

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

Beyond Nuclear, <i>et al.</i> ,)	Case No. 1:16-cv-01641
Plaintiffs,)	Judge Chutkan
-vs-)	
U.S. Department of Energy, <i>et al.</i> ,)	
Defendants.)	
)	

* * * * *

**CORRECTED MEMORANDUM OF POINTS AND AUTHORITIES
IN SUPPORT OF PLAINTIFFS' OPPOSITION TO
DEFENDANTS' MOTION FOR SUMMARY JUDGMENT AND
PLAINTIFFS' CROSS-MOTION FOR SUMMARY JUDGMENT**

Terry J. Lodge, Esq.
Ohio Bar No. 0029271
316 N. Michigan St., Ste. 520
Toledo, OH 43604-5627
Tel.: (419) 255-7552
Fax (440) 965-0708
tjlodge50@yahoo.com

Diane Curran, Esq.
Harmon, Curran, Spielberg
& Eisenberg, LLP
1725 DeSales Street NW, Suite 500
Washington, D.C. 20036
Tel: (240) 393-9285
Email: dcurran@harmoncurran.com

Co-Counsel for Plaintiffs

November 22, 2016
Corrected November 29, 2016

TABLE OF CONTENTS

TABLE OF CONTENTS..... i

TABLE OF AUTHORITIES..... ii

GLOSSARY OF TERMS..... iv

I. INTRODUCTION AND SUMMARY OF ARGUMENT..... 1

II. STATUTORY AND REGULATORY BACKGROUND..... 4

 A. General Requirements of NEPA..... 4

 B. Requirements for Supplementation..... 6

 C. Limited role of Supplement Analyses..... 7

III. STATEMENT OF FACTS..... 8

 A. Proposed Action: Transport of Target Materials in Liquid Form from Canada to
 U.S..... 8

 B. History of Consideration of Transportation Impacts in EISs..... 9

 C. DOE’s EISs Regarding Transportation of Target Materials and Other Forms of
 Spent Fuel..... 12

 D. If Members of the Public Were Allowed to Comment, They Would Point Out
 Significant Environmental Impacts of Target Material Transport and
 Deficiencies in DOE’s Supplement Analyses..... 17

IV. ARGUMENT..... 20

 A. Standard of Review..... 20

 B. DOE’s Refusal to Prepare a New EIS is Arbitrary and Capricious Because It is
 Not Supported by the Record..... 21

V. CONCLUSION..... 24

CERTIFICATE OF SERVICE..... 24

TABLE OF AUTHORITIES

Cases

California v. Block, 690 F.2d 753 (9th Cir.1982). 6

Conservation Law Foundation v. General Services Administration, 707 F.2d 626 (1st Cir.1983) 6

County of Suffolk v. Sec'y of the Interior, 562 F.2d 1368 (2d Cir. 1977). 17

Dep't of Transp. v. Pub. Citizen 541 U.S. 752 (2004). 5

Environmental Defense Fund v. Marsh, 651 F.2d 983 (5th Cir.1981). 6

Found. on Econ. Trends v. Heckler, 756 F.2d 143 (D.C. Cir. 1985).. . . . 21

Hodges v. Abraham, 300 F.3d 432 (4th Cir. 2002) 7

Hughes River Watershed Conservancy v. Johnson, 165 F.3d 283 (4th Cir. 1999). 4, 6

Huls Am., Inc. v. Browner, 83 F.3d 445 (D.C. Cir. 1996) 21

Idaho Sporting Congress v. Thomas, 137 F.3d 1146 (9th Cir.1998).. . . . 5, 25

Int'l Fabricare Inst v. EPA, 972 F.2d 384 (D.C. Cir. 1992) 21, 23

Marsh v. Or. Nat. Res. Council, 490 U.S. 360 (1989).. . . . 6

Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins., 463 U.S. 29 (1983).. . . . 21

Natural Resources Defense Council, Inc. v. City of New York, 672 F.2d 292 (2d Cir. 1982).. . . . 6

New York v. U.S. Nuclear Regulatory Comm'n, 824 F.3d 1012 (D.C. Cir. 2016). 20

North Idaho Community Action Network v. U.S. Dept. of Transp., 545 F.3d 1147 (9th Cir. 2008) 6, 7

Ocean Advocates v. U.S. Army Corps of Eng'rs, 402 F.3d 846 (9th Cir.2005).. . . . 5

Price Rd. Neighborhood Ass'n v. United States Dep't of Transp., 113 F.3d 1505 (9th Cir. 1997) 7

Robertson v. Methow Valley Citizens Council, 490 U.S. 332 (1989). 4, 23
Webb v. Gorsuch, 699 F.2d 157 (4th Cir. 1983) 17

Statutes

42 U.S.C. § 4321-4370h. 4
5 U.S.C. § 706(2). 20

Regulations

10 C.F.R. § 1021.314(a) 6
40 C.F.R. § 1501.4(e). 5
40 C.F.R. § 1502.9(c)(1). 6
40 C.F.R. § 1503.1. 5
40 C.F.R. § 1506.6. 5
40 C.F.R. § 1508.8 5

Federal Rules

Fed.R.Evid. 702 17

GLOSSARY OF TERMS

AEC	Atomic Energy Commission
AECL	Atomic Energy of Canada, Ltd.
AR	Appendix to the Record
CNSC	Canadian Nuclear Safety Commission
DOE	Department of Energy
EIS	Environmental Impact Statement
FEIS	Final Environmental Impact Statement
FRR FEIS	Foreign Research Reactor Final Environmental Impact Statement
SRS SNF EIS	Savannah River Site Spent Nuclear Fuel Environmental Impact Statement
FSST	Fissile solution storage tank
HEU	Highly-enriched uranium
NRC	Nuclear Regulatory Commission
ROD	Record of Decision
SA	Supplement Analysis
SEIS	Supplemental Environmental Impact Statement
SER	Safety Evaluation Report
SRS	Savannah River Site
SRS FEIS	Savannah River Site Final Environmental Impact Statement

