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General Comment

See attached file(s)

Submitted on behalf of the Alliance for a Green Economy

Attachments

Final AGREE NRC Comments Waste Confidence Scope 1.2.13

AGREE New York

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January 2, 2013

Nuclear Regulatory Commission
Re: **Docket ID: NRC-2012-0246**

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

Alliance for a Green Economy represents seven environmental organizations in New York and collectively thousands of New Yorkers, working to educate and protect the public from unsafe and unsustainable energy sources and to promote environmentally preferred fuel alternatives. We submit the following comments addressing the scoping process for an environmental impact statement regarding "temporary" storage of nuclear waste at nuclear reactors, even though no draft scope has been provided.

Summary

Irradiated nuclear fuel poses a long-lasting danger to public health and the environment that decades of scientific research and government policy have been unable to effectively address. With no safe permanent repository on the horizon, and failed efforts for removing irradiated fuel from reactor sites, it is likely that commercial high-level waste will remain in on-site reactor storage facilities for the indefinite future, at least for decades.

Yet, the Nuclear Regulatory Commission (NRC) policy around nuclear waste has consistently asserted the concept of "waste confidence" – the idea that the agency is confident that there will be a disposal solution for nuclear waste in the United States. Yet, no government agency in any country has been able to provide confidence that there is or ever will be a solution to the nuclear waste problem. Therefore no analysis of the environmental impact of nuclear waste can be considered complete without acknowledgment of this fact and its obvious implication: that the continued generation of nuclear waste only adds to the intractable nuclear waste problem.

Any Environmental Impact Statement (EIS) regarding nuclear waste storage must first and foremost consider alternatives to nuclear waste generation. Creating additional nuclear waste while there is no solution for the waste problem cannot be justified. Plenty of economically viable, environmentally preferable alternatives to nuclear power exist such as conservation, energy efficiency, wind, solar, tidal and other green technologies. These must be explored and compared to nuclear energy

The Environmental Impact Statement must also consider and compare the implications for the variety of possible methods for storing more than 150,000 tons of irradiated nuclear fuel expected to be housed at atomic reactors in the United States in 2050. Storage in spent fuel pools poses an especially severe and unjustifiable risk to public health and the environment. In addition to studying this for the EIS, NRC should take immediate action to reduce the inventory of fuel assemblies in fuel pools. Additionally, the deficiencies of dry casks and needed standards and monitoring should be studied in the EIS.

The consequences of a spent fuel catastrophe should be examined in the EIS, as well as the

emergency planning and recovery implications – including federal agency involvement and assistance to states and local governments.

Questions of environmental justice such as who bears the burdens and who reaps the benefits must be considered in the environmental impact statement. Native Americans and other people of color and poor communities have historically been disproportionately impacted by the mining, generation and storage of radioactive nuclear fuel.

The true costs associated with nuclear energy should be accounted for in the Environmental Impact Statement. The nuclear power industry is the recipient of substantial subsidies on the front end, while a number of monetary and non-monetary costs are shifted to the public, especially for nuclear waste. These hidden costs must be accounted for via full cost accounting.

The unpredictable and dangerous effects of global climate change must be factored into the analysis.

Detailed comments are attached. Thank you for your attention.

Submitted on behalf of the Alliance for a Green Economy by:

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Background / History

At the dawn of the age of atomic power, more than 60 years ago lots of promises were made, especially that electricity would be too cheap to meter and nuclear waste was a simple problem to solve given US technical competence. More than a half century later, there is no technical or scientific solution for nuclear waste. The problem has assumed monumental proportions with no available permanent disposal repository site, overcrowded and extremely dangerous fuel pools, storing approximately four times the original design capacity of each nuclear reactor's fuel pool, and additional storage of fuel rods in dry casks at each reactor. The NRC's waste confidence rule is concerned primarily with used nuclear fuel, so the larger problem of nuclear waste at thousands of nuclear waste sites across the country will not be addressed. However, nuclear waste is produced at every stage in the nuclear fuel chain and has real effects on communities across the country, particularly where contamination is not contained, but spreading, affecting water supplies or local populations.

