

**Final
SUPPLEMENT ANALYSIS
FOR THE
PROPOSED SHIPMENT OF COMMERCIAL
SPENT NUCLEAR FUEL
TO IDAHO NATIONAL LABORATORY FOR
RESEARCH AND DEVELOPMENT
PURPOSES**

**Idaho Operations Office
U.S. DEPARTMENT OF ENERGY**

November 2023

CONVERSION FACTORS

Metric to English			English to Metric		
Multiply	by	To get	Multiply	by	To get
Area					
Square kilometers	247.1	Acres	Acres	0.0040469	Square kilometers
Square kilometers	0.3861	Square miles	Square miles	2.59	Square kilometers
Square meters	10.764	Square feet	Square feet	0.092903	Square meters
Concentration					
Kilograms/sq. meter	0.16667	Tons/acre	Tons/acre	0.5999	Kilograms/sq. meter
Milligrams/liter	1 ^a	Parts/million	Parts/million	1 ^a	Milligrams/liter
Micrograms/liter	1 ^a	Parts/billion	Parts/billion	1 ^a	Micrograms/liter
Micrograms/cu. meter	1 ^a	Parts/trillion	Parts/trillion	1 ^a	Micrograms/cu. meter
Density					
Grams/cu. centimeter	62.428	Pounds/cu. ft.	Pounds/cu. ft.	0.016018	Grams/cu. centimeter
Grams/cu. meter	0.0000624	Pounds/cu. ft.	Pounds/cu. ft.	16,025.6	Grams/cu. meter
Length					
Centimeters	0.3937	Inches	Inches	2.54	Centimeters
Meters	3.2808	Feet	Feet	0.3048	Meters
Micrometers	0.00003937	Inches	Inches	25,400	Micrometers
Millimeters	0.03937	Inches	Inches	25.40	Millimeters
Kilometers	0.62137	Miles	Miles	1.6093	Kilometers
Temperature					
<i>Absolute</i>					
Degrees C + 17.78	1.8	Degrees F	Degrees F – 32	0.55556	Degrees C
<i>Relative</i>					
Degrees C	1.8	Degrees F	Degrees F	0.55556	Degrees C
Velocity/Rate					
Cu. meters/second	2,118.9	Cu. feet/minute	Cu. feet/minute	0.00047195	Cu. meters/second
Meters/second	2.237	Miles/hour	Miles/hour	0.44704	Meters/second
Volume					
Cubic meters	264.17	Gallons	Gallons	0.0037854	Cubic meters
Cubic meters	35.314	Cubic feet	Cubic feet	0.028317	Cubic meters
Cubic meters	1.3079	Cubic yards	Cubic yards	0.76456	Cubic meters
Cubic meters	0.0008107	Acre-feet	Acre-feet	1,233.49	Cubic meters
Liters	0.26418	Gallons	Gallons	3.78533	Liters
Liters	0.035316	Cubic feet	Cubic feet	28.316	Liters
Liters	0.001308	Cubic yards	Cubic yards	764.54	Liters
Weight/Mass					
Grams	0.035274	Ounces	Ounces	28.35	Grams
Kilograms	2.2046	Pounds	Pounds	0.45359	Kilograms
Kilograms	0.0011023	Tons (short)	Tons (short)	907.18	Kilograms
Metric tons	1.1023	Tons (short)	Tons (short)	0.90718	Metric tons
English to English					
Acre-feet	325,850.7	Gallons	Gallons	0.00003046	Acre-feet
Acres	43,560	Square feet	Square feet	0.000022957	Acres
Square miles	640	Acres	Acres	0.0015625	Square miles

a. This conversion factor is only valid for concentrations of contaminants (or other materials) in water.

CONTENTS

<u>Section</u>	<u>Page</u>
ACRONYMS AND ABBREVIATIONS.....	V
UNDERSTANDING SCIENTIFIC NOTATION	VI
1 INTRODUCTION	1
1.1 Proposed Action	1
1.2 Purpose and Need for the Proposed Agency Action	2
1.3 Scope of this Supplement Analysis	2
1.4 Relevant National Environmental Policy Act Documents	6
2 AFFECTED ENVIRONMENT.....	9
2.1 Resource Areas Considered in this Supplement Analysis.....	9
2.2 Resource Areas Eliminated from Detailed Analysis.....	13
2.3 New Information	14
3 COMPARISON OF IMPACTS	16
3.1 Introduction	16
3.2 Environmental Impacts.....	16
3.2.1 Spent Nuclear Fuel Transportation Impacts	16
3.2.2 Research and Operations at the Materials and Fuels Complex.....	19
3.2.3 Waste and Spent Nuclear Fuel Management	21
3.2.4 Intentional Destructive Acts	24
4 CUMULATIVE IMPACTS.....	26
5 PUBLIC COMMENTS ON THE DRAFT SA.....	27
5.1 Draft Supplement Assessment Public Comment Period	27
5.2 How DOE Considered Public comments	27
5.3 Comment Responses	28
5.3.1 Proposed Action/Purpose and Need.....	28
5.3.2 NEPA Process.....	28
5.3.3 Spent Nuclear Fuel and Waste Management	37
5.3.4 Environmental Impact Issues.....	40
5.3.5 Miscellaneous	42
6 CONCLUSION.....	44
7 DETERMINATION.....	44
8 REFERENCES	45
 Appendix A: 1995 Settlement Agreement	
Appendix B: 2011 Memorandum of Agreement	
Appendix C: 2019 Supplemental Agreement	

LIST OF TABLES

<u>Table</u>		<u>Page</u>
2-1	Minority and Low-Income Populations Surrounding the INL Site.....	11
2-2	Resource Areas Eliminated from Detailed Analysis.....	14
3-1	Summary of Potential Transportation Impacts.....	19

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
2-1	Representative Transportation Routes Associated with the Proposed Action	10
2-2	Typical Commercial SNF Cask.....	11
3-1	Assessment Process Used in this Supplement Analysis.....	17

ACRONYMS AND ABBREVIATIONS

AIP	Agreement in Principle
ASER	Annual Site Environmental Report
ALARA	as low as reasonably achievable
CEQ	Council on Environmental Quality
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act</i>
CFA	Central Facilities Area
CFR	<i>Code of Federal Regulations</i>
CH-LLW	contact handled low-level radioactive waste
CH-TRU	contact handled transuranic waste
DOE	U.S. Department of Energy
EA	environmental assessment
EBR	Experimental Breeder Reactor
EIS	environmental impact statement
EPRI	Electric Power Research Institute
FR	<i>Federal Register</i>
GHG	greenhouse gas
GTCC	Greater-than-Class-C
HeTO	Heritage Tribal Office
HFEF	Hot Fuels Examination Facility
HLW	high-level waste
ICP	Idaho Cleanup Project
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
LLW	low-level radioactive waste
MEI	maximally exposed individual
MFC	Materials and Fuels Complex
MOA	Memorandum of Agreement
MTHM	metric tons of heavy metal
NEPA	<i>National Environmental Policy Act</i>
NESHAP	National Emission Standards for Hazardous Air Pollutants
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
ORNL	Oak Ridge National Laboratory
PEIS	programmatic environmental impact statement
PIE	post-irradiation examination
PL	protection level
R&D	research and development
ROD	Record of Decision
RH-LLW	remote-handled low-level radioactive waste
RH-TRU	remote handled transuranic waste
RWMC	Radioactive Waste Management Complex
SA	supplement analysis
SDA	Subsurface Disposal Area
SEIS	supplemental environmental impact statement

SNF	spent nuclear fuel
SWEIS	site-wide environmental impact statement
TRU	transuranic (waste)
U.S.C.	<i>United States Code</i>
WIPP	Waste Isolation Pilot Plant

UNDERSTANDING SCIENTIFIC NOTATION

DOE has used scientific notation in this Supplement Analysis to express numbers that are so large or so small that they can be difficult to read or write. Scientific notation is based on the use of positive and negative powers of 10. The number written in scientific notation is expressed as the product of a number between 1 and 10 and a positive or negative power of 10. Examples include the following:

<u>Positive powers of 10</u>	<u>Negative powers of 10</u>
$10^1 = 10 \times 1 = 10$	$10^{-1} = 1/10 = 0.1$
$10^2 = 10 \times 10 = 100$	$10^{-2} = 1/100 = 0.01$
and so on, therefore,	and so on, therefore,
$10^6 = 1,000,000$ (or 1 million)	$10^{-6} = 0.000001$ (or 1 in 1 million)

1 INTRODUCTION

1.1 PROPOSED ACTION

The U.S. Department of Energy (DOE) has prepared this supplement analysis (SA) to evaluate the *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (DOE/EIS-0203)* (DOE 1995a) in light of changes that could have bearing on the potential environmental impacts previously analyzed. The Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations direct agencies to prepare a supplement to either a draft or final Environmental Impact Statement (EIS) when a major Federal action remains to occur and either the “agency makes substantial changes to the proposed action that are relevant to environmental concerns” or there are “significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” (40 CFR 1502.9(d)(1)(i)–(ii)). DOE’s NEPA regulations state that when it “is unclear whether or not an EIS supplement is required, DOE shall prepare a Supplement Analysis.” (10 CFR 1021.314(c)). This SA provides sufficient information for DOE to determine whether (1) to supplement an existing EIS, (2) to prepare a new EIS, or (3) no further NEPA documentation is required. (10 CFR 1021.314(c)(2)(i)–(iii)).

DOE is proposing to transport, in one truck shipment, a small quantity of commercial power used nuclear (light water reactor) fuel to the Idaho National Laboratory (INL) Site for research purposes consistent with the mission of the DOE Office of Nuclear Energy. The shipment would come from the Byron Nuclear Power Station in Illinois and would consist of one cask of 25 spent nuclear fuel (SNF) rods, totaling approximately 0.04 to 0.05 metric ton of heavy metal (MTHM),¹ or approximately 40 to 50 kilograms (88 to 110 pounds) of heavy metal. Each SNF rod is approximately 3/8 inch in diameter and approximately 13 feet long. Upon receipt, the SNF rods would be transferred directly into a hot cell in the Materials and Fuels Complex (MFC)² to begin the research activities. The MFC is the center for fuel fabrication and post-irradiation examination (PIE) at the INL Site. Major MFC facilities include the Hot Fuel Examination Facility (HFEF), Fuel Conditioning Facility, Fuel Manufacturing Facility, and Analytical Laboratory. The MFC currently conducts operations that are similar to the operations associated with the proposed action evaluated in this Supplement Analysis (SA). The research activities at the INL Site would occur within an approximately 8-year period.

The proposed research using the SNF rods would include the following types of activities: (i) a study of the technical and economic feasibility and nonproliferation acceptability of electrochemical recycling of used light water reactor fuel via electrochemical recycling and other used fuel management options; (ii) post-irradiation fuel examinations to investigate performance

¹ SNF inventories are generally described in terms of metric tons of heavy metal. Heavy metal refers to the mass of actinide elements (elements with atomic numbers greater than 89) in the SNF.

² The MFC, which became operational in 1949, was referred to as the Argonne National Laboratory-West in the 1995 PEIS. The 1995 PEIS specifically addresses operations in several facilities that are currently part of the MFC; notably, the Hot Fuels Examination Facility and Fuel Cycle Facility (see Appendix B of DOE 1995).

of higher-burnup fuels and advanced cladding materials; and (iii) transient testing and post-testing inspection activities to improve understanding of advanced cladding performance in transient conditions to support accident tolerant fuel development, and funded by the Electric Power Research Institute (EPRI), DOE-NE, and the Organization for Economic Co-Operation and Development – Nuclear Energy Agency (OECD-NEA) international joint program on nuclear fuel safety. Negotiations are currently in progress to establish the Westinghouse and the EPRI activities (INL 2021a).

Upon completion of all research activities, approximately 4 cubic meters (43kgHM) will be disposed as transuranic (TRU) wastes and approximately 3 kgHM will be disposed as low-level waste (LLW). Management of both the TRU and LLW will be in accordance with DOE Order 435.1, Chg.1, *Radioactive Waste Management Manual*, and will meet all disposal facility waste acceptance criteria. Less than 5 kgHM of pressurized water reactor fuel may be selected and saved in a fuel library to enable future research activities regarding fuel safety and performance issues.

1.2 PURPOSE AND NEED FOR THE PROPOSED AGENCY ACTION

In order to perform the research at the INL Site, the 25 SNF rods from the Byron Nuclear Power Station must be transported to the INL Site because this specific material does not currently exist at MFC and is not readily accessible at the INL Site or in the DOE complex (INL 2014a). DOE has on-going cooperation in fuel cycle technologies with international partners, including France, Japan, Republic of Korea, and the United Kingdom, to maintain awareness of global technology trends and to leverage U.S. resources. This research is intended to explore the technical, economic, and non-proliferation aspects of electrometallurgical processing of commercial light water reactor fuels, which would be important for discussions with the 48 country members of the Nuclear Suppliers Group and the International Atomic Energy Agency. Electrometallurgical processing technology has potential benefits nationally and internationally as a means of dealing with SNF inventories. It is important for DOE to conduct these studies to maintain U.S. expertise in this area and ensure that if or when the technology is implemented, it is implemented responsibly with appropriate safeguards in place. Several of these rods would also be used for fuel performance studies (INL 2014a).

1.3 SCOPE OF THIS SUPPLEMENT ANALYSIS

On June 12, 2015, DOE published a Draft SA that evaluated two shipments of SNF to the INL Site: (1) the shipment from the Byron Nuclear Power Station, which is the proposed action evaluated in this Final SA; and (2) a shipment from the North Anna Nuclear Power Station in Virginia. Since publication of that Draft SA, DOE decided to transport the SNF from the North Anna Nuclear Power Station to the Oak Ridge National Laboratory (DOE 2015a). Consequently, the scope of this Final SA does not include that shipment.

This SA has been prepared in accordance with DOE *National Environmental Policy Act* (NEPA) Implementing Regulations at 10 *Code of Federal Regulations* (CFR) 1021.314 and

Recommendations for the Supplement Analysis Process, Second Edition (DOE 2019). This SA evaluates whether the proposed action warrants preparing a supplemental environmental impact statement (EIS), a new EIS, or no further NEPA documentation. In this SA, DOE considers if there are substantial changes to the proposal or significant new circumstances or information relevant to environmental concerns. To aid in understanding the evaluation in this SA, a brief discussion of the notable historic events related to SNF operations at the INL Site follows.

In April 1995, DOE completed the *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (DOE/EIS-0203)* (hereafter, 1995 PEIS) (DOE 1995a). The 1995 PEIS contains an analysis of the potential environmental impacts associated with managing DOE’s complex-wide SNF Program from 1995 until 2035 and includes an analysis of a broad spectrum of fuel element designs (including both DOE and commercial SNF).

In the June 1995 Record of Decision (ROD) for the 1995 PEIS, DOE selected Alternative 4a (Regionalization by Fuel Type), DOE decided to transport 165 MTHM in 1,940 planned shipments of SNF (including 575 Navy shipments) to the INL Site through the year 2035 [60 *Federal Register* (FR) 28680, June 1, 1995]. The ROD also states that “[e]xcept for some special-case commercial fuel, these decisions do not apply to the management of spent nuclear fuel from commercial power plants.” The category of special-case commercial nuclear fuel described in the 1995 PEIS (Volume 1, Section 1.1.2.5) includes: “SNF from development reactors (Shipping Port and Peach Bottom Unit); SNF used for destructive and nondestructive examination and testing, SNF remaining at the West Valley Demonstration Project; SNF from fuel performance testing at Babcock and Wilcox Research Center; and special case SNF debris (Three-mile Island Unit 2).” The fuel being considered for the proposed research falls within the category of special case commercial fuel contemplated in the ROD.

In October 1995, the State of Idaho, U.S. Navy, and DOE entered into a Settlement Agreement (included as Appendix A of this SA), settling a lawsuit filed by the State of Idaho. The Settlement Agreement includes the following statements:

- “After December 31, 2000, DOE may transport shipments of spent fuel to INEL [INL Site] constituting a total of no more than 55 metric tons of DOE spent fuel (equivalent to approximately 497 truck shipments)” (Section D.2.c of DOE 1995b) ... and “no more than 20 truck shipments of spent fuel in any calendar year” (Section D.2.f of DOE 1995b); and
- “DOE shall remove all spent fuel, including naval spent fuel and Three Mile Island spent fuel from Idaho by January 1, 2035” (Section C.1 of DOE 1995b).

The Settlement Agreement also includes a provision that DOE “will make no shipments of spent fuel from commercial nuclear power plants” to the INL Site (Section D.2.e of DOE 1995b). Following the Settlement Agreement, DOE issued an amended ROD in June 1996 for the 1995

PEIS, which lowered the number of planned shipments of SNF to the INL Site to 1,133 (575 shipments for the Navy and 558 planned shipments for DOE) (61 FR 9441, March 8, 1996).

