0575 was the dilemma caused by the absence of an anticipated place where spent fuel would be sent – in that case for reprocessing. The cause of the problem today is the absence of a permanent waste repository but the dilemma is the same. In both cases reactors were generating spent fuel while licensees expected it would be removed from the site in a finite period of time. Now it is clear that expectation will not be met. Thus, there remains the same need for the same type of generic analysis of the environmental consequences of long term and possibly permanent spent fuel storage at reactor sites, and reservation of appropriate issues for site-specific review.

In 1979 the preferred solution was reracking of spent fuel to allow more spent fuel to be stored at the reactor sites in spent fuel pools. NUREG-0575 evaluated that proposed action and considered a number of alternatives including dry cask storage and ending the further production of spent fuel. Today NRC's preferred solution is to allow more spent fuel to be generated and stored at reactor sites in spent fuel pools and for longer periods of time. It is that proposed action that the DGEIS must evaluate, including an analysis of alternatives to that proposed action,

as well as measures to mitigate the environmental consequences of the proposed action.

NRC faces the same type of issues it faced in 1979, when it explicitly recognized that it must analyze whether to allow the continued production of spent fuel and the continued storage of spent fuel at reactor sites in spent fuel pools. NRC must still answer, in the context of NEPA, the same question the Court ordered it to answer in the remand in *Minnesota v. NRC*:

the court contemplates consideration on remand of the specific problem isolated by petitioners determining whether there is reasonable assurance that an off-site storage solution will be available by the years 2007-09, the expiration of the plants' operating licenses, and if not, whether there is reasonable assurance that the fuel can be stored safely at the sites beyond those dates.

Minnesota v. N.R.C., 602 F.2d at 412. The Waste Confidence decision in 1984 was a direct outgrowth of that mandate, and NUREG-0575 was the principal basis for the NRC's conclusion that spent fuel could be safely stored at reactor sites in either spent fuel pools or dry casks:

The Commission is confident that the regulations now in place will assure adequate protection of the public health and safety and the environment during the period when the spent fuel is in storage ("Final Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel," NUREG-0575, August 1979: Vol. 1, pp. ES-12, 4-10 to 4-17).

49 Fed. Reg. 34658, 34682, Final Waste Confidence Decision (Aug. 31, 1984).

Today, utilities continue to struggle with what to do with spent fuel, and NEPA requires that the NRC evaluate whether to let spent fuel continue to build up at reactor sites and remain in spent fuel pools. In addition to fully exploring the

environmental consequences of such action, the NRC must examine all the reasonably available alternatives to that action, as well as mitigation measures if the proposed action is to go forward. Such alternatives and mitigation measures include not producing spent fuel, alternative methods for producing spent fuel (*e.g.*, banning the use of high burnup fuel) and alternative methods for storing spent fuel (*e.g.*, in dry casks after five years of pool storage). The NRC stated in 1977 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.” 42 Fed. Reg. 34391. The Waste Confidence process was the mechanism adopted by NRC to fulfill that obligation (*see* Final Waste Confidence Decision, Statement of Consideration (49 Fed. Reg. 34658 (Aug. 31, 1984)) and the DGEIS is the NEPA-mandated analysis that NRC must complete before it can make that determination.

Thus, contrary to the DGEIS’s characterization of the proposed action and the statement of purpose and need, this DGEIS is the continuation of a process begun in 1979 to examine the environmental consequences of not having a permanent repository for spent fuel. The DGEIS must examine the full range of those previously examined issues in light of all the current available information if it is to fully examine the major federal actions NRC is considering, as well as alternatives and mitigation measures.

While NUREG-0575 recognized the broad scope of environmental issues raised by the presence of spent fuel at reactor sites, at no time since 1979 has NRC undertaken a comprehensive look at the environmental implications of onsite spent

fuel storage. Yet, if anything, the need for a comprehensive look is all the greater now due to: (1) increased amounts of fuel that is (2) more volatile because it is high burnup fuel and (3) may remain onsite indefinitely. Rather than undertake a comprehensive update to NUREG-0575, NRC has engaged in a handful of narrow examinations of some of the issues raised by the changes since 1979, several of which have occurred outside the procedural and substantive rights created by NEPA, without ever combining its analyses into a single environmental impact statement that addresses anew the now outdated analysis contained in NUREG-0575.

The issue of whether and how spent fuel should be stored at reactor sites and alternative ways to accomplish such storage is inexplicably intertwined with the issue of waste confidence. Whether the Commission ultimately concludes that it has a date certain by which a waste repository will likely be available, as the current Staff prepared DGEIS proposes, or not, the Commission must still address the question of potential environmental impacts of spent fuel storage at reactor sites both during and following plant shutdown and must examine alternatives to mitigate those potential impacts. 10 C.F.R. §§ 51.30(a)(1)(ii) and (iii), 51.103(a)(4) and 42 U.S.C. §§ 4332(2)(C)(iii) and (E). In fact, a number of reactors are already shutdown and storing spent nuclear fuel at the reactor site. *See* 2013-2014 Information Digest, NUREG-1350 Vol. 25 (August 2013) APPENDIX C U.S. Commercial Nuclear Power Reactors Undergoing Decommissioning and Permanently Shut Down Formerly Licensed To Operate.

D. Until NRC Completes A Legally Sufficient NEPA Analysis, Its Decisions To Allow Nuclear Reactors to Continue to Store Spent Fuel In Spent Fuel Pools At Reactor Sites and to Continue to Generate Spent Fuel for Which There is No Permanent Waste Repository Violate NEPA

The initial waste confidence findings were modified over the years but, until 2010, continued to conclude that (1) a permanent waste repository would be available by a date certain and (2) the storage of spent fuel at reactors could be accomplished without undue adverse environmental impacts for 30 years after plant shutdown, provided the permanent waste repository was operational no later than 2025. However, in 2010 the Commission concluded that:

there are issues beyond the Commission's control, including the political and societal challenges of siting a HLW repository, that make it premature to predict a precise date or time frame when a repository will become available. The Commission has therefore decided not to adopt a specific time frame in Finding 2 or its final rule. Instead, the Commission is expressing its reasonable assurance that a repository will be available 'when necessary.'

Waste Confidence Decision Update (75 Fed. Reg. 81037, 81042 (Dec. 23, 2010) (footnote omitted)). The finding that it was "premature to predict a precise date or time frame when a repository will become available" was undisturbed by *New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012).

At the time of its decision that it could no longer predict a precise date or time frame for when a repository will become available, the NRC also determined that it needed to look at the environmental and safety implications of storing spent fuel at reactor sites for periods beyond 60 years after plant shutdown because no such analysis had ever been conducted:

The Commission, as a separate action, has directed the staff to develop a plan for a longer-term rulemaking and Environmental Impact Statement (EIS) to assess the environmental impacts and safety of long-term SNF and HLW storage beyond 120 years (SRM–SECY–09–0090; ADAMS Accession Number ML102580229). This analysis will go well beyond the current analysis that supports at least 60 years of postlicensed life storage with eventual disposal in a deep geologic repository. The Commission believes that a more expansive analysis is appropriate because it will provide additional information (beyond the reasonable assurance the Commission is recognizing in the current rulemaking) on whether spent fuel can be safely stored for a longer time, if necessary.

75 Fed. Reg. at 81040. In its Project Plan for the Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel (June 15, 2010) COMSECY-10-0007, NRC Staff “developed a seven-year plan for enhancing the technical and regulatory basis for extended storage and transportation by FY 2017” to be followed by a rulemaking if warranted. However, there is no mention of that 7-year effort in the current draft GEIS and it is unclear what has happened to those carefully developed research initiatives.

At this time the Commission does not have any legally sufficient analysis, under NEPA, that addresses the issue of the environmental impacts of spent fuel storage beyond 30 years after plant shutdown or alternatives that could be used to mitigate those impacts. In fact, the Commission has only one document that purports to comprehensively address those issues under NEPA, NUREG-0575. However, as noted above, that document only looked at the issue of spent fuel storage at reactor sites for the period up to 2000, when it assumed a permanent waste repository would be available. Further, it is outdated for a number of reasons, including ignoring what is now known to be a credible threat of a terrorist

attack.¹⁷

II. THE DGEIS' ANALYSIS OF IMPACTS IS FLAWED

A. NRC's Use of "Small," "Medium," and "Large" Does Not Comport With NEPA

NEPA provides for a detailed statement of "(i) the environmental impact of the proposed action, [and] (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented." 42 U.S.C. § 4332(2)(C). The NRC frames its impacts by using the vague terms of "Small," "Medium," or "Large," although neither NEPA, CEQ regulations, nor NRC regulations reference, define, or sanction the use of such terms. NRC's basis for so doing appears to be that it has done so before. DGEIS at xx ("NRC used terms in other NEPA documents ... for defining the standard of significance for assessing environmental issues" and does the same here). Yet this set of terms has no relevance under NEPA, CEQ, or NRC NEPA regulations, and does not comport with NEPA's "significant impacts vs. non-significant impacts" parlance. NEPA requires the NRC to

include in every recommendation or report on proposals for ... Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on—
(i) the environmental impact of the proposed action,

¹⁷ In the Generic Environmental Impact Statement for License Renewal of Nuclear Plants, NUREG-1437 (1996) ("NUREG-1437") and its update NUREG-1437 Rev. 1 (June 2013) ("NUREG-1437 Rev. 1") NRC purported to look at the environmental impacts of spent fuel storage at reactor sites during plant operations but did not separately look at the question of storage at reactor sites after plant shutdown. NUREG-1437; NUREG-1437 Rev. 1 at 4-175. In addition, neither of those updates addressed the issue of environmental impacts with consideration of the information NRC Staff assembled in its non-NEPA analysis included with COMSECY-13-0300 including its conclusions that under several scenarios, spent fuel storage in dry casks would reduce environmental consequences of spent fuel storage in pools at a cost that was less than the benefits to be gained by such dry cask storage. *See* COMSECY-13-0300.

- (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented,
- (iii) alternatives to the proposed action,
- (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and
- (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

42 U.S.C. § 4332(2)(c)(i)-(v). The DGEIS does not directly relate back to this statutory scheme. NRC's Small/Medium/Large characterization does not explain what adverse environmental effects cannot be avoided should the proposal be implemented, for example, or irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented, nor does it provide any specific values that can be included in the ultimate cost benefit analyses that will have to be conducted for each licensing action that will rely on the final generic impact statement.

Under NEPA, the discussion of adverse effects must not improperly minimize negative side effects. *Western Watersheds Project v. Kraayenbrink*, 632 F.3d 472, 491 (9th Cir. 2011) (quoting *Earth Island Inst. v. U.S. Forest Serv.*, 442 F.3d 1147, 1159 (9th Cir. 2006), *abrogated on other grounds by Winter v. Natural Res. Def. Council, Inc.*, 555 U.S. 7 (2008)). NRC's vague analysis of impacts is particularly troubling given the D.C. Circuit's direction to NRC in the context of waste confidence that "[o]nly if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the [NEPA] analysis." *New York v. NRC*, 681 F.3d

471, 482 (D.C. Cir. 2012). Thus, NRC cannot avoid a discussion of even “small” impacts in the DGEIS.

By using the term “small,” “medium,” and “large,” NRC is cloaking impacts in vague terms that avoid disclosing what the actual impacts are. Moreover, for some of these impacts, NRC has no basis for even making these findings. *See* DGEIS at 6-56 (acknowledging that “[a]ctivities that involve bare fuel handling in a postulated dry transfer facility at nearby facilities could involve additional accident risk” but postulating that those impacts would be “Small;” without any functioning DTS facility anywhere in this country, the NRC does not have a factual basis for making this finding.)

This is unacceptable under NEPA, and the DGEIS should be revised to include a qualitative and quantitative assessment of each impact and its significance in plain language. At a minimum, NRC must clearly set out the legal authority that supports the use of these terms, and include an explanation of what the “small,” “medium,” and “large” label means for each individual impact.

B. NRC’s Characterization of the Probability-Weighted Impacts of Severe Accidents As “Small” Is Inadequate Under NEPA

In evaluating the potential impacts of severe accidents, the DGEIS acknowledges that “[t]he consequences of a severe (or beyond-design-basis) accident, if one occurs, could be significant and destabilizing,” but then goes on to characterize them as “small.” *See, e.g.*, DGEIS at 4-68- 69. NRC is only able to reach the conclusion that severe accident impacts are small by accounting for “the low probability of these events.” *Id.* Former NRC Chairman Jaczko expressed his

concern about this approach during a public meeting on the impacts of an accident in the license renewal context:

CHAIRMAN JACZKO: So, you know, I can appreciate that so, you know, it's kind of the catch-all with all the things dealing with severe accidents is that it becomes small because you don't think it's going to happen. I can't say the more I hear of this that I'm comfortable with that. The more I hear it I think I don't think that's the right approach. I mean, I think the practical reality is that we should be honest about what the consequences are and, you know, again it is -- we are dealing in the environmental space, so our ability here is not regulatory requirements that we're putting in place, but I think it would be much more straight forward if we were actually communicating severe accidents in the actual way in terms of what their consequences were, which would bring in then, more naturally, I think this discussion about what are the environmental impacts of an evacuation. So, it's probably one of the most confusing things I think about the EIS and the -- it's not restricted, of course, to this GEIS or to how we do it. I mean, the good part about it is we do it consistently in all our EISs.

So in that vein, and I want just to highlight, I know that severe accidents are generally site-specific. To what extent, I mean, when we look at the site-specific analysis, to what extent is the site-specific analysis, the severe accident analysis, is that most of what is really in the site-specific or there are other things that get addressed?

ANDREW IMBODEN: Well, in the site-specific reviews, the staff -- well, the applicants bring us in and the staff assesses the severe accident mitigation alternatives, how the severe accidents would be mitigated and then are the costs beneficial or not? And all of that is discussed in the site-specific reviews, because it is, you know, very dependent on which site and how you mitigate those.

CHAIRMAN JACZKO: And, again, we're dealing with this in NEPA space and we're not in -- this is not a licensing review piece. To what extent, you know, we ultimately have no authority then. I mean, we're not -- these mitigating measures are not things that we have authority to implement, maybe in some cases we put license conditions on, I don't know. But in general there are things that come about as part of the analysis. Do we keep track then of what they do for mitigation measures or anything that comes out of the same analysis? I mean, do we track that in any way? Does it become a commitment or does it get any kind of tracking?

MELANIE GALLOWAY: No, no we don't.

ANDREW IMBODEN: And to explain that a little bit further is sometimes, and we're seeing this in Columbia's environmental review, the applicant goes through this process, identifies something and does it by the time we finish our review.

CHAIRMAN JACZKO: [affirmative]

ANDREW IMBODEN: So there's that.

CHAIRMAN JACZKO: But it's not -- I mean it's not captured other than maybe being referenced in the EIS.

ANDREW IMBODEN: Well, and if there is anything that then needs to be done --

CHAIRMAN JACZKO: Yeah.

ANDREW IMBODEN: The staff would have a process for, you know, making sure it goes through the backfit as appropriate and those kinds of things.

Id. at 81-82.

CEQ regulations require the opposite of the NRC's approach, providing that impacts "include[] *impacts which have catastrophic consequences, even if their probability of occurrence is low*, provided that the analysis of the impacts is supported by credible scientific evidence, is not based on pure conjecture, and is within the rule of reason." 40 C.F.R. § 1502.22(b)(4)(emphasis added). Under NEPA, an agency cannot dispense with impacts based on probability alone.

As discussed above, not only does this characterization violate NEPA and CEQ regulations, it is also in direct conflict with the D.C. Circuit's holding that "[o]nly if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the [NEPA] analysis." *New York v. NRC*, 681 F.3d 471, 482

(D.C. Cir. 2012). Commissioner Magwood has observed that “there were several interveners or NGO groups that had the comment that the [license renewal] GEIS is deficient because it doesn’t take into account these future unplanned releases, and I struggle with this because I don’t know how you go about estimating that.” Transcript of Proceedings, Briefing On Proposed Rule To Revise The Environmental Review For Renewal Of Nuclear Power Plant Operating Licenses (Part 51) (Jan. 1, 2011), ML120180209 at 69.

III. THE DGEIS DOES NOT ASSESS THE CUMULATIVE OR INDIRECT IMPACT OF A SEVERE ACCIDENT AT A REACTOR SITE

NEPA requires that an EIS consider the potential direct, indirect, and cumulative impacts of a proposed action. 40 C.F.R. § 1508.25(c). Cumulative impacts are defined in 40 C.F.R. § 1508.7 as

the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

An environmental impact statement must “catalogue adequately past projects in the area” and provide a “useful analysis of the cumulative impact of past, present, and future projects.” *City of Carmel-by-the-Sea v. United States DOT*, 123 F.3d 1142, 1160 (9th Cir. 1997); see *Lands Council v. Forester of Region One of the United States Forest Serv.*, 395 F.3d 1019, 1027 (9th Cir. 2005)

NRC’s cumulative impacts assessment for severe accidents in Section 6.4.17 of the DGEIS is wholly insufficient. The DGEIS completely ignores the fact that if a

severe accident were to occur at a reactor site, it could affect not only a spent fuel pool, but also one or more reactors at the site – and one or more spent fuel pools at the site. The multi-facility accident at Fukushima demonstrated that such events are not speculative. Moreover, the radiation that was released during the Fukushima does not reflect the upper limit of severe accident scenarios. *See Official Exhibit - NYS000420-00-BD01 - Pre-filed Rebuttal Testimony of Dr. Francois J. Lemay, Ph.D. in support of Contention NYS-12C at 11-16 (June 29, 2012) (ML12340A678).* There is no attempt to quantify this in the DGEIS, or perform a site-wide SAMA-type analysis. In fact, some of the assumptions in the DGEIS regarding what will happen at a site following an accident involving the spent fuel pool assume that the rest of the plant is intact. However, if the initiating cause of the accident is an earthquake or other natural disaster, it is likely that the entire plant, not just the spent fuel pool, will be damaged, as occurred at Fukushima. This synergistic destruction is ignored in the DGEIS's optimistic assessment of the consequences of a severe accident.