Whether or not the waste confidence rule deals directly with the larger inventory of nuclear wastes and the current and potential environmental threats, the specter of this growing inventory and government's failure to properly manage nuclear waste thus far will exert a major influence on the future viability of nuclear power. The public has lost trust in government's ability to properly manage radioactive materials. The costs of nuclear power are currently higher than other sound alternative energy options, despite the fact that the costs of proper management of nuclear wastes for hundreds of thousands of years have never been adequately included in the true costs of nuclear power.

In 2010, the NRC made its third Waste Confidence decision, another generic determination that permanent disposal for spent nuclear fuel would be available when it was needed. The NRC once again was kicking the "nuclear waste" can down the road. There were two parts to this decision: that spent nuclear fuel could be stored both safely and without significant environmental impacts for as long as 60 years after a nuclear power plant closes. NRC with no nuclear repository anywhere in sight or any proposals on the table, was once again expressing "confidence" that a waste solution would be available when necessary. Public interest groups and several states legally challenged NRC's "confidence" in the absence of any reasonable analysis of safety and environmental impacts as required under NEPA, the National Environmental Policy Act.

The Fukushima nuclear reactor disaster occurred approximately 3 months after the NRC Final Waste Confidence decision in December 2010. Not only was spent fuel spewed from explosions at the GE Mark I reactors at Fukushima Daiichi, but the continuing unstable condition of spent fuel at Unit #4 threatens a conflagration that could spread severe radioactive contamination across the globe, at levels many times worse than Chernobyl. The early GE Mark BWR designs are of particular concern because of their vulnerability to explosions and the location of the spent fuel pool above the reactor core and outside the containment.

Two major recommendations have been made by independent scientists and the public interest community post-Fukushima:

1) Close all of the Mark I reactors immediately and 2) Reduce the inventory of spent fuel held in pools by removing to hardened on-site storage.

As a New York based coalition, these recommendations are of particular concern to us. In Oswego, NY we have two Mark I reactors.

The most immediate response to the Fukushima disaster was the NRC Near Term Task Force Report and while many recommendations have been made, neither of the two above recommendations have been acted on by the NRC. To its credit NRC staff have proposed eventually dealing with the crowded spent fuel pools at nuclear reactors many years from now, as a Tier 3 recommendation.

The President's Blue Ribbon Commission represented a major recent effort to assure a nuclear future in the face of the intractable problem of nuclear waste. Despite the Commission's decision to focus solely on spent nuclear fuel, rather than the larger problem of all nuclear waste, the Commission ended up punting to another agency on the critical safety issues associated with overcrowded spent fuel pools – the NRC or the National Academy of Sciences in some future deliberation. The Commission did express concern that in the event of a serious emergency at a nuclear power plant, there is no current ability to move fuel rods out of pools to safe storage.

After years of kicking the nuclear waste can down the road for some other agency or future generations to deal with, the US Court of Appeals for the District of Columbia Circuit ruled that "waste confidence" was illusory without a proper environmental assessment. Such an assessment requires review and analyses of all the relevant facts under NEPA, even if NRC wishes to issue a finding of no significant impact.

Scoping Comments

1. Public Participation.

The Federal Register notice "Consideration of Environmental Impacts of Temporary Storage of Spent Fuel After Cessation of Reactor Operation" (Document ID: NRC-2012-0246-0001) is unclear and fails to provide enough information for organizations like ours or our members to comment in a truly meaningful manner. Additionally, the comment period provided (October 26, 2012 to January 2, 2013) is so short so as to make it extremely difficult for the public to participate meaningfully in the scoping process. Providing so few days, some of which span the traditional holiday and vacation period, is inadequate. On an issue so significant and with such a lasting impact as nuclear waste policy, the NRC is neglecting its responsibility to provide for adequate public participation. The agency should provide a reasonable number of public hearings in geographically diverse parts of the country, especially in reactor communities, to inform the public of the intentions of the agency and the process for public participation. It is imperative that the public comment period be extended to allow a reasonable opportunity for the public to engage with the process.

2. Draft Scope is missing.

It is impossible to legitimately begin a scoping process absent the proposed action or draft scope. The public should have been provided with the proposed action or the draft scope of the EIS as required under NEPA. The Federal Register notice in fact promised a proposed scope of the EIS would be provided at the Dec. 5th webinar, but it was not. (FR Oct.25,2012, p. 65139, top of column 2) The Agency only talked

about a scoping process.