On January 6, 2011, the State of Idaho and DOE signed a Memorandum of Agreement (MOA) (included as Appendix B of this SA), establishing conditions under which the INL Site could receive limited research quantities of commercial SNF for examination, testing, and storage (DOE 2011a). Key provisions of the MOA include the following:

- “INL may receive for the purpose of research and examinations conducted at the INL research quantities of Commercial Power SNF” (Section 3.(a) of DOE 2011a);
- “... not more than 400 kilograms total heavy metal content of Commercial Power SNF may be received in any calendar year” (Section 3.(b) of DOE 2011a);
- “Nothing in this Agreement shall be construed to allow DOE to exceed the 55 MTHM limit for SNF allowed by the 1995 Agreement” (Section 3.(f) of DOE 2011a); and
- “All Commercial Power SNF shipped to Idaho pursuant to this Agreement and stored at the INL for any reason shall be removed from Idaho in accordance with the deadline set forth in Section C.1 of the 1995 Agreement” (Section 8 of DOE 2011a).

On November 6, 2019, the State of Idaho and DOE signed a Supplemental Agreement providing a one-time conditional waiver of Sections D.2.e and K.1 of the 1995 Agreement relating to the receipt for research purposes of 25 SNF rods from the Byron Nuclear Generating Station and for the conditional renewal of the January 6, 2011 Memorandum of Agreement. Key provisions of the supplemental agreement include the following:

- “Prior to receipt at the INL of the Byron Nuclear Generating Station SNF rods for research purposes, DOE shall have achieved radioactive operations of the Integrated Waste Treatment Unit and have provided verified notice to Idaho of attaining such radioactive operation. For purposes of this paragraph "radioactive operations" shall mean the introduction of sodium-bearing high-level waste (HLW) to the treatment unit and successful treatment of sodium-bearing HLW resulting in at least one (1) full canister of dry solid sodium-bearing HLW.”
- “Limits and Material Management-Byron Shipment:
 - a. INL may receive for the purpose of research and examinations conducted at the INL 25 SNF rods from the Byron Nuclear Generating Station for purposes of the Byron Rods for High Burnup Fuel Testing and Fuel Cycle RD&D Project, the total estimated weight of which is 100 pounds *heavy metal*.

- b. The 25 SNF rods from the Byron Nuclear Generating Station will count as a shipment of DOE SNF for purposes of the annual shipment limits contained in Section D.2.f of the 1995 Agreement.
- c. The amount of SNF from the Byron Nuclear Generating Station, measured in fractions of metric tons *heavy metal* (MTHM), including the equivalent amount contained in any wastes generated during research, remaining on site at the end of each calendar year will count toward the total metric tonnage limits for DOE SNF contained in Section D.2.c of the 1995 Agreement.
- d. The SNF from the Byron Nuclear Generating Station will be stored and managed as SNF until shipped off-site in compliance with the 2035 shipment deadline of the 1995 Agreement.
- e. Any transuranic waste and low-level waste resulting from the research on the SNF from the Byron Nuclear Generating Station may be consolidated with other laboratory waste and managed appropriately.
- f. Nothing in this Supplemental Agreement shall be construed to allow DOE to exceed the 55 MTHM limit for SNF allowed by the 1995 Agreement.”

The Integrated Waste Treatment Unit initiated operations on April 11, 2023, and has since completed the Supplemental Agreement requirement for successful treatment of sodium-bearing HLW resulting in at least one full canister of dry solid sodium-bearing HLW. Therefore, the SNF shipment of 25 rods from the Byron Nuclear Generating Station is no longer prohibited by the Settlement Agreement.

Currently, approximately 308 MTHM of SNF are stored at the INL Site, mostly from foreign and domestic research reactors.³ Of the 308 MTHM of SNF, approximately 28 MTHM have been shipped to the INL Site since the 1995 PEIS was completed. The material is stored in licensed and safe facilities primarily at the Idaho Nuclear Technology and Engineering Center (INTEC), the Naval Reactors Facility, and the MFC. Storage facilities consist of dry vaults, dry storage casks, and air and inert atmosphere hot cells. Based on current planning, DOE anticipates the INL Site would receive less than 21 MTHM of additional SNF before 2035. Therefore, DOE would not exceed the 55 MTHM limit imposed through the Settlement Agreement by receiving the additional 0.05 MTHM if the proposed action was implemented.

³ On December 31, 2014, the Secretary of Energy requested an indication of support from the State of Idaho related to the research projects that would require the receipt of two shipments of commercial SNF at the INL Site (DOE 2014a). In reply to this request, on January 8, 2015, the Governor of Idaho and the Attorney General stated that, “Idaho remains supportive of the type of research DOE proposes to conduct and will grant a one-time, conditional waiver to allow receipt of the proposed SNF shipments at the INL Site if DOE and Idaho are able to agree upon an enforceable commitment and timeframe for timely resolving the 1995 Settlement Agreement noncompliance issues” (Idaho 2015). The proposed activities would be conducted in compliance with the procedures and processes of the Settlement Agreement and the 2011 MOA, including counting the R&D shipment quantities in the overall limit of 55 metric tons for DOE SNF to the INL Site; the total annual SNF shipment limits to INL; and the notice and reporting requirements. Necessary State approvals would be in place prior to shipment.

1.4 RELEVANT NATIONAL ENVIRONMENTAL POLICY ACT DOCUMENTS

The following NEPA documents are relevant to the proposed agency action described in Section 1.1. The discussions that follow describe the relevance of these NEPA documents to the proposed action and explain how DOE used these documents to help determine whether there are any significant new circumstances or information relevant to environmental concerns.

- ***Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement, DOE/EIS-0203 (DOE 1995a)***. As discussed in Section 1.3 of this SA, the 1995 PEIS contains an analysis of the potential environmental impacts associated with managing DOE’s complex-wide SNF Program from 1995 until 2035. The 1995 PEIS, ROD, and amended ROD provide the NEPA analysis for:
 - Shipments of SNF, such as those proposed in this SA, to the INL Site (see specifically Appendix I of the 1995 PEIS; Section 3.1 and 3.2.1 of the ROD; and Tables 1.1 and 1.2 of the amended ROD).
 - Research and operations involving SNF, such as those proposed in this SA, at INL (see specifically Section 3.1.4.4 of Appendix B of the 1995 PEIS). As discussed in that section, DOE assumes that electrometallurgical processing would be conducted at the INL Site with SNF. Specifically, that section states that “this alternative [the selected Alternative 4a] would include the continuation of activities related to the treatment of spent nuclear fuel, including research and development (e.g., Electrometallurgical Process Demonstration Project), and the construction of the Dry Fuels Storage Facility. DOE would initiate pilot programs as needed to support future decisions on spent nuclear fuel management and disposition. DOE would use historic data on spent nuclear fuel to provide the bounding case for a determination of the impacts associated with potential pilot program activities.”

The 1995 PEIS provides a baseline against which the potential impacts of the proposed action in this SA can be compared and evaluated. Specifically, this SA evaluates: (1) the potential transportation impacts of the proposed action against the transportation analysis in Appendix I of the 1995 PEIS; and (2) the potential impacts associated with research and operations at the INL Site related to the treatment of SNF (including research and development such as electrometallurgical processing), against the analysis in the 1995 PEIS.

- ***Final Environmental Assessment (EA) on Electrometallurgical Treatment Research and Demonstration Project in the Fuel Conditioning Facility at Argonne National Laboratory West [Now the Materials and Fuels Complex], DOE/EA-1148 (DOE 1996)***. In May 1996, DOE completed this EA, which provides an analysis of the potential environmental impacts of demonstration-scale electrometallurgical processing on SNF

rods from Experimental Breeder Reactor (EBR)-II containing 1.6 MTHM of which 0.4 MTHM was highly enriched driver fuel. This EA provides detailed analyses of the potential environmental impacts related to air emissions and human health from processing the EBR-II Fuel (see specifically Sections 4.1.1.2 and 4.1.2 of the EA). Subsequent to the Final EA, DOE published a Finding of No Significant Impact for the proposed action (61 FR 25647, May 22, 1996). This SA evaluates the potential impacts of the proposed action in the areas of air emissions/human health and waste management against the impacts presented in the EA.

- ***Waste Isolation Pilot Plant (WIPP) Disposal Phase Final Supplemental Environmental Impact Statement (SEIS), DOE/EIS-0026-S-2 (DOE 1997)***. In September 1997, DOE completed the WIPP SEIS, which provides an analysis of the potential environmental impacts associated with disposing of transuranic (TRU) waste from defense activities and programs of the U.S. government. The WIPP SEIS includes an analysis of the transportation of TRU waste from the INL Site to WIPP, as well as the disposal of TRU waste at WIPP, such as waste that may result from the proposed action evaluated in this SA. As such, the WIPP SEIS provides a baseline against which the potential impacts of TRU waste transportation and disposal from the proposed action in this SA can be compared and evaluated.
- ***Final Site-Wide Environmental Impact Statement (SWEIS) for the Continued Operation of the Department of Energy/National Nuclear Security Administration (NNSA) Nevada National Security Site (NNSS) and Offsite Locations in the State of Nevada, DOE/EIS-0426 (DOE 2013)***. In October 2013, DOE/NNSA completed the NNSS SWEIS, which provides an analysis of the potential environmental impacts associated with continued operation of the NNSS. The SWEIS includes an analysis of the transportation of low-level radioactive waste (LLW) waste from the INL Site to NNSS, as well as the disposal of LLW at NNSS, such as waste that may result from the proposed action evaluated in this SA. As such, the SWEIS provides a baseline against which the potential impacts of LLW transportation and disposal from the proposed action in this SA can be compared and evaluated.
- ***Final Supplemental 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, DOE/EIS-0250F-S1 (DOE 2008)***. In June 2008, DOE completed the Yucca Mountain SEIS, which provides an analysis of the potential environmental impacts associated with constructing, operating, monitoring, and eventually closing a geologic repository at Yucca Mountain for the disposal of SNF and high-level radioactive waste. The SEIS also evaluates the potential impacts of transporting SNF, including SNF associated with the proposed action evaluated in this SA. The SEIS provides a baseline against which the potential impacts of SNF transportation from the proposed action in this SA can be compared and evaluated.

- ***Supplement Analysis, Proposed Shipment of Commercial Spent Nuclear Fuel to DOE National Laboratories for Research and Development Purposes, U.S. Department of Energy, Office of Nuclear Energy, DOE/EIS-0203-SA-07, DOE/EIS-0250F-S-1-SA-02, December.*** In December 2015, DOE completed an evaluation of the transport of a small quantity of commercial power SNF from the North Anna Nuclear Power Station to the Oak Ridge National Laboratory (ORNL) in Tennessee for research purposes consistent with the mission of DOE. to determine if the action warrants preparing a supplement to the 1995 PEIS or the Yucca Mountain SEIS, a new environmental impact statement (EIS) altogether, or no further NEPA documentation. The analysis determined that there are no substantial changes to either the 1995 PEIS or the Yucca Mountain SEIS that are relevant to environmental concerns, and there are no significant new circumstances or information relevant to environmental concerns, therefore it was determined that no further NEPA documentation is required.

2 AFFECTED ENVIRONMENT

2.1 RESOURCE AREAS CONSIDERED IN THIS SUPPLEMENT ANALYSIS

Because the proposed action involves the transport of SNF from commercial reactors to the INL Site, this SA evaluates transportation activities and associated potential environmental impacts. Following receipt of the SNF at the INL Site, subsequent research activities could result in radiological emissions, which could impact human health, as well as generate wastes. Additionally, because water quality is a resource of particular interest to the State and stakeholders, it is also specifically addressed in this SA. Therefore, this SA evaluates the potential impacts to air quality/human health, environmental justice, the disposition of wastes, and water quality. An update to the environmental conditions for the resource areas evaluated in detail, including a discussion of changes to the environment that have occurred since 1995, follows.

Transportation. The likely shipment route from the Byron Nuclear Power Station overlaps the representative route used for the analysis of shipments of SNF from West Valley, New York, to the INL Site [primarily along Interstate 80 (I-80)]. The route from West Valley to the INL Site, which is approximately 1,990 miles, was one of the many routes analyzed in the 1995 PEIS. Only about 80 miles of the likely route from the Byron Nuclear Power Station to the INL Site were not covered in the analysis conducted for West Valley SNF shipments. The route from the Byron Nuclear Power Station to the INL Site (Figure 2-1) is approximately 1,400 miles, or approximately 590 miles shorter than that used in the analysis for the West Valley shipments.

The population along the representative transportation route has changed since the 1995 PEIS was prepared. Given that the transportation route extends across much of the length of the Continental United States, the analysis in this SA assumes that the population along the transportation routes has changed in a manner consistent with the overall population change for the United States. Since approximately 1995, the U.S. population has increased by approximately 25 percent; from 265 million people to approximately 332 million people (Census 2022). The transportation analysis in this SA factors in this increase.



Figure 2-1. Representative Transportation Route Associated with the Proposed Action (Source: DOE 2008, modified)

Commercial SNF is transported in specially designed casks (Figure 2-2) certified by the U.S. Nuclear Regulatory Commission (NRC). Casks must meet the following requirements (NRC 2015):

- Prevent the loss of radioactive contents;
- Provide shielding and heat dissipation; and
- Prevent nuclear criticality (a self-sustaining nuclear chain reaction).

To show that it can withstand accident conditions, a cask must pass impact, puncture, fire, and water immersion tests. Casks must survive these tests in sequence, including a 30-foot drop onto a rigid surface followed by a fully engulfed fire of 1,475 degrees Fahrenheit for 30 minutes. The test sequence encompasses more than 99 percent of vehicle accidents (NRC 2015). The SNF evaluated in this SA would be transported in an NRC-licensed cask.

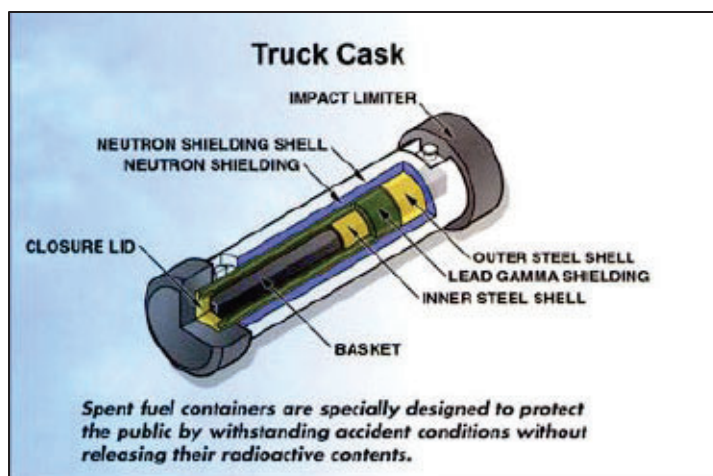


Figure 2-2. Typical Commercial SNF Cask (Source: NRC 2015, modified)

Air Quality/Human Health. Radiological operations at the INL Site have the potential to impact the health of the public and workers. The affected environment for air quality/human health is best described by the estimated annual radiological doses projected in the 1995 PEIS and the recent estimated doses from current INL Site operations. The analysis in the 1995 PEIS provides an estimate of the annual cumulative doses to the maximally exposed worker, offsite maximally exposed individual (MEI), and the collective population from DOE’s decision to implement the preferred alternative for environmental restoration and waste management and the SNF Regionalization Alternative 4a (DOE 1995a, Volume 2, Table 5.7-4). The annual dose to the maximally exposed worker was estimated to be 0.46 millirem per year; the annual dose to the MEI was estimated to be 0.63 millirem per year; and the dose to the collective population was estimated to be 2.9 person-rem per year. The effective dose equivalent to the offsite MEI from all operations at the INL Site in 2019 was reported as 0.056 millirem (INL 2020). The total population dose (50-mile radius around the site) from existing operations at the INL Site is estimated to be approximately 0.0285 person-rem per year (INL 2022).

Environmental Justice. The region of influence for the environmental justice analysis is defined as an area within a 50-mile radius around the INL Site that encompasses parts of 11 counties in Idaho. In 2019, minorities made up approximately 18 percent of the population of the 11-county area surrounding INL (Census 2021). Approximately 11 percent of the population residing within the 11-county area around the INL Site reported incomes below the poverty threshold. (Census 2021). Table 2-1 presents the data related to minority and low-income populations from 1995 and based on current information for the INL Site.

Table 2-1. Minority and Low-Income Populations Surrounding the INL Site

	1995 Estimate	Current Estimate
Minority Population Percentage	10.1	17.8
Low-income Population Percentage	12.6	10.6

Source: DOE 2000, Census 2021.

Waste Management. In addition to waste management conditions at INL, this section updates the waste management conditions at WIPP and NNSS because those two sites would receive radiological wastes as a result of the proposed action.

Idaho National Laboratory. Existing activities at the INL Site generate both radioactive and non-radioactive wastes.⁴ When the 1995 PEIS was prepared, DOE disposed of LLW on site. Through 1991, DOE disposed of approximately 5,130,000 cubic feet of LLW at the Radioactive Waste Management Complex (RWMC). The projected 1995 baseline at RWMC for LLW generation was approximately 5,120,600 cubic feet annually (DOE 1995a).

INL's Integrated Waste Tracking System shows that from 2019 through 2022 INL generated approximately 854,600 cubic feet of LLW annually. Approximately 52,300 cubic feet of LLW was shipped to NNSS for disposal during the same time period (DOE 2015a).

In 2020, approximately 670 cubic meters (26,652 cubic feet or 876 cubic yards) of mixed low-level waste and 193 cubic meters (6,831 cubic feet or 253 cubic yards) of low-level waste was shipped off the INL Site for treatment, disposal, or both. Approximately 39.93 cubic meters (1,410.21 cubic feet or 52.23 cubic yards) of newly generated, low-level waste was disposed of at the Subsurface Disposal Area (SDA) in 2020 (INL 2021b).