In the license renewal context, recent severe accident mitigation alternatives analyses have focused on a severe accident occurring at a single reactor. In a similar manner the DGEIS and its Appendix F focus on a severe accident occurring at a single spent fuel pool. This approach ignores the real world reality that several sites have two reactors along with two adjacent spent fuel pools and that some sites have three reactors and three adjacent spent fuel pools. In July 2011, following the

multi-unit accident at Fukushima, the NRC Commissioners convened a meeting to discuss site-wide probabilistic risk assessments.

Although the DGEIS does not mention any ongoing NRC efforts to prepare a comprehensive, site-wide level 3 PRA analysis (including a consequence analysis) of severe accident risk, publicly-available documents show that such an effort is underway, but appears to be at a preliminary stage. It is not clear when this will be completed or for which sites this will be completed. *See, e.g.*, SECY-13-0118 - Recent Accomplishments and Near-Term Anticipated Accomplishments - 2013 at p. 11 (ML13273A122). It is for one plant only, and will not be completed by NRC for several years. The DGEIS should at least mention this effort, explain how and if it relates to the cumulative impact analysis, and examine whether it should be prioritized. For sites such as Indian Point where the potential severe accident consequences are enormous, a site-wide level 3 PRA that considers the risk of a severe accident for the whole site (reactors, spent fuel pools, and dry casks included) must be performed to evaluate the true cumulative impacts under NEPA. *See* Expert Review of Analytic Assumptions and Methods Applied in the NRC's September 2013 Draft Waste Confidence GEIS prepared by Robert E. Unsworth and Maura Flight of Industrial Economics, Incorporated, Ex. E ("IE Report") (discussing probabilities that are calculated for one year at one reactor and not multiplied by the number of reactors and the number of years).¹⁸

¹⁸ The IE Report is discussed in more detail below.

Instead of performing a site-wide level 3 PRA to assess the severe accident risks at a plant site, the DGEIS essentially concludes that the probability-weighted risk of a severe reactor accident is small and the probability-weighted risk of a spent fuel pool fire is small, so the cumulative impacts of a severe accident, even when allowing continued on-site fuel storage in pools, is small.

The DGEIS and the Spent Fuel Pool Consequence Study approach that looks only at a severe accident to *one* spent fuel pool at a multi-facility nuclear power station segments the analysis from the site wide risk and avoids examining cumulative impacts. Such a narrow inquiry violates NEPA.

Similarly, the DGEIS fails to acknowledge the indirect impacts of evacuation in a severe accident. In the context of license renewal, NRC Staff noted that “in the [license renewal] GEIS, sever[e] accidents have been determined to have small impact. So I think, too, a point that wasn’t made is that when we look at the evacuation question, because the impact has already been determined from a severe accident to be small, the evacuation -- the probability of it occurring would make it most likely a small impact as well.” Transcript of Proceedings, Briefing On Proposed Rule To Revise The Environmental Review For Renewal Of Nuclear Power Plant Operating Licenses (Part 51) (Jan. 11, 2012), ML120180209 at 73. Unlike in the license renewal context, however, where these issues may be addressed again, no further discussion of the indirect storage of nuclear waste will take place after promulgation of 10 C.F.R. § 51.23. These impacts must be analyzed in the context of this rulemaking. As counsel for the State of Connecticut

represented to the Commissioners in January of 2012 at a public meeting regarding the License Renewal GEIS, Connecticut would shoulder the environmental consequences of displacements from residents fleeing an accident at Indian Point. *Id.* at 17-24. Those impacts have not been analyzed in the DGEIS, though they are indirect impacts from the long-term storage of high level nuclear waste on-site at Indian Point and thus required to be addressed under NEPA.

IV. THE DGEIS INCLUDES NO MITIGATION MEASURES AT ALL, IN VIOLATION OF NEPA AND NRC REGULATIONS

An EIS must also contain a detailed discussion of possible mitigation measures and the extent to which adverse effects can be avoided. *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 351-52 (1989). CEQ regulations require a discussion of mitigation measures. 40 C.F.R. § 1500.2(f) (“Federal agencies shall to the fullest extent possible . . . use all practicable means, consistent with the requirements of the Act and other essential considerations of national policy, to restore and enhance the quality of the human environment and avoid or minimize any possible adverse effects of their actions upon the quality of the human environment”); *see also* 40 C.F.R. §§ 1502.14(f); 1502.16(h), 1508.25(b)(3). NRC’s own regulations also require discussion of mitigation measures, referred to as “alternatives available for reducing or avoiding adverse environmental effects.” 10 C.F.R. § 51.71(d). The mitigation of impacts must be considered whether or not the impacts are significant. Forty Most Asked Questions and Answers on the CEQ Regulations, Number 19a. The “omission of a reasonably complete discussion of possible mitigation measures would undermine the ‘action-forcing’ function of

NEPA. Without such a discussion, neither the agency nor other interested groups and individuals can properly evaluate the severity of the adverse effects.”

Robertson, 490 U.S. at 351-52.

But NRC has included no mitigation measures at all to offset any of the environmental impacts identified in the DGEIS. In a number of instances, however, NRC appears to assume that mitigation measures will be taken but without evaluating their likelihood or alternative mitigation measures that might work better or be more certain, including measures to prevent the adverse consequence from occurring. *See, e.g.*, DGEIS at 3-12 (“Based on EPA’s determination, the NRC recognizes that GHGs contribute to climate change, climate change can affect health and the environment, and mitigation actions are necessary to reduce impacts.”); 3-19 (“Timely detection of leakage will allow licensees to identify and repair leaks and employ mitigation measures, as necessary, to minimize or eliminate any environmental impacts that would result from leaks.”); 4-36 (“The severity of impacts associated with impingement and entrainment is dependent upon several factors including the amount of water withdrawn relative to the size of the cooling-water source, location and configuration of intake structures, type of waterbody from which water is withdrawn, conditions within that waterbody, proximity of withdrawal structures to sensitive biological habitats (*e.g.*, spawning and nursery habitats), sensitivity of populations of impinged and entrained organisms to potential losses of individuals, and mitigation measures in place to reduce impingement and entrainment.”); 5-15 (“For an away-from-reactor ISFSI,

the NRC assumes that, if necessary, any site-specific permits would include appropriate mitigation to ensure that impacts would not be destabilizing to local air quality.”).

Despite acknowledging potential impacts in these areas (climate change, aquatic impacts, air pollution) and others, such as severe accidents including spent fuel pool fires, the DGEIS offers no mitigation measures at all.

Indeed, a number of the “assumptions” the DGEIS makes—such as requiring the replacement of dry casks every 100 years—are only “assumptions” and the NRC explains that it is not actually requiring such measures. The NRC provides no explanation for why it is not imposing—as a mitigation measure—the regular replacement of dry casks every 100 years. This could be because such a measure would fail to meet NRC’s backfit requirements (which impose by regulation a cost-benefit analysis that is markedly different from the statutorily-required NEPA analysis). This is precisely the situation where NEPA requires assumptions to be imposed as actual mitigation measures if the agency intends to rely on them in its environmental analysis. In short, the environmental analysis required by NEPA should refer to the actual regulations that are currently in place as well as mitigation measures actually imposed by the NRC.

V. THE DGEIS ARTIFICIALLY LIMITS ITS ALTERNATIVES ANALYSIS BECAUSE OF ITS FLAWED STATEMENT OF PURPOSE AND NEED.

The analysis of alternatives, 42 U.S.C. § 4332(2)(C)(iii), is the “heart” of an EIS and “should present the environmental impacts of the proposal and the alternatives in comparative form, thus sharply defining the issues and providing a

clear basis for choice.” 40 C.F.R. § 1502.14. Alternatives to be considered include the “no action” alternative, other reasonable courses of action, and mitigation measures (not in the proposed action). 40 C.F.R. § 1508.25(b).

The alternatives that must be examined are bounded by the “purpose and need” for the proposed agency action. *See* 40 C.F.R. §§ 1502.13, 1508.9(b). By unreasonably limiting its purpose and need to paperwork reduction, the NRC impermissibly frames the alternatives in terms of paperwork also, avoiding the *Minnesota v. NRC* question of whether the NRC can continue to license nuclear power plants. The DGEIS’s alternatives are:

- (1) GEIS-only
- (2) Policy-Statement Alternative

The only comparison of these alternatives in the DGEIS is a cost-benefit comparison focused on the cost of paper used and staff time expended. There is no evaluation whatsoever of the relative environmental impacts of each alternative, as is required under NEPA.

While the NRC mentions its role under the Atomic Energy Act to establish criteria for licensing power plants, it fails to acknowledge 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.” 78 Fed. Reg. 56776, 56778 (Sept. 13, 2013), quoting 42 Fed. Reg. 34391, 34391; July 5, 1977, *pet for rev. dismissed sub nom., NRDC v. NRC*, 582 F.2d 166 (2d Cir. 1978). Thus, the NRC appears to have abandoned this rational policy as it now states that “without Congressional

direction to do so, the NRC may not deny a reactor license unless it determines that a license applicant has not met the NRC's regulatory standards for issuance of a license." DGEIS at 1-9. In other words, the Commission is now taking the irrational position here that it would continue to license nuclear power plants even if there is no place to safely store the waste and even if it concluded that continuing to license the plants to produce additional nuclear wastes would cause substantial adverse environmental consequences. *See* IE report, Ex. E.

This is not an alternatives analysis. Case law is clear that an "agency may not define the objectives of its action in terms so unreasonably narrow that only one alternative from among the environmentally benign ones in the agency's power would accomplish the goals of the agency's action, and the EIS would become a foreordained formality." *Citizens Against Burlington, Inc. v. Busey*, 938 F.2d 190 (D.C. Cir. 1991). This is precisely what NRC has done here. For example, by stating that "[t]he NRC also determined that additional requirements on spent fuel storage would not meet the purpose and need" (DGEIS at xxvi), the DGEIS explains one way the NRC used the unreasonably narrow purpose and need to artificially limit alternatives.

To remedy this deficiency, as discussed above, the DGEIS must identify the true federal action here, licensing and relicensing of reactors or storage installations that result in the generation and management of nuclear waste. Once the true federal action is correctly defined, the true purpose and need of the DGEIS can also be defined: analyzing the environmental impacts of continued fuel storage absent a

permanent repository. Only then can the reasonable range of alternatives be adequately evaluated under NEPA—including the non-generation of waste, as well as alternatives that mitigate the potential impacts of a severe accident, which the DGEIS acknowledges could be “significant and destabilizing.” DGEIS at 4-68. These alternatives include the accelerated transfer of spent fuel to dry storage, which would reduce the risk of fire during the short-term timeframe and beyond (since, as discussed below, there is no basis for assuming that waste will be removed from pools by 60 years after the licensed life of a reactor) and beyond, as well as banning the use of high burnup fuel.

The NRC appears to believe that it is without authority to analyze the true no-action alternative of ceasing to license and relicense plants until a permanent repository is available. *See, e.g.*, DGEIS at 1-9 (“Through the Atomic Energy Act, Congress has mandated that the NRC establish criteria to allow the licensing of nuclear power plants. Therefore, without Congressional direction to do so, *the NRC may not deny a reactor license* unless it determines that a license applicant has not met the NRC’s regulatory standards for issuance of a license.” (emphasis added)). That cannot be so. First, this sets up precisely the type of “foreordained” conclusion that the courts have rejected. 938 F.2d at 196; *see also, e.g., California v. Block*, 690 F.2d 753, 767 (9th Cir. 1982) (“[I]t is troubling that the Forest Service saw fit to consider from the outset only those alternatives leading to [its] end result.”); *Calvert Cliffs’ Coordinating Committee, Inc. v. U.S. Atomic Energy Commission*, 449 F.2d

1109, 1114 (D.C. Cir. 1971) (“Congress did not intend [NEPA] to be such a paper tiger.”)

Second, even if the NRC were correct that the Atomic Energy Act somehow trumped the requirements imposed by a later Congress through NEPA, the NRC would still have to at least *study* the no-action alternative to provide a baseline for evaluating the environmental impacts of the proposed action. *See, e.g., Se. Alaska Conservation Council v. Fed. Highway Admin.*, 649 F.3d. 1050, 1058 (9th Cir. 2011) (rejecting a “cursory” three-paragraph explanation of the no-action alternative).

Third, Congress’ authorization to NRC to license nuclear plants is conditioned on the issuance of the license providing adequate protection for the public health and safety. Atomic Energy Act, § 182 (42 U.S.C. § 2232)

VI. THE DGEIS SHOULD HAVE DIRECTLY EXAMINED EXPEDITED FUEL TRANSFER TO DRY CASKS AS A MITIGATION MEASURE OR AN ALTERNATIVE

The NRC has made a number of inconsistent statements about the expedited fuel transfer to dry casks. In the DGEIS, it says:

Imposing new regulatory requirements, such as requiring licensees to ... reduce the density of spent fuel in pools, or expedite transfer of spent fuel from pools to ISFSIs, is outside the scope of this proposed action, which includes alternatives that improve the efficiency of the NRC’s licensing process by generically addressing the environmental impacts of continued storage. ... [T]he NRC cannot impose new requirements or regulations on the duration of spent fuel storage in pools through this proposed action. In separate proceedings, the NRC is considering implementing revised security requirements as part of the ongoing ISFSI security rulemaking effort. The rulemaking effort is described in the December 16, 2009, *Federal Register* notice (74 FR 66589), “Draft Technical Basis for Rulemaking Revising Security Requirements for Facilities Storing SNF [spent nuclear fuel] and HLW

[high-level waste]; Notice of Availability and Solicitation of Public Comments.”

This position is problematic for three reasons. First, this position is only potentially tenable if the federal action was properly cast as guiding agency efficiency, which, as discussed above, it is not. Second, the NRC is confusing its AEA obligations with its obligations under NEPA. Third, the NRC is, in fact, evaluating the expedited transfer of spent fuel to dry casks in a document they intend to cite in the DGEIS; they are simply not doing it at the draft stage such that all parties can comment on it or by applying the NEPA standards for evaluating the alternative provided in 10 C.F.R. Section 51.103(a)(4).

The reasons why the federal action, Statement of Purpose and Need, and alternatives are artificially limited have been discussed above. A proper evaluation of the federal action and the impacts and alternatives to that action would lead to a discussion of alternatives and mitigation measures to address spent fuel pool fire risk that would naturally include moving fuel out of pools.

As the States raised in their scoping petition, the NRC cannot defer discussion of NEPA-required information because another, yet to be completed, non-NEPA proceeding is evaluating some of those issues in the context of an AEA rulemaking. To the contrary, the Guidance makes clear that the NEPA process must be fully completed *before* a decision is made on the major federal action:

Agencies must integrate the NEPA process into their planning at the earliest possible time to ensure that planning and decisions reflect environmental values, avoid delays later in the process, and anticipate and attempt to resolve potential issues. NEPA should not become an

after-the-fact process that justifies decisions that have already been made.

[A]n agency shall prepare an EIS so that it can inform the decisionmaking process in a timely manner “and will not be used to rationalize or justify decisions already made.”

CEQ Guidance, 77 Fed. Reg. at 14476-77 (footnotes and citations omitted). The “Rulemaking Revising Security Requirements for Facilities Storing SNF and HLW” contains no analysis of the environmental impacts of spent fuel, and thus cannot serve as any deterrent to the full exploration of all of those impacts here. Moreover, if the NRC wanted to rely on that rulemaking as part of the DGEIS process in these proceedings, it would have to wait for that rulemaking to be finalized before completing its environmental impact statement analysis here.

Finally, the NRC is looking at expedited transfer of spent fuel to dry casks. Instead of properly examining expedited transfer of spent fuel to dry casks as an alternative in the DGEIS, the NRC examined expedited fuel transfer to dry casks using other documents such as the Spent Fuel Pool Study, which was finalized after the draft DGEIS was released, is not cited or explicitly referenced in the DGEIS, but somehow already incorporated into the DGEIS and apparently the NRC seeks to reference it in the DGEIS at a later date. *See, e.g., NRC, Two Separate NRC Efforts Address Spent Fuel Safety*, <http://public-blog.nrc-gateway.gov/2013/06/24/two-separate-nrc-efforts-address-spent-fuel-safety/> (June 24, 2013) (“The draft GEIS does not explicitly reference the pool study, though the waste confidence staff

worked closely with the staff preparing the pool study while developing relevant chapters of the draft GEIS. If a final version of the study is published before the final waste confidence GEIS, the staff will incorporate a reference to it in the final GEIS.”).

In response to comments New York submitted on the Spent Fuel Pool Study, the NRC was clear that “[t]his research study does not authorize any licensee action or set regulatory requirements. This study also does not establish any Commission policy.” Spent Fuel Pool Consequence Study, Response to Comment #72. Yet, Staff has indicated that the DGEIS will incorporate the results of this study. Failure to explicitly reference documents upon which the DGEIS relies violates NEPA and the APA.

The NRC’s justifications for not including this alternative are unpersuasive. First, the NRC insists “that additional requirements on spent fuel storage would not meet the purpose and need.” DGEIS at xxvi. The NRC goes to state that “the draft GEIS is a NEPA review and not a licensing action; therefore, this draft GEIS would not be the appropriate activity in which to mandate new spent fuel storage requirements.” *Id.* One purpose of a properly conducted NEPA review is to provide the agency with complete information “to ensure that the agency does not act upon incomplete information, only to regret its decision after it is too late to correct.”