Along with many other environmental and public interest organizations throughout the United States, we recommend that the proposed action and draft scope be provided in a new federal notice and that an additional comment period be provided, since the earlier notice does not meet NEPA requirements.
We note that the original agency action that causes the production of spent reactor fuel and its impacts is the licensing of nuclear reactors. Therefore the scope and the EIS should be analyzing the cessation of reactor licensing and operation.

3. Provision for Site-Specific EISs must be included.

NRC has verbally described its interest in doing a generic EIS, not a site specific EIS. Therefore the proposed environmental impact statement will not consider site-specific factors. At some point site-specific factors will need to be considered. Yet NRC has indicated that reactor licensing and renewals will proceed through the entire process, leaving only the final approvals pending the waste confidence decisions. The public interest is poorly served by such an arrangement. Not only are public stakeholders prevented from bringing spent fuel related issues into licensing hearings, but the generic waste confidence EIS and rulemaking will not be considering critical site-specific issues. As a New York state- based coalition we can readily see the impacts this will have on the safety review for Indian Point. At the juncture of two seismic faults and with close proximity to New York City, Indian Point is vulnerable to earthquakes, terrorist acts, fires, and station blackouts that could result in a spent fuel catastrophe for millions of people. Prior to final licensing decisions, site-specific analysis will be necessary related to all of the issues that relate to spent fuel, whether studied or neglected in the generic EIS. Therefore, the NRC must make provision for site-specific analysis of factors that relate to spent fuel and a public process in each licensing decision.

4. Important Definitions are needed.

Definitions: **Waste confidence** is apparently a conceptual idea that only the NRC can understand. Given that there has been no viable solution for nuclear waste for more than 60 years, NRC should abandon the "waste confidence" oxymoron or specify a definition. The only confidence we have around waste is that it will be a perpetual problem. NRC must make a true and realistic statement about the situation and not resort to confusing terminology.

A definition of **permanent disposal** is essential. We believe the definition should incorporate the National Academy of Sciences recommendations for a successful repository: waste placement with plans for reversibility, long term monitoring and control, capability for treating wastes and waste retrieval if necessary.

A definition for **temporary storage** is also essential. The definition should include the specific time period constituting temporary storage and make provision for monitoring, the continued integrity of storage containers and replacement as necessary based on expected life of materials under high levels of radiation.

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5. Essential facts must be the basis for any EIS analyzing nuclear waste.

Fact: Nuclear power creates nuclear waste.

Fact: There is NO technical or scientific solution to the nuclear waste problem. This fact alone makes nuclear energy unsustainable.

Fact: More Nuclear Reactors = More Nuclear Waste.

A key principle of Zero Waste approaches is to stop generating waste.

NRC must acknowledge these essential facts. The EIS is the place to answer the question – How can we stop generating nuclear waste?

6. Description of Setting & Existing Conditions.

The starting point for most Environmental Impact Statements is a description of existing conditions. Even in the case of a generic EIS, a description of the nuclear reactor universe is necessary – the number of nuclear reactors, their ages and equipment condition, their inventory of nuclear waste and how it is stored including original design capacity of spent fuel pools, quantities of other radioactive waste generated and how it is handled, physical site hazards, power output, nearby population, etc.
Setting & Existing Conditions should include Descriptions of Nuclear Waste sites and facilities throughout the nation and their status in terms of cleanups and corrective actions, including quantification of the total historic costs.

7. Alternatives to the proposed action

An Alternatives analysis is a typical part of any EIS. Once the NRC determines the proposed action, it needs to conduct an analysis of alternatives for all or part of the proposed action. The best way to protect the environment and the public from nuclear waste hazards is to first stop licensing atomic reactors, thus stopping the generation of additional nuclear waste. There are plenty of economically viable, environmentally preferable alternatives to nuclear power generation, and these must be thoroughly considered. The possibility of rejecting licenses for the construction of new reactors and the rejection of applications for license renewal must be considered.

Further, since there has been no technical or scientific solution for over 60 years, it is critical that the NRC admit that nuclear waste is not a solvable problem. The alternatives analysis should include a future without nuclear energy, that systematically deals with closing existing reactors, decommissioning them, and managing existing nuclear waste more responsibly.