When the 1995 PEIS was prepared, about 65,000 cubic meters of TRU waste was in retrievable storage, 62,000 cubic meters of TRU waste had been buried at the RWMC, and there were no disposal facilities at the INL Site for TRU waste. Since then, DOE opened WIPP, to which TRU waste from the INL Site has been transported for disposal. As of December 31, 2020, a total of 61,820 cubic meters (80,858 cubic yards) of original volume TRU-contaminated waste has been processed (i.e., shipped or certified for disposal to the Waste Isolation Pilot Plant [WIPP]). INL's Integrated Waste Tracking System shows that approximately 5 cubic meters of TRU waste was generated at the INL Site in 2013 from activities other than the processing of existing buried or retrievable TRU and alpha-contaminated waste. Approximately 171 cubic meters of TRU waste was shipped to WIPP from the INL Site in 2020 (INL 2021b).

Waste Isolation Pilot Plant. The WIPP SEIS evaluated the disposal of approximately 88,360 cubic meters of TRU waste from the INL Site at WIPP by 2033 (35 years of operations) (DOE 1997). WIPP has received and emplaced approximately 49,000 cubic meters of TRU waste from the INL Site through January 2022 (WIPP 2022). The WIPP SEIS includes an evaluation of the transportation impacts associated with TRU waste disposal from the INL Site at WIPP.

Nevada National Security Site. The NNSS SWEIS evaluated the disposal of up to 48 million cubic feet of LLW at the NNSS. Of this total, only 1.3 million cubic feet of LLW would result from NNSS activities. The majority of LLW (46.7 million cubic feet) would come from activities at sites other than those at the NNSS, including those at the INL Site (DOE 2013). The NNSS

⁴ This SA presents waste information as follows: (1) LLW quantities are presented in cubic feet, which is the unit of measurement used in the NNSS SWEIS; (2) TRU waste quantities are presented in cubic meters, as that is the unit of measurement used in the 1995 Settlement Agreement and the WIPP SEIS.

SWEIS includes an evaluation of the transportation impacts associated with LLW disposal from the INL Site to the NNSS.

Water Quality. The INL contractor and the Idaho Cleanup Project (ICP) contractor monitor drinking water, liquid effluent, surface water runoff, and groundwater that could be impacted by the INL Site operations and activities. This monitoring is conducted to comply with applicable State and local laws and wastewater reuse permit requirements. During 2020, permitted facilities were (INL 2021b):

- Advanced Test Reactor Complex Cold Waste Pond,
- INTEC New Percolation Ponds,
- MFC Industrial Waste Ditch and Industrial Waste Pond

These facilities are sampled for parameters required by their facility-specific permits. Based on this sampling, no permit limits were exceeded in 2020, and all parameters were below applicable health-based standards (INL 2021b).

The INL and ICP contractors monitored ten drinking water systems in 2020 for parameters required by Idaho Rules for Public Drinking Water Systems (Idaho Administrative Code 58.01.08). Water samples collected from drinking water systems were well below safe drinking water limits for all relevant regulatory parameters. Because workers are potentially impacted from radionuclides in the Central Facilities Area (CFA) distribution system, the collected water samples also calculated the dose of tritium ingested by a CFA worker. The dose was estimated to be 0.20 millirem. This is below the U.S. Environmental Protection Agency standard of 4 millirem per year for public drinking water (INL 2021b).

The ICP contractor sampled surface water runoff from the Subsurface Disposal Area of the RWMC in 2020 for radionuclides in compliance with all regulatory standards. Americium-241, plutonium-239/240 (239/240Pu), and strontium-90 (90Sr) were detected in 2020 samples collected from the SDA Lift Station. The detected concentrations are well below standards established by DOE for radiation protection of the public and the environment. (INL 2021b).

2.2 RESOURCE AREAS ELIMINATED FROM DETAILED ANALYSIS

Resource areas that would be unaffected by the proposed action evaluated in this SA or any impacts that would be minimal and clearly bounded by analyses in prior NEPA documents were eliminated from detailed analysis in this SA. For example, because the proposed action would not result in any land disturbance, there would be no potential to impact land, cultural, soil, or geologic resources at the INL Site. Consequently, the environmental conditions for these resource areas are not further discussed. Table 2-2 identifies the resource areas and provides the rationale for eliminating these resources from detailed analysis.

Table 2-2. Resource Areas Eliminated from Detailed Analysis

Resource Area Eliminated from Detailed Analysis	Rationale
Land	Proposed action would not disturb land and would not change land uses.
Cultural and Paleontological	Proposed action would not disturb land and would not impact cultural or paleontological resources.
Soil	Proposed action would not disturb land and would not impact soils.
Geology	Proposed action would not disturb land and would not impact geological resources.
Visual	Proposed action would not require new construction and would not change visual characteristics.
Noise	Proposed action would not introduce new noise sources and would not change background noise levels.
Ecological	Proposed action would not disturb ecological habitats and would not result in impacts that could affect ecological resources.
Socioeconomics	Proposed action would not change workforce requirements and would not notably impact socioeconomic resources in the region of influence. However, DOE has acknowledged that the funding associated with the research activities would be about \$4 to \$8 million annually for three years, through 2026 (INL 2021a).
Utilities	Proposed action would not result in any measurable utility changes compared to existing requirements.
Greenhouse Gas Emissions	Proposed action would not substantially increase carbon dioxide-equivalent emissions or associated climate change impacts (see Section 2.3).

2.3 NEW INFORMATION

Intentional Destructive Acts. When DOE prepared the 1995 PEIS, DOE NEPA documents did not normally include an analysis of the potential impacts of intentional destructive acts. Following the terrorist attacks of September 11, 2001, DOE has implemented measures to minimize the risk and consequences of potential terrorist attacks on its facilities and now, consistent with Council on Environmental Quality (CEQ) guidance, also analyzes the potential impacts of intentional destructive acts in NEPA documents. In this SA, DOE has evaluated security scenarios involving intentionally destructive acts to assess potential environmental impacts (see Chapter 3). The analysis addresses both the transportation of SNF and radiological wastes, as well as activities at the INL Site.

Dose Conversion Factor. When converting radiological doses to potential latent cancer fatalities, the 1995 PEIS used a factor of 5×10^{-4} fatality per rem for the public and a factor of 4×10^{-4} fatality per rem for workers. The value for workers was lower due to the absence of children and the elderly, who were considered to be more radiosensitive (DOE 2000). Since publication of the 1995 PEIS, DOE guidance (DOE 2003) recommends the use of a conversion factor of 6×10^{-4} fatality per rem for both workers and members of the public. The DOE guidance recommends use of factors developed by the Interagency Steering Committee on Radiation Standards. Using the higher conversion factor increases the potential radiological impacts presented in the 1995 PEIS by 50 percent for workers and 20 percent for the public. Chapter 3 of this SA presents the results of this change.

LATENT CANCER FATALITY

A latent cancer fatality is a death from a cancer that results from, and occurs an appreciable time after, exposure to ionizing radiation. Death from radiation-induced cancers can occur any time after the exposure. However, latent cancers generally occur from 1 year to many years after exposure. Using a conversion factor of 0.0006 latent cancer fatality per rem of radiation exposure, the result is the increased lifetime probability of developing a latent fatal cancer. For example, if a person received a dose of 0.033 rem, that person's risk of latent cancer fatality from that dose over a lifetime would be 0.00002. This risk corresponds to 1 chance in 50,000 of a latent cancer fatality during that person's lifetime. Because estimates of latent cancer fatalities are statistical, the results often indicate less than 1 latent cancer fatality for cases that involve low doses or small populations. For instance, if a population collectively received a dose of 500 person-rem, the number of potential latent cancer fatalities would be 0.3.

Greenhouse Gas Analysis. Where appropriate, DOE NEPA documents consider the potential impacts associated with greenhouse gas (GHG) emissions. The proposed action evaluated in this SA would emit less than approximately 4.5 metric tons of carbon dioxide-equivalent GHG emissions in transporting the SNF to the INL Site. Because the GHG emissions associated with the proposed action would be minimal, a detailed GHG analysis is not required for this SA.

3 COMPARISON OF IMPACTS

3.1 INTRODUCTION

Figure 3-1 illustrates the impact assessment process DOE used in this SA. As this figure indicates, DOE conducted an initial screening review to determine if there were new circumstances or information relevant to environmental concerns or impacts associated with the proposed action evaluated in this SA that would warrant additional NEPA analysis.

As part of the initial screening review, DOE identified the resource areas the proposed action could affect, as described in Section 2.1 of this SA. The following section contains further analysis of these resource areas.

3.2 ENVIRONMENTAL IMPACTS

3.2.1 Spent Nuclear Fuel Transportation Impacts

The 1995 PEIS addressed the impacts of transporting approximately 2,700 SNF shipments to the INL Site (see Figure 3-4 of DOE 1995a). For shipments of DOE SNF (which includes special-case commercial SNF), the 1995 PEIS addressed the transportation impacts associated with 1,551 truck shipments (DOE 1995a, Volume 1, Table I-2 of Appendix I). For the alternative selected in the 1995 PEIS ROD (Regionalization by Fuel Type), the potential impacts associated with the incident-free⁵ truck transportation of DOE SNF were estimated for the population along the routes across the United States as follows (DOE 1995a, Table I-8 of Appendix I):

- 0.060 radiation-related latent cancer fatality for transportation workers,
- 0.17 radiation-related latent cancer fatality for the general population, and
- 0.0098 non-radiological fatality from vehicular emissions.

These fatalities were estimated over the 40-year period from 1995 through 2035 and were based on an assumption that each SNF cask would contain 5 MTHM and that external dose rates would be the maximum allowed by regulation [10 millirem per hour at any point 2 meters from the transport vehicle (10 CFR 71.47)]. The impacts per shipment for DOE SNF would be:

- 3.9×10^{-5} radiation-related latent cancer fatality for transportation workers,
- 1.1×10^{-4} radiation-related latent cancer fatality for the general population, and
- 6.2×10^{-6} non-radiological fatality from vehicular emissions.

In contrast, the proposed action evaluated in this SA would involve one SNF truck shipment, containing 25 SNF rods totaling approximately 0.04 to 0.05 MTHM. Based on this much smaller cask loading (a maximum of 0.05 MTHM per shipment for the proposed

⁵ "Incident-free" refers to transportation activities without accidents or other unexpected or unusual occurrences.

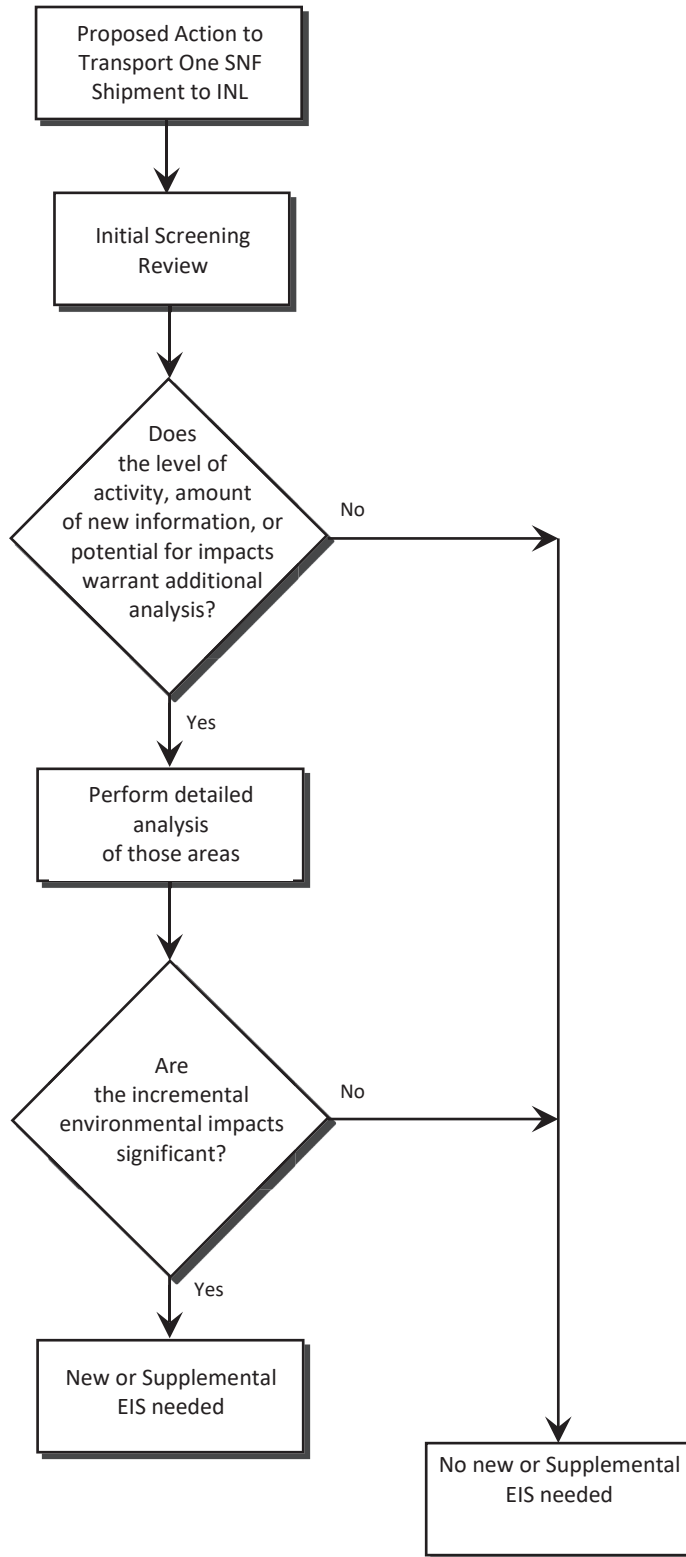


Figure 3-1. Assessment Process Used in this Supplement Analysis

action versus 5 MTHM for the fully loaded cask analyzed in the 1995 PEIS), the potential incident-free radiological impacts of the SNF shipment would be expected to be a fraction (approximately one-half of one percent) of the potential radiological impacts presented in the 1995 PEIS, assuming no other differences. However, to be conservative, this SA assumes that the external dose from the SNF would not be reduced, but instead would be the maximum allowed by regulation. When taking into account other changes that have occurred since the 1995 PEIS was issued [e.g., a 20-percent increase in the population along the transportation routes (see Section 2.1) and changes in the dose conversion factor (see Section 2.3)], the potential impacts associated with the incident-free truck transportation of the shipment of SNF for the proposed action is estimated as follows:

- 7.0×10^{-5} radiation-related latent cancer fatality for transportation workers;
- 1.9×10^{-4} radiation-related latent cancer fatality for the general population; and
- 7.5×10^{-6} non-radiological fatality from vehicular emissions.

The potential impacts associated with the incident-free truck transportation of the truck shipment of SNF for the proposed action evaluated in this SA would be small and are bounded by the impacts presented in the 1995 PEIS for shipments of DOE SNF.

The 1995 PEIS contains a detailed analysis of the potential impacts associated with transportation accidents involving SNF (see Section I-5 of Appendix I). For the alternative selected in the 1995 PEIS ROD (Regionalization by Fuel Type), the total accident risk⁶ (from 1995 to 2035) for truck transportation was estimated to be:

- 0.0010 latent cancer fatality and 0.26 traffic fatality (see Table I-34 of Appendix I in the PEIS).

With regard to the proposed action evaluated in this SA, the material in the shipment would be approximately 1 percent as much as that analyzed in each shipment in the 1995 PEIS. Although release fractions associated with accidents would not change, the source term (i.e., the quantity of radiological material released in a given accident) would be approximately 1 percent as much as was analyzed in the 1995 PEIS. Taking into account all of the factors that would affect the accident risk (e.g., 1 shipment versus 1,551; 1 percent as much material at risk per shipment; a 20-percent increase in the population along the transportation routes; and changes in the dose conversion factor⁷), the total accident risk for truck transportation from the proposed action would be:

- 1.2×10^{-8} latent cancer fatality and 0.0002 traffic fatality.

⁶ Risk is calculated by multiplying the consequence of an accident times the probability that the accident would occur. The total accident risk is the compilation of all risks.

⁷ The 1995 PEIS does not present accident risk separately for the public and workers. Consequently, the accident analysis in this SA conservatively assumes a 50-percent increase in impacts from the dose conversion factor.

Table 3-1 summarizes the potential transportation impacts of the proposed action evaluated in this SA and the impacts presented in the 1995 PEIS. As can be seen, the potential accident impacts associated with the transport of the SNF for the proposed action evaluated in this SA would be smaller than and are bounded by the impacts presented in the 1995 PEIS. To date, only approximately 28 MTHM of SNF have been shipped to the INL Site since the 1995 PEIS was issued, and the addition of 0.04 to 0.05 MTHM of SNF (e.g., the quantity associated with the proposed action in this SA) is much less than that analyzed in the 1995 PEIS, selected in the amended ROD, and identified in the Settlement Agreement (i.e., 55 MTHM).