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF COLUMBIA**

Beyond Nuclear, <i>et al.</i> ,)	Case No. 1:16-cv-01641
Plaintiffs,)	Judge Chutkan
-vs-)	
U.S. Department of Energy, <i>et al.</i> ,)	
Defendants.)	
)	

* * * * *

**CORRECTED MEMORANDUM OF POINTS AND AUTHORITIES
IN SUPPORT OF PLAINTIFFS’ OPPOSITION TO DEFENDANTS’
MOTION FOR SUMMARY JUDGMENT AND
PLAINTIFFS’ CROSS-MOTION FOR SUMMARY JUDGMENT**

I. INTRODUCTION AND SUMMARY OF ARGUMENT

In their complaint and cross-motion for summary judgment, Plaintiffs seek to enjoin the U.S. Department of Energy’s (DOE’s) proposal to make a series of unprecedented shipments totaling 6,000 gallons of highly-radioactive liquid waste, a form of spent fuel known as “target residue,” or “target material” (TRM) or “Highly-Enriched Uranyl Nitrate Liquid” (HEUNL), from Chalk River, Ontario to South Carolina’s Savannah River Site (SRS). Plaintiffs contend that before shipping the target material, DOE must comply with the requirements of the National Environmental Policy Act (NEPA) for preparation of a new Environmental Impact Statement (EIS), or at the very least a Supplemental Environmental Impact Statement (SEIS) that revises earlier relevant EISs to address the never-before-considered and potentially significant

environmental impacts of shipping the target materials in liquid form.

Plaintiffs respectfully submit that NEPA requires DOE to prepare an entirely new or supplemental EIS in these circumstances, because DOE's current proposal to ship the target materials in liquid form constitutes a significant departure from previous EISs, which rejected shipment of liquid targets as environmentally unacceptable. Because shipment of liquid target materials would pose significant environmental impacts that have not previously been considered, NEPA requires the DOE to either prepare a new or supplemental EIS. 40 C.F.R. § 1502.9(c)(1)(i), (ii); *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360, 370-78 (1989).

In addition, the proposal to ship target materials in liquid form deviates fundamentally from the elements of the Preferred Alternative selected in the EIS prepared by DOE for repatriation of target materials and other spent fuel containing HEU: the Final Environmental Impact Statement, Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (DOE/EIS-0218F, Feb. 1996) (AR0007678 - AR0007902) (FRR FEIS). In the FRR FEIS, the DOE evaluated the environmental impacts of shipping target materials as a solid, and stipulated in the Preferred Alternative that conversion of the target materials to U₃O₈ or UO₂ (both solid materials) would be a requirement for shipment. FRR FEIS at 2-28 (AR0008070). DOE's selection of the Preferred Alternative and its "implementation elements" are memorialized in the related Record of Decision (ROD), 61 Fed. Reg. 25,092, 25,095 (May 17, 1996) (AR0009577).

Defendants argue that the record supports their Motion for Summary Judgment, because the record shows that (a) "Defendants' previous EISs thoroughly evaluated the potential environmental impacts of accepting target material from Canada for management in the United

States” and (b) “the impact of accepting the material in a liquid form would not significantly differ from the impacts that Defendants previously evaluated with regard to accepting the material in a solid form.” Defendants’ Motion for Summary Judgment at 1 (Nov. 4, 2016). But Defendants’ previous EISs were not at all “thorough,” because they evaluated *only* the environmental impacts of shipping targets and other forms of spent fuel as solids; and made no mention at all of the impacts of shipping them as liquids. And the record shows that DOE’s assumption in the FRR FEIS that target residue would be shipped as a solid was based on earlier NEPA studies by the U.S. Nuclear Regulatory Commission (NRC) that explicitly rejected shipment of radioactive waste in liquid form, because it was more easily dispersed into the environment than solid radioactive waste. The DOE is not entitled to summary judgment where the record so blatantly contradicts its claims. *Int’l Fabricare Inst. v. EPA*, 972 F.2d 384, 389 (D.C. Cir. 1992) (despite deferential standard of review, an agency must show that it has “examined the relevant data and has articulated an adequate explanation for its action.”).

As discussed below, the DOE has never offered the public an opportunity to comment on its new proposal to ship target materials in liquid form. If such an opportunity were offered, Plaintiffs would update the concerns raised in previous environmental documents with new and more detailed information about the significant hazards of shipping target materials in liquid form. They would also point out significant discrepancies in the DOE’s decision-making documents that raise significant questions about the adequacy and scientific integrity of the analysis presented in DOE’s Supplement Analyses of 2013 and 2015, in which DOE purports to

justify its conclusion that the proposed liquid shipments would have insignificant impacts.¹

Plaintiffs respectfully submit that public comment therefore could lead to a decision by DOE that is significantly better-informed and thus more protective of the environment.

Accordingly, the Court should find that DOE's failure to issue a new EIS for its proposed shipments of target residue from Canada to the U.S. is arbitrary and capricious, and order that shipments must await full compliance with NEPA.²

II. STATUTORY AND REGULATORY BACKGROUND

A. General Requirements of NEPA

NEPA, 42 U.S.C. § 4321-4370h, requires a federal agency to take a "hard look" at potential environmental consequences of its decisions by preparing an environmental impact statement (EIS) prior to any "major Federal action[] significantly affecting the quality of the human environment." *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 348 (1989). *See also* 42 U.S.C. § 4332(2)(C), 40 C.F.R. § 1508.9. "[A]n agency takes a sufficient hard look when it obtains opinions from its own experts, *obtains opinions from experts outside the agency, gives careful scientific scrutiny and responds to all legitimate concerns that are raised.*" *Hughes River Watershed Conservancy v. Johnson*, 165 F.3d 283, 288 (4th Cir. 1999) (emphasis added). NEPA's mandate, which incorporates notice and comment procedures, serves the twin "action-forcing" purposes of ensuring that (1) agency decisions include informed and careful

¹These concerns are presented in the Declaration of Gordon Edwards, Ph.D. (Nov. 22, 2016) (R. __) and the Declaration of Dr. Marvin Resnikoff (Nov. 22, 2016) (R. __).