The alternative energy analysis should examine more sustainable energy solutions – energy conservation, efficiency, and renewables such as solar, wind and tidal power. The time factor for implementation is also critically important in a warming world, affected by climate change. Conservation and efficiency can be rapidly deployed, whereas nuclear reactors take decades to come on line and produce electricity.

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The uniquely unsustainable characteristics of nuclear energy must be included in this analysis: the potential for severe and irreparable harm to human health and the environment, including the loss of vast areas of land, as well as the need for proper management and isolation of nuclear waste for hundreds of thousands of years from future generations.

8. Importation of Nuclear waste from other countries.

Nuclear arms and nuclear power have increased nuclear inventories in other countries. One solution has been for the US to accept nuclear waste to prevent international nuclear proliferation. The EIS should describe and analyze the magnitude of this problem and the implications of importation for nuclear waste management in the US.

9. Failure of Nuclear Reprocessing must be reviewed and analyzed.

The US experience with reprocessing should be fully reviewed and explored in the EIS. While nuclear proliferation was a key factor in halting reprocessing, it is worth reviewing that reprocessing also substantially increases nuclear waste quantities, including high level wastes.
The State of New York bought into federal promises when it supported commercial nuclear reprocessing. After just six short years, the contractor left the venture and the contamination. Since the 1970s the state and the public have been dealing with widespread contamination at West Valley, NY and battling the federal government over the cleanup. Inadequate funding and the political will to complete a full cleanup threaten the Great Lakes and drinking water for millions of people.

10. Assessing True Costs.

The EIS should include a full cost accounting study that accounts for the true costs associated with nuclear energy. Substantial and disproportionate subsidies are provided at the front end of nuclear energy – nuclear enrichment, nuclear reactors, weapons, research – and little funding at the back end for proper nuclear waste management. This results in the shifting of responsibility for nuclear waste and health, environmental and monetary costs onto localities, taxpayers and ratepayers. Full cost accounting requires all monetary and non-monetary costs to be included, no matter who is paying the bill.

11. Environmental Justice.

An Environmental Justice analysis should be part of this EIS. Two key questions are essential guides to an adequate EJ analysis: Who bears the burdens? Who reaps the benefits? Historically some groups bear more of the negative consequences of a policy, while small groups receive all the benefits, such as a particular company or industry. In the US nuclear waste has particularly burdened Native Americans. Environmental justice should also embody generational justice, as large amounts of nuclear waste are generated for short term energy use, yet future generations will need to carefully manage this waste over the long term.

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12. Spent Fuel Pools pose multiple and serious potential impacts that now must be thoroughly reviewed.

The Court decision in June 2012 requires the NRC to thoroughly evaluate the following in the EIS:

1. the environmental effects of failing to secure permanent disposal
2. the risks of spent fuel pool leaks
3. the consequences of spent fuel pool fires.

The NRC will be required to examine alternatives to permanent disposal since it is highly unlikely that adequate capacity at a new permanent repository will be available. The Blue Ribbon Commission found that a Yucca Mountain-like repository would be filled immediately since we currently have 75,000 tons of spent fuel from current reactors. Even with no new reactors we would have 150,000 tons of spent fuel by 2050 and thus we would need twice the storage capacity of the failed Yucca Mountain project.
Yet, NRC has already approved the construction of new reactors and subsidies are also being provided for small modular reactors. More reactors=More waste.

The EIS must study reducing the generation of nuclear waste as a key alternative strategy to siting permanent repositories or interim storage sites.

The NRC must consider Hardened On-Site Storage (HOSS) as a possible required standard, as has been requested by nearly 200 environmental organizations and nuclear experts in the US. The spent fuel pools currently employed for a large portion of nuclear waste storage at US reactors pose a major risk to the public because they are vulnerable to drain-downs or boil-downs. Nuclear fuel in these pools must be removed as soon as possible and transferred to a modified, robust form of on-site dry storage, commonly referred to as HOSS. Dry storage must be subject to strict standards for protection from accidents, purposeful attack, and corrosion.