Table 3-1. Summary of Potential Transportation Impacts

	SA Proposed Action	1995 PEIS ^a
Number of SNF shipments	1	1,551
Incident-free impacts		
Number of radiation-related latent cancer fatalities for transportation workers	7.0×10^{-5}	0.060
Number of radiation-related latent cancer fatalities for the general population	1.9×10^{-4}	0.17
Number of non-radiological fatalities from vehicular emissions	7.5×10^{-6}	0.0098
Total accident risk		
Number of latent cancer fatalities	1.2×10^{-8}	0.0010
Number of traffic fatalities	0.0002	0.26

a. Based on shipments of DOE SNF (which includes special-case commercial SNF).

An analysis was also performed of any possible impacts to estimated dose rates that could result from using a NAC-LWT cask loaded with 25 high-burnup fuel rods. The conclusions of the analyses demonstrated that the payloads will be under 49 CFR 174.441(a) limits not to exceed 200 mrem per hour at any point on the external surface of the package and not exceeding 10 mrem per hour at 2 meters from the outer lateral surfaces of the vehicle (INL 2021a).

3.2.2 Research and Operations at the Materials and Fuels Complex

Specific to the proposed action evaluated in this SA, research and operations at the MFC would have the potential to generate air pollutants, including but not limited to radionuclides, chemical and combustion emissions, and ozone-depleting substances. The types of air emissions associated with operations under the proposed action are the same as those analyzed in the 1995 PEIS and DOE/EA-1148 (DOE 1996).

The 1995 PEIS states that “[a]s with Alternative 3, this alternative [the selected Alternative 4a] would include the continuation of activities related to the treatment of spent nuclear fuel, including research and development (e.g., Electrometallurgical Process Demonstration Project) (DOE 1995a). For the alternative selected in the 1995 PEIS ROD (Alternative B, which includes

Regionalization by Fuel Type), the potential impacts from annual radiological emissions at the INL Site were estimated as follows (DOE 1995a, Volume 2, Table 5.7-4):

- 0.46 millirem to the maximally exposed worker,
- 0.63 millirem to the MEI offsite, and
- 2.9 person-rem to the 50-mile population surrounding the INL Site.⁸

Additionally, DOE/EA-1148 includes an analysis of the potential impacts of radiological emissions from electrometallurgical treatment of SNF. The analysis in DOE/EA-1148 is based on much higher quantities of SNF than those associated with the proposed action in this SA. For example, DOE/EA-1148 analyzed operations consisting of seven batches, with a throughput of approximately 160 kilograms (353 pounds) of SNF per batch. As summarized in Section 4.1.1.2 of that EA, the potential offsite radiological doses from routine operations were “quite small” (less than 1.1×10^{-6} rem per year to the MEI). This is more than a factor of 9,000 less than the 0.01 rem per year annual dose limit imposed by the National Emission Standards for Hazardous Air Pollutants (NESHAP). No increased radiation levels, above background, would be detectable at the INL Site boundary (DOE 1996).

For the proposed action evaluated in this SA, DOE has estimated air emissions to be minor, and concentrations would not exceed the existing monitored air emissions from HFEF. Small quantities of volatilized fission products and fission gas emissions would be released to the HFEF Main Cell environment, and the potential radiological releases to the Main Cell would be consistent with other in-cell processes. Facility operations would control particulate emissions via high-efficiency particulate air filtration and would monitor emissions using a continuous emissions monitoring system (INL 2014b). DOE calculated the estimated MEI that may result from implementing the proposed action to be 1.17×10^{-3} millirem per year (1.17×10^{-6} rem per year) (INL 2021a). The doses calculated for both DOE/EA-1148 and the proposed action are very conservative, in that DOE assumed the receptor was a person living approximately 5 kilometers from the MFC facility (the nearest highway). In addition, the dose for the proposed action was assumed to occur in a single year and not each year for the duration of the project. For the proposed action, the dose to the MEI at the location used for INL Site-wide NESHAPs reporting would be 4.78×10^{-4} millirem. That additional increment would not change the total 2013 site-wide MEI dose (0.03 millirem).

With respect to worker doses, DOE controls worker doses to as low as reasonably achievable (ALARA). The proposed action would not affect this approach (INL 2021a).

⁸ For comparative purposes, in 2013, the dose to the hypothetical MEI was estimated to be 0.03 millirem, and the maximum potential population dose (to the approximately 314,069 people residing within a 50-mile radius of any INL Site facility) was estimated to be 0.499 person-rem (INL 2014a).

Because there would be no special pathways that could result in disproportionately high and adverse impacts on minority or low-income populations, there would be no environmental justice impacts.

According to the analysis in this section, the potential air emissions and human health impacts associated with the proposed action evaluated in this SA would be smaller than and are bounded by the impacts presented in the 1995 PEIS and DOE/EA-1148.

The proposed action evaluated in this SA would not use measurable quantities of water and would not release pollutants to surface water or groundwater (INL 2014a). Consequently, no impacts to water resources are expected under normal operations.

The proposed action evaluated in this SA would not introduce any new processes or new types of materials into the MFC than currently exist and would not increase the quantities of materials to change the accident analyses presented in the 1995 PEIS (DOE 1995a; see specifically Table 5.15-11) or DOE/EA-1148 (DOE 1996; see specifically Tables 4-1 and 4-2). The analyses in those documents considered the potential impacts from accidents involving significantly greater quantities of material than are associated with the proposed action evaluated in this SA. Consequently, the accident risks and consequences presented in those documents would bound any potential impacts associated with the proposed action evaluated in this SA.

The bounding accident for INL's Materials and Fuel Complex facilities involved in commercial fuels work, entails a seismic induced release at the HFEF, which is considered extremely unlikely (HFEF Safety Analysis Report, SAR-405, Revision 3). The addition of the approximately 50 kgHM of proposed material does not appreciably change the bounding source term nor the material considered at risk used in the analysis (INL 2021a).

3.2.3 Waste and Spent Nuclear Fuel Management

During the performance of this research, four types of wastes will be generated. Contact-handled low-level waste (CH-LLW) includes sample residues and associated wastes (e.g., protective clothing, wipes, vials) generated from sample analyses during fuel characterization and testing. Low-level liquid wastes will also be generated during sample analyses. These wastes will be neutralized and solidified. Remote handled low-level wastes (RH-LLW) will be generated and include irradiated reactor hardware, filters, and equipment. Contact-handled and remote-handled transuranic waste (CH-TRU, RH-TRU) will be generated from product samples and analysis, electrochemistry electrolytes, and waste from research and development (R&D) activities (INL 2021a).

The total projected waste volume over the 8-year timeframe is estimated to be approximately 7 cubic meters of waste (INL 2021a). INL currently has operating waste management facilities and required permits to manage all wastes that are anticipated to be generated as a result of the proposed action. The wastes that would result from the proposed action evaluated in this SA

would be managed [and disposed of] in accordance with the waste management practices in place at the time DOE determines the material is no longer useful and is considered waste. The waste would then undergo a waste classification and be sent to the appropriate facilities for disposal.

LLW may be generated as part of the proposed action in quantities estimated at 3 cubic meters (106 cubic feet). Currently, DOE disposes of the majority of INL Site contact handled LLW (CH-LLW) at the NNSS and anticipates this disposal option would be available for the duration of the proposed action. The quantities of CH-LLW that could be sent to the NNSS would be inconsequential in comparison with the 1.32 million cubic meters (46.7 million cubic feet) NNSS would receive from the activities at other DOE sites (as evaluated in DOE 2013). DOE has a facility for disposal of remote-handled LLW (RH-LLW) for waste generated at the INL Site (DOE 2011b). Continuing and potential new DOE missions could result in the generation of remote-handled debris and process waste such as gloves, tools, steel hardware, and process components (e.g., pumps and drain tanks). RH-LLW meeting the waste acceptance criteria and containing less than 100 nanocuries per gram of transuranic radionuclides may be disposed of in the RH-LLW disposal facility

POTENTIAL WASTES FROM THE PROPOSED ACTION

TRU: Waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes with half-lives greater than 20 years per gram of waste, except for (1) high-level radioactive waste; (2) wastes the Secretary of Energy has determined, with the concurrence of the Administrator of EPA, that do not need the degree of isolation required by the disposal regulations; or (3) wastes the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

LLW: As defined by the *Low-Level Radioactive Waste Policy Amendments Act of 1985*, LLW is radioactive waste that is not high-level waste, spent nuclear fuel, transuranic waste, or by-product material (as defined in Section 11e(2) of the *Atomic Energy Act of 1954*, as amended, and material that the NRC, consistent with existing law, classifies as low-level radioactive waste.

GTCC-like: As used in this SA, GTCC-like waste refers to radioactive waste that is owned or generated by DOE and has characteristics similar to those of GTCC waste such that a common disposal approach may be appropriate. GTCC-like waste consists of LLW and potential non-defense-generated transuranic waste that has no identified path for disposal. The term is not intended to, and does not, create a new DOE classification of radioactive waste.

HLW: (A) the highly radioactive material resulting from the reprocessing of SNF, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the [NRC], consistent with existing law, determines by rule requires permanent isolation.

TRU waste may be generated as part of the proposed action in quantities estimated at 4 cubic meters (43kgHM). Current facilities and operations require the use of the HFEF Hot Cell, which is radioactively contaminated as a result of years of management and examination of both defense- and non-defense-related materials and contamination. Because segregation of these two types of materials is virtually impossible, waste generated from activities proposed to be conducted in the HFEF Hot cell could be determined to be defense-related TRU and would be eligible for disposal at WIPP. If such waste is determined to be non-defense-related it would be ineligible for disposal at WIPP and could be managed as GTCC-like waste, SNF, or HLW. GTCC-like wastes could be sent to one of the facilities DOE is has evaluated in the *Environmental Impact Statement for the Disposal of GTCC LLW and GTCC-Like Waste* (DOE 2016), or it could be sent to the Nuclear Waste Policy Act repository as could materials classified as SNF or HLW. SNF, HLW, and GTCC-like wastes were included in the analysis of potential environmental impacts from waste management operations in the Volume 2 portion of the 1995 PEIS.

While not anticipated, approximately 0.028 cubic meter (1.0 cubic foot) of HLW may be generated upon discard of the electrorefiner contents. The waste determination would be made at the time DOE has no further use for the research material. The potential quantity of HLW that may be generated by the proposed action is encompassed by the quantities identified in the 1995 PEIS Volume 1, Appendix B, Table 5.14-1 (i.e., 3 cubic meters annually).

If there is no existing disposal facility available for wastes generated by the proposed action, the wastes would be safely stored in existing facilities in accordance with federal and state regulations until it could be disposed of at an offsite permitted and licensed facility.

No more than 0.01 MTHM of SNF (10 kilograms of heavy metal) may be selected and saved in a fuel library to enable future research activities into issues of fuel safety or performance. That material would constitute a 0.00003 percent increase in the quantity of SNF that is currently stored at the INL Site (i.e., 308 MTHM) and would be well within the quantities selected in the amended ROD and the limits established by the 1995 Settlement Agreement and the MOA. The SNF and SNF debris would be securely and safely stored with DOE's existing SNF and SNF debris inventory at the INL Site and disposition with that existing SNF. The storage of SNF debris was included in the analysis of the 1995 PEIS, and potential quantities from the proposed action that may need storage are well within the quantities of SNF analyzed in the 1995 PEIS.

3.2.4 Intentional Destructive Acts

When the 1995 PEIS was prepared, DOE NEPA documents did not normally include an analysis of intentional destructive acts. Following the events of September 11, 2001, DOE has implemented measures to minimize the risk and consequences of potential intentional destructive acts on its facilities. Consistent with CEQ guidance, DOE currently analyzes the potential impacts of intentional destructive acts in NEPA documents. DOE guidance for this analysis is provided in *Recommendations for Analyzing Accidents under the National Environmental Policy Act* (DOE 2002).

It is not possible to predict whether intentional destructive attacks would occur, or the nature or types of such attacks. Nevertheless, DOE has evaluated security scenarios involving intentionally destructive acts to assess potential vulnerabilities and identify improvements to security procedures and response measures. Security at its facilities is a critical priority for DOE. Therefore, DOE continues to identify and implement measures to defend and deter attacks. DOE maintains a system of regulations, orders, programs, guidance, and training that form the basis for maintaining, updating, and testing site security to preclude and mitigate any potential intentional destructive attacks.

The conservative assumptions inherent in the accidents analyzed in the 1995 PEIS assumed initiation by natural events, equipment failure, or inadvertent worker actions. The accidents evaluated in the 1995 PEIS included earthquakes, fires, criticalities, and airplane crashes, all of which could cause a release of radiological materials to the environment (DOE 1995a, Section 5.15 of Appendix B). Intentional destructive acts could also potentially cause a release of

radiological materials to the environment. If that were to occur, the resulting radiological release and consequences to workers and the public would be similar to those occurring from natural or man-caused events. Notwithstanding the remote risk of an intentional destructive act that could affect operations at the INL Site, in the unlikely event that an intentional destructive act did successfully breach the physical and other safeguards at DOE facilities resulting in the release of radionuclides, the potential consequences would be no worse than those of the highest consequence accident analyzed in the 1995 PEIS. The receipt of Byron research materials will not increase the protection level (PL) or risk to HFEF spent nuclear fuels because HFEF has already been designated a PL-6 asset (INL 2021a).

Mitigation of intentional acts is addressed as follows (INL 2021a):

- The threat of unauthorized access to the spent fuel by outsiders or by insiders lacking proper access authorization is mitigated by alarms, access controls, and an armed protective force presence within the area. HFEF is considered to be “low” risk based on DOE-NE risk rating criteria for these threats.
- The threat of insiders with authorized access to the spent fuel is mitigated by the security clearance process for employees, robust spent fuel storage, and access controls that prevent the majority of the facility population from having authorized access to the spent fuel. In instances where the insider risk could be considered higher than “Low,” risk can be accepted by the Idaho Operations Office Officially Designated Federal Security Authority (ODFSA) for a PL-6 asset.

There is also a potential for an intentional destructive act during SNF transport from the Byron Nuclear Power Station to the INL Site. In the Yucca Mountain SEIS, DOE examined the potential impacts associated with intentional destructive acts involving SNF transportation (DOE 2008). That analysis conservatively estimated (that is, tended to overstate the risk) the potential impacts of an intentional destructive act in which a high energy density device penetrated a rail or truck cask of SNF. DOE estimated that there would be 28 latent cancer fatalities in the exposed population if the intentional destructive act occurred in an urban area. If the intentional destructive act took place in a rural area, DOE estimated that the probability of a single latent cancer fatality in the exposed population would be 0.055 (i.e., 1 chance in 20) (DOE 2008).

The quantity of SNF that would be transported under the proposed action evaluated in this SA would be significantly lower than the quantities of the materials used for the analysis in the Yucca Mountain SEIS (DOE 2008). For example, a typical SNF legal-weight truck cask contains approximately 5 MTHM of SNF, while the maximum quantity of SNF that would be transported for the proposed action would be approximately 0.05 MTHM per shipment (one shipment of 25 SNF rods). Therefore, the above estimates of risk identified in the Yucca Mountain SEIS bound the risks from an intentional destructive act involving the SNF transported for the proposed action.

4 CUMULATIVE IMPACTS

CEQ regulations at 40 CFR 1508.7 define cumulative impacts as “the incremental impacts 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.” Implementation of the proposed action evaluated in this SA would not require any new construction and would be conducted in the MFC, which currently conducts operations that are similar in nature to the proposed action. The impacts on transportation, worker health, waste management, water resources, and environmental justice concerns are not significant and cumulative effects are anticipated to be minimal. The only resource area where cumulative impacts may be slightly affected is related to the radiological dose to the offsite MEI.

In December 2022, DOE completed a cumulative impacts analysis for the INL Site that included potential doses from past, present, and reasonably foreseeable future actions for both private and public entities as part of the *Final Versatile Test Reactor Environmental Impact Statement* (DOE 2022). DOE estimated the cumulative dose to the MEI to be 1.8 millirem per year. The addition of the estimated dose from the proposed action of 1.17×10^{-3} millirem per year (INL 2021a) constitutes a very small change in the estimated cumulative dose.

5 PUBLIC COMMENTS ON THE DRAFT SA

This chapter consists of responses to comments received on the Draft SA. DOE prepared the Draft SA in accordance with DOE NEPA Implementing Regulations at 10 CFR 1021.314 and *Recommendations for the Supplement Analysis Process* (DOE 2005). Although a public comment period is not required for a Draft SA, DOE circulated the Draft SA for public comment in response to the level of government and community interest in the proposed action. The following paragraphs describe the public-comment process.

5.1 DRAFT SUPPLEMENT ASSESSMENT PUBLIC COMMENT PERIOD

DOE issued the Draft SA on June 11, 2015, for public comment. DOE announced the availability of the Draft SA for public review and comment via direct notice to the INL stakeholder mailing list and press release distributed to local media; this announcement began a 30-day comment period, which ended on July 13, 2015. DOE made the Draft SA available on the DOE NEPA Website at <http://energy.gov/nepa/downloads/draft-supplement-analysis> and provided the Draft SA and related documents on the DOE Idaho Operations Office Website at <http://www.id.energy.gov/insideNEID/PublicInvolvement.htm>.

DOE received 100 comment documents on the Draft SA from elected officials; tribal, state, county, and city governments; public and private organizations; and individuals. These comments were submitted via U.S. Mail and electronic mail. All comments received by DOE have been considered in this chapter. Two requests for an extension of the comment period were received. DOE informed the requestors that it would not extend the comment period, believing that the 30-day comment period was sufficient time given the length and scope of the document.