Duke Energy Corporation (McGuire, Units 1 and 2; Catawba, Units 1 and 2) CLI-02-17, 56 N.R.C. 1 (July 23, 2002) at 10.

NRC has the full authority to order expedited fuel transfer under the AEA, but is also obligated to discuss environmental impacts of this option in the context of mitigation measures or alternatives under NEPA. The expedited fuel transfer should be examined as an alternative so it can be assessed for all plants, not in an ad hoc way under the backfit or other NRC procedure.¹⁹ Additionally, to the extent the DGEIS is relying upon the Spent Fuel Pool Study, it should expressly explain any such reliance.

Finally, since the Spent Fuel Pool Study has only now been finalized, a supplemental DGEIS will be now required if the NRC seeks to incorporate its conclusions in this rulemaking.

VII. THE DGEIS USES AN INAPPROPRIATE METHODOLOGY

In addition to making numerous substantive errors and failing to provide a substantively adequate environmental impact statement, NRC has also failed to use an appropriate methodology for conducting the analysis. Attached to these comments is a report prepared by experts in the proper conduct of the type of analysis NRC is attempting in the DGEIS.

The Expert Review of Analytic Assumptions and Methods Applied in the NRC's September 2013 Draft Waste Confidence GEIS prepared by Robert E. Unsworth and Maura Flight of Industrial Economics, Incorporated ("IE Report")

¹⁹ Former Commission Chairman Jaczko explained the problems and uncertainties inherent in the "so-called 'backfit' regulations that allow licensed reactors to avoid compliance with new safety enhancements based on considerations like implementation costs" and the "difficulty of requiring timely compliance with new safety requirements that are not tied down in the license." Southern Nuclear Operating Co. (Vogtle Electric Generating Plant, Units 3 and 4), Dkt. Nos. 52-025-COL & 52-026-COL, Memorandum and Order, CLI-12-02 (Feb. 9, 2012) (Jaczko, dissenting).

concludes that:

A. The Draft GEIS fails to demonstrate that site-specific evaluations would not result in different findings than the GEIS with respect to environmental consequences. This demonstration is required to support the decision to follow a GEIS approach with no issues identified as requiring site-specific analysis.

B. The Draft GEIS does not properly evaluate the cumulative risks of potential low probability but high-consequence events and therefore does not support its conclusions that associated environmental impacts are “small” across all timeframes considered.

C. The Draft GEIS only considers environmental impacts of limited storage scenarios and does not specify whether, and in what context, additional scenarios may be considered at a given site or in general. In short, while the Draft GEIS appears to conclude that site specific factors can be considered at a later time, the overall conclusion is that no such site specific analyses would be required with respect to environmental impacts of continued storage.

The authors of the IE Report have had years of experience in conducting complex cost and benefit analyses of Federal programs for many governmental agencies and private entities including the U.S. Department of Justice, the National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of the Interior (DOI), the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Energy, other Federal agencies, various U.S. states, tribal governments, the New York State Energy Research and Development Authority and the Electric Power Research Institute.

The IE Report identifies how the DGEIS subverts the NEPA process by failing to justify the use of a generic approach to address problems that are widely considered to be site-specific. What the DGEIS would have needed to do, but has not done, is to demonstrate that the many differences between reactor sites that

bear on the environmental consequences of spent fuel storage for indefinite periods at those sites are either captured in the environmental analysis or are not sufficiently different to warrant separate treatment. As the IE Report demonstrates, the DGEIS does neither but, instead, assumes away the differences. The use of assumptions instead of analysis is not an acceptable approach under NEPA.

The IE Report also demonstrates that even if the generic approach were acceptable, the DGEIS fails to properly evaluate the consequences and probabilities, and thus the risks, of indefinite spent fuel storage at reactor sites because it ignores the cumulative risks associated with the proposed action. By using the DGEIS to support a rule that excludes consideration of any environmental impacts associated with spent fuel storage at reactor sites on an individual basis, the DGEIS provides a generic approval of such storage but it fails to conduct a generic analysis of the consequences of that approval. To do that the DGEIS would have to look at the cumulative risks of allowing these conditions to exist at over 100 reactors for the indefinite future. Instead the DGEIS provides a single year's risk for a single hypothetical reactor. NEPA does not allow the use of such a distorting methodology to assess environmental consequences. This problem is made even worse by the failure of the DGEIS to use well-accepted methodologies to properly discount impacts to estimate a present value. Both EPA and the OMB have developed such methodologies but the DGEIS relies on neither.

Finally, the DGEIS fails to identify the reasonably available alternatives to the storage of spent fuel at reactor sites or to assess the different environmental consequences that would arise from each of those alternatives. By failing to properly identify the major federal action and failing to properly identify the purpose and need for the proposed action, the DGEIS has failed to properly consider alternatives.

VIII. THERE IS NO BASIS FOR THE NRC'S ASSUMPTION THAT ALL WASTE WILL BE MOVED FROM POOLS TO DRY CASK BY THE END OF 60 YEARS AFTER LICENSED LIFE.

A. The DGEIS Does Not Meet The D.C. Circuit's Mandate That Environmental Impacts Must Be Analyzed Unless Their Probability Is Zero.

The D.C. Circuit in its decision concluded that the NRC was required to examine the consequences of pool fires unless their probability was zero. 681 F.3d at 482. Yet in response to this directive, in the DGEIS the NRC again opted not to offer any analysis of the consequences of spent fuel pool fires and leaks after the short-term time frame, citing without basis the NRC's belief that all waste will be moved from pools to dry cask by the end of 60 years after licensed life. This position is clearly inconsistent with the Court's order. The Court gave the NRC one option only for concluding that no analysis of consequences was necessary: "Only if the harm in question is so 'remote and speculative' as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis." 681 F.3d at 482 (emphasis added). The Court recognized that finding that the probability of a given harm is nonzero does not in and of itself require an

EIS, but faulted the Commission for “not undertak[ing] to examine the consequences of pool fires at all.” *Id.* The NRC in response again fails to examine the consequences of pool fires or leaks at all for any time period other than the short-term.

There is no basis in the DGEIS for the assumption that all waste will be moved from pools to dry cask by the end of 60 years after licensed life. *See* DGEIS at 1-14 (acknowledging that the precise time spent fuel is stored in pools will vary from one reactor to another, but characterizing the assumption that waste will remain in pools for the longer-term as “reasonable.”). (Similarly, the NRC has also not provided a basis for its assertion that a permanent repository will be available within 60 years). The NRC did not state that it is unambiguously requiring all nuclear power plant operators to move all spent fuel, for example, or even that it intends to do so; moreover, the DGEIS acknowledges that a dry transfer system would be required to do so, and that none currently exists in the United States (this issue is discussed in more detail below).

Instead, the DGEIS relies only on 10 C.F.R. § 50.82, the regulation requiring decommissioning of power plants within 60 years of the permanent cessation of operation of the reactor, as the basis for its assertion that all waste will be out of pools within sixty years of the licensed life of a facility. But this regulation explicitly authorizes the Commission to extend decommissioning beyond sixty years – thus leaving spent fuel in pools – when there is no place to put the waste:

Decommissioning will be completed within 60 years of permanent cessation of operations. Completion of decommissioning beyond 60

years will be approved by the Commission only when necessary to protect public health and safety. Factors that will be considered by the Commission in evaluating an alternative that provides for completion of decommissioning beyond 60 years of permanent cessation of operations include unavailability of waste disposal capacity and other site-specific factors affecting the licensee's capability to carry out decommissioning, including presence of other nuclear facilities at the site.

10 C.F.R. § 50.82(a)(3) (emphasis added). The Court explicitly required the NRC to do a full analysis spent fuel pool fires assuming that no repository or other waste disposal option is available if the probability of a fire was not zero. This same analysis applies equally to leaks. Nowhere has NRC shown that the chance of spent fuel pool fire is zero after 60 years because no spent fuel will remain in pools. In fact, the DGEIS acknowledges that an act of sabotage or terrorism on a spent fuel pool could be catastrophic. DGEIS at 4-84, 4-86, 4-89.

NRC Staff attempts to justify its decision not to perform this analysis by indicating that if a licensee made a request under § 50.82(d) to extend decommissioning, NRC Staff would conduct “any appropriate site-specific NEPA analysis” at that time. Presumably most, if not all, licensees will seek to employ § 50.82's decommissioning extension since there is currently no estimate of repository availability within the 60-year timeframe contemplated by these regulations, which would mean many site-specific spent fuel pool fire analyses would be done many decades from now.²⁰ Simply put: the Court did not permit the

²⁰ As the GEIS notes in footnote 3, “the Commission's regulations provide that renewed operating licenses may be subsequently renewed, although no licensee has yet submitted an application for such a subsequent renewal.” This would mean that no spent fuel pool fire analysis would be done for another potentially 80 years for plants nearing the end of their license now but that obtain a second license renewal. The Court clearly did not authorize this approach.

NRC to opt out of doing a long-term analysis of spent fuel pool risk because the probability of such an occurrence is not zero. That analysis needs to be done before plants are licensed or relicensed, thus generating spent fuel which may remain on-site beyond 60 years post-operating life if neither dry cask storage or a permanent repository is available.

The DGEIS does not indicate that the NRC is currently taking any action to expedite removal of spent fuel rods from pools into casks. In fact, as discussed above, the recent COMSECY-13-0030 states that expediting fuel transfer will not be considered any further—it is essentially off the table. Moreover, this restricted analysis of one alternative was done outside the procedural protections and substantive requirements of NEPA.

As to radioactive leaks, the D.C. Circuit invalidated the 2010 findings and rule in part on grounds that, although the NRC “has addressed, or is in the process of addressing” spent fuel pool leaks, those actions were untested and that the court could not defer to the Commission’s conclusion that no harm would result from leaks. NRC has even less to rely on here, as it has not even pointed to any action it is currently taking to ensure that waste is indeed moved within 60 years of a reactor’s licensed life. Using the court’s language, NRC has not even asserted that it is “on duty” (681 F.3d at 481) when it comes to moving waste out of pools; instead there are no “considerable enforcement and inspection efforts” underway at all to support the NRC’s wishful thinking that all waste will be out of pools in time such that no analysis of spent fuel pool fires or leaks in the long-term time period is

warranted here. The court required NRC to do this analysis and NRC has not done it in this DGEIS. A proper analysis here would result in adjustments to other sections of the DGEIS, for example, increased impacts on fish kill and water usage resulting from additional years of intake for cooling.

B. International Experience Offers No Assistance Regarding Timing

NRC also references international experience when deciding on what is a reasonable timeframe for finding a permanent repository – but there is no repository anywhere, in any country, and therefore no relevant international experience to draw from, and the DGEIS does not clarify what timeframes exactly it found reasonable by comparison. Of the fourteen other nuclear power-generating countries, only a handful intend to use direct disposal like the United States does, including Canada, Finland, Sweden, Spain, and South Korea. Of those, only one - Finland - has selected a repository location and begun construction. Sweden has a confirmed location, but because it was a volunteered location, Sweden's experience is inapplicable to the timeline analysis done by the NRC. Spain is still conducting research on deep disposal and has not selected a location, and South Korea is looking only at interim storage right now, starting in 2016.²¹ Given this limited pool of comparison points, and the fact that no country at all has achieved direct disposal yet, the timeframe laid out by the NRC cannot be characterized as

²¹ World Nuclear Association, "Radioactive Waste Management" (updated Apr. 2012), *available at* <http://www.world-nuclear.org/info/Nuclear-Fuel-Cycle/Nuclear-Wastes/Radioactive-Waste-Management/> (last accessed Sept. 16, 2013).

reasonable by comparison to international experience. Moreover, even if other countries had had more success, their experience would not be a basis for concluding that no spent fuel will remain in U.S. pools after 60 years post-licensed life.

C. The Dry Transfer System And Independent Spent Fuel Storage Installation Options Are Hypothetical And Require Site-Specific Review

1. No dry transfer system currently exists in the United States

The key to the NRC's long-term storage plan is the combination of ISFSIs and dry transfer system ("DTS") facilities. Currently, not every facility in the U.S. has an ISFSI. Indeed, as of November 2010, only 63 ISFSIs were licensed, at 57 sites. See NRC, Spent Fuel Storage in Pools and Dry Casks, Key Points and Questions & Answers, *available at* <http://www.nrc.gov/waste/spent-fuel-storage/faqs.html> (last accessed Nov. 18, 2013). More importantly, the DGEIS acknowledges that no DTS facility currently exists anywhere in the United States. DGEIS at 2-20. The Department of Energy has not asked the NRC to approve the license for a DTS facility (DGEIS at 2-21), and the NRC has thus not required licensees to construct DTS facilities.²² This is true despite NRC's acknowledgment in a 2010 Staff memorandum to the Commissioners that "[f]or most (if not all) reactor sites, the SFPs do not have sufficient capacity to hold all the spent fuel generated during 60 years of potential operation under 10 CFR Part 50, 'Domestic

²² See, e.g., *Northern States Power Company, Prairie Island Nuclear Generating Plant and Prairie Island Independent Spent Fuel Storage Installation, Issuance of Director's Decision under 10 C.F.R. 2.206*, 63 Fed.Reg. 8703, 8710 (Feb. 20, 1998) (rejecting petitioner's request to order licensee to build a DTS facility).

Licensing of Production and Utilization Facilities.” Memorandum, Robert Borchardt to Commissioners, COMSECY-10-0007 (June 15, 2010), ML101390413, at 2. Clearly, an alternative to spent fuel pool storage during the 60-year timeframe will be needed, and yet none is contemplated by the DGEIS.

For both the at-reactor and away-from-reactor storage sites, the NRC assumes in the DGEIS that the construction, operation, and replacement of a DTS facility is necessary at some point to handle the transfer of fuel, and further assumes that ISFSI and DTS facilities would be replaced approximately once every 100 years. DGEIS at xxviii. The DGEIS contemplates first the construction of the ISFSI, and then at a later date, the DTS facility because it would not be needed right away (that is, it would not be constructed during short-term storage). DGEIS at 5-2, 6-8. The DGEIS contemplates that “[a] dry transfer system would be built at ISFSI sites (at-reactor or away-from reactor) in the long-term storage timeframe. A DTS would enable retrieval of spent fuel for inspection or repackaging without the need to return the spent fuel to a spent fuel pool.” DGEIS at xxviii.

NRC cannot rely on the hypothetical DTS option unless and until it is a reality in this country: until the technology has been proven and adopted, and until regulations requiring facilities to construct DTS facilities by a date certain have been promulgated. Otherwise, the DTS option is another effort by NRC to assume how nuclear waste storage might one day be handled to limit environmental review of present reality. The D.C. Circuit has rejected the NRC’s attempts to do just that. *See New York v. NRC*, 681 F.3d 471 (D.C. Cir. 2012). In the absence of this

information, the NRC cannot assume that all fuel will be removed from spent fuel pools or transferred from one dry cask to another at a certain time. Thus, the NRC must at a minimum conduct a spent fuel pool analysis, including severe accident or fire impacts, resulting from the storage of waste in pools for the long-term and indefinite time periods.

Also, the NRC's reliance on the future DTS licensing idea has resulted in the NRC failing to do a number of other required analyses here. For example, there is no environmental justice analysis for long term-storage because the NRC asserts that will be done as part of the DTS licensing proceedings taking place at each facility. This segmented approach fails to provide the adequate information in this DGEIS for all impacts related to the storage of waste.

2. The DGEIS does not establish that independent spent fuel storage installations are a viable possibility at every reactor site such that generic review is appropriate

Additionally, the DGEIS explicitly assumes that each reactor will have an at-reactor ISFSI or DTS by the end of a reactor's life, in doing so assuming that every nuclear power plant has the capability of accommodating an ISFSI or DTS if they don't already have one. DGEIS at 4-5. The DGEIS does not establish that this is true at each plant site, to support a generic finding. The States submit that in order to rest a generic finding on the assumption that ISFSIs and DTS facilities will be constructed at every facility, the NRC must examine every facility and make an affirmative finding that indeed each and every power plant site can accommodate these new facilities. The DGEIS offers only a sample of the total site area vs. land

area developed for ISFSIs for seven locations around the country (Table 3-1, DGEIS at 3-4), and does not include a site-by-site list of facilities that were assessed for ISFSI viability. This does not support a generic finding for all locations around the country.

The DGEIS recognizes that each ISFSI and DTS facility must be licensed through separate licensing proceedings. DGEIS at 1-16. Yet, the DGEIS assumes that every ISFSI and DTS license application would be granted (*id.*), when in fact the federal government has not approved the technology itself and DOE has not asked NRC to license it. The DGEIS fails to consider options if DTS facilities never become a reality, if licenses are not granted to ISFSIs or DTS facilities at specific sites, or if these facilities are not an option at certain sites around the Nation.

3. The DGEIS does not indicate a funding mechanism for the ISFSI and DTS facility construction or replacement

The DGEIS not only assumes that ISFSI and DTS facilities will be constructed at every facility where they are needed, but also explicitly assumes ISFSI and DTS facilities will be replaced every 100 years, without identifying a funding source for either option or estimated costs. Little information is publicly available concerning costs of dry transfer systems, but a search of the NRC's Agencywide Documents Access and Management System (ADAMS) reveals a 1995 report prepared for Private Fuel Storage by Energy Resources International, Inc., which assumed dry transfer facility costs of \$8.1 million in 1995 dollars, based on an estimate by the Electric Power Research Institute. Energy Resources International, Inc., Utility At-Reactor Spent Fuel Storage Costs For The Private

Fuel Storage Facility Cost-Benefit Analysis Revision 2 (Apr. 2000), ML003705093 at 6, citing *Dry Transfer System for Spent Fuel: Project Report, A System Designed to Achieve the Dry Transfer of Bare Spent Fuel Between Two Casks*, EPRI TR-105570 (Dec. 1995).²³ This report includes dry transfer costs “for sites unable to handle large spent fuel storage and transport systems.” *Id.* at 7 (implying that some sites are not able to handle large spent fuel storage and transport systems, rendering the DTS option a possibility only upon site-specific review in the Waste Confidence DGEIS as discussed above). Certainly, costs on that scale, multiplied by the number of sites at which the DTS systems as well as ISFSIs would be needed, is a substantial cost for the industry – and ultimately on the public – that has not been accounted for in the DGEIS. Without a reliable measure of costs, how the costs would be covered, and/or a cost-benefit analysis, the DTS option is more of the same NRC assumptions of future events that the courts have already rejected.