The Environmental Impact Statement must consider the possibility of pool and cask leaks into the groundwater, which has already occurred at Indian Point 2 & 3 (NY/Hudson River), Salem 1 (NJ/Delaware River), CT Yankee (Connecticut River & Long Island Sound), the US Deptartment of Energy's Brookhaven High Flux Beam Reactor (Long Island's sole source drinking water aquifer), BWXT Technologies (VA/James River), Hatch (GA/Altamaha River), and Davis-Besse (OH/Lake Erie).

The Environmental Impact Statement must also consider the risk of fires with the spent fuel pools, and the possibility of damage from earthquake, hurricane, or terrorist or other causes of drain-downs or boil-downs (such as power loss). As illustrated by the evolving situation at Fukushima Daiichi Unit 4, which is currently vulnerable to complete collapse and the possibility of 135 tons of irradiated fuel catching fire, fuel pools pose an indefensible risk to public safety, health, and the environment, not to mention significant economic consequences.

The Blue Ribbon Commission raised the need to provide for a means of reducing the inventory of spent fuel in pools at reactors experiencing a severe accident scenario. The Commission noted that US reactors are storing far more nuclear fuel assemblies that were stored at Fukushima reactors. It also stated that currently there is NO ability to move fuel rods out of the pools to another site.

NRC could take immediate action to dramatically increase safety for all nuclear reactors in the nation and correct this neglected post-Fukushima safety measure by doing the following:

- Requiring reactor owners to begin to restore spent fuel pools to their original design capacity for fuel rods by moving them to HOSS storage under rapid phased scheduling. Fuel rods older than 5 years should all be removed from pools.

- Require extra dry casks at each nuclear reactor for emergency needs to move fuel rods.

While we are discussing the EIS process and these issues will clearly have to be studied under the waste confidence rulemaking, the NRC also has the ability to move up its staff recommendation pertaining to spent fuel pools and give it immediate attention. The article below was written by a team of authors, including Allison Macfarlane, current NRC Chairperson. The entire article as well as other studies of spent fuel pools, such as the National Academy of Sciences study should be used for the EIS analysis.

Alvarez, R. et.al., *Science and Global Security,* 11:1–51, 2003

Summary

"Because of the unavailability of off-site storage for spent power-reactor fuel, the NRC has allowed high-density storage of spent fuel in pools originally designed to hold much smaller inventories. As a result, virtually all U.S. spent-fuel pools have been re-racked to hold spent-fuel assemblies at densities that approach those in reactor cores. In order to prevent the spent fuel from going critical, the fuel assemblies are partitioned off from each other in metal boxes whose walls contain neutron-absorbing boron. It has been known for more than two decades that, in case of a loss of water in the pool, convective air cooling would be relatively ineffective in such a "dense-packed" pool. Spent fuel recently discharged from a reactor could heat up relatively rapidly to temperatures at which the zircaloy fuel cladding could catch fire and the fuel's volatile fission products, including 30-year half-life 137Cs, would be released. The fire could well spread to older spent fuel. The long-term land-contamination consequences of such an event could be significantly worse than those from Chernobyl.

No such event has occurred thus far. However, the consequences would affect such a large area that alternatives to dense-pack storage must be examined—especially in the context of concerns that terrorists might find nuclear facilities attractive targets. To reduce both the consequences and probability of a spent-fuel-pool fire, it is proposed that all spent fuel be transferred from wet to dry storage within five years of discharge. The cost of on-site dry-cask storage for an additional 35,000 tons of older spent fuel is estimated at $3.5–7 billion dollars or 0.03–0.06 cents per kilowatt-hour generated from that fuel. Later cost savings could offset some of this cost when the fuel is shipped off site. The transfer to dry storage could be accomplished within a decade. The removal of the older fuel would reduce the average inventory of 137Cs in the pools by about a factor of four, bringing it down to about twice that in a reactor core. It would also make possible a return to open-rack storage for the remaining more recently discharged fuel. If accompanied by the installation of large emergency doors or blowers to provide large scale airflow through the buildings housing the pools, natural convection air cooling of this spent fuel should be possible if airflow has not been blocked by collapse of the building or other cause. Other possible risk-reduction measures are also discussed. Our purpose in writing this article is to make this problem accessible to a broader audience than has been considering it, with the goal of encouraging further public discussion and analysis. More detailed technical discussions of scenarios that could result

in loss-of-coolant from spent-fuel pools and of the likelihood of spent-fuel fires resulting are available in published reports prepared for the NRC over the past two decades. Although it may be necessary to keep some specific vulnerabilities confidential, we believe that a generic discussion of the type presented here can and must be made available so that interested experts and the concerned public can hold the NRC, nuclear-power-plant operators, and independent policy analysts such as ourselves accountable."