DOE also considered additional comments on the Draft SA from the Shoshone-Bannock Tribes on November 28, 2023.

5.2 HOW DOE CONSIDERED PUBLIC COMMENTS

DOE considered all public comments submitted on the Draft SA. Some comments led to modifications of the analysis and text included within the SA. As applicable, the responses in this chapter identify changes DOE made to this SA as a result of comments.

5.3 COMMENT RESPONSES

This section contains summaries of responses to the draft SA. Comments were categorized within the following five categories: (1) Proposed Action/Purpose and Need; (2) NEPA Process; (3) SNF and Waste Management; (4) Environmental Impacts; and (5) Miscellaneous. These categories were broken down further into sub-issues, and responses have been prepared for each of the sub-issues.

5.3.1 Proposed Action/Purpose and Need

5.3.1.1 Need for Proposed Action

Comments were received in support of, or opposition to, the proposed action.

Response: DOE acknowledges the comments related to the need to proceed with these research and development activities. Similarly, DOE acknowledges the comments generally related to opposition to the proposed action.

5.3.1.2 Need for Nuclear Power

Comments were received in opposition to nuclear power.

Response: Evaluating nuclear energy's place in the energy market is out of scope of this effort. Regardless of opposition to nuclear power, the intent of the proposed action is to improve the safeguards and safety of nuclear energy operations.

5.3.2 NEPA Process

5.3.2.1 Request for Additional NEPA Documentation

Several commenters requested that DOE prepare an EIS or EA for the proposed action.

Response: The question on whether DOE should complete a supplemental EIS, a new EIS, or no further NEPA documentation for the proposed action is the basis for preparation of this SA. The analysis included within this SA determines whether the proposed action represents a substantial change or significant new circumstances or information relevant to environmental concerns.

DOE identified six existing NEPA documents relevant to the proposed action (which are identified and discussed in Section 1.4 of this SA). The most relevant, existing NEPA document is the *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Environmental Impact Statement* (1995 PEIS), which analyzed the potential environmental consequences of alternatives related to the transport, receipt, and subsequent management (including research and development activities) of SNF under the responsibility of the DOE until the year 2035. DOE has been implementing the selected alternative since 1995.

The 1995 PEIS and the other relevant NEPA documents identified in this SA evaluated the potential impacts of transporting SNF to the INL Site, the subsequent research and operations at the INL Site involving the SNF, and the management and disposition of SNF and waste from the research and operations at the INL Site. DOE does not consider the proposed action a change to the current SNF program. The types of activities [commercial SNF research and development (R&D)] now contemplated by DOE were included within the scope of the 1995 PEIS and do not change past decisions, are not a substantive change to those decisions, and, as this SA indicates, would not have a significant environmental impact to human health or the environment. There are no broad generic issues or broad technology changes contemplated by this SA that were not already contemplated in the 1995 PEIS. The analysis in this SA indicates that the identified and projected environmental impacts of the proposed action would not be significantly different than impacts analyzed in the 1995 PEIS and the relevant NEPA documents.

5.3.2.2 Age of Existing NEPA Documents

Comments were received that the existing NEPA documents considered in the SA process are outdated.

Response: The dates of the existing analyses were considered as part of the SA process. The SA evaluation of existing NEPA analyses included a review of technical, regulatory, and policy developments since they were prepared to assess whether new information or decisions would affect the existing analyses. In addition, existing NEPA documentation does not expire at a specific point. NEPA does not impose a requirement upon agencies to supplement or prepare a new EIS every time new information comes to light.

DOE does not believe the analyses in the existing NEPA documents referenced in this SA are outdated and not useful to make informed decisions. This SA provides a current analysis of the potential environmental impacts of the proposed action, which are compared to the analyses in the existing relevant NEPA documents.

5.3.2.3 Decision-making

Commenters expressed concern that the decisions have already been made to ship the SNF to the INL Site and questioned the role of the State of Idaho in any decision-making process (including whether the shipments could be waived individually).

Response: No decision to ship the SNF to the INL Site would be made until this SA, or any required, subsequent NEPA document, has been completed. Any determination made as a result of the SA process is only part of the ultimate decision as to whether DOE would move forward with the proposed action and would not supersede the requisite waiver from the State of Idaho. In order for DOE to receive the proposed SNF shipment at the INL Site, the State of Idaho must issue a waiver for the shipment.

5.3.2.4 Similar Actions

A commenter questioned the appropriateness of assessing the two shipments under a single document, stating that “there appears to be no connection between the two shipments that comprise the proposed action, other than DOE’s desire that they occur within the same short timeframe.” The commenter asserts that including the two shipments in one SA has “distorted this analysis.”

Response: When DOE prepared the Draft SA, DOE determined the two actions to be “similar” given their common timing and purpose, and therefore appropriately addressed under a single document in accordance with 40 CFR 1508.25(a)(3). As discussed in Section 1.3, DOE is no longer proposing to transport SNF from the North Anna Nuclear Power Station to the INL Site. Consequently, in this Final SA, DOE is only proposing one shipment of SNF to the INL Site, and this Final SA assesses that one shipment and the subsequent research and development activities.

5.3.2.5 Extension Request

Two commenters requested an extension of the public comment period on the SA.

Response: DOE informed the requestors that it would not extend the comment period, believing that the 30-day comment period was sufficient time given the length and scope of the document.

5.3.2.6 Nonproliferation

One commenter stated that a new nonproliferation impact assessment should be conducted.

Response: If the results of the proposed research on pyroprocessing of commercial light water reactor fuel showed that the process is applicable to that fuel type, DOE anticipates that any type of production level use of that process would require a nonproliferation impacts assessment. At this time, DOE does not know if the results of the potential research would produce a material that would have a nonproliferation concern. Conducting a nonproliferation impact assessment is beyond the scope of this SA.

5.3.2.7 Future Shipments

Several commenters expressed concern about potential future shipments of SNF to INL beyond the proposed action. Commenters requested that DOE fully disclose its plans for commercial SNF shipments to the INL Site through a full EIS that is up to date and that addresses all potential future commercial SNF shipments. Many commenters were particularly concerned with the research activities at North Anna Nuclear Power Station.

Response: DOE routinely performs assessments of facilities within its complex to determine the extent of its capabilities to perform a broad array of potential future missions. The report referenced by one commenter, *Viability of Existing INL Facilities for Dry Storage Cask Handling*, is one such assessment. Similar assessments have been conducted recently at facilities

at DOE's Savannah River Site. As discussed in Section 1.3 of this SA, DOE is no longer proposing to transport the SNF from the North Anna Nuclear Power Station to the INL Site.

5.3.2.8 Tribal Consultation

The Shoshone Bannock Tribes expressed concern that government-to-government consultation was not conducted appropriately, and that DOE had failed to comply with the consultation requirements of the National Historic Preservation Act.

Response: DOE recognizes and respects the Shoshone-Bannock Tribes' (Tribes) unique connection to their ancestral homelands; a portion of this land (890 square miles) is now occupied and set aside for DOE operations. Pursuant to the Agreement in Principle (AIP) and the DOE Order 144.1 American Indian Tribal Government Interactions and Policy, DOE is committed to upholding its federal trust relationship through an ongoing and constructive government-to-government relationship with the Tribes. DOE considered the scope of the activities involved in the proposed action and determined they would not have the potential to cause effects to historic properties. Based on that assessment, a Section 106 consultation was not specifically required. However, to meet the intent and spirit of the NHPA and the AIP, local DOE representatives met with the Fort Hall Business Council on February 6, 2015, to present information to the Council on the proposals. On May 14, 2015, the DOE Headquarters Assistant Secretary for Nuclear Energy met with the Fort Hall Business Council to present the proposal and listen to Tribal concerns and input. The DOE Idaho Operations Office Manager briefed the Fort Hall Business Council on November 20, 2023, on the updates to the proposed action.

DOE is committed to the intent and substance of the AIP, respects the cultural and natural resources of importance to the Tribes, and will continue to strive to meet the Tribes' expectations for consultation. The Tribes are a fully engaged and a critical part of DOE's efforts to protect and manage cultural and natural resources on the INL Site through participation and involvement of the Tribes' Heritage Tribal Office (HeTO) within the Tribal/DOE Program. HeTO is a foundational member of the Cultural Resource Working Group (CRWG), which is composed of the Tribes, DOE, and DOE's contractor, Battelle Energy Alliance (BEA). The CRWG schedules monthly meetings to coordinate cultural resource surveys and research projects, to discuss INL Site projects, and share issues of cultural concerns around the INL Site. By consistently and effectively working closely with the HeTO, DOE keeps the Tribes informed of activities that have the potential to affect resources to which the Tribes attach cultural and spiritual importance.

In addition, the Department routinely briefs the Fort Hall Business Council on program and project issues at the INL Site. This ongoing communication reflects the Department's commitment to a government-to-government relationship. The core of this relationship is developed by trust and through working together. DOE respects and values the Tribes' input to its processes as a National Laboratory, and DOE's commitment to protect and preserve the environment through our cleanup efforts. DOE, HeTO, and BEA (the INL Contractor), through scheduled annual monitoring, visit cultural and natural resource sites. These visits assess status

and condition of sites to determine if there are any changes resulting from naturally occurring, environmental events, as well as any human or animal intrusions. The residual results of project activities are also reviewed and assessed.

The Tribes stated that the proposed action may have the potential to significantly impact resources of the Tribes, the environment, and surrounding public. The Tribes stated that DOE should prepare a new environmental impact statement for the proposed action, instead of relying on the 1995 PEIS and a supplement analysis, as significant changes have been made to the environment since 1995. The Tribes stated that the EIS should provide a full analysis of the potential harms/impacts that the shipment may have on communities, especially if an accident involving a radioactive release occurred.

Response: The 1995 PEIS and the other relevant NEPA documents identified in this SA evaluated the potential impacts of: transporting SNF to the INL Site, the subsequent research and operations at the INL Site involving the SNF, and the management and disposition of SNF and waste from the research and operations at the INL Site. DOE does not consider the proposed action a change to the current SNF program. The types of activities [commercial SNF research and development (R&D)] now contemplated by DOE were included within the scope of the 1995 PEIS and do not change past decisions, are not a substantive change to those decisions, and, as this SA indicates, would not have a significant environmental impact to human health or the environment. There are no broad generic issues or broad technology changes contemplated by this SA that were not already contemplated in the 1995 PEIS. The analysis in this SA indicates that the identified and projected environmental impacts of the proposed action would not be significantly different than impacts analyzed in the 1995 PEIS and the relevant NEPA documents.

The transportation cask system to be used for the shipment has been used by industry to transport U.S. commercial spent fuel and has been recently certified by the NRC as safe to protect persons, property and environment from the effects of radiation during the transport of radioactive material. The NRC Certificate of Compliance for the transportation casks (NAC-LWT) was last revised in 2020 and has been extended to 2025. The NAC-LWT certification is fully compliant with the latest regulations, including transport safety regulations implemented by NRC in 2004.

5.3.2.9 2011 Memorandum of Agreement

A commenter stated that DOE did not perform any kind of disclosure or analysis of the 2011 MOA pursuant to NEPA.

Response: DOE did not complete a NEPA analysis of the 2011 MOA because there was no specific action being proposed with the potential for environmental impacts (see Section 1.3). Until a specific action with a potential for environmental impacts is proposed, a NEPA analysis is not required.

5.3.2.10 Unavailable References

A commenter raised concern about four documents cited and referenced in the Draft SA that were not publicly available, including three documents published by DOE and one document published by the NRC.

Response: DOE has accessed the NRC document via the URL provided with the Draft SA, which can be accessed at <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/transport-spenfuel-radiomats-bg.html#spent>. The reference list in this SA has been updated to include the document weblinks. The third document, identified in the Draft SA reference list as the “Environmental Checklist for the Shipment of Sister Rods from North Anna to INL” has been deleted from this Final SA.

5.3.2.11 Schedule of Shipments

Two commenters questioned the accuracy of the schedule provided in the Draft SA for receipt of the shipments, asserting that the dates provided were “misleading.”

Response: DOE modified the footnote in Section 1.3. The statement “On March 3, 2015, DOE and the State of Idaho signed such an agreement. These shipments would be conducted under the processes and procedures of the 2011 MOA” was deleted.

The footnote was further modified to clarify the position that these activities would be conducted in accordance with the procedures of the Settlement Agreement and the 2011 MOA, including counting the R&D shipment quantities in the overall limit of 55 metric ton limits for DOE SNF to INL, the total annual SNF shipment limits to INL, and the notice and reporting requirements. DOE recognizes that it could not rely on the waiver in the 2011 MOA but needed additional approval (and sought a waiver to address compliance issues with the Settlement Agreement) in order to proceed with these shipments.

5.3.2.12 Legality of Proposed Action

A commenter stated that the SA misrepresents the status of DOE’s compliance with the 1995 Idaho Settlement Agreement as well as the validity of the 2011 MOA.

Response: DOE disagrees with the commenter’s description of the proposed action as it relates to the Idaho Settlement Agreement. DOE’s understanding is based on the following interpretation of the agreements:

Commercial SNF shipments are addressed separately from shipments of DOE-owned SNF under Section D.2.e of the Idaho Settlement Agreement, which provides: “Except as set forth in Section D.2.d. above [which section addresses Ft. St. Vrain fuel], DOE will make no shipments of spent fuel from commercial nuclear power plants to INEL.”

Item J.1 in the Settlement Agreement allows Idaho the right to waive any “terms, conditions and obligations contained” in the agreement. Thus, shipments of commercial power SNF may only be received at the INL with approval of the State of Idaho. DOE recognizes that under the Settlement Agreement it requires permission from the State of Idaho to receive commercial SNF shipments.

Due to the prohibition on importation of SNF from commercial power reactors in the Settlement Agreement and DOE research needs, DOE sought, and on January 6, 2011 signed, a Memorandum of Agreement with the state of Idaho (included as Appendix B of this SA), establishing a limited waiver of the Settlement Agreement Section D.2.e and conditions under which the INL Site could receive limited research quantities of commercial power SNF for examination, testing, and storage (DOE 2011a). Per the terms of the 2011 MOA, the waiver in the 2011 MOA for shipment of R&D quantities of commercial power SNF is not effective if DOE is not in compliance with the terms of the Settlement Agreement.

Consequently, on December 31, 2014, DOE requested that the State of Idaho exercise its authority under the Settlement Agreement to allow INL to receive the two R&D quantities of commercial power reactor SNF shipments (now one shipment). DOE has always intended to receive R&D quantity shipments of commercial power reactor SNF in accordance with the agreed to processes and procedures in the 2011 MOA. As stated in the formal notification letter regarding these two (now one) R&D quantity SNF projects to the State under the procedures of the 2011 MOA dated December 16, 2014: “Your support of INL's researchers and unique capabilities has been instrumental in the commercial industry's confidence to conduct this research in Idaho. The research from these two projects is highly important to the nation's nuclear industry and aligns very well with the type of work envisioned when the MOA was approved in 2011. Due to the current restrictions on receipts of SNF to the INL, however, we are requesting specific approval to allow these two shipments to proceed” (DOE 2014c).

5.3.2.13 Resource Areas Eliminated from Detailed Analysis

The Shoshone-Bannock Tribes expressed concern over DOE’s decision to eliminate some resources areas from detailed analysis, and that the Tribes deem all resources listed in Table 2-2. *Resource Areas Eliminated from Detailed Analysis* as important and essential to the Tribes and are not viewed as separate resources.

Response: DOE recognizes the Shoshone-Bannock Tribes’ unique relationship with and knowledge of the resources found on and around the INL Site and believes it has considered the substantive and quantifiable potential environmental impacts of the proposed action. In preparing this SA, DOE considered each resource area and focused its detailed analysis on those resource areas presenting potential substantial changes in circumstances or information that could result in the impacts from the proposed action different from those already disclosed in the 1995 PEIS and other relevant NEPA documents (see Section 1.4). DOE determined that, for the resources not analyzed in detail, neither the specific circumstances of the shipment nor the time that has

passed since the 1995 PEIS would change the extent of the effects of DOE's SNF Program on the human environment (see Section 2.2, Table 2-2).

5.3.2.14 Adequacy of the Supplement Analysis for the Proposed Action

Two commenters stated that the SA is inappropriate for NEPA compliance for the proposed action.

Response: DOE disagrees with the commenters' statements that this SA does not comply with NEPA's requirements and is being used to "sidestep" or "short-circuit" DOE's NEPA obligations. This SA was prepared in accordance with DOE and CEQ regulations and policies for fulfilling its NEPA obligations in instances where NEPA analysis has previously been conducted (see 10 CFR 1021.314 and 40 CFR 1502.9(c)). This SA is a form of NEPA review tailored to the particular situation encountered here, in which NEPA analyses relevant to the proposed action exist. The SA process provides a reasoned and disciplined approach for reviewing existing NEPA analyses to determine whether supplementation is needed. This SA is used to determine if there are substantial changes in the proposed action, or significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts. In this instance, and as intended by applicable regulations and policies, preparation of this SA is the means by which such a review is conducted.