² To aid the Court's review, and in compliance with Local Rule 7(h), Plaintiffs designate as their Statement of Material Facts in the Administrative Record the facts articulated in subsections IIIA, IIIB and IIIC.

consideration of environmental impact, and (2) agencies inform the public of that impact and enable interested persons to participate in deciding what projects agencies should approve and under what terms. *Robertson*, 490 U.S. at 349. The statute does not dictate particular decisional outcomes, but “merely prohibits uninformed – rather than unwise – agency action.” *Id.* at 351; *see also Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 756-57 (2004).

The distinguishing feature of either form of NEPA analysis – Environmental Assessment (EA) or EIS – is that, unlike the Supplement Analyses used by the Department of Energy, they require public notice and comment, 40 C.F.R. §§ 1503.1, 1501.4(e), 1506.6. The agency is required to formally solicit and publicly respond to comments. EAs and EISs are each subject to judicial review, *see, e.g., Public Citizen*, 541 U.S. at 763-764.

Inherent in NEPA and its implementing regulations is a “rule of reason,” which ensures that agencies determine whether and to what extent to prepare an EIS based on the usefulness of any new potential information to the decision-making process. *Public Citizen*, 541 U.S. at 754. “[A]n EIS must be prepared if ‘substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor.’” *Idaho Sporting Congress v. Thomas*, 137 F.3d 1146, 1149 (9th Cir.1998); *Ocean Advocates v. U.S. Army Corps of Eng'rs*, 402 F.3d 846, 865 (9th Cir.2005). To trigger the need for an EIS, a plaintiff need not show that significant effects will in fact occur; “raising substantial questions whether a project may have a significant effect is sufficient.” *Id.* at 864-65 (internal quotations omitted). The effects that must be considered are both direct and indirect. 40 C.F.R. § 1508.8. Indirect effects are “caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable.” 40 C.F.R. § 1508.8(b).

B. Requirements for Supplementation

Section 1502.9(c) of Council on Environmental Quality regulations requires supplementation where “[t]he agency makes substantial changes in the proposed action that are relevant to environmental concerns” or “[t]here are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” 40 C.F.R. § 1502.9(c)(1)(i), (ii). *Also, Marsh*, 490 U.S. at 370-78; 10 C.F.R. § 1021.314(a) (“DOE shall prepare a supplemental EIS if there are substantial changes to the proposal or significant new circumstances or information relevant to environmental concerns.”).

In determining whether a particular change is substantial, the reviewing court must evaluate the proposed modifications in relation to the previous environmental documentation. *California v. Block*, 690 F.2d 753 (9th Cir.1982); *Environmental Defense Fund v. Marsh*, 651 F.2d 983 (5th Cir.1981). If neither the environmental consequences nor the overall feasibility of the changes in the proposed action can be discerned from the previous environmental documentation, a supplemental environmental impact statement is required. *Conservation Law Foundation v. General Services Administration*, 707 F.2d 626, 632-34 (1st Cir.1983). But if previous environmental documentation for a proposed action included discussion of an alternative that is finally selected, supplementation of the environmental impact statement is unnecessary. *Natural Resources Defense Council, Inc. v. City of New York*, 672 F.2d 292, 298 (2d Cir. 1982).

The “hard look” requirement imposed on new EISs attaches also to SEISs. *North Idaho Community Action Network v. U.S. Dept. of Transp.*, 545 F.3d 1147, 1154-55 (9th Cir. 2008); *Hughes River Watershed Conservancy v. Johnson*, 165 F.3d 283, 288 (4th Cir. 1999). “When an agency takes the requisite ‘hard look’ and ‘determines that the new impacts will not be significant

(or not significantly different from those already considered), then the agency is in full compliance with NEPA.” *North Idaho Community Action Network, supra.* Such determinations will only be set aside if they are arbitrary and capricious. *Id.* at 1155.

C. Limited role of Supplement Analyses

While the courts recognize that an agency may use “non-NEPA environmental evaluation procedures” such as supplement analyses to determine whether new information or changed circumstances require the preparation of a supplemental EA or EIS, an agency’s authority to conduct such a review “is limited; it may only conduct such a preliminary inquiry *to determine whether it is possible that the altered proposal's environmental impact will be significant.*” *Hodges v. Abraham*, 300 F.3d 432, 446-447 (4th Cir. 2002) (quoting *Price Rd. Neighborhood Ass'n v. United States Dep't of Transp.*, 113 F.3d 1505, 1508-09 (9th Cir. 1997) (emphasis added)). A supplement analysis may not be used to displace or substitute for an EIS. As the Fourth Circuit noted in *Hodges*, if the environmental impacts of a change in a proposal are significant in comparison with the original proposal, “then the DOE must complete additional documentation.” *Id.* A supplement analysis “cannot substitute:”

The DOE's authority to conduct such a review is limited; it may only conduct such a preliminary inquiry to determine whether it is possible that the altered proposal's environmental impact will be significant. [citation omitted]. *If ‘the environmental impacts resulting from the design change are significant or uncertain, as compared with the original design's impacts,’ then the DOE must complete additional NEPA documentation.*

(Emphasis added) *Hodges v. Abraham*, 300 F.3d at 446-447, quoting *Price Rd.*, 113 F.3d at 1508-1509.