The full article discusses some of NRC's rationale for failing to act on the risks of spent fuel pools: "No established method exists for quantitatively estimating the likelihood of a sabotage event at a nuclear facility."

Given that NRC is the sole government agency authorized to deal with nuclear facilities officially, why would NRC be looking for an established method from elsewhere? If NRC doesn't establish the methods, what agency would? It should be noted that good public policy can be made without reliance on quantitative methods. Expert judgment can be used to make sound decisions.

The article (p. 3) also cites a letter from 27 state Attorneys General to Congressional leaders asking for legislation to "protect our states and communities from terrorist attacks against civilian nuclear power plants and other sensitive nuclear facilities," specifically mentioning spent-fuel pools.

Emergency Planning & Recovery from Severe Nuclear Events

Emergency planning has to date largely focused on nuclear core meltdown, while neglecting spent fuel and reactor inventories of this material. The court directive will require that NRC fill in this gaping hole as part of the analysis for the EIS. As pointed out in the Near Term Task Force report many of the systems relevant to spent fuel storage are not designated as critical safety systems. Thus this should be the first time that the public receives a comprehensive picture of spent fuel and its management, with all its existing flaws. Our recommendation related to a full discussion of existing conditions applies here.

Recovery from severe nuclear events involving spent fuel

A spent fuel catastrophe could have far more severe consequences than a core meltdown. Such a catastrophe must be explored in this EIS. This EIS should also fully study and discuss how federal agencies have resolved to handle a disaster of widespread magnitude involving hundreds of square miles – in the near term and the long term. FEMA only has authority for natural disasters and yet is the agency with the most response experience. States and localities have limited capabilities, particularly when talking about specialized radiological equipment and training. Beyond the immediate response the nation also needs a long term plan for recovery, that addresses large areas of contamination. Which agency will lead long term recovery efforts and support states and local governments? What funds will be available given that our entire existing disaster funding is geared to natural not technological disasters?

We believe the court's waste confidence ruling requires complete analysis of worst case scenarios, the preparation for and recovery from these events. A thorough analysis should function to drive more concerted attention to prevent such catastrophes from ever occurring.

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13. Dry Cask Containers and Storage must be reviewed.

To date dry casks have not been subject to the kind of careful testing and monitoring that is necessary. The EIS should be used as an opportunity to address this deficiency. The EIS should also consider the consequences of storing fuel long term in the current dry-cask storage regime used at nuclear power plants in the US. The structural integrity and quality control for dry-cask systems currently in use has been called into serious question by NRC whistleblowers. Additionally, none of the systems in use today have been designed to withstand terrorist attacks, and they are not stored in a secure fashion. Dry casks have been subject to damage from accidents, earthquakes and explosions.

14. The Large and Varied Impacts of Climate Change

Throughout the entire Environmental Impact Statement, the NRC must seriously explore and consider the effects of global changing climate. The EIS as we understand it is meant to consider waste storage at nuclear power plant sites for decades, if not centuries. Global climate change promises to bring unpredictable weather and climate scenarios that have not been previously considered in the siting of atomic reactors. The scientific community is predicting floods, droughts, erratic weather patterns, and increased frequency of extreme storms, and we are already experiencing some of these events. Nuclear power reactors and safe storage of fuel in pools or dry casks currently depends on access to a reliable external power grid and/or a relatively stable and predictable environment, which can now not be guaranteed due to the changing climate. Any long-term nuclear waste storage proposal must take into account these factors.

Climate change and its enormous impacts will magnify the environmental impacts of failing to cease nuclear waste production or to secure the nation's nuclear waste inventory as carefully as possible at each nuclear reactor in the country. Climate change must be studied in the EIS, but a generic EIS is unlikely to be sufficient for all reactors and their unique conditions.