DOE disagrees with the comment that its reliance upon the 1995 PEIS for conducting this SA is unfounded. The 1995 PEIS addresses DOE's spent fuel program. All of the alternatives analyzed in the 1995 PEIS include a SNF research and development component, including both DOE-owned and commercially produced SNF. The selected alternative in 1995 PEIS includes research on commercial spent nuclear fuel. Table 3-3 of Volume 1 of the 1995 PEIS regarding research and development associated with the selected alternative (Regionalization by Fuel Type, 4a) states that, "Regionalization 4a and as applicable under Regionalization 4b: Electrometallurgical processing using limited quantities of commercial SNF. New technology development facility; additional research and development as needed for DOE SNF management and ultimate disposition of SNF." In addition, in Volume 1, Section 1.1.2.5 "Special Case Commercial Power Reactors," the DOE describes what is included in "Special Case Commercial Power Reactors." That section includes, among other SNF "...SNF used for destructive and nondestructive examination and testing...." DOE has been implementing the selected alternative since 1995 and is not proposing to make substantial changes to its current SNF program.

As stated in this SA (Section 1.3), the ROD for the 1995 PEIS states that DOE's selected alternative (Alternative 4a, Regionalization by Fuel Type) includes the transport of 165 MTHM in 1,940 planned shipments of SNF (including 575 Navy shipments) to the INL Site through the year 2035 (60 FR 28680, June 1, 1995). The ROD also states that "[e]xcept for some special-case commercial fuel, these decisions do not apply to the management of spent nuclear fuel from commercial power plants." The category of special-case commercial nuclear fuel described in the 1995 PEIS (Volume 1, Section 1.1.2.5) includes "SNF from development reactors (Shipping

Port and Peach Bottom Unit); SNF used for destructive and nondestructive examination and testing, SNF remaining at the West Valley Demonstration Project; SNF from fuel performance testing at Babcock and Wilcox Research Center; and special case SNF debris (Three-mile Island Unit 2).” The fuel being considered for the proposed research falls within the category of special-case commercial fuel contemplated in the ROD and analyzed in the 1995 PEIS. Subsequent to that ROD, the Settlement Agreement with the State of Idaho was signed (October 1995), and the ROD was modified to lower the total number of SNF shipments to 1,133 which include 575 Navy shipments and 558 for DOE containing 120 MTHM. The Settlement Agreement limits the amount of MTHM shipped to the INL Site to 110 MTHM (55 MTHM for the Navy and 55 MTHM for DOE). DOE did not conduct additional NEPA on the Settlement Agreement because the environmental impacts of all of the actions that were ripe for decision related to DOE’s SNF program were already analyzed. Similarly, as shown in this SA, the environmental impacts of the proposed action is encompassed by the overall analysis in the 1995 PEIS.

As a point of clarification, the potential environmental impacts of managing DOE SNF included in the 1995 PEIS represent an analysis of a broad spectrum of fuel element designs (including both DOE and commercial SNF); both for the fuel matrix material and the cladding. The SNF included in the 1995 PEIS is not solely defense-related SNF. From a technical perspective, current ownership labels (the origin point of the material, be it commercial SNF or DOE owned SNF), does not affect the environmental impacts analysis. What the material is composed of is the critical information necessary for determining environmental impacts.

The commenter views the proposed action as controversial and even unprecedented. DOE does not agree with the characterization of the proposed action as unprecedented and involving new programs of R&D that have never before occurred and could never have been analyzed in earlier NEPA documents. The proposed action is not unprecedented and does not represent new R&D programs at the INL Site. Similar types of projects have been completed at the INL Site with no significant adverse environmental impacts. For example, as noted by one of the commenters on the Draft SA, in 2004, the Idaho National Laboratory received a single shipment of used fuel from the North Anna Nuclear Power Plant for post-irradiation examination. Then Idaho Governor Kempthorne and Attorney General Wasden granted DOE’s request under Idaho’s 1995 Settlement Agreement for that particular research project to take place at the INL Site. The letter granting the request noted: “If other INEEL[now INL] mission-related proposals such as this arise in the future, we will evaluate them on a case-by-case basis to ensure the terms, spirit and intent of the 1995 Settlement Agreement remain intact.”

The commenter avers that the 1996 EA (DOE 1996) referenced in this SA is not relevant because of the limited intended scope of the proposal reviewed in the EA. The 1996 EA for electrometallurgical treatment demonstration provides a factual basis to support DOE’s position that research on SNF has been a long-standing mission for INL. The 1996 EA also provides a description of the type of processing technology that will be employed in the current proposed action and details on the expected environmental impacts of a treatment demonstration using that

technology. DOE recognizes that the EA involved activities that are not exactly the same as the current proposed action.

5.3.3 Spent Nuclear Fuel and Waste Management

5.3.3.1 Material Characterization and Waste Management

DOE received numerous comments opposing the shipment of “radioactive” or “nuclear waste” to the INL site. Many commenters also questioned how DOE would manage the wastes from the proposed action. Another commenter questioned the assumption that wastes will be shipped offsite to WIPP and to the NNSS. Two commenters specifically questioned whether there would be any HLW from metallurgical pyroprocessing activities.

Response: The SNF proposed for shipment to the INL Site is not radioactive waste and would not be managed as radioactive waste; rather, it is research material that would be managed as Special Nuclear Material (SNM) under DOE Manual 470.4-6 “Nuclear Material Control and Accountability.” All nuclear material at the INL Site is managed according to its hazard and safeguards categorization. The facilities that would be used to conduct the research with the material under the proposed action meet rigorous requirements to prevent unintended exposure or release of the material to the environment.

DOE has re-examined and revised the Waste and Spent Fuel Management section of this SA (Section 3.2.3) to better clarify that DOE has not made waste determinations and would not be able to do so until the waste is actually generated. At that time, and based on the characteristics of the material, DOE will make a waste determination.

Over the course of approximately 8 years, the material would be used in destructive experiments. The exact nature of the materials (including equipment used to conduct the experiments) will not be known until after the experiments are complete. After all of the experiments are concluded and it is determined that there is no further programmatic value to the materials, a waste determination will be made evaluating the state of the material at that time. Waste determinations are made using approved guidance provided in DOE Order 435.1b, “Low-level Waste Requirements,” and the associated manual and guide.

For purposes of evaluating the potential impacts associated with any wastes from the proposed action, DOE has made conservative assumptions regarding the types and quantities of wastes that may be generated. Waste generated from the research would be disposed of according to approved waste management practices for hot cell operations by evaluating the material in its final form. These include, but are not limited to, the disposal of TRU waste at WIPP and LLW at the NNSS. A description of waste, including potential disposal paths, and SNF management is included in Section 3.2.3 of this SA.

5.3.3.2 Idaho Settlement Agreement/Existing Waste Treatment

DOE received numerous comments questioning whether DOE is in compliance with the Idaho Settlement Agreement and requesting that DOE treat existing wastes per the Settlement Agreement prior to any new shipments.

Response: DOE is fully committed to compliance with the Settlement Agreement and recognizes the State of Idaho’s role in decision-making. The specific purpose of this SA is to examine the environmental impacts of the proposed action in relation to the environmental impacts examined in specific relevant NEPA documents described in this SA (see Section 1.4), to determine whether there are any significant, new circumstances or information relevant to environmental concerns warranting the preparation of a supplemental EIS, a new EIS, or no further NEPA documentation. This SA is not intended to evaluate the legality of the proposed action pursuant to agreements with other entities. Rather, this SA is being prepared to fulfill DOE’s responsibilities under NEPA as identified in DOE’s implementing regulations found at 10 CFR 1021.314.

With regard to the treatment and management of wastes at the INL Site, DOE is committed to complying with all requirements of the Settlement Agreement.

To eliminate non-NEPA-related differences of understanding, DOE removed the following statement from the footnote in Section 1.3: “On March 3, 2015, DOE and the State of Idaho signed such an agreement. These shipments would be conducted under the processes and procedures of the 2011 MOA.” The footnote has been further modified to clarify the position that once DOE and the State of Idaho have resolved all compliance issues and DOE receives authority from the State of Idaho to ship the research quantities of commercial SNF to the INL Site, those activities would be conducted in compliance with the 2011 MOA.

5.3.3.3 Future SNF Storage

Several commenters raised concerns that the INL Site would become a de facto storage and/or reprocessing site for SNF as a result of the proposed action.

Response: Conducting research on a small quantity of commercial SNF does not imply that the INL Site would become a reprocessing and storage site. Under the Nuclear Waste Policy Act, DOE cannot accept commercial SNF for storage until the NRC has issued a license for the construction of a repository. DOE is not seeking a license for construction of a SNF reprocessing or storage facility. The potentially remaining SNF and SNF debris would be securely and safely stored with DOE’s existing SNF and SNF debris inventory at the INL Site and dispositioned with that existing SNF and SNF debris (see Section 3.2.3).

5.3.3.4 WIPP Eligibility

Commenters questioned what will happen to the TRU waste generated as a result of the proposed action, given the current closure of the WIPP facility and the prohibition against sending any commercial TRU waste to WIPP. Commenters also questioned whether the waste potentially generated by the R&D projects would be non-defense waste and therefore ineligible for disposal at WIPP. One commenter asserted that the TRU waste resulting from the proposed project would need to be shipped out of the state by 2018, in accordance with the Settlement Agreement.

Response: In its management of radioactive waste, DOE follows all statutes applicable to radioactive waste management including the Land Withdrawal Act. All TRU waste that is sent to WIPP must meet rigorous waste acceptance criteria, which include, among other things, a defense waste determination. DOE takes all actions that are practical to segregate and keep separate defense origin material from non-defense origin material. However, due to the inevitability of cross contamination, DOE cannot eliminate the generation and transportation of TRU wastes to WIPP from consideration in this SA. It is often inevitable that research materials are contaminated with both defense and non-defense origin isotopes because materials are used as long as feasible in the HFEF. DOE makes the waste determination (including the defense determination) after the end of the materials' useful life when it is determined that the material no longer has any programmatic value.

DOE has not made a final determination of whether the potential waste produced from the proposed action is defense-related. DOE agrees that it should recognize that the TRU waste generated from the proposed action may not be determined to be defense-related and, therefore, not eligible for disposal at WIPP. The description of waste generation in this SA (Section 3.2.3) was revised to better clarify this fact. The Final SA recognizes the possibility that TRU waste determined to be non-defense related may not be eligible for disposal at WIPP. In this event, the waste would be classified and managed as GTCC or GTCC-like. GTCC-like wastes were included in the analysis of potential environmental impacts from waste management operations in the Volume 2 portion of the 1995 PEIS.

Regarding the Settlement Agreement's 2018 deadline for TRU waste removal, DOE believes that the clause referenced by the commenter applies only to waste located at INL in 1995, when the Settlement Agreement was executed. Section B.1 of the Idaho Settlement Agreement states: "DOE shall ship all transuranic waste now located at INEL, currently estimated at 65,000 cubic meters in volume, to the Waste Isolation Pilot Plant (WIPP) or other such facility designated by DOE, by a target date of December 31, 2015, and in no event later than December 31, 2018." The deadline does not apply to TRU waste generated after that date.

5.3.4 Environmental Impact Issues

5.3.4.1 Water Quality

Commenters expressed concern about potential groundwater impacts to the Snake River Aquifer associated with the proposed action. One commenter specifically questioned DOE's methodology related to existing drinking water contamination.

Response: DOE believes there is no credible way for any radioactive contamination from the proposed action to reach the Snake River Plain Aquifer (see Section 2.1). The SNF would be transferred from the cask while it is in the hot cell where R&D will be conducted, and any radioactive materials leaving the hot cell awaiting transport to another site would be in sealed containers licensed for storage of nuclear materials. The 1995 PEIS addressed the risks and potential accident impacts associated with natural phenomena initiators such as weather-related (e.g., flood) events (see Appendix B, Section 5.15.1). The analysis in this SA included consideration of such events. The potential impacts to groundwater are presented in Section 3.2.2, which states: "The proposed action evaluated in this SA would not use measurable quantities of water and would not release pollutants to surface water or groundwater (INL 2014a). Consequently, no impacts to water resources are expected." Based on the analysis in this SA, no impacts to the Snake River Plain Aquifer are expected as a result of the proposed action.

5.3.4.2 Seismicity/Accidents

Commenters expressed concern about the potential impacts from accidents, particularly those related to seismic activity in the area. Another commenter requested that the NEPA document address the current safety practices (including criticality controls, fire prevention, and seismic activity) at the MFC. Commenters also questioned the safety of WIPP given the February 2014 fire and radiological event at that site.

Response: The potential impacts from accidents are addressed in Section 3.2.2 of this SA. With regard to seismicity, criticalities, and fires, DOE evaluated the impacts of these events within the accident analyses in the 1995 PEIS (Appendix B, Table 5.15.11), as identified in this SA in Section 3.2.2. Based on its review of the existing analyses, DOE has concluded that the accident risks and consequences previously presented would bound any potential impacts associated with the proposed action evaluated in this SA.

Potential accidents at WIPP are addressed in the Waste Isolation Pilot Plant (WIPP) Disposal Phase Final Supplemental Environmental Impact Statement, DOE/EIS-0026-S-2 (DOE 1997).

5.3.4.3 Human Health & Transportation

Commenters expressed concern about the potential impacts to human health, including radiation dose from INL air emissions, and the transportation impacts associated with the proposed action. Regarding the latter, commenters raised concern about the status of "crumbling" transportation infrastructure that may pose a risk to the safety of the shipments. One commenter questioned

whether the assumption made by DOE that population increase along the proposed route could be approximated by the national population increase. Another commenter questioned whether the casks could survive train fires exceeding a 1,475 degree Fahrenheit for 30 minutes.

Response: Impacts to human health and safety as a result of the transportation and research associated with these SNF rods are analyzed in Section 3.2 of this SA. Section 2.1 of this SA discusses the radiation dose from INL air emissions and representative routes that are considered for the transport of the SNF. As stated in that section, radiation doses at the INL Site are well below regulatory requirements.

The SNF would be transported in specially designed casks that are tested to withstand accident conditions, including impact, puncture, fire, and water immersion. Casks must survive these tests in sequence, including a 30-foot drop onto a rigid surface followed by a fully engulfed fire of 1,475 degrees Fahrenheit for 30 minutes. The test sequence encompasses more than 99 percent of vehicle accidents (NRC 2015). Issues related to cask survival beyond NRC requirements are beyond the scope of this SA. Casks are transported along NRC- and U.S. Department of Transportation-approved routes that take into account the gross vehicle weight of the package and the limits of the transportation infrastructure in place along those routes. DOE considers the impacts of an accident related to “crumbling” infrastructure to be encompassed by transportation accidents already analyzed in existing NEPA documents. This SA acknowledges that the population along the representative transportation routes has changed since the 1995 PEIS was prepared, and this SA provides a reasonable update to the population estimates along the routes that is appropriate for assessing if substantive changes in circumstances may exist relative to environmental concerns.

5.3.4.4 Climate Change/Drought

Four comments were received regarding climate change impacts, particularly those related to water levels in the Snake River Plain Aquifer. Commenters requested updates to the SA to reflect aquifer changes.

Response: As documented in Table 2-2 of this SA, the proposed action would not substantially increase carbon dioxide-equivalent emissions or associated climate change impacts. In addition, Section 2.3 of this SA provides more details regarding greenhouse gases and climate change. With regard to groundwater, as discussed in Section 3.2.2, the proposed action evaluated in this SA would not use measurable quantities of water and would not release pollutants to surface water or groundwater (INL 2014a). Consequently, no impacts to water resources, including water levels in the Snake River Plain Aquifer, are expected under normal operations.

5.3.4.5 Intentional Destructive Acts

One commenter specifically requested that the SA include intentionally set fires and transportation fires, as well as intentional strikes from terrorist drones and crop dusters.

Response: As discussed in Section 2.3 of this SA, DOE has evaluated security scenarios involving intentional destructive acts to assess potential environmental impacts. The analysis addresses both the transport of SNF and radiological wastes, as well as activities at the INL Site. That analysis is provided in Section 3.2.4 of this SA. DOE's analysis concluded that "the potential consequences would be no worse than those of the highest consequence accident analyzed in the 1995 PEIS."

5.3.4.6 Radiation Standards

One commenter stated that radiation standards are not protective of human health, including the most vulnerable populations such as the unborn, children, and the elderly. One commenter noted that some radiological data in the Idaho National Laboratory Site Environmental Report Calendar Year 2013 was incorrect.

Response: The analysis in this SA is based on the best available scientific evidence. Issues regarding the adequacy of generally accepted radiation standards are beyond the scope of this SA. DOE completed a review of air emissions data in the 2012 and 2013 Annual Site Environmental Reports (ASER) and determined that corrections are needed to address errors in Tables 4-2 (Radionuclide Composition on INL Site Airborne Effluents) and 8-1 (Summary of Radionuclide Composition of INL Site Airborne Effluents) in the 2013 ASER. The errors were editorial in nature and were caused during updates to several electronic spreadsheets. DOE revised and posted Tables 4-2 and 8-1 in the web version of the 2013 ASER and sent errata sheets to the hardcopy recipients. DOE verified the errors did not affect any regulatory reporting and that no corrections were identified for Table 4-2 of the 2012 ASER. DOE also corrected airborne effluent data for select radionuclides, including plutonium from the RWMC.

5.3.5 Miscellaneous

5.3.5.1 Competency of Federal and Contractor Personnel

Commenters questioned the ability of DOE and its contractors to properly manage the proposed action and protect the health of the worker, public, and environment.