III. STATEMENT OF FACTS

A. Proposed Action: Transport of Target Materials in Liquid Form from Canada to U.S.

This case concerns the question of whether DOE's proposed shipments from Canada to the U.S. of "target material" or "target residue" are transported in liquid rather than solid form. Target materials are a form of spent fuel created when "targets" containing High Enriched Uranium (HEU) are irradiated to produce medical isotopes. Defendants' Memorandum of Points and Authorities in Support of Their Motion for Summary Judgment (Defendants' Memorandum) at 9, Federal Research Reactor FEIS at B-22 (AR0008576). While the DOE argues that spent fuel (including target materials) is not "nuclear waste" because it contains HEU that can be stripped out and used (Defendants' Memorandum at 9), ultimately spent fuel must be disposed of permanently, along with all forms of high-level radioactive waste.

The waste material, referred to by the U.S. Department of Energy (DOE) as "target residue material" (TRM) or as "Highly-Enriched Uranyl Nitrate Liquid" (HEUNL), will contain fissile materials and actinides³ at radioactive levels never before contemplated for shipment over public roads in liquid form. Highly-radioactive liquid waste is a form of spent nuclear fuel and contains weapons-useable concentrations of enriched uranium. As explained in this memo, Plaintiffs urge that because of the comparative mobility of liquid compared to solid material that TRM poses unique dangers for transport, storage, handling and acceptance at the Savannah River Site (SRS) for reprocessing.

³Actinides are a series on the Periodic Table which encompasses the 15 metallic chemical elements with atomic numbers from 89 to 103, actinium through lawrencium. All are radioactive and undergoing constant decay into other elements.

“Until 2003, liquid inventories containing HEU were stored in a double-walled stainless-steel vessel known as the Fissile Solution Storage Tank (FISST), located at CRL [Chalk River Laboratory],” according to the official Canadian website.⁴ “Since 2003, when FISST reached its storage capacity, new liquid material generated from medical isotope production has been cemented and is in long-term storage at CRL.” *Id.*

B. History of Consideration of Transportation Impacts in EISs

For almost forty years, all U.S. government EISs regarding transportation of spent fuel and radioactive waste, and the studies on which they rely, have assumed that spent fuel and radioactive waste will be shipped in solid form. This assumption was firmly based on the government’s consensus that environmental impacts of shipping liquid spent fuel and other radioactive wastes were significant and unnecessary, given the feasibility of shipping the materials in solid form.

1. 1977 NRC Transportation EIS

The first EIS to address the environmental impacts of transporting radioactive waste was published by the NRC in 1977: Final Environmental Statement on the Transportation of Radioactive Waste by Air and other Modes (NUREG-0170, 1977) (AR0000001-AR0000198) (“NRC Transportation EIS”). The NRC Transportation EIS assumed spent fuel would be shipped as solids. *Id.* at 7-2 (spent fuel) and 7-2 - 7-3 (low-level radioactive waste) (AR___ and AR___, respectively).⁵

⁴<http://nuclearsafety.gc.ca/eng/reactors/research-reactors/nuclear-facilities/chalk-river/highly-enriched-uranium-in-canada.cfm#sec2> (last visited 11/20/2016).

⁵While the DOE designated the NRC Transportation EIS as part of the record, it omitted the second half of Volume 1 from the record index, as well as Vol. 2. Plaintiffs will provide a

The NRC Transportation EIS did not compare the relative risks of shipping spent fuel and radioactive waste in solid and liquid form, but rather deemed that shipping these materials in solid form was essential for minimizing environmental impacts. As asserted by the NRC in explaining its reasons for concluding that environmental impacts of radioactive waste transportation shipments will not be severe in most cases:

Examination of the consequences of a major accident and assumed subsequent release of radioactive material indicates that the potential consequences are not severe for most shipments of radioactive material (Chapter 5, Section 5.6). The consequences are limited by one or more parameters: short half-life, *nondispersible form*, low radiotoxicity.

Id. (AR0000009) (emphasis added). With respect to shipments of spent reactor fuel, the NRC further explained that even in a severe accident, the solid material ejected from a transportation cask would not travel far, and therefore would not cause significant impacts:

A massive rupture of the containers by mechanical means or high explosives that would result in the radioactive contents being ejected or removed is considered to be essentially impossible. Although unlikely, the possibility exists that the container could be breached to the extent that the gaseous inventory and *a small portion of the solids would be dispersed into the atmosphere*.

Id. at 7-2 (emphasis added) (AR__).

Further explanation of the NRC's reasoning is provided in a 1972 environmental transportation study on which the NRC Transportation EIS relies. It is titled the U.S. Atomic Energy Commission's⁶ "Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants" (WASH-1238, December 1972) ("AEC Environmental

citation to this portion of the record when the error is corrected. In the meantime, AR citations to the missing portions of the NRC Transportation EIS are left blank.

⁶The Atomic Energy Commission was the predecessor agency to the NRC.

Transportation Survey”).⁷ The AEC Environmental Survey states:

The probability of an accident occurring in transportation is small, about one accident per million vehicle miles, and decreases with increased severity of the accident to about one severe accident per 100 million vehicle miles and one extremely severe accident per 10 million-million vehicle miles. For a typical nuclear power reactor, an estimated 112 shipments of fuel and wastes involving a total shipping distance of about 90,000 vehicle miles will be made each year. Based on these data, a shipment of fuel or waste will be involved in a transportation accident once in about 10 years and one accident out of about 100 will be severe. Because of the package design and quality assurance, the probability of a breach in the containment of a package involved in an accident is small and related to the accident severity. Because of regulatory limits on contents of packages and the nature and *form of* the unirradiated and irradiated nuclear fuel and *solid radioactive waste* from a light-water nuclear power plant, the amount of radioactivity which would be released if a breach were to occur in a package is unlikely to be large and although the consequences could be serious, they would not be catastrophic.