In short: the DGEIS must analyze the potential impacts of long-term pool storage because the DTS and ISFSI options are not concrete enough at this point to form the basis for any facility’s actual waste-storage planning.

IX. THE DGEIS’S DISCUSSION OF FIRES AND SEVERE ACCIDENTS IS INADEQUATE

A. The NRC’s Treatment Of Severe Accident Impacts Is Internally Inconsistent And Arbitrary

In the Revised GEIS for License Renewal issued earlier this year, NRC Staff states that:

²³ Upon information and belief, this report is not publicly available.

For severe accidents, the probability-weighted consequences of atmospheric releases, fallout onto open bodies of water, releases to groundwater, and societal and economic impacts from severe accidents are SMALL for all plants. However, alternatives to mitigate severe accidents must be considered for all plants that have not considered such alternatives. This is a Category 2 issue.

NUREG-1437, Rev. 1 (Mar. 2013), ML13106A241 at S-17. This finding applies to nuclear power plants during their licensed life. And yet the Waste Confidence DGEIS treats this issue *generically* for the post-operation time period, with no indication why it is treating severe accident mitigation alternatives differently than the License Renewal GEIS does during a facility's licensed life. In addition, as noted earlier, in all previous analyses of spent fuel storage at reactor sites—most notably NUREG-0575 and NUREG-1738—the NRC has concluded that there are factors that are inherently site-specific and require site-specific consideration. The DGEIS does not recognize these site-specific factors and does not provide for addressing them in future individual licensing proceedings.²⁴

NRC has also historically treated severe accidents related to a spent fuel pool differently than severe accidents at an adjacent reactor. Early analyses of severe accidents focused exclusively on reactor accidents. WASH-740 (1957); WASH-1400 (1975). At the time these studies were developed, the Atomic Energy Commission's and the Nuclear Regulatory Commission's stated policy was that spent nuclear fuel

²⁴ NRC may believe that the provision of 10 C.F.R. § 2.335, allowing for waiver of regulations, could be used in such cases. However, the DGEIS description of purpose and need for the proposed 10 C.F.R. § 51.23 makes that impossible. Because the asserted purpose and need is to develop a generic analysis of impacts, no waiver can be obtained because no one will be able to show that the purpose and need of the rule will not be served unless a site-specific analysis is conducted. Exelon Generation Company, LLC (Limerick Generating Station, Units 1 and 2), CLI-13-07, 2013 NRC LEXIS 7 (Oct. 31, 2013).

would be quickly removed from the reactor sites and transported to a reprocessing or disposal facilities. The federal agencies told the public that reactor sites would not become radioactive waste storage sites. Given this policy there was no need for large spent fuel pools or dense storage of spent fuel in the pools. As a result, given the minimal inventory anticipated for the existing spent fuel pools there was little perceived need to examine severe accidents in spent fuel pools.

Even if that dichotomy in the approach to severe accidents was reasonable decades ago when a permanent repository was expected in some reasonable timeframe, it is no longer appropriate given the fact that fuel storage is occurring at different plants and different sites.²⁵ NRC's spent fuel pool exception to the requirement that mitigation of severe accidents be handled on a site-specific basis is no longer rational. *Limerick Ecology Action, Inc. v. U.S. Nuclear Regulatory Comm'n*, 869 F.2d 719 (3d Cir. 1989), requires a site-specific analysis of mitigation of severe accident risk. There, the Third Circuit held that NEPA requires NRC to examine the environmental effects of significant accidents at nuclear power plants and measures to mitigate those effects. The *Limerick* court recognized that "the potential consequences [of a severe accident] will largely be the product of the

²⁵ *Limerick* understood that generic analysis for permanent spent nuclear fuel disposal was only appropriate because there would be a permanent repository. *Limerick Ecology Action, Inc. v. NRC*, 869 F.2d 719, 738 (3d Cir. 1989) ("Given that the NRC's long-term storage plans did not provide for permanent storage at each individual site, the common storage of the wastes in bedded-salt repositories provided a generic basis for the regulation because the effect of long-term storage could be expected to arise from the situs of the waste, rather than from the particular characteristics of the plants at which the waste was generated."). Twenty five years after *Limerick*, the Nation is no closer to an operating permanent repository. At various sites, including, for example, Indian Point and Pilgrim, the spent fuel pools that are outside containment hold more potential source term of radiation than do the adjacent reactors that are inside the containment shell.

location of the plant.” *Id.* at 738. “[T]he same probability of the same accident in a plant such as Limerick will produce a higher risk than that produced by the same accident at a plant not located within twenty-five miles of a major metropolitan area. ***Therefore, it is unlikely that severe accident mitigation can be treated as a generic issue.*** In fact, in its conclusion that severe accidents pose “no undue risk,” the [NRC’s] Final Policy Statement did not take into account the added risks of a plant located in a densely populated area.” *Id.* at 738-39 (emphasis added).

Former NRC Commissioner Victor Gilinsky recommended that spent fuel storage be examined on a site-specific basis in his Separate Views Regarding Proposed Amendments to 10 CFR Parts 50 and 51, Waste Confidence Proceeding, 48 Fed. Reg. 22730 (May 20, 1983) (“While I agree that there is no obstacle in principle to extended on-site storage, I think it is clear that each power reactor site will have to be examined in detail.”). Allan S. Benjamin *et al.*, Spent Fuel Heatup Following Loss of Water During Storage (Sandia National Laboratory, NUREG/CR-0649, SAND77-1371) at 50 (“1979 Sandia Report”) (Mar. 1979) (“The high density holders ... are the least well-suited to heat removal, as expected, particularly if the spent fuel is packed wall-to-wall so as to preclude a down-comer space at the edge of the pool.”); *see* 2006 Sandia Report at viii (“[D]ispersed configurations [of spent fuel assemblies] provided additional time for mitigative actions before the release of fission products versus a non-dispersed configuration.”); *see also* NAS Report at 103 (“[M]odifying the storage racks to provide for closer spacing of the fuel assemblies ...

can make it more difficult to cool the freshly discharged fuel if there is catastrophic loss of the fuel pool water.”)

B. NRC’s Analysis of Spent Fuel Pool Fires Relies Heavily Upon NUREG-1738 Without Considering NUREG-1738’s Limitations

The DGEIS Appendix F explains: “A significant portion of the NRC’s analysis for spent fuel pool fires during the short-term storage timeframe is derived from NUREG–1738, ‘Technical Study of Spent Nuclear Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants (NRC 2001).’” DGEIS at F-2. NRC states that this twelve year old, pre-Fukushima study “represents the NRC’s current judgment as to the expected impacts from a spent fuel pool fire during the short-term storage timeframe.” *Id.* As explained in the International Safety, Inc. (“ISR”) report submitted under separate cover by the New York State Office of the Attorney General (“ISR Report”), NRC’s use of NUREG-1738 is flawed for several reasons.

First, ISR points out that the DGEIS fails to acknowledge NUREG-1738’s assumptions and the stated limitations of a generic approach to spent fuel pool fires. ISR Report at 6-8. Because NUREG-1738 was a study performed in connection with a decommissioning rulemaking, it relied on a series of Industry Decommissioning Commitments and Staff Decommissioning Assumptions, which, if not carried out, could invalidate the analysis. *Id.* at 7-8. As described in more detail in the ISR Report, these decommissioning assumptions include assumptions regarding the age of the fuel beyond which a spent fuel pool fire can be ruled out (p. 2-1, NUREG-1738); the pool fire frequencies for all initiators (p. 3-7, NUREG-1738); the possibility for air cooling following damage caused by severe weather (p. 3-10,

NUREG-1738); the low initiating event frequency for the loss of pool inventory (p. 3-12, NUREG-1738); the probability of loss of cooling, loss of inventory, and loss of off-site power (p. 3-12, NUREG-1738); and the assumption that leaks are self-limiting. ISR explains how the DGEIS used vague language and largely ignored these specifics in NUREG-1738.

With respect to frequency, NUREG-1738 uses the average frequencies for the seismic events (p. 3-9) and acknowledges that *site-specific values could be ten times higher or lower* (p. 3-7). ISR Report at 15. The DGEIS does not even mention examples of sites with lower or higher seismic frequencies. Again, it fails to use a conservative bounding analysis. A recent statement from Chairman Allison M. Macfarlane supports site-specific review:

There's one additional item I'd like to raise with respect to our ongoing post-Fukushima work that may be of particular interest to you. We're reviewing the updated information from our licensees concerning external flooding and seismic events. Logic dictates that with such diverse topography and climate in this country, we must apply different assumptions when considering hazards for plants in California than those we apply for plants in Pennsylvania.

Prepared Remarks of NRC Chairman Allison M. Macfarlane, State Liaison Officers Conference, Tuesday, November 5, 2013, Rockville, Maryland. This is another flaw that should be dealt with in a site-specific manner.

The DGEIS also uses these average probabilities in Table F-1 (DGEIS at F-4). The total probability of pool drainage from NUREG-1353 (2×10^{-6} events per year) is based on best estimates of the frequency of various event sequences and is dominated by the seismic risk of structural failure (p. 4-36, NUREG-1353).

C. NRC Failed to Use a Conservative Bounding Analysis in Evaluating the Consequences of Spent Fuel Fires

In leaving the decision of whether to perform a site-specific or generic analysis to NRC, the D.C. Circuit conditioned the Commission's discretion to utilize generic analysis on the "Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing." *New York v. NRC*, 681 F.3d 471, 480 (D.C. Cir. 2012). The NRC has not employed a conservative bounding analysis for spent fuel pool fires, and the NRC has not provided a meaningful opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing (see discussion of waiver below).

Although the DGEIS acknowledges in passing that "the economic impacts would vary for different facilities," and notes that "[f]or example, higher total population or population density could result in higher relocation costs, and land use (*e.g.*, whether land is used as farmland or not) could also impact decontamination and condemnation costs" (DGEIS at F-7), there is absolutely no acknowledgement of the disparity in impacts at Indian Point and other plants as compared to the sites used by NRC in the documents it relies upon—chiefly Surry, which is surrounded by farmland in rural Virginia, and Peach Bottom, via the Spent Fuel Consequence Study, which is surrounded by a much lower population density.

In addition, the DGEIS includes a few short sections briefly discussing potential severe accidents at spent fuel pools including spent fuel leaks, spent fuel

pool fires, and sabotage or terrorist acts. DGEIS at Sections 4.18, 5.18, and 6.4.17. However, the only type of accident that is analyzed in detail is a spent fuel pool fire.

1. The Consequences of a Severe Accident at Indian Point Necessitate Site-Specific Review

As the ISR Report explains, the consequence assessment presented in the DGEIS is based on CRAC2 calculations, MACCS calculations, and MACCS2 calculations. The most detailed set of data comes from NUREG-1738 and is based on MACCS2 calculations. The central purpose of the Spent Fuel Pool Consequence Study is to determine if it is cost-beneficial to expedite the transfer of spent fuel from high-density spent fuel pools (reference) to dry storage casks (alternative) by analyzing the probabilities and consequences of severe accidents originating from a spent fuel pool. It likewise relied on MACCS2 calculations to determine the collective dose and various economic costs (*i.e.*, costs associated with decontamination, interdiction and property condemnation).

None of these consequence analyses constitutes a conservative bounding analysis. Indeed, they fail to account for the consequences at sites other than the reference site. For example, they ignore the unique, site-specific consequences that would occur as a result of a severe accident at Indian Point. The ISR Report details why Indian Point needs to be examined on a site-specific basis, but some of the general conclusions are summarized here.

- In the reference case of Peach Bottom used in the Spent Fuel Pool Consequence Study, the total population within a 50-mile radius is 5.7 million. By comparison, the total population within a 50-mile radius surrounding the Indian Point site is 17 million.

- The wind rose (*i.e.*, probability of wind directions) of the site has a direct correlation to the probability of certain areas being contaminated and thus requiring mitigative actions. In the Spent Fuel Pool Consequence Study, the reference plant's wind rose was such that the predominant wind directions were towards lower population areas (Spent Fuel Pool Consequence Study, Section A.2). By comparison, the predominant wind directions at the Indian Point site are to the North/North-Northwest and to the South; the latter would affect the New York City metropolitan area, one of the most populated areas in the United States.
- The value of nonfarm wealth (VALWNF) includes all public and private property not associated with farming that would be unusable if the region was rendered either temporarily or permanently uninhabitable. This value should include the cost of land, buildings, infrastructure, and the cost of any non recoverable equipment or machinery (MACCS2 manual). The value chosen for the Consequence Study, which uses the Peach Bottom site as the reference case, is \$210,000/person (2012 USD). By its definition, this value is site-specific. As a comparison, in its submission for a license renewal for Indian Point Units 2 and 3, Entergy calculated VALWNF to be \$209,000 (2004 USD). In 2012 USD, this value is approximately \$250,000, which is 20% higher than the value used in the Spent Fuel Pool Consequence Study.
- The per capita cost of long-term relocation (POPCST) takes into account both personal and corporate income losses, as well as moving expenses, for a transitional period. The value chosen for the Spent Fuel Pool Consequence Study is \$12,000/person (2012 USD). This value is site-specific. For example, in the state of New York, the average per capita income is approximately \$32,000 (2011 USD). Using an interdiction period of 140 days as recommended in NUREG/CR-4551, the total amount of lost wages is \$12,600/person (2012 USD). With the addition of corporate income losses and moving expenses, this amount is expected to be higher than the value used in the Spent Fuel Pool Consequence Study.
- The cost and time for decontamination, CDNFRM and TIMDEC respectively, are not site-specific, and do not take into account the differences in decontamination efforts required for varied land use surrounding the site (e.g., rural, semi-urban and urban).

Table 1: Summary of site-specific MACCS2 input parameters relevant to Indian Point

Parameter	Value used in the Consequence Study reference site	Minimum appropriate value for the Indian Point site	Minimum Ratio (Indian Point/reference site)	Applicable to the population dose cost	Applicable to the economic cost
Population within a 50-mile radius	5.7 million	17 million	3.0	Yes	Yes
Predominant wind direction	Towards lesser populated areas	Towards heavily populated areas	N/A	Yes	Yes
Value of nonfarm wealth (2012 USD)	\$210,000/person	\$345,000/person*	1.6	No	Yes
Relocation costs (2012 USD)	\$12,000/person	\$12,500/person*	1.04	No	Yes
Cost of decontamination (DF=3,15) (2012 USD)	\$7,110/person \$19,000/person	\$17,630/person* \$83,500/person*	2.5 4.4	No	Yes
Time of decontamination (DF=3,15)	1 year (DF=3) 1 year (DF=15)	1 year (DF=3)* 2 years (DF=15)*	1 2	No	Yes

* The ISR Report and updated tables submitted in the context of the Indian Point relicensing proceeding provided a suggested range of appropriate values for each of these parameters. For the sake of simplicity, and for illustrative purposes in this DGEIS proceeding, only the minimum value is represented here in Table 3. Values were CPI-adjusted to 2012 USD. The reader is directed to ISR Report 13014-01-01: Review of Indian Point Severe Accident Off Site Consequence Analysis (Dec. 21, 2011) (ML12334A761) as modified in Revisions to Tables in ISR Report 13014-01-01 (Jun. 28, 2012) (ML12340A648) for a complete discussion of site-specific input parameters for Indian Point, which also include higher input values.

An agency's use of a model is arbitrary if that model "bears no rational relationship to the reality it purports to represent." *American Iron & Steel Inst. v. EPA*, 115 F.3d 979, 1005 (D.C. Cir. 1997) (quotation marks and citations omitted). Models need not fit every application perfectly, nor need an agency "justify the model on an ad hoc basis for every chemical to which the model is applied." *Chemical Mfrs. Ass'n v. EPA*, 28 F.3d 1259, 1265 (D.C. Cir. 1994). If, however, "the model is challenged, the agency must provide a full analytical defense." *Eagle-Picher Indus., Inc. v. EPA*, 759 F.2d 905, 921 (D.C. Cir. 1985); *see also Natural*

Resources Defense Council, Inc. v. Herrington, 768 F.2d 1355, 1385 (D.C. Cir. 1985). Furthermore, an agency “retains a duty to examine key assumptions as part of its affirmative burden of promulgating and explaining a non-arbitrary, non-capricious rule.” *Small Refiner Lead Phase-Down Task Force v. EPA*, 705 F.2d 506, 534 (D.C. Cir. 1983). Here, the NRC knows that “key assumptions” underlying Sample Problem A/NUREG-1150 MACCS2 code inputs are wrong and yet has offered no defense of its continued reliance on those inputs. *C.f.*, *Columbia Falls Aluminum Co. v. EPA*, 139 F.3d 914, 923 (D.C. Cir. 1998).