Response: DOE and its contractors take its mission to protect the health and safety of the public and the environment very seriously and continually strive through existing programs and oversight activities to have zero incidents that impact human health and the environment.

5.3.5.2 Funding

One commenter questioned whether the funding associated with the research activities would represent new money at the INL Site.

Response: As stated in Table 2-2 of this SA, DOE has acknowledged that the funding associated with the research activities would be about \$4 to \$8 million annually for three years, through

2026 (INL 2021a). If the proposed action does not proceed, that funding would be re-allocated in accordance with current and future appropriations.

6 CONCLUSION

The 1995 PEIS and the other relevant NEPA documents identified in this SA evaluated the potential impacts of transporting SNF to the INL Site, the subsequent research and operations at the INL Site involving the SNF, and the management and disposition of SNF and waste from the research and operations at the INL Site. DOE prepared this SA in accordance with 10 CFR 1021.314, which requires a supplemental EIS be issued when “there are substantial changes to the proposal” or there are “significant new circumstances or information relevant to environmental concerns.” In accordance with DOE regulations, this SA provides sufficient information to enable DOE to determine whether the 1995 PEIS and other relevant NEPA documents identified in this SA should be supplemented, a new EIS be prepared, or no further NEPA documentation is required.

7 DETERMINATION

DOE prepared this SA on the 1995 PEIS, in accordance with 40 CFR 1502.9 (c) and 10 CFR 1021.314, for the proposal to transport, in one truck shipment, small quantities of commercial power SNF to the INL Site for research purposes consistent with the mission of the DOE Office of Nuclear Energy. Based on the analysis in this Final SA, DOE’s proposed action does not represent substantial changes to the 1995 PEIS that are relevant to environmental concerns, and there are no significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its environmental impacts. DOE has therefore determined that no further NEPA documentation is required.

8 REFERENCES

- Census (U.S. Census Bureau) 2021. Annual Estimates of the Resident Population: July 1, 2021 v2021. <https://www.census.gov/quickfacts/fact/table/US/PST045219>.
- Census (U.S. Census Bureau) 2022. U.S. and World Population Clock. January 12, 2022. Available online at: <https://www.census.gov/popclock/>
- DOE (U.S. Department of Energy) 1995a. *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*. DOE/EIS-0203. April. Available online at: <http://energy.gov/nepa/eis-0203-spent-nuclear-fuel-management-and-idaho-national-engineering-laboratory-environmental>.
- DOE (U.S. Department of Energy) 1995b. “1995 Settlement Agreement.” October. Included as Appendix A.
- DOE (U.S. Department of Energy) 1996. *Final Environmental Assessment on Electrometallurgical Treatment Research and Demonstration Project in the Fuel Conditioning Facility at Argonne National Laboratory West* [Now the Material Fuel Complex]. DOE/EA-1148. May. Available online at: <http://energy.gov/nepa/ea-1148-electrometallurgical-treatment-research-and-demonstration-project-fuel-conditioning>.
- DOE (U.S. Department of Energy) 1997. *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement*. DOE/EIS-0026-S2. September. Available online at: <http://energy.gov/nepa/eis-0026-s2-waste-isolation-pilot-plant-disposal-phase-carlsbad-new-mexico>.
- DOE (U.S. Department of Energy) 2000. *Final Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Research and Development and Isotope Production Missions in the United States, Including the Role of the Fast Flux Test Facility*. DOE/EIS-0310. December. Available online at: <http://energy.gov/nepa/eis-0310-accomplishing-expanded-civilian-nuclear-energy-research-and-development-and-isotope>.
- DOE (U.S. Department of Energy) 2002. *Recommendations for Analyzing Accidents under the National Environmental Policy Act*. July. Available online at: http://energy.gov/sites/prod/files/nepapub/nepa_documents/RedDont/G-DOE-AccidentAnalysis.pdf.
- DOE (U.S. Department of Energy) 2003. *Estimating Radiation Risk from Total Effective Dose Equivalent (TEDE), ISCORS Technical Report No. 1*. DOE/EH-412/0015/0802, Rev. 1. Available online at: https://www.energy.gov/sites/prod/files/2018/02/f48/DOE%202003_Estimating%20Rad%20Risk%20ISCORS%20Tech%20Report%20No.%201_0.pdf.

- DOE (U.S. Department of Energy) 2008. *Final Supplemental 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*. DOE/EIS-0250F-S1. June. Available online at: <https://www.energy.gov/nepa/eis-0250-s1-final-supplemental-environmental-impact-statement-geologic-repository-disposal>
- DOE (U.S. Department of Energy) 2011a. “Memorandum of Agreement.” January 6. Included as Appendix B.
- DOE (U.S. Department of Energy) 2011b. *Environmental Assessment for the Replacement Capability for Disposal of Remote-Handled Low-Level Radioactive Waste Generated at the Department of Energy’s Idaho Site*. DOE/EA-1793. December. Available online at: <http://energy.gov/sites/prod/files/EA-1793-FEA-2011.pdf>.
- DOE (U.S. Department of Energy) 2013. *Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Offsite Locations in the State of Nevada*. DOE/EIS-0426. October. Available online at: <http://energy.gov/nepa/downloads/eis-0426-final-environmental-impact-statement>.
- DOE (U.S. Department of Energy) 2014a. Letter from the Secretary of Energy Dr. Ernest J. Moniz to The Honorable C. L. “Butch” Otter, Governor, State of Idaho. December 31.
- DOE (U.S. Department of Energy) 2014b. *Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials*. DOE/EA-1954. February. Available online at: <http://energy.gov/nepa/downloads/ea-1954-final-environmental-assessment>.
- DOE (U.S. Department of Energy) 2014c. Letter from Richard B. Provencher, Manager of the DOE’s Idaho Operations Office, to Idaho Governor Otter and Attorney General Wasden, December 16.
- DOE (U.S. Department of Energy) 2015a. Supplement Analysis on *Proposed Shipment of Commercial Spent Nuclear Fuel to DOE National Laboratories for Research and Development Purposes*. DOE/EIS-02303-SA-07, DOE/EIS-0250F-S-1-SA-02. December. Available online at: <https://www.energy.gov/sites/prod/files/2016/01/f28/Commercial%20Fuel%20Shipment%20SA%20Dec%2028%202015%20FINAL%20-%20signed.pdf>
- DOE (U.S. Department of Energy) 2016. Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste DOE/EIS-0375. December 2016. <https://www.energy.gov/nepa/articles/eis-0375-final-environmental-impact-statement>
- DOE (U.S. Department of Energy) 2019. *Recommendations for the Supplement Analysis Process, Second Edition*. Office of NEPA Policy and Compliance. January. Available online at: <https://www.energy.gov/sites/default/files/2019/01/f59/SA-guidance-2019-01-31.pdf>

DOE (U.S. Department of Energy) 2022. *Final Versatile Test Reactor Environmental Impact Statement*. DOE/EIS-0542. May 2022. <https://www.energy.gov/nepa/articles/doeeis-0542-final-environmental-impact-statement>

Idaho (State of Idaho) 2015. Letter from The Honorable C. L. “Butch” Otter, Governor, State of Idaho to the Secretary of Energy Dr. Ernest J. Moniz. January 8.

INL (Idaho National Laboratory) 2014a. *Idaho National Laboratory Environmental Checklist for the Joint Fuel Cycle Studies - Integrated Recycling Test*. INL-14-044 R1. June 23. Available online at: <http://www.id.energy.gov/insideNEID/PDF/INL-14-044%20R1%20JFCS%20Revised.pdf>.

INL (Idaho National Laboratory) 2014b. *National Emission Standards for Hazardous Air Pollutants—Calendar Year 2013 INL Report for Radionuclides*. DOE/ID-11441. June. Available online at: http://www.id.energy.gov/insideNEID/PDF/NESHAP_CY2012_INL_Report_for_Radionuclides.pdf.

INL (Idaho National Laboratory) 2020. *National Emission Standards for Hazardous Air Pollutants—Calendar Year 2019 INL Report for Radionuclides*. DOE/ID-11441. June. Available online at: [http://idahoeser.com/Surveillance/ASER/ASERDocuments/DOE-ID-11441%20\(2019\)%20Rad%20NESHAP%20report.pdf](http://idahoeser.com/Surveillance/ASER/ASERDocuments/DOE-ID-11441%20(2019)%20Rad%20NESHAP%20report.pdf).

INL (Idaho National Laboratory) 2021a. “Response to Request for Updated Information to Support the Department of Energy’s Supplement Analysis of Proposed Commercial Fuel Research and Development Efforts.” Letter from Adam Andersen, Battelle Energy Alliance, to JoAnne Hanners. CCN 249270. April 22.

INL (Idaho National Laboratory) 2021b. *Idaho National Laboratory Site Environmental Report Calendar Year 2020*. DOE/ID-12082(20). Environmental Surveillance, Education, and Research Program, Idaho Falls, Idaho. September. Available online at: <https://idahoeser.inl.gov/Surveillance/ASERdocuments2020.html>

INL (Idaho National Laboratory) 2022. *Idaho National Laboratory Site Environmental Report Calendar Year 2021*. DOE/ID-12082(21). Environmental Surveillance, Education, and Research Program, Idaho Falls, Idaho. September. Available online at: https://idahoeser.inl.gov/Surveillance/ASER/2021/2021%20ASER_Final.pdf

NRC (U.S. Nuclear Regulatory Commission) 2015. “Backgrounder on Transportation of Spent Fuel and Radioactive Materials.” Available online at: <http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/transport-spenfuel-radiomats-bg.html#spent>.

WIPP 2022. WIPP Status Report. Reporting Date January 12, 2022. Available at: <https://www.wipp.energy.gov/general/GenerateWippStatusReport.pdf>.

APPENDIX A:

1995 SETTLEMENT AGREEMENT

1995 Settlement Agreement

The State of Idaho, through the Attorney General, and Governor Philip E. Batt in his official capacity; the Department of Energy, through the General Counsel and Assistant Secretary for Environmental Management; and the Department of the Navy, through the General Counsel and Director, Naval Nuclear Propulsion Program, hereby agree on this 16th day of October, 1995, to the following terms and conditions to fully resolve all issues in the actions Public Service Co. of Colorado v. Batt, No. CV 91-0035-S-EJL (D. Id.) and United States v. Batt, No. CV-91-0065-S-EJL (D. Id.):

A. Definitions

For purposes of this Agreement, the following definitions shall apply:

1. The "State" shall mean the State of Idaho and shall include the Governor of the State of Idaho and the Idaho State Attorney General.
2. The "federal parties" means U.S. Department of Energy (DOE) and the U.S. Department of the Navy (the Navy), including any successor agencies.
3. "Treat" shall be defined, as applied to a waste or spent fuel, as any method, technique, or process designed to change the physical or chemical character of the waste or fuel to render it less hazardous; safer to transport, store, dispose of; or reduce in volume.
4. "Transuranic waste" shall be defined as set forth in the EIS, Volume 2, Appendix E.
5. "One shipment of spent fuel" shall be defined as the transporting of a single shipping container of spent fuel.
6. "High-level waste" shall be defined as set forth in the EIS, Volume 2, Appendix E.
7. "DOE spent fuel" shall be defined as any spent fuel which DOE has the responsibility for managing with the exception of naval spent fuel and commercial spent fuel which DOE has accepted or will take title to pursuant to the Nuclear Waste Policy Act of 1982, 42 U.S.C. 10101 et seq. or comparable statute.
8. "Naval spent fuel" shall be defined as any spent fuel removed from naval reactors as a result of refueling overhauls (refueling) or defueling inactivations (defueling).
9. "Metric ton of spent fuel" shall be defined as a metric ton of heavy metal of spent fuel.
10. "Naval reactors" shall be defined as nuclear reactors used aboard naval warships (submarines, aircraft carriers, or cruisers), naval research or training vessels, or at land-based naval prototype facilities operated by the Naval Nuclear Propulsion Program for the purposes of research, development, or training.
11. "Calendar year" shall be defined as the year beginning on January 1, and ending on December 31.

12. "Mixed Waste" shall be defined as set forth in the EIS, Volume 2, Appendix E.
 13. "EIS" shall be defined as the Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Program Final Environmental Impact Statement issued April, 1995.
 14. "ROD" shall be defined as the Record of Decision issued by DOE on June 1, 1995, concerning the EIS.
 15. "INEL" shall be defined as the Idaho National Engineering Laboratory.
 16. "Running Average" shall mean the total number of shipments of naval spent fuel to INEL, or transuranic waste from INEL, over any period of three years, divided by three.
 17. The "Court" shall mean the United States District Court for the District of Idaho before which is pending Public Service Company of Colorado v. Batt, No. CV 91-0036-S-EJL and United States v. Batt, No. CV 91-0054-S-EJL, and any appellate court to which an appeal may be taken, or with which an application for a writ of certiorari may be filed, under applicable law.
- B. Transuranic Waste Shipments Leaving Idaho
1. DOE shall ship all transuranic waste now located at INEL, currently estimated at 65,000 cubic meters in volume, to the Waste Isolation Pilot Plant (WIPP) or other such facility designated by DOE, by a target date of December 31, 2015, and in no event later than December 31, 2018. DOE shall meet the following interim deadlines:
 - a. The first shipments of transuranic waste from INEL to WIPP or other such facility designated by DOE shall begin by April 30, 1999.
 - b. By December 31, 2002, no fewer than 3,100 cubic meters (15,000 drum-equivalents) of transuranic waste shall have been shipped out of the State of Idaho.
 - c. After January 1, 2003, a running average of no fewer than 2,000 cubic meters per year shall be shipped out of the State of Idaho.
 2. The sole remedy for failure by DOE to meet any of these deadlines or requirements shall be the suspension of DOE spent fuel shipments to INEL as set forth in Section K.1.
- C. Spent Fuel and High-Level Waste Shipments Leaving Idaho
1. DOE shall remove all spent fuel, including naval spent fuel and Three Mile Island spent fuel from Idaho by January 1, 2035. Spent fuel being maintained for purposes of testing shall be excepted from removal, subject to the limitations of Section F.1 of this Agreement.
 2. Until all of the aluminum-clad spent fuel then stored at INEL has been shipped to the Savannah River Site, the cumulative number of shipments of spent fuel from the Savannah River Site to INEL under Section D as of the end of any calendar year shall

not exceed the cumulative number of shipments of aluminum-clad spent fuel from INEL to the Savannah River Site for the same period.

3. DOE shall treat all high-level waste currently at INEL so that it is ready to be moved out of Idaho for disposal by a target date of 2035.

D. Shipments of Spent Fuel to INEL

The federal parties may transport shipments of spent fuel to INEL only in accordance with the following terms and conditions.

1. Shipments of naval spent fuel to INEL shall take place as follows:

- a. The Navy may make only those shipments of naval spent fuel to INEL that are necessary to meet national security requirements to defuel or refuel nuclear powered submarines, surface warships, or naval prototype or training reactors, or to ensure examination of naval spent fuel from these sources. The Secretary of Defense, upon notice to the Governor of the State of Idaho, shall certify the total number of such shipments of naval spent fuel required to be made through the year 2035.
- b. The Navy shall not ship more than twenty four (24) shipments to INEL from the date of this Agreement through the end of 1995, no more than thirty six (36) shipments in 1996, and no more than twenty (20) shipments per year in calendar years 1997 through 2000. From calendar year 2001 through 2035, the Navy may ship a running average of no more than twenty (20) shipments per year to INEL. The total number of shipments of naval spent fuel to INEL through 2035 shall not exceed 575. Shipments of naval spent fuel to INEL through 2035 shall not exceed 55 metric tons of spent fuel.
- c. Prior to January 1 of each calendar year through the year 2035, the Navy shall provide to Idaho an estimate of the number of shipments and the number of metric tons of naval spent fuel to be shipped during the following calendar year.
- d. By January 31 of each calendar year, the Navy shall provide to Idaho the actual number of shipments and actual number of metric tons of naval spent fuel shipped during the preceding calendar year.
- e. The naval spent fuel stored at INEL on the date of the opening of a permanent repository of interim storage facility shall be among the early shipments of spent fuel to the first permanent repository or interim storage facility.
- f. The sole remedy for the Navy's failure to meet any of the deadlines or requirements set forth in this section shall be suspension of naval spent fuel shipments to INEL as set forth in Section K.1.

2. Shipments of DOE spent fuel to INEL shall take place as follows:

- a. If DOE and the U.S. Department of State adopt a policy to accept spent fuel from foreign research reactors into the United States, DOE may send to INEL a maximum of 61 shipments of spent fuel from foreign research reactors during the period

beginning on the date such a policy is adopted and ending on December 31, 2000. The Secretary of Energy, upon notice to the Governor of the State of Idaho, must certify that these shipments are necessary to meet national security and nonproliferation requirements. Upon such certification, DOE may ship not more than 10 such shipments from the date such policy is adopted through December 31, 1996, not more than 20 such shipments from the date the policy is adopted through December 31, 1997, and not more than 40 such shipments from the date the policy is adopted through December 31, 1998.