Id. at 2, AR ____.⁸ See also *id.* at 54 (AR __) (“The packages used for the waste are designed and constructed and the *solid form in which the waste is shipped* is such that in the unlikely event a shipment of solid waste is involved in an accident, it is unlikely that the radioactive material would be released.”) (emphasis added).

The NRC Transportation EIS and supporting AEC Environmental Transportation Survey considered and rejected transportation of liquid spent fuel on environmental grounds. The NRC assumed that these radioactive materials would be shipped as solids – not because solids constituted a comparably preferable alternative – but because shipment of liquids posed unnecessary and unacceptable environmental risks. Thus, the option of shipping spent fuel and radioactive waste in liquid form was rejected out of hand.

⁷The AEC Environmental Survey is cited as a reference in the 1977 Transportation EIS at 4-50 and 5-56 (AR0000141 and AR0000198, respectively).

⁸Plaintiffs intend to seek inclusion of the AEC Environmental Transportation Survey in the record, as a reference document cited in the NRC Transportation EIS. In the meantime, AR citations to this document are left blank.

C. DOE's EISs Regarding Transportation of Target Materials and Other Forms of Spent Fuel

As described in Defendants' Memorandum at 9, DOE's policy for nonproliferation of nuclear weapons includes accepting shipments from foreign countries of enriched uranium, including enriched uranium originating in the U.S. DOE's "Acceptance Policy" is supported by three EISs: the Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental and Waste Management Program EIS (1995) (AR0001570 – AR0007167), the FRR FEIS issued in 1996 (AR7903 – AR0009572), and the Savannah River Site Spent Fuel Management EIS (2000) (SRS SNF EIS) (AR0011522 – AR0012151). *See* Defendants' Memorandum at 10-12.

Of these EISs, the 1996 FRR FEIS and the SRS SNF EIS give the most consideration to shipment of target materials and other forms of spent reactor fuel. Both EISs assume that target materials would be solidified before transport at the Canadian Chalk River facility where they are currently stored. The 1996 FRR FEIS recognizes the undesirability of transporting liquid highly-radioactive materials: "To preclude the necessity for transporting liquid high-level wastes, these wastes would be processed on the sites where they were generated." *Id.* at 2-18 (AR0008059). In the SRS SNF EIS, DOE also "assumes" that liquid target materials "would be converted to oxides [in Canada] prior to shipment to SRS." *Id.* at C-5 (AR0012017).⁹ In evaluating the risks of spent fuel transportation accidents, the DOE further concluded that "For most accidents, essentially none of the radioactive materials would be released *because it is an integral part of the solid*

⁹*See also* Supplement Analysis, Savannah River Site Spent Nuclear Fuel Management (DOE, 2013) (repeating that both the FRR FEIS and the SRS SNF EIS assumed that target materials "would be transported in a solid form." *Id.* at 2 (AR0026361).

fuel.” *Id.* at 4-4 (emphasis added) (AR0008280).

Defendants omitted to mention that the 1996 FRR SNF FEIS considered only *solid* spent fuel while arguing that highly-radioactive liquid waste was assessed for its performance in an accident scenario. Defendants’ Memorandum at 17. The FRR FEIS considered the most severe accident to be a “truck or train crash followed by a large fire.” The 1996 presumption was never anything but solid material inside the cask, and the policy expressly provided for the management of HEU target residue material as a solid:

In addition to aluminum-based and TRIGA-type spent nuclear fuel, target material containing HEU is considered for management under Implementation Alternative 1, subalternative 1c (Section 2.2.2.1). Targets are irradiated in a research reactor to produce molybdenum-99, a medical isotope. Molybdenum production peaks at a low burnup, about three percent. Once the target is removed from the reactor, the fuel is dissolved in acid, and molybdenum-99 is separated from the solution. The residual material after removal of molybdenum-99 is called target material, and is currently kept in solution form. The target material considered for management would be put in U3O8 or UO2 form and canned for transport to the United States.

Id. at 2-29 (AR0008070). DOE admits this in the 2013 Supplement Analysis, but omits to explain the significance, *viz.*, that this became the formal policy adopted via the Record of Decision in 1996. 61 Fed. Reg. 25,095 (AR0009577).¹⁰

Against this backdrop, in 2008, Canada’s Atomic Energy of Canada, Ltd. (AECL, a Crown corporation), reported to DOE that equipment at its Chalk River Laboratories, where U.S.-originated HEU targets had been used to produce medical isotopes, could not process the target material “waste” to a “standard solid form” because of “[o]perational demands” and “constrained

¹⁰“Under the Preferred Alternative (which is a combination of the implementation elements of Management Alternative 1), DOE would accept and manage in the United States up to 19.2 MTHM of foreign research reactor spent nuclear fuel in up to approximately 22,700 individual spent fuel elements and up to an additional 0.6 MTHM of target material.” *Id.*

shielded facility capabilities.” Letter from Joan Miller, AECL, to Chuck Messick, DOE, re: Collaboration on Disposition of Target Materials (AR0024238). Accordingly, AECL sought “to collaborate with the USDOE Savannah River Site (SRS) to assess alternative treatment processes that would permit this material to be transported to Savannah River for HEU recovery and/or disposition.”

This marked the very first time that either the U.S. or Canada had considered shipment of highly-radioactive target materials in a liquid state, without converting them to a stable solid. For the preceding forty-plus years, both DOE and the NRC had rejected the option of shipping target materials in liquid form based on their concern that the environmental risks of shipping spent fuel were significant and unnecessary.