By failing to account for the differences between spent fuel pool sites and the effects of those differences on the impacts of an accident, the DGEIS fails to perform a conservative bounding analysis. NRC Staff has failed to ensure that the DGEIS contains accurate information. *See Native Ecosystems Council v. U.S. Forest Serv.*, 418 F.3d 953, 964-65 (9th Cir. 2005) (NEPA requires that agencies rely on high quality data and accurate scientific analysis); 40 C.F.R. § 1500.1(b) (same), § 502.24 (“Agencies shall insure the professional integrity, including scientific integrity, of the discussions and analyses in environmental impact statements”); *Entergy Nuclear Operations, Inc.* (Indian Point, Units 2 and 3), LBP-11-17, at 11-12 (citing *ShieldAlloy Metallurgical Corp. v. NRC*, 624 F.3d 489, 492-93 (D.C. Cir. 2010)) (“NRC would be acting arbitrarily and capriciously if it did not look at relevant data and sufficiently explain a rational nexus between the facts found in its review and the choice it makes as a result of that review.”); *see Nw. Ecosystem Alliance v. Rey*, 380 F. Supp. 2d 1175, 1196 (W.D. Wash. 2005) (the fact that older data had been

used for a previous NEPA analysis is not a justification for its continued use where more recent data dictated a different result) (citing *Friends of the Clearwater v. Dombeck*, 222 F.3d 552, 557 (9th Cir. 2000) (“The agency must be alert to new information that may alter the results of its original environmental analysis”)). Administrative convenience or tradition do not justify use of obsolete or inapplicable information.

The ISR Report also addressed site-specific characteristics for the configuration of spent fuel pool and seismicity. These are also crucial to a conservative bounding analysis and should also be corrected.

D. The DGEIS Fails to Acknowledge the Liquid Releases That Occur During a Severe Accident

The ISR report explains that one of the lessons learned from the Fukushima accident is that mitigation measures that stop the progression of a severe accident may have clear benefits in the short term, but may create longer term hazards from liquid releases to the environment. ISR Report at 18-19. At Fukushima, the emergency workers pumped water into the damaged reactors. This water became contaminated on contact with the damaged fuel elements and leaked out into the basement of the reactors. This additional volume of highly radioactive water continues to add to the complexity and severity of the Fukushima accident. A recognition of this issue, much less any discussion of it, is utterly lacking from the DGEIS.

There have been many reports regarding continuing radiological aqueous releases at the Fukushima site – more than two and a half years after the start of

the severe accidents that damaged four of the Dai-ichi nuclear facilities. According to news articles, the receptacles holding radiation contaminated fluids at the Fukushima site have leaked and have released radiological material to the environment. See, e.g., Martin Fackler, *Damaged Nuclear Plant in Japan Leaks Toxic Water*, New York Times (April 6, 2013); Mari Iwata, *Japan Nuclear Plant Finds New Leaks*, Wall Street Journal (April 7, 2013); Hiroko Tabuchi, *Nuclear Plant in Japan Has Leak in Other Tank*, New York Times (April 9, 2013); Hiroko Tabuchi, *Fukushima Nuclear Plant Is Still Unstable, Japanese Official Says*, New York Times (April 10, 2013); *Fukushima Plant Has 300-Ton Water Leak*, Associated Press, New York Times (Web Edition) (August 20, 2013) (“The operator of Japan’s tsunami-crippled nuclear power plant said Tuesday that about 300 tons (300,000 liters, 80,000 gallons) of highly radioactive water have leaked from one of the hundreds of storage tanks there — its worst leak yet from such a vessel.”); Martin Fackler & Hiroko Tabuchi, *Memo From Japan With a Plant’s Tainted Water Still Flowing, No End to Environmental Fears*, New York Times (October 24, 2013); *Latest Leak at Japan’s Fukushima Plant Contaminates Six Workers*, Mari Saito, Reuters (October 9, 2013); Mari Iwata & Toko Sekiguchi, *Japan Unveils Strategy to Deal With Fukushima Daiichi Water Leaks Projects to Cost Around \$475 Million Include a Wall of Ice, Second Processing Plant to Filter Radioactive Particles*, Wall Street Journal (Sept. 3, 2013).

On August 1, 2013, NRC made the transcript of a December 2012 Advisory Committee on Reactor Safeguards (“ACRS”) subcommittee meeting publicly

available. July 30, 2013 Memorandum to ACRS Members regarding Certified Minutes of the ACRS Reliability and PRA Subcommittee Meeting on Level 3 PRA on December 4, 2012 (ML13211A477) (“ACRS Transcript”). At that meeting Alan Kuritzky from NRC’s Office of Research, Division of Risk Analysis, explained

Aqueous transport and dispersion of radioactive materials, this is something very big given the Fukushima event, but something we simply are not going to address in our study, but the Agency as a whole is looking into it.

ACRS Transcript at 43:17-21.

In fact, the MACCS2 code, used by the NRC to examine severe accidents, does not even take aqueous releases into consideration. A presentation by the Director of NRC’s Research Office from NRC’s March 2013 Regulatory Information Conference makes clear that the MACCS2 computer code used to examine severe accidents lacks the ability to analyze the impacts to water resources and the environment resulting from aqueous radiological releases accompanying such an accident. International Session - Post-Fukushima Research, Brian Sheron, Director, NRC Office of Nuclear Regulatory Research (March 13, 2013).²⁶ In slide 7 of that presentation (reproduced below), NRC notes (1) aqueous releases occurred during the Fukushima accident, and (2) current models do not address aqueous release pathways.

²⁶ The document is available at <https://ric.nrc-gateway.gov/m/Docs/Abstracts/sheronb-rev1-hv-w15.pdf>.



Research on Aqueous Pathways Resulting from Severe Accidents

- Aqueous release occurred during Fukushima accident
- Current models do not address aqueous release pathways
- RES is starting a program to assess:
 - Containment failure modes that could lead to aqueous releases
 - Source term modeling for aqueous pathways
 - Transport of contaminated water and its radiological consequences: surface water bodies, groundwater
- Expected outcome: whether potential aqueous releases warrant further mitigating action.

The term “current models,” as used in the slide, would include computer codes such as MACCS2.

Aqueous releases following a severe accident would be of particular concern at Indian Point, which sits on the Hudson River. Aqueous releases have the potential to contaminate the Hudson River’s waters, riverbanks, riverbed and sediment, adjacent freshwater tidal wetlands, and fish and other aquatic organisms, and impacts to the environment and human health could exceed the impacts flowing from the aqueous releases into the Pacific Ocean at Fukushima.

E. The DGEIS Does Not Include Mitigation Analysis For Probability-Weighted Impacts Of Severe Accidents.

In general, the DGEIS’s complete lack of analysis regarding mitigation measures is wholly inadequate under NEPA. Although the DGEIS does not so much as include a section discussing ways to mitigate the present-day severe accident impacts the DGEIS discloses, the DGEIS does, confusingly, discuss NRC’s past efforts at “mitigation.” Under DGEIS Section 4.18.2.1, the DGEIS states that “[i]n the event of even a long-term loss of normal pool makeup water capability at

U.S. power plants, measures that were installed in response to the September 11, 2001 terrorist attacks, plus additional measures that are required as a result of the post-Fukushima March 12, 2012, mitigating strategies order, would ensure additional defense-in-depth protection for cooling of the spent fuel.” The DGEIS, however, fails to (1) identify which specific post-September 11 and post-Fukushima “measures” it is referring to, (2) acknowledge that not all of these measures were implemented at all plants, and (3) quantify what “additional defense-in-depth protection” these unidentified measures provide, either generically or on a site-specific basis. Furthermore, it fails to identify, discuss, and evaluate other alternatives measures that would mitigate the impacts of a severe accident at a spent fuel pool. Indeed, contrary to NEPA, it excludes the consideration of such other readily available mitigation alternatives.

X. THE DGEIS FAILS TO EXAMINE THE SPECIAL PROBLEMS CREATED BY THE USE OF HIGH BURNUP FUELS

The DGEIS has failed to adequately consider the potential additional adverse environmental impacts associated with the use of high burnup fuel. The increasing use of high burnup fuel at reactors is creating problems for spent fuel pools. As of 2008, the NRC allows reactors using uranium fuel to operate at the highest burnup rates of any country in the world.²⁷ Nonetheless, NRC and others acknowledge that there are many aspects of high burnup fuel that could make their use problematic for spent fuel storage and handling. For instance:

²⁷ Erik Kolstad, Nuclear Fuel Behaviour in Operational Conditions and Reliability, Prepared for IPG meeting-Workshop on Fuel Behaviour, Argonne National Laboratory (Sept. 2008), at 10.

- “There is limited data to show that the cladding of spent fuel with burnups greater than 45,000 MWd/MTU will remain undamaged during the licensing period.”²⁸
- “For the most part, the current licensing basis for dry storage of spent fuel is largely based on fuel examinations and dry storage performance demonstrations performed in the 1980s and 1990s. Spent fuel used in the dry storage performance demonstrations had discharge burnups of ~36 GWd/MTU, or less.”²⁹
- “the majority of isotopic assay measurements available to date involve spent fuel with burnups of less than 40 GWd/MTU and initial enrichments below 4 wt % ²³⁵U, limiting the ability to validate computer code predictions and accurately quantify the uncertainties of isotopic analyses for modern fuels in the high burnup domain.”³⁰
- “Only limited references were found on the inspection and characterization of fuel in dry storage, and they all were performed on low-burnup fuel after 15 years or less of dry storage. Insufficient information is available yet on high-burnup fuels to allow reliable predictions of degradation processes during extended dry storage, and no information was found on inspections conducted on high-burnup fuels to confirm the predictions that have been made.”³¹
- “the technical basis for the spent fuel currently being discharged (high utilization, burnup fuels) is not well established ...the NRC has not yet granted a license for the transport of the higher burnup fuels that are now commonly discharged from reactors. In addition, spent fuel that may have degraded after extended storage may present new obstacles to safe transport.”³²

²⁸ U.S. Nuclear Regulatory Commission, Standard Review Plan for Spent Fuel Dry Storage Facilities, Final Report NUREG-1567 (Mar. 2000), at 6-15. <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1567/sr1567.pdf>.

²⁹ Electric Power Institute, Dry Storage Demonstration for High-Burnup Spent Nuclear Fuel Feasibility Study (Sept. 2003) at 5-1.

³⁰ NUREG/CR-7013, G. Ilas and I.C. Gauld, Analysis of Experimental Data for High-Burnup PWR Spent Fuel Isotopic Validation— Vandellös II Reactor, ORNL/TM-2009/32 at 1. Available at <http://info.ornl.gov/sites/publications/files/Pub22621.pdf>.

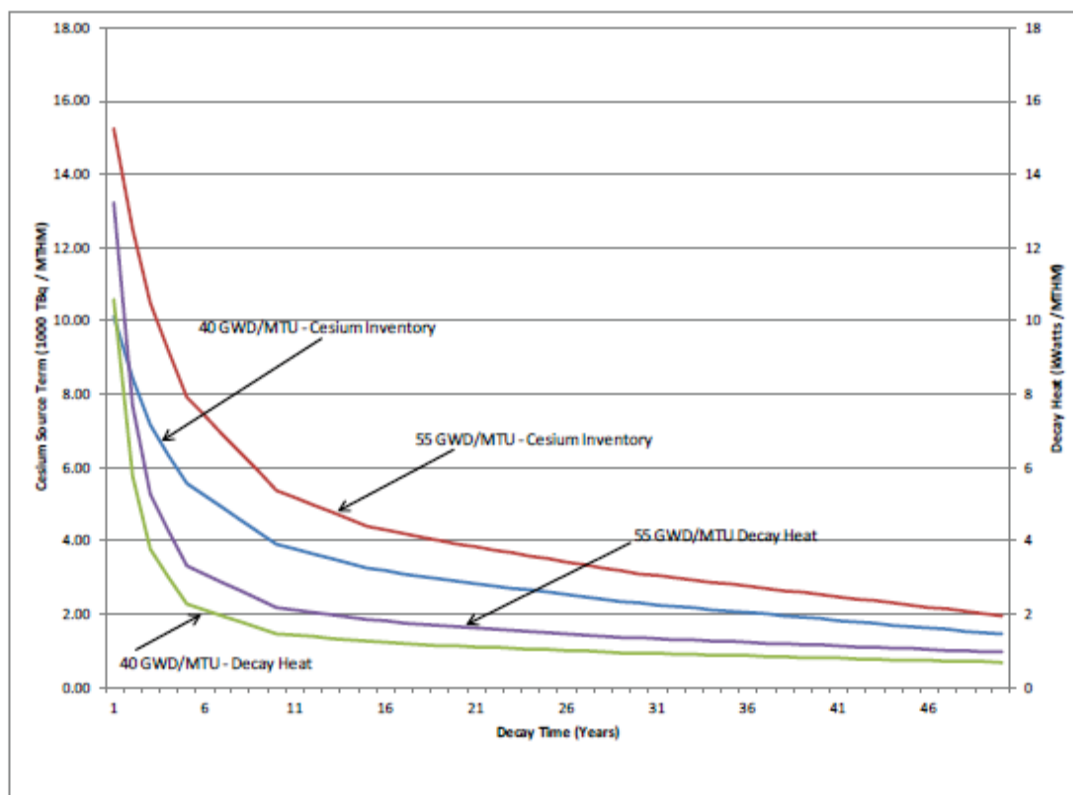
³¹ United States Nuclear Waste Technical Review Board, *Evaluation of the Technical Basis for Extended Dry Storage and Transportation of Used Nuclear Fuel*, December 10, 2010, available at http://www.nwtrb.gov/reports/eds_execsumm.pdf (last accessed Dec. 17, 2013).

³² National Academy of Engineering, Managing Nuclear Waste, Summer 2012, pp 21, 31. <http://www.nae.edu/File.aspx?id=60739>.

These unknowns are particularly troubling because of special problems that are created when high burnup fuel is used. High burnup fuel contains much more radioactivity. *See, e.g.,* Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada (Feb. 2002), *available at* http://energy.gov/sites/prod/files/EIS-0250-FEIS-01-2002_0.pdf.

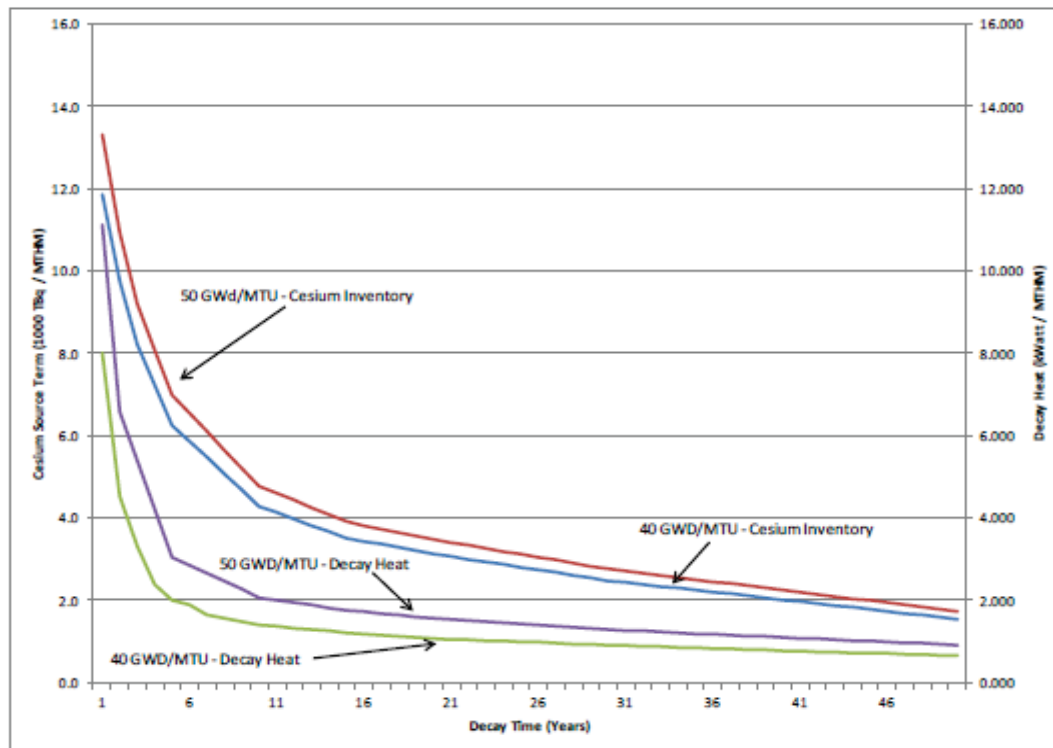
This increase in radioactivity also produces an increase in decay heat as the following chart, based on information from EPRI, demonstrates for a PWR:

PWR SNF Assembly Decay Heat (right axis) and Cesium Inventory (left axis) as a Function of Burnup and Cooling Time



E. Supko, Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling, Revision 1, Electric Power Research Institute, (Aug. 2012), Fig. 2-2, *available at* <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025206#!> (last accessed Dec. 20, 2013).

The BWR has similar results for the use of high burnup fuel:



E. Supko, Impacts Associated with Transfer of Spent Nuclear Fuel from Spent Fuel Storage Pools to Dry Storage After Five Years of Cooling, Revision 1, Electric Power Research Institute, (Aug. 2012), Fig. 2-3, *available at* <http://www.epri.com/abstracts/Pages/ProductAbstract.aspx?ProductId=000000000001025206#!> (last accessed Dec. 20, 2013).