Aware that DOE was considering its response to AECL’s request for a change in the plan for shipment of solid target materials to the U.S., four environmental organizations sent a letter to DOE’s NEPA Compliance office, demanding an EIS or PEIS on Chalk River shipments and a proposed German target material shipment. Letter from Tom Clements, Friends of the Earth *et al.* to Carol Borgstrom, EPA, re: Need for New Environmental Impact Statement on the Unprecedented Import from Canada to the Savannah River Site of Liquid High-Level Waste Containing Highly Enriched Uranium (HEU), *etc.* (Feb. 27, 2013) (AR 26951). Disregarding this request, in the spring of 2013, DOE announced its decision to go ahead with shipments of liquid target materials from Canada to the U.S., without preparing an EIS or supplementing any of the three previous EISs related to spent fuel shipment and storage. Supplement Analysis, Savannah River Site Spent Nuclear Fuel Management (DOE, 2013) (AR0026359) (2013 SA). The 2013 SA was accompanied by an Amended Record of Decision, Spent Fuel Management at the Savannah

River Site, 78 Fed. Reg. 20,625 (Apr. 5, 2013) (AR0026397 – AR0026400).

In an appendix to the 2013 SA, DOE purported to justify its failure to prepare a new EIS or supplemental EIS regarding the proposed shipments of liquid target materials. *See SA, Appendix A (AR0026379)*. While Appendix A to the SA presented an analysis of accident impacts, including severe transportation accidents, it contained no discussion of any differences in how liquid target materials would behave during an accident in comparison with solid target materials.

Although the 2013 SA presented a technical environmental analysis on an entirely new subject not previously analyzed, the DOE offered no opportunity for comment on the SA and instead issued it as a final document.

Despite the fact that DOE compiled the 2013 SA outside of public view and did not solicit public comments, many citizens and organizations responded to the SA by requesting DOE to prepare an EIS or SEIS before shipping the target materials. For instance, forty (40) social justice and environmental organizations, including four Plaintiffs in this litigation, sent a detailed letter to the New York Governor and DOE, objecting to the shipments because of the lack of precedent for transporting liquid highly-radioactive material, the possibilities of an accident with spillage of radioactive material, and the potential for a criticality accident. They requested consideration of downblending the waste at Chalk River to reduce the proliferation risks, and asked DOE to consider leaving the waste in place in Canada. Letter from Alaska Community Action on Toxics, *et al.* to Andrew Cuomo re: Unprecedented shipment of High Level LIQUID radioactive waste across New York State (July 3, 2013) (AR 26923).

The fruitless supplications to DOE included multiple letters from members of the House

Committee on Homeland Security, expressing concerns about the unprecedented nature of liquid waste shipments and the prospects of accidents and terrorist acts that could cause cask breaches. *See* letter from Rep. Brian Higgins to Ernest J. Moniz, DOE (July 16, 2014), (AR0026966). *See also* letter from Brian Higgins and four other members of House Committee on Homeland Security to Ernest J. Moniz (Aug. 3, 2015) (AR0027283), expressing safety concerns and demanding an EIS.

The New York Attorney General also weighed in repeatedly with the Department of Energy. *See* letter from Eric T. Schneiderman to Ernest J. Moniz (July 25, 2014) (AR 26967), a stating New York's concerns that DOE had failed to analyze potential releases of the liquid waste and pointing out that the proposed shipments contradicted DOE's previous position that transporting radioactive material in solid form is "an important factor decreasing the chance of release during an accident." *See also* letter from Eric T. Schneiderman to Mark Whitney, DOE, re: DOE-proposed Shipments of Liquid High enriched uranium From Chalk River, Ontario, Canada, through New York, to Aiken, South Carolina (Dec. 2, 2014), urging DOE to comply with federal regulations for supplementation of EISs.

These requests were to no avail. On November 30, 2015, the DOE issued another SA, confirming its intention to go ahead with shipments of target materials in liquid form, without preparing a new EIS or supplemental EIS. (2015 SA) (AR0027334). The 2015 SA also relied on NRC and Canadian approval in 2014, of a shipping cask that would accommodate target materials in liquid form. These approvals consisted of (a) NRC amendment of the Certificate of Compliance for the NAC-LWT transportation cask and (b) issuance by the Canadian Nuclear Safety Commission (CNSC) of a certificate approving the shipping cask design. *See* SA at 7 – 12

(AR27366-27371). The 2015 SA also added a discussion of the environmental impacts of what DOE considered to be a credible severe accident involving the release of a small quantity of liquid target material from a transportation cask during an accident. *Id.* at 15-16 (AR0027374-0027375).

The 2015 SA was the DOE's final issuance regarding the transport of liquid target materials, and no further documents have been issued.

D. If Members of the Public Were Allowed to Comment, They Would Point Out Significant Environmental Impacts of Target Material Transport and Deficiencies in DOE's Supplement Analyses

If members of the public were allowed to comment on the analyses in the 2013 SA and the 2015 SA, they would raise serious concerns about the adequacy of the DOE's analysis to address the potentially significant environmental impacts of shipping liquid target materials. Examples of issues that would be raised in comments are presented in the Declaration of Marvin Resnikoff, Ph.D. (Nov. 22, 2016) (Resnikoff Declaration) (Rec. ___) and the Declaration of Gordon Edwards, Ph.D. (Nov. 22, 2016) (Edwards Decl.) (Rec. __).¹¹

¹¹While the declarations of Dr. Resnikoff and Dr. Edwards are not in the administrative record, there is no other way that Plaintiffs could give the Court a sense of the seriousness and complexity of the technical issues on which they would seek to comment if the DOE were ordered to prepare a new or supplemental EIS. In NEPA cases, courts have allowed extraneous evidence to be introduced where it (1) explains technical information or agency action not adequately explained in record; (2) shows an agency failed to consider relevant evidence; or (3) shows an agency, in bad faith, failed to include information it considered in the record. *Webb v. Gorsuch*, 699 F.2d 157, 159 fn. 2 (4th Cir. 1983) (citing *County of Suffolk v. Sec'y of the Interior*, 562 F.2d 1368, 1384 (2d Cir. 1977), and cases cited therein and considering several affidavits and reports which were not made part of the "record" in determining whether the agency action was arbitrary or capricious).