In terms of the risk of a zirconium fire in the spent fuel pool, increasing decay heat in spent fuel is particularly troublesome where air and steam are present:

[the reaction] is strongly exothermic – that is, the reaction releases large quantities of heat, which can further raise cladding temperatures... if a supply of oxygen and or steam is available to sustain the reactions. The result could be a runaway oxidation –

referred to as a *zirconium cladding fire* – that proceeds as a burn front (e.g., as seen in a forest fire or fireworks sparkler)...As fuel rod temperatures increase, the gas pressure inside the fuel rod increases and eventually can cause the cladding to balloon out and rupture.³³

NRC has recognized the problem created by high burnup fuel and is not able to establish a generic analysis of it: “it was not feasible, without numerous constraints, to establish a generic decay heat level (and therefore a decay time) beyond which a zirconium fire is physically impossible.”³⁴

In addition to increasing the possibility of zirconium fires and making the calculation of their probability on a generic basis impossible, high burnup fuels are also causing problems with the integrity of the spent fuel pools themselves:

as nuclear plants age, degradations of spent fuel pools (SFPs), reactor refueling cavities...are occurring at an increasing rate, primarily due to environment-related factors. During the last decade, a number of NPPs have experienced water leakage from the SFPs [spent fuel pools] and reactor refueling cavities.

it is often hard to assess their in situ condition because of accessibility problems...Similarly, a portion of the listed concrete structures are either buried or form part of other structures or buildings, or their external surfaces are invisible because they are covered with liners.³⁵

³³ National Research Council, Board on Radioactive Waste Management, Committee on the Safety and Security of Commercial Spent Nuclear Fuel Storage, National Academies Press (2006), p. 38-39. Available at http://www.nap.edu/openbook.php?record_id=11263&page=38, http://www.nap.edu/openbook.php?record_id=11263&page=39.

³⁴ U.S. Nuclear Regulatory Commission, Technical Study of Spent Fuel Pool Accident Risk at Decommissioning Nuclear Power Plants, October 2000, p. ix. available at <http://pbadupws.nrc.gov/docs/ML0104/ML010430066.pdf>.

³⁵ U.S. Nuclear Regulatory Commission, “A Summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, TORI and Safety-Related Concrete Structures,” NUREG/CR-7111 (2011) at vxiii, available at <http://pbadupws.nrc.gov/docs/ML1204/ML12047A184.pdf>.

These structural problems are creating additional risks of criticality accidents at spent fuel pools:

The conservatism/margins in spent fuel pool (SFP) criticality analyses have been decreasing...The new rack designs rely heavily on permanently installed neutron absorbers to maintain criticality requirements. Unfortunately, virtually every permanently installed neutron absorber, for which a history can be established, has exhibited some degradation. Some have lost a significant portion of their neutron absorbing capability. In some cases, the degradation is so extensive that the permanently installed neutron absorber can no longer be credited in the criticality analysis.³⁶

This problem cannot be fixed merely by adding more boron to the spent fuel pool since concrete “could be negatively impacted by adverse environments of borated water or where there is the possibility of alkali aggregate material reactivity.”³⁷ And adding any equipment to the spent fuel pool (e.g., to control water chemistry or to absorb neutron) is not a viable solution because it restricts water flow in the pool and thus increases the risk of an accident from a loss of adequate cooling.

In sum, the DGEIS has failed to adequately consider the potential additional adverse environmental impacts associated with the use of high burnup fuel. Relatedly, the NRC has failed to analyse the extent to which those impacts could be mitigated by, for instance, preventing further use of high burnup fuel at reactors and requiring the immediate transfer of all high burnup spent fuel that is at least 5 years old to dry casks.

³⁶ U.S. NRC, Office of Nuclear Reactor Regulation, On Site Spent Fuel Criticality Analyses, NRR Action Plan, May 21, 2010. <http://pbadupws.nrc.gov/docs/ML1015/ML101520463.pdf>.

³⁷ NUREG/CR-7111, *supra* note 35, at xiv.

XI. THE DGEIS'S DISCUSSION OF LEAKS IS INADEQUATE

A. The DGEIS Fails To Examine Spent Fuel Pool Leaks In The Long-Term And Indefinite Timeframes

As discussed above, the DGEIS “assumes that spent nuclear fuel . . . is removed from the pool within 60 years of the end of the reactor’s licensed life for operation.” DGEIS at E-1. Therefore, the DGEIS looks only at spent fuel pool leaks that occur within sixty years from the end of plant operation, which is referred to as the “short-term” timeframe. As discussed above, there is no basis for NRC’s assumption that all waste will be moved from pools to dry cask by sixty years after licensed life.

The D.C. Circuit found that “a proper analysis of the risks [of leaks] would necessarily look forward to examine the effects of the additional time in storage.” *New York*, 681 F.3d at 481. It gave the NRC one option only for concluding that no analysis of spent fuel pool leaks is necessary: “Only if the harm in question is so ‘remote and speculative’ as to reduce the effective probability of its occurrence to zero may the agency dispense with the consequences portion of the analysis.” *Id.* at 482. Since NRC cannot predict with certainty that all spent fuel will be removed from pools within sixty years, it must look at the consequences of leaving fuel in pools beyond that timeframe.

For example, NRC must examine the effects of aging on spent fuel pool structural integrity and how this will affect leaks throughout the entire period covered by the EIS, including the short-term, long-term, and indefinite timeframes. As shown by the data provided in Appendix E, spent fuel pool leaks have occurred

at numerous plants during the reactors' *initial* licensing terms. DGEIS at E-19 to E-21. In addition, a study cited in the DGEIS concluded: "As nuclear plants age, occurrences of degradation of spent fuel pools (SFPs), reactor refueling cavities, and the torus structure of light-water reactor nuclear power plants (NPPs) are occurring at an increasing rate, primarily due to environment-related factors." Copinger et al., Summary of Aging Effects and Their Management in Reactor Spent Fuel Pools, Refueling Cavities, Tori, and Safety-Related Concrete Structures, NUREG/CR-7111 (2012) (ML12047A184). This raises concerns that the structural integrity of the spent fuel pools may diminish significantly during the long-term and indefinite timeframes, increasing the likelihood and severity of leaks. Moreover, the aging management programs relied on by NRC Staff (DGEIS at E-4 to E-5) to monitor spent fuel pool structural integrity were designed to cover only the twenty-year period of extended operations, not the sixty-year period after operations have ceased. These programs may therefore be inadequate to provide a long term assurance of pool structural integrity.

Furthermore, as fuel remains in spent fuel pools during the long-term and indefinite timeframes, the outer cladding material encasing the fuel may degrade, thereby allowing fission products to be released from the fuel into the pool water.³⁸ This may cause the radioactivity of the spent fuel pool water to increase over time, further contributing to the severity of leaks in the long-term and indefinite

³⁸ See NRC, Liquid Radioactive Release Lessons Learned Task Force Final Report at i (2006) (ML062650312); Robert Alvarez, Spent Nuclear Fuel Pools in the U.S.: Reducing the Deadly Risks of Storage, at 2 and 16 (May 2011); National Academy of Sciences, *Safety and Security of Commercial Spent Nuclear Fuel Storage: Public Report*, The National Academies Press, at 19, FN 10 (2006).

timeframes. Since NRC cannot predict with certainty that all spent fuel will be removed from pools within sixty years, it must examine the probability and environmental consequences of leaks after that time, as well as techniques for managing the aging of spent fuel pools in order to prevent such leaks.

B. The DGEIS Fails To Examine Short-Term, High-Volume Leaks From Spent Fuel Pools

NRC further limits its evaluation of spent fuel pool leaks to “long-term, low-volume undetected” leaks, based on its assumption that this is “the most probable scenario where spent fuel pool leakage would lead to an offsite environmental impact.” DGEIS at E-10. NRC states that it does not need to examine the environmental consequences of short-term, high-volume leaks in the DGEIS because “licensees would likely identify and mitigate, if necessary, the impacts from any significant short-term water loss before noticeable offsite environmental impacts would occur.” DGEIS at E-9 to E-10. However, NRC does not find that short-term, high-volume leaks could not occur in the future, nor does it cite any studies or reports to support the assumption such leaks will not cause offsite environmental impacts. Effectively, NRC asserts that short-term, high-volume leaks will not affect the environment because NRC and licensees are “on duty.” But, as the D.C. Circuit found, “merely pointing to the compliance program is in no way sufficient to support a scientific finding that spent-fuel pools will not cause a significant environment impact during the extended storage period.” *New York*, 681 F.3d at 481. Also, NRC’s compliance program is voluntary—there is no NRC requirement that licensees conduct onsite groundwater monitoring. Instead, NRC

allows licensees to rely on a voluntary groundwater monitoring initiative set forth by industry. DGEIS at E5-E6.

In fact, short-term, high-volume spent fuel pool leaks have occurred at U.S. reactors. For example, in 1986, the spent fuel pool at Edwin I. Hatch Unit 1 released an estimated 141,500 gallons of contaminated water, 124,000 gallons of which was released into a swamp that drains into the Altamaha River. NRC, *Liquid Radioactive Release Lessons Learned Task Force Final Report*, at 5, (Sept. 1, 2006) (ML062650312). Moreover, while NRC states that licensees will mitigate the impacts of high-volume leaks before noticeable off-site environmental impacts will occur, it does not set forth a mitigation plan for such leaks or present evidence that past mitigation measures have proven successful. This may be because NRC regulations do not require the immediate mitigation of spent fuel pool leaks and often, NRC allows licensees to simply monitor leaks rather than remediate them. *See id.* at 3-10. An agency may forego an analysis based on “specific mitigation measures which completely compensate for any possible adverse environmental impacts,” *Cabinet Mountains Wilderness/ Scotchman’s Peak Grizzly Bears v. Peterson*, 685 F.2d 678, 682 (D.C. Cir. 1982), but those measures must be supported by “substantial evidence” showing their adequacy, *Nat’l Audubon Soc’y v. Hoffman*, 132 F.3d 7, 17 (2d Cir. 1997). NRC must either explain how mitigation measures can prevent environmental impacts from short-term, high-volume leaks or look at the probability and consequences of such leaks. This includes examining how human error, severe accidents, natural disasters, climate change, and sabotage or

terrorism may increase the likelihood of short-term, high-volume spent fuel pool leaks in the future.

C. The DGEIS Fails to Examine Past Leaks In Detail

The D.C. Circuit directed NRC to examine past leaks in a manner “that would allow the Commission to rule out the possibility that those leaks were only harmless because of site-specific factors or even sheer luck.” *New York*, 681 F.3d at 481. Despite this command, the NRC failed to undertake a detailed examination of past leaks. Similar to the 2010 Waste Confidence Update which “has no analysis of those possibilities other than to say that past leaks had ‘negligible’ near-term health effects,”³⁹ the DGEIS simply lists the occurrence of past leaks, the dose from past leaks, and the Groundwater Task Force finding that no past leaks have affected the health of the public. *See* DGEIS at E-20 to E-22. The DGEIS fails to examine why these leaks did not affect public health or whether they were “harmless” because of site-specific factors. Moreover, despite acknowledging that at least seven leaks have resulted in inadvertent liquid radioactive releases to the environment, the DGEIS does not examine whether those leaks caused any type of environmental impact other than a public health impact.

Nor does the DGEIS explain how the impacts of past leaks give any indication of the potential for future leaks. Such an analysis would be a standard procedure in the kind of “root cause analysis” that NRC requires its licensees to undertake whenever there is radiation release. *See e.g.* Standard Review Plan for

³⁹ *New York*, 681 F.3d at 481.

the Review of a License Application for the Tank Waste Remediation System Privatization (TWRS-P) Project Final Report, NUREG-1702 (Mar. 2000) at Section 11.8. Such an analysis requires ascertaining the underlying cause of the problem and taking measures to fix the cause so it will not recur. The DGEIS includes no such root cause analysis of the many spent fuel pool leaks and thus provides no reasoned basis to conclude that such leaks will not continue or that they will not be more severe in the future. For example, if the root cause of the leaks is the aging of the spent fuel pools, which were never meant to be long-term storage solutions, then the prospect for even greater and more damaging leaks in the future is far more serious than the DGEIS's optimistic assumption.

The D.C. Circuit specifically noted: “Even setting aside the fact that near-term health effects are not the only type of environmental impacts, the harm from past leaks—without more—tells us very little about the potential for future leaks or the harm such leaks might portend.” *New York*, 681 F.3d at 481. The DGEIS should take a more detailed examination of the causes of past leaks and explain whether or not aging will increase such causes. Without providing more detailed analysis of past leaks, the DGEIS cannot predict the impacts of future leaks.

D. The DGEIS Fails to Employ Conservative Bounding Assumptions for Leaks

The D.C. Circuit found that a comprehensive general analysis of risks is sufficient, particularly “given the Commission’s use of conservative bounding assumptions.” *New York*, 681 F.3d at 480. However, NRC fails to employ conservative bounding assumptions in examining the impacts of spent fuel pool

leaks. For example, its conclusion that groundwater impacts will be small rests on its finding that “the hydrologic characteristics associated with typical nuclear power plant settings . . . will act to impede the offsite migration of future spent fuel pool leakage.” DGEIS at 4-26. Relying on the characteristics of typical nuclear plants does not result in a conservative estimation of the impacts of leaks. Such an analysis gives no sense of the groundwater impacts at a plant lacking typical hydrologic characteristics such as proximity to a large water body, shallow water table flow toward that water body, flat hydraulic gradients in the shallow water tables, large distance to local groundwater users, and the likelihood that local groundwater usage is in deeper confined aquifers. *Id.* While NRC states that leaks at sites with different hydrological conditions could have the potential to affect nearby groundwater users (DGEIS at E-14), it simply concludes that in the unlikely event that contamination exceeded Maximum Contaminant Level for a groundwater source, “the EPA could take emergency action under the Safe Drinking Water Act (EPA 1991).” DGEIS at E-16. The DGEIS does not state which plants lack the “typical hydrologic characteristics,” what combination of hydrologic characteristics could lead to groundwater contamination, or what the expected groundwater impacts could be (aside from exceeding drinking water standards). NRC does not even explain what emergency actions might be taken by EPA. Such actions might include preventing the affected population from using their only source of potable water or preventing farmers from using their only source of irrigation. NRC must conduct a conservative bounding analysis that takes a detailed look at the impacts

at plants lacking “typical hydrologic characteristics,” such as plants where there are nearby groundwater users of shallow groundwater aquifers.

Similarly, NRC’s examination of surface water impacts lacks conservative bounding assumptions. While NRC acknowledges that a leak could result in “indirect effects on surface-water quality” due to groundwater contamination, it concludes that the effects would be small because the contaminated groundwater would be diluted by the large volume of surface water. DGEIS at E-17. Contrary to NRC’s approach, impacts to surface waters should be bounded by sites that are different in character. For example, the impact on a river that is designated for the best uses of surface water will be different than the impact on an ocean that does not have that designation. In addition, plants like Vermont Yankee, which is near a downstream dam where contaminated sediment can accumulate, are different than plants that are discharging to free-flowing rivers. NRC also states that even if a pool leaked into surface waters continuously, the quantities of radioactive material would be comparable to values associated with permitted, treated effluent discharges from plants. However, NRC fails to examine the combined impact of a leak and effluent discharges on sensitive surface waters, including whether state or federal water quality standards could be violated.

Nor did NRC employ conservative bounding assumptions to determine the impacts of leaks on soils. Such an analysis would look at the impacts at sites that are in agricultural areas such as Fort Calhoun in Nebraska or Duane Arnold in Iowa. At a minimum, NRC must include such conservative bounding assumptions

if it is to conduct a generic analysis of the risks of spent fuel pool leaks. That being said, the findings of the DGEIS indicate that generic analysis is not appropriate for spent fuel pool leaks.

E. Generic Analysis is Not Appropriate for Spent Fuel Pool Leaks

In many instances, NRC is not able to predict the environmental impacts of spent fuel pool leaks because these impacts are dependent on site-specific factors. The following are several examples of statements from the DGEIS where NRC indicates that impacts can be determined only on a site-specific basis:

- “The impacts of a spent fuel pool leak on offsite groundwater depend on many factors, including the volume and rate of water released from the spent fuel pool, the radionuclide content and concentration and water chemistry of the spent fuel pool water, the direction of groundwater flow, the distance to an offsite groundwater receptor, the velocity or transport rates of radionuclides through the subsurface, and radioactive decay rates.” DGEIS at E-16.
- “Contaminants may enter an aquifer system and be transported with the hydraulic gradient. The direction and rate of contaminant transport will depend on the site-specific properties of the aquifer.” DGEIS at 3-18 to 3-19.
- “The concentrations of radionuclides in offsite surface waters will depend on the rate of release from the spent fuel pool, direction and rate of groundwater flow, the distance to nearby offsite surface waters toward which groundwater flows, the velocity of transport rates of radionuclides through the subsurface, and radioactive decay rates.” DGEIS at E-17.
- “The degree of offsite soil contamination will depend on the rate of release from the spent fuel pool, direction of groundwater flow, the distance to offsite locations, the velocity or transport rates of radionuclides through soils, and radioactive decay rates.” DGEIS at E-18.

Simply listing the site-specific factors that determine the impact of spent fuel pool leaks does not allow NRC or the public to reasonably anticipate what those impacts will be. Impacts may only be analyzed generically if they “do not involve

particularized situations.” *Minnesota v. NRC*, 602 F.2d 412, 416 (D.C. Cir. 1979)) and only if they involve “on-site risks that are essentially common to all plants” (*New York v. NRC*, 681 F.3d at 480). NRC’s inability to generically determine what the impacts of spent fuel pool leaks will be shows that this is a particularized situation that necessitates site-specific review. NRC must review the impacts of spent fuel pool leaks on a site-specific basis both because the consequences of such leaks vary from site to site but also because the probability of such leaks vary based on the specific characteristics of the spent fuel pool and spent fuel in the pool. Some factors that should be examined for each individual plant include: the geological landscape underlying the reactor and the spent fuel pool (including the composition of the subsurface, direction of groundwater flow, etc); the nature and uses of nearby resources (such as the proximity of wells supplying drinking water and the classification of local water bodies); the degree to which already existing groundwater contamination from past radiological leaks may affect the impact of new leaks; the ecology of local water bodies; the presence of nearby significant habitats and endangered species; and possible site-specific causes of leaks (tornados, earthquakes, flooding, etc). Factors relevant to the characteristics of the pool and its contents include the rack configuration used in the pool, the types of equipment and devices used to provide boron to offset the potential for criticality accidents, and the vulnerability of the fuel to leaks due to the presence of high burnup fuel in the pool.

Finally, as they did with severe accidents as discussed above, the NRC has taken internally inconsistent positions on whether leaks should be evaluated on site-specific or generic basis, evaluating them on a site-specific basis during the licensed life of a facility in the GEIS for License Renewal, but proposing to evaluate them generically here for the post-licensed life period of time. *See* NUREG-1437, Rev. 1 (Mar. 2013), ML13106A241 at 1-24 (stating that despite comments requesting generic review of leaks, “[r]adionuclides released to groundwater” remains a Category 2 issue). Neither DGEIS provides a basis for this inconsistent treatment of the same issue.

XII. THE DGEIS DOES NOT ADEQUATELY ADDRESS NON-HUMAN HEALTH ENVIRONMENTAL AND CULTURAL IMPACTS

A. The DGEIS Does Not Address Impact Of A Spent Fuel Pool Fire Or Accident On Non-Human Biota At All.

The DGEIS offers absolutely no analysis of the impact of a spent fuel pool fire, accident, or leak on non-human biota. As discussed above, the low probability of an accident or fire does not absolve the NRC of performing the analysis of potential impacts, as the D.C. Circuit made clear. Quantifiable impacts to biota occur after releases of radioactivity from power plants. For example, after the meltdown at Fukushima, the New York Times reported that:

- Initially, scientists found that the abundance of birds, butterflies and cicadas had decreased significantly as the level of radiation increased. Bumblebees, dragonflies and grasshoppers were not affected by the release of radioactive materials, however. Surprisingly, spiders actually increased in abundance with the rise in radiation. *Fukushima v. Chernobyl: How Have Animals Fared?*, NYTimes GreenBlog, July 13, 2012, available at http://green.blogs.nytimes.com/2012/07/12/fukushima-vs-chernobyl-how-have-animals-fared/?_r=0 (last visited Nov. 15, 2013)

- Dr. Mousseau (a biologist at the University of South Carolina at Columbia) speculates that perhaps the insect prey that spiders normally feed on are weaker and easier to catch in the radioactive zones, and that spiders are possibly not particularly sensitive to the immediate contaminants. He predicts that over the long term, the [population of] spiders, bees, dragonflies and grasshoppers will eventually begin to drop off. *Id.*
- In Fukushima, animals have only cycled through a few generations at most since the disaster, so any mutations have probably not begun to manifest themselves. For short-lived species like insects, however, mutations could soon start to appear. *Id.*
- Scientists found that contaminated areas of Chernobyl and Fukushima are unlikely to be hospitable habitats for years to come. In Chernobyl, for example, the amount of americium-241, a highly radiotoxic isotope if ingested, is actually increasing as its parent nuclide, plutonium, decays. Radioactive materials like cesium are brought back to the surface soil each year by plant growth and pollination. *Id.*
- Scientists conclude that “artificial radionuclides from the Fukushima Nuclear Power Plant caused physiological and genetic damage to [pale grass blue butterflies.]” CNN, “Mutant butterflies a result of Fukushima nuclear disaster, researchers say” (Aug. 14, 2012), *available at* <http://news.blogs.cnn.com/2012/08/14/mutant-butterflies-a-result-of-fukushima-nuclear-disaster-researchers-say/> (last accessed Nov. 18, 2013), citing Hiyama, et al., The biological impacts of the Fukushima nuclear accident on the pale grass blue butterfly, SCIENTIFIC REPORTS (Aug. 9, 2012), *available at* <http://www.nature.com/srep/2012/120809/srep00570/full/srep00570.html> (last accessed Nov. 18, 2013).

Moreover, sensitivity to irradiation varies between species (CNN, *supra*), warranting a species-by-species examination of the impacts of a spent fuel pool accident or fire. Similarly, past studies by Fukushima Prefecture found that as time passed, radioactivity levels declined at a faster pace for fish and shellfish in deeper parts off the coast than those on the seabed closer to the coast, indicating that analyses must be done both near and farther from each plant to capture full impacts. Asahi Shimbun, “With radiation fears rekindled, researchers seek truth

off Fukushima coast,” *available at* <http://ajw.asahi.com/article/0311disaster/fukushima/AJ201308120096> (last accessed Nov. 18, 2013).

B. The DGEIS Uses Vague Language And Fails To Incorporate Relevant Documents

The DGEIS often uses vague language that does not adequately describe impacts; for example, it says various occupational activities “*may have effects* on upland vegetative communities and habitats” (DGEIS at 3-21, emphasis added). The DGEIS claims, with no basis, that the effects of indefinite storage would be the same as the effects of long term storage. The DGEIS frequently refers to the “License Renewal GEIS” determinations, without adequately explaining how the License Renewal GEIS reached that determination or incorporating the License Renewal GEIS’s conclusions into this document. The State submits that a reader residing in one of the dozens of nuclear waste storage communities around the country trying to understand the impacts of nuclear waste storage near their home deserves to have all of the relevant information in one place.

C. NEPA Requires Consideration Of The Environmental Impacts Of License Renewal Or Non-Renewal On Nearby Lands, Including Impacts To Property Values

As previously set forth, the NRC must conduct a legally adequate evaluation of the environmental effects of “failing to secure permanent storage for spent fuel” and “to properly examine future dangers and key consequences” of spent fuel storage at reactor sites. *New York v. NRC*, 681 F.3d 471, 473 (D.C. Cir. 2012). Among these “key consequences” are socioeconomic impacts.

“NEPA requires an EIS to disclose the significant health, *socioeconomic* and cumulative consequences of the environmental impact of a proposed action.” *Baltimore Gas and Elec. Co. v. NRDC*, 462 U.S. 87, 106-07 (emphasis added). *Accord Society Hill Towers Assoc. v. Rendell*, 210 F.3d 168, 176-178 (3d Cir. 2000) (project opponents who alleged, inter alia, that “the impact of the proposed project on their neighborhood will decrease their property values” had standing); *Kelley v. Selin*, 42 F.3d 1501 (6th Cir. 1995) (residents who lived near nuclear power facility that proposed to use dry cask storage had standing to protest alleged diminution in property value); *Matter of Connecticut Yankee* (Haddam), 54 N.R.C. 33 (Jul. 9, 2001) at *44 (affidavits alleging impact to property values by nuclear facility that had contaminated groundwater and released radioactive waste established standing because alleged injuries were within NEPA “zone of interests”); *see also* App’x B to Subpart A of Part 51 (“Table B-1 . . . represents the analysis of the environmental impacts associated with renewal of any operating license”); *id.* (requiring analysis of “socioeconomics,” including license renewal impacts on housing, public services, public utilities, education, offsite land use, historic and archaeological resources, and aesthetics).

Environmental impact review must also analyze the potential impacts to off-site land use. Property values are affected by amenities and disamenities, including power plants. Nuisances and amenities are important considerations in determining property values, which, in turn, are an important driver in land use. In a peer reviewed article, Glenn Blomquist demonstrated that, after adjusting for

other factors (property size, demographic composition of the neighborhood, and so on), the presence of a power plant had a statistically significant impact on property values. Glenn Blomquist, *The Effect of Electric Utility Power Plant Location on Area Property Value*, Land Economics, Vol. 50, No. 1 (Feb. 1974) (ML12334A750) at 97-100. The impact to property values was most clearly detectable up to a distance of 11,500 feet from the power plant. Within this zone, increasing the distance from the power plant by 10% was associated with an increase in market value of residential properties of 0.9 percent. This level of negative impact was evaluated for sample mean properties, meaning that it could be expected to hold for typical properties in the area.

A study of the impact on property values in the vicinity of Three Mile Island also found evidence of a positive relationship between distance from Three Mile Island and home sales price, suggesting that the plant had a small negative impact on residential housing prices. H. Gamble and R. Downing, *Effects of Nuclear Power Plants on Residential Property Values*, 22 J. of Regional Sci. 457 (1982) (ML12335A686).

Scholars have also studied the impact on property values of spent nuclear fuel on residential property values. *Spent Nuclear Fuel and Residential Property Values: The Influence of Proximity, Visual Cues and Public Information*, David E. Clark and Tim Allison, Papers Reg. Sci. 78, 403–421 (1999) (ML12341A393 (non-public)).

Indeed, nearly 40 years ago the Commission determined that the alternatives analysis for the handling and storage of spent fuel had to include a cost-benefit analysis of the environmental, social, and economic costs of each alternative. 40 Fed. Reg. 42801 (Intent to Prepare Generic Environmental Impact Statement on Handling and Storage of Spent Light Water Power Reactor Fuel (Aug. 1979)).

Consistent with NEPA's mandate to study the potential "effects" of a proposed action on the "human environment," 40 C.F.R. §§ 1508.8, 1508.14, the Commission has acknowledged the potential for power plant relicensing and its alternatives to impact property values. GEIS for License Renewal of Nuclear Plants, NUREG-1437, at 4-133 (June 2013) ("Property values for nearby private residences could be affected positively if plant workers were to live locally. Property values could also be affected negatively, if there were impacts associated with noise, traffic, or if there were visual impacts associated with the plant").

Although the DGEIS purports to address the land use impacts of continued storage of spent fuel in (DGEIS §§ 4.1, 5.1) it does not even mention the impact of such storage on nearby property values, whether industrial, commercial or residential. The impact of long term spent fuel storage on property values is a fundamental socioeconomic impact, a determinant of land use, which must be addressed as to both on-site and away-from-reactor storage. Property values are a key driver of land use. Because land use and tax-driven impacts are among the socioeconomic factors that an EIS must examine, the DGEIS must examine the impacts to property value caused by long-term storage of spent nuclear fuel. Absent

such analysis, the DGEIS's conclusion that "the environmental impacts on land use during the long-term storage timeframe would be SMALL" (*see, e.g.*, DGEIS at 4-6), is unsupported, arbitrary and capricious.

D. The DGEIS Fails To Adequately Consider The Long-Term Viability Of The Prairie Island Reservation As A Homeland For The Tribe In Light Of The Continued, Indefinite Storage Of Spent Nuclear Fuel And The Implications Of Long-Term Or Indefinite Storage Of Spent Nuclear Fuel On The Preservation Of Tribal Life And Culture.⁴⁰

The DGEIS fails to fulfill the D.C. Circuit Court's mandate "to properly examine future dangers and key consequences" of spent fuel storage at reactor sites on lands held in trust by the United States for the benefit of federally-recognized Indian tribes. *See New York v. NRC*, 681 F.3d at 473. The federal government's role as trustee imposes "moral obligations of the highest responsibility and trust" and should "be judged by the most exacting fiduciary standards." *Seminole Nation v. United States*, 316 U.S. at 297. In order for the trust responsibility to have any vitality, Federal agencies must exercise a higher responsibility when taking actions that may affect a federally recognized Indian tribe, its people, land and cultural and natural resources. It is precisely this trust responsibility that led federal officials to refuse to approve the construction of an ISFSI on reservation lands of the Skull Valley Band of Goshute Indians, even though the tribe *wanted* to host that facility. In its Record of Decision, the Bureau of Indian Affairs noted that it was acting as a "fiduciary" with respect to reservation lands, which were held in trust for the Skull

⁴⁰ This comment is attributable to the Tribe.

Valley Band.⁴¹ “As trustee-delegate, the Secretary has the complex task of weighing the long-term viability of the Skull Valley Goshute reservation as a homeland for the Band (and the implications for preservation of Tribal culture and life) against the benefits and risks from economic development activities proposed for property held in trust by the United States for the benefit of the Band.”⁴² Because of the delay in constructing a permanent repository to store nuclear waste, the Secretary was concerned that even though the reservation lease was only for a 25-year storage term, in fact, the nuclear waste might end up staying much longer.⁴³ The Secretary stated that its “primary duty as trustee-delegate” was “the protection of the trust *res* as a future homeland and productive land base for the Band through the prudent exercise of informed discretion after considering all relevant factors.”⁴⁴ In that case, the Secretary concluded “that it is not consistent with the conduct expected of a prudent trustee to approve a proposed lease that promotes storing [spent nuclear fuel] on the reservation.”⁴⁵ A critical consideration

⁴¹Bureau of Indian Affairs, Record of Decision for the Construction and Operation of an Independent Spent Fuel Storage Installation (ISFSI) on the Reservation of the Skull Valley Band of Goshute Indians (Band) in Tooele County, Utah (“ROD”) at 17 (*available at* <http://www.deq.utah.gov/Issues/topics/highlevelwaste/docs/2006/Sep/ROD%20PFS%2009072006.pdf> (last accessed Dec 20, 2013)).

⁴²ROD at 18.

⁴³ROD at 19.

⁴⁴ ROD at 18-19.

⁴⁵ ROD at 19. The Secretary’s decision was ultimately vacated and remanded by the U.S. District Court for the District of Utah, because the Secretary’s ROD did not even mention 25 C.F.R. § 162.107(a). That provision requires the Secretary to defer, “to the maximum extent possible,” to the tribe’s determination that the lease was in its best interests. *Skull Valley Band of Goshute Indians v. Davis*, 728 F.Supp.2d 1287 (D. Utah 2010). Since the Skull Valley Band was in favor of storing nuclear waste on its reservation, the Secretary needed to at least explain why it was not possible to

of the Secretary was that “years-long delays in construction of a permanent [spent nuclear fuel] repository, reflected in the Waste Confidence Decisions of the NRC, provide[] no firm basis to determine when and under what circumstances [spent nuclear fuel] might be taken away from trust land if the proposed ISFSI is built.”⁴⁶

The same considerations ought to apply to the ongoing – indeed, potentially indefinite – storage of spent nuclear fuel on Prairie Island. The DGEIS is insufficient because it fails to adequately consider and weigh the long-term viability of the Prairie Island Reservation as a homeland for the Tribe (and the implications for preservation of Tribal life and culture) against the risks of continued, indefinite storage of an ever-increasing amount of spent nuclear fuel. A spent fuel accident or act of sabotage (even if unsuccessful) would have a devastating socioeconomic impact on the Tribe, and perhaps render the Tribe’s reservation homeland uninhabitable. The Tribe cannot simply go out and buy new land and relocate its reservation.⁴⁷ It is a long, cumbersome and uncertain process pursuant to which the Tribe must apply to have land placed into trust by the United States for the

defer to this determination. This decision is irrelevant here, because the Tribe has consistently opposed the storage of nuclear waste near its Reservation. The Secretary’s concerns about the impact of long term spent nuclear fuel storage and the federal government’s trust responsibility seems prescient in light of the withdrawal of the Yucca Mountain license application and the invalidation of the NRC Waste Confidence Decision and the Temporary Storage Rule. To date, the Secretary has not taken further action on the subject lease or right of way.

⁴⁶ ROD at 19.

⁴⁷ The Indian Reorganization Act (IRA), enacted in 1934, authorizes the Secretary of the Interior to acquire land and hold it in trust “for the purpose of providing land for Indians.” 25 U.S.C. § 465; *see also* 25 C.F.R. Part 151.

benefit of the Tribe, and there is no guarantee that its fee-to-trust application would be approved.

XIII. THE DGEIS ANALYSIS OF CLIMATE CHANGE'S IMPACT ON WASTE STORAGE IS INADEQUATE

The DGEIS offers only three paragraphs on climate change (4-75 – 4-76). This section inexplicably only addresses the impacts of climate change on nuclear waste storage in the short term, relies on outdated climate change projections, and only addresses postulated design basis accidents instead of the potential for wholesale impacts on the storage of nuclear waste caused not only by accidents, but by increased temperatures and increased sea level rise. The DGEIS also improperly cites to the invalidated 2010 Waste Confidence Decision Update as the basis for certain scientific and technical assertions, rendering them meaningless.

A. The DGEIS Inexplicably Only Discusses Climate Change Impacts As To The Short Term Timeframe, And Only In the Severe Accident Scenario

The DGEIS states that “[t]he consideration of climate change impacts for pool storage only needs to address the short-term timeframe.” DGEIS at 4-75. As discussed above, there is no basis for the NRC’s assertion that all waste will be removed from pools within sixty years of the licensed life of a facility. As such, the DGEIS must analyze the potential impacts of climate change on pool storage in the long-term and indefinite timeframes. Anything less falls short of the D.C. Circuit’s very clear directive.

Moreover, the DGEIS houses its climate change impact within Section 4.18, entitled “Environmental Impacts of Postulated Accidents.” But the NRC must examine the impacts of climate change as to ongoing waste storage in the long-term and indefinite timeframes as to everyday operations as well as in the accident scenarios the NRC considers so unlikely. The DGEIS is bereft of any discussion of the impacts of climate change on everyday operations in the waste storage context.

B. The DGEIS Cited Outdated Projections For Sea Level Rise

The DGEIS cites out of date projections for sea level rise. The EIS says that sea levels are estimated to rise less than 1 meter by 2100. DGEIS at 4-75, citing 75 FR 81037.⁴⁸ Based on this estimate, the DGEIS concludes that “none of the U.S. nuclear power plants (operational or decommissioned) will be under water or threatened by water levels by 2050. No basis for this conclusion is provided. *Id.* Indeed, the DGEIS merely repeats an uncited, unsubstantiated statement appearing in the now-vacated Waste Confidence Decision Update in support of this idea – no further information is given, including the name or location of the facility. As such, this statement cannot form the basis for any conclusions in the DGEIS regarding the impact of sea level rise on the short-term, long-term, or indefinite storage of nuclear waste.

⁴⁸ As a citation for this proposition, the DGEIS cites an NRC federal register notice from 2010, which in turn cites to a National Academy of Science transportation report, the IPCC 2001 report, (there have been two new IPCC reports since 2001, in 2007 and 2013) and the 2009 US Global Change report. 75 Fed. Reg. 81037, citing J.A. Church et al., *Climate Change 2001: Impacts, Adaptation, and Vulnerability*, Intergovernmental Panel on Climate Change, 642 (2001).