Also, Fed.R.Evid. 702 allows a witness "who is qualified as an expert by knowledge, skill, experience, training, or education" to testify in the form of an opinion or otherwise if: (a) the expert's scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue. . . ."

For instance, Dr. Resnikoff points out that a “regulatory” fire, *i.e.*, a 30-minute fire with the heat of a flaming house, “could potentially cause the release of the liquid waste and the serious accidents in ways that solid material would not.” Resnikoff Decl., ¶¶ 4-5. In such a fire, more radionuclides would be released from burning liquid fuel than from the particulates in solid fuel. *Id.*

Dr. Resnikoff also notes that all discussion of thermal matters in the NRC’s safety evaluation report (“SER”) for the Amended Certificate of Compliance for the NAC-LWT shipping cask¹² has been redacted for proprietary reasons, making it impossible for scientists and the informed public to review the calculations by NAC that were accepted by the NRC. *Id.*, ¶¶ 7-9. *See also* SER at AR0027080, AR0027082, AR0027086.

Dr. Resnikoff further questions the analysis of potential fissile materials criticality which could occur in the event of a cask accident:

The full HEUNL cask contains 1.6 kg of U-235 and a fraction of a kg of Pu-239. The cask is broken into four containers to avoid a critical reaction, but in a serious accident all containers may be broken, mixing all the contents into the entire cask volume. DOE and CNSC should clearly discuss that the full cask itself will not go critical. Criticality means, like a nuclear reactor, the cask contents would fission and gamma products like Sr-90 and Cs-137 would be produced along with a strong neutron field. This would be an extremely serious accident.

Resnikoff Decl. ¶ 16.

Dr. Resnikoff notes that there appears to be no accounting in the publicly-available NRC analysis of the cask for “thermal inertia,” where the interior of the heavy metal cask structure continues to intensify from the heat of a fire that may be suppressed or diminishing outside the cask. *Id.* ¶ 9. He further suggests the failing of O-rings and seals, and the venting of steam and

¹²Safety Evaluation Report, Docket No. 71-9225, Model Number NAC-LWT, Certificate of Compliance No. 9225 (Dec. 24, 2014) (AR0027079 – AR0027104).

gases from an overheated liquid cargo, which may credibly occur at different temperatures than would cause failure of the cask metal. *Id.* ¶¶ 6, 10.

Dr. Edwards points out a serious inconsistency in different agencies' inventories of the radioactive contents of the target materials. Table 3 in Appendix A to the 2013 SA (AR0026385) purports to be a list of the "Content of a Fully Loaded NAC-LWT Shipping Cask". It lists only 13 fission products, compared with the 123 fission products that are listed in the 2012 AECL Memo. Compare AR0026385 with AR0025062-25072.

Adding to the confusion, the 2014 CNSC Technical Assessment Report, Table 2 (AR0026986), entitled "Concentration of radionuclides in the solution," lists 21 fission products. Of the 21 fission products listed in the CNSC document, only 5 of them are listed in the 2013 DOE SA Appendix. Even absent the list of 123 fission products in the 2012 AECL Memo, the remaining two inventory lists published by CNSC and DOE are incomplete. The shortest accounting of dangerous radioisotopes is the DOE's list in the SA, which was the basis for DOE's assessment that there is little difference between shipping liquid material vs. solid target waste, and for the NRC's assessment that the risks from spillage of liquid target waste would be unlikely, and minimal if it occurred at all. As Dr. Edwards notes, the discrepancies in the reported radioactive inventories of shipping casks raise questions as to whether DOE's risk analysis is based on correct figures, and implicates the quality of the risk assessment to assess the significance of environmental impacts. Edwards Decl., ¶ 11.

Dr. Edwards also discusses the environmental risks posed by a spill of liquid target materials into a drinking water supply. Edwards Decl., ¶¶ 12-24. A single liter of radioactive target materials – which is less than one half of one percent of the 232.4 liters in each truckload

-- is more than enough to ruin an entire city's water supply. *Id.*, ¶ 21. Even assuming, as DOE does, that only 0.033 percent of a cask's inventory would be released, 0.033 percent of 232.4 liters is enough to make the water in Washington, D.C.'s Georgetown reservoir undrinkable based on the concentration of cesium-137 alone. *Id.*, ¶ 12. If the target residue material were in a solid form, even if it fell into a reservoir of drinking water or a river, lake, or stream, it could perhaps be retrieved with a minimum degree of contamination of the receiving water body. The situation is very different when the radioactive material is in liquid form. The liquid would be essentially irretrievable. *Id.*, ¶ 24. Such significant impacts, which are fundamentally different than the impacts of a spill of solid materials, should be thoroughly analyzed in an EIS.

IV. ARGUMENT

A. Standard of Review

Plaintiffs concur with Defendants that their claims are governed by the Administrative Procedure Act's (APA) standard of review, and that an agency action must be upheld unless it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." 5 U.S.C. § 706(2). Under the APA, a reviewing court may set aside agency actions, findings or conclusions that are "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law," U.S.C. § 706(2)(A).

Courts thus typically review an agency action to determine whether the agency has "relied upon factors which Congress has not intended it to consider, entirely failed to consider an important aspect of the problem, offered an explanation for its decision that runs counter to the evidence before the agency, or is so implausible that it could not be ascribed to a difference in view or the product of agency expertise." *Motor Vehicle Mfrs. Ass'n v. State Farm Mut. Auto. Ins.*,

463 U.S. 29, 42 (1983).

Courts in this Circuit “will give an extreme degree of deference to the agency when it ‘is evaluating scientific data within its technical expertise.’” *Huls Am., Inc. v. Browner*, 83 F.3d 445, 452 (D.C. Cir. 1996) (quoting *Int'l Fabricate Inst.*, 972 F.2d at 389, citing *Marsh*, 490 U.S. at 377. But that review must “ensure that the [agency] has examined the relevant data and has articulated an adequate explanation for its action.” *Int'l Fabricare Inst.*, 972 F.2d at 389; *City of Waukesha v. E.P.A.*, 320 F.3d 228, 247 (D.C. Cir. 2003). Put another way, while DOE’s reliance on “predictive judgments” and “incomplete data” may be “‘entitled to deference,’ that deference extends only so far as the [agency's] decision is not arbitrary or capricious.” *New York v. U.S. Nuclear Regulatory Comm’n*, 824 F.3d 1012, 1022 (D.C. Cir. 2016).

“Simple, conclusory statements of ‘no impact’ are not enough to fulfill an agency’s duty under NEPA.” *Found. on Econ. Trends v. Heckler*, 756 F.2d 143, 154 (D.C. Cir. 1985).

B. DOE’s Refusal to Prepare a New EIS is Arbitrary and Capricious Because It is Not Supported by the Record.

The Court should reverse DOE’s decision not to prepare a new EIS or SEIS for its proposed shipments of target materials in liquid form, because the record demonstrates that DOE’s decision is based on its disregard for the federal government’s well-established and longstanding environmental conclusion and policy that shipping radioactive materials in liquid form is unacceptable from an environmental standpoint. DOE simply ignores an array of crucial environmental findings and policy determinations that reject, as environmentally unacceptable, shipment of spent fuel (including target materials) and other radioactive waste in liquid form. These findings and determinations include:

- EISs by both DOE and NRC that repeatedly conclude that shipments of liquid radioactive materials are significantly more dangerous than solid shipments, and therefore unworthy of any serious consideration;
- The lack of any environmental analysis or even serious consideration, in any EIS, of the environmental impacts of shipping liquid radioactive materials;
- The assumption, built as a fundamental precept into every EIS that has considered transportation of spent fuel or other radioactive waste, that the material would be shipped as a solid;
- The inclusion in the Record of Decision for the FRR FEIS of the assumption that target materials would be solidified into U3O8 or UO2 before shipping, as an element of the Preferred Alternative for shipments of spent fuel from foreign research reactors to the U.S.;
- NRC's failure to support its recent approval of a cask for shipment of target materials in liquid form with an EIS or any type of environmental study.

The record therefore provides no support whatsoever for Defendants' principal arguments that the record shows that (a) "Defendants' previous EISs thoroughly evaluated the potential environmental impacts of accepting target material from Canada for management in the United States" and (b) "the impact of accepting the material in a liquid form would not significantly differ from the impacts that Defendants previously evaluated with regard to accepting the material in a solid form." Defendants' Motion at 1. Given DOE's disregard for the evidence in the administrative record, this Court owes it no deference, and must reject DOE's decision as arbitrary and capricious. *Motor Vehicle Mfrs. Ass'n*, 463 U.S. at 42; *Int'l Fabricare Inst.*, 972 F.2d at 389; *City of Waukesha*, 320 F.3d at 247.

Furthermore, while DOE argues that the proposed change of target residue shipments from solid to liquid form has no significant environmental implications, the record shows that the environmental impacts resulting from the change in the form of the shipped materials are “significant or uncertain, as compared with the original [proposal’s] impacts.” *Hodges*, 300 F.3d at 446-447 (quoting *Price Rd.* at 1508-1509). Thus, they warrant preparation of a new or supplemental EIS. *Id.* See also *Idaho Sporting Congress*, 135 F.3d at 1149 (“ [A]n EIS must be prepared if ‘substantial questions are raised as to whether a project . . . may cause significant degradation of some human environmental factor.’”)

For over 40 years, DOE and the NRC have rejected shipment of liquid spent fuel and other radioactive waste as environmentally unacceptable. DOE’s attempt to reverse that well-considered environmental policy with a cursory SA, performed without any public input, violates NEPA’s fundamental principle that decisions with important implications must take into account all relevant environmental factors and consider the input of members of the public and state and local government officials. *Robertson*, 389 U.S. at 349. As demonstrated by the expert declarations of Drs. Edwards and Resnikoff, public comment therefore could lead to a decision by DOE that is significantly better-informed and thus more protective of the environment.

Accordingly, the Court should find that DOE’s failure to issue a new EIS for its proposed shipments of target residue from Canada to the U.S. is arbitrary and capricious, and order that shipments must await full compliance with NEPA.

V. CONCLUSION

For the foregoing reasons, the Court should deny Defendants' Motion for Summary Judgment and Grant Plaintiffs' Cross-Motion for Summary Judgment.

/s/ Diane Curran
Diane Curran, Esq.
Harmon, Curran, Spielberg
& Eisenberg, LLP
1725 DeSales Street NW, Suite 500
Washington, D.C. 20036
Tel: (240) 393-9285
Email: dcurran@harmoncurran.com
Counsel for Plaintiffs

/s/ Terry J. Lodge
Terry J. Lodge, Esq.
Ohio Bar No. 0029271
316 N. Michigan St., Ste. 520
Toledo, OH 43604-5627
(419) 255-7552
Fax (440) 965-0708
tjlodge50@yahoo.com
Co-Counsel for Plaintiffs

CERTIFICATE OF SERVICE

I hereby certify that on November 29, 2016, I electronically filed the foregoing corrected document and its attachments with the Clerk of the Court using the CM/ECF system, which will send notification of the filing to all parties.

/s/ Terry J. Lodge
Terry J. Lodge, Esq.
Co-Counsel for Plaintiff