Regardless, the National Oceanic and Atmospheric Administration (NOAA) sea level rise estimates for the 2013 U.S. National Climate Assessment indicate that sea levels could rise as much as 2 meters (6.6 feet) by 2100 – double the sea level rise figures cited in the DGEIS. *See* Global Sea Level Rise Scenarios for the United States National Climate Assessment, NOAA, December 6, 2012 (giving a range of potential sea level rise from low (0.7 meters) to highest (2.0 meters)). The DGEIS states that “[t]he lowest grade above sea level of concern for an NRC-licensed facility is currently about 4.3 meters. DGEIS at 4-75, citing 75 FR 81037. ⁴⁹ The basis for this conclusion, including how associated storm surge calculations were performed, precludes analysis of its accuracy. The updated 2 m sea level rise estimate should be used.

Scenario	SLR by 2100 (m)*	SLR by 2100 (ft)*
Highest	2.0	6.6
Intermediate-High	1.2	3.9
Intermediate-Low	0.5	1.6
Lowest	0.2	0.7

* Using mean sea level in 1992 as a starting point.

NOAA suggests this “Highest Scenario should be considered in situations where there is little tolerance for risk (e.g. new infrastructure with a long anticipated life cycle such as a power plant).” *Id.* Certainly, the long-term storage

⁴⁹ As discussed below, the NRC cannot cite to its own invalidated Federal Register notice in support of scientific arguments.

of nuclear waste, especially in pools which require reliable cooling mechanisms, qualifies as a “situation where there is little tolerance for risk.” The NRC does not use the NOAA estimates. As such, the DGEIS offers no reliable analysis – or adaptation measures – for the possible impact of sea level rise on nuclear waste storage.

Apart from using outdated sea level rise projections, the DGEIS’s conclusion that sea level rise is not a risk to nuclear waste storage due to their elevations - “[t]he lowest grade above sea level of concern for an NRC-licensed facility is currently about 4.3 meters” (DGEIS at 4-75) - is completely unsupported. The DGEIS includes no list of nuclear waste storage locations and their elevations vis-à-vis sea level, and does not even include the name or location of this one referenced facility. In support of this proposition the DGEIS cites back to the invalidated Nuclear Waste Storage rule, which itself contains no citation for this assertion.

C. The DGEIS’s Climate Change Analysis Is Artificially Limited to Design Basis At the Time of Initial Licensing

NRC’s analyses of the adequacy of a current design to protect against natural phenomena hazards are based upon the original design basis. Climate change renders invalid analyses that rely only on historical conditions as a proxy for the future. In addition, the original design for plants in the Northeast, particularly Indian Point, were based on seismic analyses that are outdated. Recent analyses conducted by the United States Geological Survey show a greater probability of a severe earthquake in the Northeast in general, and at Indian Point in particular,

and a greater likelihood of more severe damage from such an earthquake, than was assumed when Indian Point was sited and when its seismic design was determined. Statement in Support of New York State Contentions and in Response to the April 30, 2007 License Renewal Application Submitted by Entergy for Indian Point Units 2 and 3 by Lynn. R. Sykes, Ph.D. Higgins Professor Emeritus, Earth & Environmental Sciences Lamont-Doherty Earth Observatory of Columbia University, Palisades NY 10964 (Nov. 29, 2007) and Declaration Of Leonardo Seeber, senior research scientist at the Lamont-Doherty Earth Observatory of Columbia University (Nov. 29, 2007) both filed as exhibits to New York State Notice Of Intention To Participate And Petition To Intervene in *Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC and Entergy Nuclear Operations, Inc.*, Docket Nos. 50-247-LR and 50-286-LR (Nov. 30, 2007), ML073400205.

If meteorological and climate conditions relevant to the design basis have changed over the intervening years, which is likely given observations in, for example, current trends in rainfall intensity, such changes have not been considered. As vulnerabilities from natural hazards change over time, a determination on the adequacy of systems to protect against such hazards should include up to date information available at the time of the DGEIS is written, not no longer relevant historical information. In this same vein, when the DGEIS states that General Design Criterion 2 (of Appendix A, “General Design Criteria for Nuclear Power Plants,” to 10 C.F.R. Part 50) requires the design bases for

structures, systems, and component reflect appropriate consideration of the most severe natural phenomena historically reported for the site and surrounding area (DGEIS at 4-71), the phrase “historically reported” should be interpreted as information available up until publication of the DGEIS in September 2013.

DGEIS states that

All safety-significant structures, systems, and components are required to be protected against the design basis flood by siting them above the highest flood water-surface elevation or providing adequate flooding protection. The NRC requires that this protection be achieved by using a dry site concept, external barriers, or incorporated barriers (NRC 1976). The dry site concept involves constructing the nuclear power plant above the design basis flood water surface elevation using either the natural terrain or engineered fill. External barriers are engineered solutions that can include levees, seawalls or floodwalls, bulkheads, revetments, or breakwaters. Incorporated barriers are also engineered solutions that involve specially designed walls or penetration closures.

DGEIS at 4-73. But the DGEIS nowhere references revisions to the design basis flood that may have occurred since facilities were initially licensed. The DGEIS should also evaluate the impacts of recent intense storms, such as Superstorm Sandy, which caused high water levels at the cooling water intakes of both the Salem Nuclear Power Plant Unit 1 and the Oyster Creek Nuclear Power Plant, forcing the shutdown of those New Jersey power reactors. *See* NRC Preliminary Notice of Event or Occurrence (PNO-I-12-007) issued October 31, 2012 (ML12305A460); B. Gallo, Jr., “Salem 1 nuclear reactor, shut down by Hurricane Sandy, returns to service,” www.nj.com Nov. 4, 2012)(*available at* http://www.nj.com/salem/index.ssf/2012/11/salem_1_nuclear_reactor_shut_d_2.html), last accessed Nov. 30, 2013). Superstorm

Sandy also knocked out power lines whose loss idled other power reactors, including Indian Point Unit 3. PNO-I-12-007.

The NRC appears to consider storms like Superstorm Sandy design-basis events. *See, e.g.*, 4-76 (“Summary”). If so, these northeastern plants were not able to withstand them.

Other climate change impacts, such loss of cooling capacity due to increased cooling water temperatures also need to be considered. Summer heating of Long Island Sound waters put Millstone Power Station, Unit 2 offline in August 2012, and heating of Cape Cod Bay forced Pilgrim Nuclear Power Station to reduce output in July 2013. M. Wald, “Heat Shuts Down a Coastal Reactor,” NYTimes.com (Aug. 13, 2012), available at <http://green.blogs.nytimes.com/2012/08/13/heat-shuts-down-a-coastal-reactor/> (last accessed Nov. 30, 2013).

The increasing likelihood of climate-change-induced beyond-design basis events must be evaluated in this DGEIS , and the NRC must identify additional adaptation measures plants must take to respond to increasingly frequent, increasingly severe design conditions.

D. The DGEIS Offers No Adaptation Measures to Minimize the Impact of Climate Change on Nuclear Waste Storage Facilities

The DGEIS acknowledges that:

- climate change can lead to an increased intensity and frequency of severe weather events, such as flooding and hurricanes,

- in addition to impacts from sea level rise, spent fuel facilities may be affected by increased storm surges, erosion, shoreline retreat, and inland flooding, and
- climate change can lead to an increase in the frequency of droughts, and that the frequency of droughts in the Southeast and West has already increased.

DGEIS at 4-75. During an April 12, 2012 full committee hearing by the Senate Committee on Energy and Natural Resources that explored the Impacts of Rising Sea Levels on Domestic Infrastructure, the Committee heard testimony on the potential impacts of sea level rise on energy infrastructure. *See* <http://www.energy.senate.gov/public/index.cfm/2012/4/full-committee-hearing-impacts-of-rising-sea-levels-on-domestic-infrastructures-> (last visited Nov. 30, 2013). Compounding factors will further exacerbate the effect of global sea level rise due to climate change, “in some areas, especially for Louisiana, Texas, and mid-Atlantic states, sinking land will add to the total effective rise and compound problems,” according to testimony from Benjamin H. Strauss, Director of the nonprofit organization Program on Sea Level Rise at Climate Central. Louisiana houses two of the nation’s coastal nuclear power plants, and the Mid-Atlantic states 25 power plants, and therefore nuclear waste storage facilities as well.

Yet in light of that, the DGEIS offers only three paragraphs on climate change, does not mention land subsidence (though the Waste Confidence Decision Update did, 75 Fed. Reg. 81037, 81053, noting that land subsidence was already occurring in the central Gulf Coast region) and offers no adaptation measures to mitigate against the impact of these events, on the storage of nuclear waste. Nevertheless, it does acknowledge impacts, and yet offers no adaptation measures.

As such, the DGEIS does not adequately assess the environmental impacts of the long-term or indefinite storage of nuclear waste.

E. The DGEIS Improperly Cites To The Vacated 2010 Waste Confidence Decision Update As The Basis For Its Climate Change Analysis

In support of a number of propositions related to climate change, the DGEIS refers the reader back to the now-invalidated 2010 Waste Confidence Decision Update. *See, e.g.*, DGEIS at 4-75 (citing the invalid Waste Confidence Decision Update in support of an estimate of sea level rise, and the facility with the lowest above- sea level grade elevation). Even worse, the section referenced was not an extensive scientific review performed by the NRC – the Waste Confidence Decision Update didn’t contain one of those. The section referenced was NRC’s response to a comment from the public.

As the Waste Confidence Decision Update was vacated wholesale as being arbitrary and capricious, reliance on statements therein is *per se* arbitrary. Statements supported by reference to the Waste Confidence Decision Update are therefore unsupported, and cannot form the basis for conclusions regarding the safe storage of nuclear waste or the basis for the promulgation of 10 C.F.R. § 51.23 (especially when the statements in the Waste Confidence Decision Update are themselves uncited and unsubstantiated, as discussed above). In any case, studies referenced in the vacated 2010 document are years out of date. *See, e.g.*, 75 Fed. Reg. 81037, 81053 (citing a 2001 National Academy of Science report).

Moreover, the DGEIS fails to meet the requirements of NRC's own regulations requiring it to use plain language in EISs. By referring a concerned member of the public back to an invalid federal register notice, after which the public must then find the relevant page number of that notice and then find the citations cited therein, NRC Staff unduly burden reviewers of the EIS. The NRC Inspector General has recently faulted the NRC Staff for this practice. The DGEIS should cite clearly, with as much information as possible, the source of the assertions it makes concerning the safe storage of nuclear waste in American communities.

XIV. THE PROPOSED 10 C.F.R. § 51.23 FAILS UNDER THE D.C. CIRCUIT'S OPINION BECAUSE IT SEEKS TO FORECLOSE FURTHER REVIEW OF SITE-SPECIFIC IMPACTS AT THE TIME OF A SPECIFIC SITE'S LICENSING

The promulgation of the proposed 10 C.F.R. § 51.23 is not lawful based on the D.C. Circuit's ruling, which conditioned the NRC's generic analysis of the impacts of long-term nuclear waste storage on the "Commission's use of conservative bounding assumptions and the opportunity for concerned parties to raise site-specific differences at the time of a specific site's licensing." *New York v. NRC*, 681 F.3d 471, 480 (D.C. Cir. 2012). The regulation as proposed reads as follows:

(b) As provided in §§ 51.30(b), 51.53, 51.61, 51.80(b), 51.95, and 51.97(a), and within the scope of the generic determinations in paragraph (a) of this section, no discussion of environmental impacts of spent nuclear fuel storage in reactor facility storage pool or an independent spent fuel storage installations (ISFSI) for the period following the term of the reactor operating license or amendment, reactor combined license or amendment, or ISFSI license, renewal, or amendment for which application is made, is required in any environmental report, environmental impact statement, environmental

assessment, or other analysis prepared in connection with the issuance or amendment of an operating license for a nuclear power reactor under parts 50 and 54 of this chapter, or issuance or amendment of a combined license for a nuclear power reactor under parts 52 and 54 of this chapter, or the issuance of a license for storage of spent nuclear fuel at an ISFSI, or any amendment thereto.

Proposed 10 C.F.R. § 51.23(b); 78 Fed. Reg. 56804 (Sept. 13, 2013).

The NRC argued in *New York v. NRC* that the NRC's waiver provision provided for this site-specific review. Brief for Respondents at 40-41, *New York v. NRC*, 681 F.3d 471 (No.11-1045). But as the States argued to the D.C. Circuit, the NRC has never granted a waiver petition (Final Brief for States of New York, Vermont, Connecticut, and New Jersey, and the Prairie Island Community at 30-31, *New York v. NRC*, 681 F.3d 471 (No.11-1045)), and based on a recent NRC ruling, it appears NRC will never find that the requirements for waiver will be met. Exelon Generation Company, LLC (Limerick Generating Station, Units 1 and 2), CLI-13-07, 2013 NRC LEXIS 7 (Oct. 31, 2013). The provision found at 10 C.F.R. § 2.335 does not afford a meaningful opportunity for site-specific analysis in licensing proceedings, where NRC routinely denies requests for waivers.

NRC's burden-shifting proposal is necessarily ineffective for identifying all relevant environmental risks. Unlike NRC, the States and other affected parties do not have full access to nuclear reactor sites, nor do they have NRC's ability to request data from plant operators. As the primary federal regulator, NRC cannot shed its NEPA responsibilities by asking affected parties to compile site-specific data and independently evaluate environmental risks and impacts, obligations that NEPA imposes on NRC alone.

XV. COMMENTS REQUESTED BY THE NRC IN THE FEDERAL REGISTER RULEMAKING NOTICE

Issue 1. Issue 1 contains a request for comment on whether the Commission should remove the timeline for repository availability from the rule. This question refers to the finding in the proposed 10 C.F.R. § 51.23(a)(2)(ii) that “it is feasible to have a mined geologic repository within 60 years following the licensed life for operation of a reactor.” The sentence should be removed from the rule. The Commission is correct when, in the Federal Register notice accompanying the rule, it states that “there are national policy decisions, and societal and political factors that can significantly influence the actual timing of the availability of mined geologic repository, and these policy decisions are outside the Commission’s control.” As the D.C. Circuit has observed, the Commission has not been successful to date in estimating the timeframe by which a repository will be available. NRC asserts in the DGEIS that the “most likely, timeframe [for a permanent waste repository] is the short-term timeframe, which analyzes 60 years of continued storage after the end of a reactor’s licensed life for operation.” DGEIS at xxvii. This statement ignores the long history of NRC’s failure to ever predict this date and the well-considered comments of Commissioner Svinicki (Notation Vote, September 2009 Response Sheets of Commissioner Svinicki at 2 (publicly released on September 25 and 28, 2009)(“this is a particularly difficult time to be in the prediction business”) that NRC is not able to make such predictions with any accuracy.

Rather the Commission should remove from the DGEIS any prediction of the “likely” date when a permanent repository would be in existence, since it has no

basis for that statement in the DGEIS, and should recognize in the final rule that while it is technologically feasible to have a mined geologic repository within 60 years following the licensed life for operation of a reactor, the Commission does not have a rational basis to predict when, if ever, the political and social factors the Commission has already acknowledged will be resolved such that a repository will actually exist.

Issue 2. Issue 2 contains a request for comment on whether the finding in the proposed 10 C.F.R. § 51.23(a)(2)(i) that “it is feasible to safely store spent nuclear fuel following the licensed life for operation of a reactor” should be included in the rule. The States, the Commonwealth, and the Tribe support removing this text from the rule. In the Federal Register notice accompanying the rule, the Commission states that “the policy statement on safety is not related to, or necessary for, the generic determination on environmental impacts of continued storage, nor does it provide the safety analysis for storage in a particular dry cask or storage at a particular site: A safety evaluation is still required to support a site-specific license for dry storage, or to store spent fuel in a spent fuel pool.” Insofar as this statement is not necessary to the rule, the States, the Commonwealth, and the Tribe submits that it should be stricken.

Issue 3. Issue 3 contains a request for comment on whether the Discussion portion (Section III of this document) of the Statement of Considerations should be streamlined by removing content that is repeated from the DGEIS in order to

improve clarity of the discussion. The States, the Commonwealth, and the Tribe take no position on Issue 3.

Issue 4. In Issue 4, the Commission is seeking specific comment on whether the title of the rule should be changed in light of a DGEIS being issued instead of a separate Waste Confidence Decision. The States, the Commonwealth, and the Tribe are in favor of removing any reference to “Waste Confidence” from the title of the rule, as the D.C. Circuit invalidated the premise of “confidence” as the basis for NRC decisionmaking. NRC should adopt a title that more accurately reflects the true federal action—*i.e.*, licensing and relicensing of reactors and storage installations.

CONCLUSION

As the preceding comments demonstrate, the DGEIS fails to assess the environmental impacts of the proposed action and weigh the costs and benefits of that action. *See Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350-351 (1989). The DGEIS is deficient due to its failure to properly frame the federal action being proposed, its failure to identify the appropriate purpose and need for the proposed action, its failure to properly evaluate the adverse environmental consequences that are likely to occur if the proposed action is taken and its failure to consider any substantive measures to mitigate those adverse impacts. Given the extensive nature of the deficiencies, NRC must issue a new draft DGEIS for public comment and cannot merely respond to the concerns raised here by issuing a final GEIS which will then foreclose any further meaningful public participation in the

NEPA process. *See, e.g., Marsh v. Oregon Natural Resources Counsel*, 490 U.S. 360 (1989); 10 C.F.R. § 51.72.

Thus, the States and the Tribe request that NRC's response to these Comments be published in the form of another DGEIS, with site specific supplements as discussed above, which includes a reasonable opportunity for public comment.

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New York, New York

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