- b. Until such time as a permanent repository or interim storage facility for storage or disposal of spent fuel, located outside of Idaho, is operating and accepting shipments of spent fuel from INEL, DOE shall be limited to shipments of spent fuel to INEL as set forth in Sections D.2.a., c., d., e., and (f). After a permanent repository or interim storage facility is operating and accepting shipments of spent fuel from INEL, the State of Idaho and DOE may negotiate and reach agreement concerning the timing and number of shipments of DOE spent fuel that may be sent to INEL, in addition to those otherwise permitted under this Section D.2., for preparation for storage or disposal outside the State of Idaho.
- c. After December 31, 2000, DOE may transport shipments of spent fuel to INEL constituting a total of no more than 55 metric tons of DOE spent fuel (equivalent to approximately 497 truck shipments) and subject to the limitations set forth in Sections D.2.e., f., g., and h. below, except that the limitations of Section D.2.a. above will not apply.
- d. No shipments of spent fuel shall be made to INEL from Fort St. Vrain, unless a permanent repository or interim storage facility for spent fuel located outside of Idaho has opened and is accepting spent fuel from INEL, in which case such shipments may be made for the purpose of treating spent fuel to make it suitable for disposal or storage in such a repository or facility. Shipments of spent fuel from Fort St. Vrain shall remain at INEL only for a period of time sufficient to allow treatment for disposal or storage in such a repository or facility. The total number of Fort St. Vrain shipments shall not exceed 244, constituting no more than sixteen (16) metric tons of spent fuel, and shall be in addition to those allowed under Section D.2.c. above.
- e. Except as set forth in Section D.2.d. above, DOE will make no shipments of spent fuel from commercial nuclear power plants to INEL.
- f. After December 31, 2000, and until an interim storage facility or permanent repository is opened and accepting spent fuel from INEL, DOE shall not ship to INEL more than 20 truck shipments of spent fuel in any calendar year, except that:
 - (i) In one calendar year only, DOE may make not more than 83 truck shipments of spent fuel to INEL from the West Valley Demonstration Project;
 - (ii) DOE may not make more than 13 truck shipments in any of the nine calendar years succeeding the shipment of the West Valley Demonstration Project spent fuel to INEL; and

- (iii) Shipments DOE is entitled to make to INEL in any calendar year, but has not made, may be shipped in any subsequent calendar year, notwithstanding the limitations in this Section D.2.f. on the number of shipments per year.

For purposes of this section and Section D.2.c., in determining the number of truck shipments, one rail shipment shall be deemed equivalent to 10 truck shipments, except that in the case of shipments from West Valley Demonstration Project, seven rail shipments shall be deemed to be equal to 83 truck shipments. DOE may elect to make rail shipments in lieu of truck shipments, in accordance with this conversion formula and subject to other limitations of this section.

- g. Prior to January 1 of each calendar year through the year 2035, DOE shall provide to Idaho an estimate of the number of shipments and the number of metric tons of DOE spent fuel to be shipped during the following calendar year.
- h. No later than January 31st of each calendar year, DOE shall provide to Idaho the actual number of shipments and actual number of metric tons of DOE spent fuel shipped during the preceding year.
- i. The sole remedy for DOE's failure to meet any of the deadlines or requirements set forth in this section shall be the suspension of DOE spent fuel shipments to INEL as set forth in Section K.1.

E. Treatment and Transfer of Existing Wastes at INEL

1. **Treatment Commitment.** DOE agrees to treat spent fuel, high-level waste, and transuranic wastes in Idaho requiring treatment so as to permit ultimate disposal outside the State of Idaho.
2. **Mixed Waste Treatment Facility.** DOE shall, as soon as practicable, commence the procurement of a treatment facility ("Facility") at INEL for the treatment of mixed waste, transuranic waste and alpha-emitting mixed low-level waste ("Treatable Waste"). DOE shall execute a procurement contract for the Facility by June 1, 1997, complete construction of the Facility by December 31, 2002, and commence operation of the Facility by March 31, 2003. Commencement of construction is contingent upon Idaho approving necessary permits.
 - a. **Treatment of Non-INEL Wastes.** Any and all Treatable Waste shipped into the State of Idaho for treatment at the Facility shall be treated within six months of receipt at the Facility, with the exception of two cubic meters of low-level mixed waste from the Mare Island Naval Shipyard which will complete base closure for nuclear work in 1996. DOE may request an exception to the six month time period on a case-by-case basis, considering factors at the shipping site such as health and safety concerns, insufficient permitted storage capacity, and base or site closures. Any transuranic waste received from another site for treatment at the INEL shall be shipped outside of Idaho for storage or disposal within six months following treatment. DOE shall continue to use the Federal Facility Compliance Act process, as facilitated by the National Governors' Association, to determine what locations are suitable for mixed low-level waste treatment and storage.

3. **Operation of High-Level Waste Evaporator.** DOE shall commence operation of the high-level waste evaporator by October 31, 1996, and operate the evaporator in such a manner as to reduce the tank farm liquid waste volume by no fewer than 330,000 gallons by December 31, 1997. Efforts will continue to reduce the remaining volume of the tank farm liquid waste by operation of the high-level waste evaporator.
4. **Calcination of Remaining Non-Sodium Bearing Liquid Wastes.** DOE shall complete the process of calcining all remaining non-sodium bearing liquid high-level wastes currently located at INEL by June 30, 1998.
5. **Calcination of Sodium-Bearing Wastes.** DOE shall commence calcination of sodium-bearing liquid high-level wastes by June 1, 2001. DOE shall complete calcination of sodium-bearing liquid high-level wastes by December 31, 2012.
6. **Treatment of Calcined Wastes.** DOE shall accelerate efforts to evaluate alternatives for the treatment of calcined waste so as to put it into a form suitable for transport to a permanent repository or interim storage facility outside Idaho. To support this effort, DOE shall solicit proposals for feasibility studies by July 1, 1997. By December 31, 1999, DOE shall commence negotiating a plan and schedule with the State of Idaho for calcined waste treatment. The plan and schedule shall provide for completion of the treatment of all calcined waste located at INEL by a date established by the Record of Decision for the Environmental Impact Statement that analyzes the alternatives for treatment of such waste. Such Record of Decision shall be issued not later than December 31, 2009. It is presently contemplated by DOE that the plan and schedule shall provide for the completion of the treatment of all calcined waste located at INEL by a target date of December 31, 2035. The State expressly reserves its right to seek appropriate relief from the Court in the event that the date established in the Record of Decision for the Environmental Impact Statement that analyzes the alternatives for treatment of such waste is significantly later than DOE's target date. In support of the effort to treat such waste, DOE shall submit to the State of Idaho its application for a RCRA (or statutory equivalent) Part B permit by December 1, 2012.
7. **Transfer of Three Mile Island Fuel.** DOE shall complete construction of the Three Mile Island dry storage facility by December 31, 1998. DOE shall commence moving fuel into the facility by March 31, 1999, and shall complete moving fuel into the facility by June 1, 2001.
8. **Transfer Out of Wet Storage.** By December 31, 1999, DOE shall commence negotiating a schedule with the State of Idaho for the transfer of all spent fuel at INEL out of wet storage facilities. DOE shall complete the transfer of all spent fuel from wet storage facilities at INEL by December 31, 2023. If DOE determines that transfer to dry storage of any portion of such spent fuel is technically infeasible, or that transfer to such dry storage presents significantly greater safety or environmental risks than keeping the fuel in wet storage, DOE shall inform the State and propose a later date or alternative action. If the State does not agree to such later date or alternative action, DOE may apply to the Court for appropriate relief. DOE shall, after consultation with the State of Idaho, determine the location of the dry storage facilities within INEL, which shall, to the extent technically feasible, be at a point removed from above the Snake River Plain Aquifer ("Aquifer").

9. The sole remedy for DOE's failure to meet any of the deadlines or requirements set forth in this section shall be the suspension of DOE spent fuel shipment to INEL as set forth in Section K.1.

F. Spent Fuel Program

1. **Establishment of INEL as DOE Spent Fuel Lead Laboratory.** DOE shall, within thirty days of entry of this Agreement as a court order, designate INEL as the Department's lead laboratory for spent fuel. DOE shall direct the research, development and testing of treatment, shipment and disposal technologies for all DOE spent fuel, and all such DOE activities shall be coordinated and integrated under the direction of the Manager, DOE-Idaho Operations Office. Such designation shall not permit the shipment to INEL of any spent fuel beyond that permitted by this Agreement with the exception that quantities of spent fuel brought to INEL for testing in excess of those permitted by this Agreement shall leave the State of Idaho within five years of the date of receipt at INEL.
2. **Construction of Dry Storage.** DOE shall include in its appropriation request for federal fiscal year 1998 to the Executive Office of the President funds necessary for DOE to initiate the procurement of dry storage at INEL to replace wet, below ground facilities. Spent fuel loading into dry storage shall commence by July 1, 2003.
3. **Funding for Dry Cell Expansion Project.** The Naval Nuclear Propulsion Program shall include in its appropriation request to the Executive Office of the President for federal fiscal year 1997 funds necessary for the Dry Cell Expansion Project ("Project") at the Expended Core Facility at the Naval Reactors Facility to accommodate removal of excess material and examination of naval spent fuel in a dry condition. The Project shall commence as soon as Idaho Issues the required permit under the Clean Air Act and funding is appropriated. Completion of this project shall result in the expenditure of approximately \$26 million dollars over the next five years.
4. **Multi-Purpose Canisters.** DOE and the Navy shall employ Multi-Purpose Canisters ("MPCs") or comparable systems to prepare spent fuel located at INEL for shipment and ultimate disposal of such fuel outside Idaho. Procurement shall be performed in accordance with the Federal Acquisition Regulation which ensures that companies in Idaho will have opportunity to bid on and obtain any competitive contracts for such work. The Record of Decision on the NEPA analysis shall be completed by April 30, 1999.
5. **ECF Hot Cell Facility Upgrade.** The Naval Nuclear Propulsion Program shall include in its appropriation request for federal fiscal year 1997 to the Executive Office of the President funds necessary to proceed with upgrades which shall require approximately \$12 million of expenditures during the next three years.
6. **ECF Dry Storage Container Loading Station.** The Naval Nuclear Propulsion Program shall include in its appropriation request for federal fiscal year 1997 to the Executive Office of the President funds necessary to proceed with design and construction of a dry storage container loading station at ECF. This project shall require no less than \$20 million of expenditures during the next five years.

7. **Funding for Discretionary Environmental Remediation Work at the Naval Reactors Facility.** The Naval Nuclear Propulsion Program shall undertake environmental remediation efforts at the Naval Reactors Facility totaling approximately \$45 million over the next five years.
 8. **Water Pool Reracking.** DOE may proceed with installing new racks into the water pool in the building at the Idaho Chemical Processing Plant Facility currently holding naval spent fuel to provide enhanced capability for spent fuel storage in the existing water pool space until dry storage can be made available. Installation of the new racks may commence as soon as Idaho issues the necessary permit under the Clean Air Act. Idaho shall issue said permit within 180 days after DOE re-submits its application to Idaho.
- G. INEL Environmental Restoration Program
1. **INEL Environmental Restoration Program to Continue.** DOE shall continue to implement the INEL environmental restoration program in coordination with Idaho and EPA. Such implementation shall be consistent with the schedules contained in the Federal Facilities Agreement and Consent Order (FFA/CO) entered into with the State of Idaho, EPA and DOE, and it shall include schedule requirements developed pursuant to the completed and future records of Decision under the FFA/CO. The sole remedies for failure to implement the environmental restoration activities specified in the FFA/CO shall be those specified in the FFA/CO.
- H. Obtaining Timely Federal Funding for Compliance with this Order
1. **Compliance Funding.** DOE and the Naval Nuclear Propulsion Program shall share budget information concerning INEL with Idaho prior to submitting the budget request to the Executive Office of the President. Consultations with the State of Idaho shall continue throughout the budget process. The current DOE estimate for the costs of the activities and projects described in Sections A through G over the next five years is approximately \$200 million above established budget targets.
- I. Federal Funds for this Settlement Agreement
1. DOE shall provide to the State of Idaho beginning in federal fiscal year 1996 and continuing through 1997-2000, a total amount of \$30 million for community transition purposes and any other purposes that are mutually acceptable to the parties, such as the non-Federal development of Boron Neutron Capture Therapy and Radiological Toxicology technology in Idaho.
 2. **Acoustic Research Funding.** The Navy shall include in its appropriation request to the Executive Office of the President for federal fiscal year 1997 no less than \$7 million for the Navy to construct a Ships Model Engineering and Support Facility at the Naval Surface Warfare Center, Carderock Division, Acoustic Research Detachment at Bayview, Idaho.
- J. Good Faith Compliance and Affirmative Support

1. The federal parties and Idaho agree that the activities to be performed under this Agreement and the subsequent Consent Order are in the public interest. The federal parties and Idaho acknowledge the complexity of this Agreement and have agreed to act in good faith to effectuate its fulfillment. The federal parties and Idaho shall affirmatively support this Agreement and its terms, conditions, rights and obligations in any administrative or judicial proceeding. The federal parties and Idaho intend to seek a sense of the Congress resolution expressing support for the terms, conditions, rights and obligations contained in this Agreement and the subsequent Consent Order and recommending to future Congresses that funds requested by the President to carry out this Agreement be appropriated. In any administrative or judicial proceeding, Idaho shall support the adequacy of the EIS and ROD against any challenges by third parties. Idaho shall have the ability, in its sole discretion, to waive performance by the federal parties of any terms, conditions and obligations contained in this Agreement.
2. Idaho shall promptly issue, upon submission of legally sufficient applications, all permits, licenses or other approvals needed by the DOE, the Navy or the Naval Nuclear Propulsion Program for the performance of any of their respective obligations set forth in this Agreement.
3. No provision of this Agreement shall compel any party to act without due legal authority. Performance by every party under this Agreement shall be subject to and comply with all applicable federal statutes, regulations and orders, including the Anti-Deficiency Act. The inability of any party to comply with the provisions of this Agreement, or a delay in such compliance, as a result of any applicable federal statute, regulation or order shall not subject that party to judicial enforcement under Section K.2.a, but shall not preclude the application of Sections K.1.a. or K.1.b.
4. In the event any required NEPA analysis results in the selection after October 16, 1995, of an action which conflicts with any action identified in this Agreement, DOE or the Navy may request a modification of this Agreement to conform the action in the Agreement to that selected action. Approval of such modification shall not be unreasonably withheld. If the State refuses to accept the requested modification, DOE or the Navy may seek relief from the Court. On motion of any party, the Court may extend the time for DOE or the Navy to perform until the Court has decided whether to grant relief. If the Court determines that the State has unreasonably withheld approval, the Agreement shall be conformed to the selected action. If the Court determines that the State has reasonably withheld approval, the time for DOE or the Navy to perform the action at issue shall be as set forth in this Agreement and subject to enforcement as set forth section in Section K.1.
5. **Effect of Certain Court Orders.**
 - a. **Navy.** In the event that a court order is entered in the case of Snake River Alliance Education Fund v. United States Department of Energy , No. CV-95-0331-S-EJL (D. Idaho), or in any other judicial proceeding, that prohibits in whole or in part any shipment of spent fuel to INEL by the Navy under section D, then all obligations, requirements and deadlines of the federal parties under this Agreement shall be suspended during the period of applicability of the order. Upon the vacating, dissolving or reversing of any such order, the obligations, deadlines and

requirements provided for in this Agreement shall be extended by a period that corresponds to their period of suspension.

- b. **DOE.** In the event that a court order is entered in the case of Snake River Alliance Education Fund v. United States Department of Energy , No. CV-95-0331-S-EJL (D. Idaho), or in any other judicial proceeding, that prohibits in whole or in part any shipment of spent fuel to INEL by DOE under section D, then the DOE has the option to suspend all DOE shipments to INEL and suspend all of DOE's obligations, requirements and deadlines under this Agreement during the period of applicability of the order. If DOE exercises this option, then upon the vacating, dissolving, or reversing of any such order, DOE's obligations, deadlines and requirements provided for in this Agreement shall be extended by a period that corresponds to their period of suspension.

K. Enforcement

1. Suspension of Shipments

- a. **DOE.** If DOE fails to satisfy the substantive obligations or requirements it has agreed to in this Agreement or fails to meet deadlines for satisfying such substantive obligations or requirements, shipments of DOE spent fuel to INEL shall be suspended unless and until the parties agree or the Court determines that such substantive obligations or requirements have been satisfied.
- b. **Navy.** If the navy or the Naval Nuclear Propulsion Program fails to satisfy the substantive obligations or requirements it has agreed to in this Agreement or fails to meet deadlines for satisfying such substantive obligations or requirements, shipments of Navy spent fuel to INEL shall to suspended unless and until the parties agree or the Court determines that such substantive obligations or requirements have been satisfied.

2. Other Enforcement

- a. **Judicial Enforcement.** The Court may enforce the rights, obligations and requirements assigned by this Agreement, other than those exclusively enforceable under Section K.1., pursuant to all legal and equitable remedies available to the courts of the United States, including, but not limited to, use of the Court's contempt powers.
- b. **RCRA Enforcement.** Nothing in this Agreement shall prohibit the State of Idaho from requiring necessary remedial actions as set forth in the Resource Conservation and Recovery Act, 42 U.S.C. section 6929 ("RCRA") (or statutory equivalent), including penalty and fine procedures, the sums of which shall be payable to the State of Idaho.
- c. **Payment Obligation.** In the event that the federal parties do not carry out the requirement that all spent fuel located at INEL be removed from Idaho by January 1, 2035, then subject to the availability of the appropriations provided in advance for this purpose, the federal parties shall pay to the State of Idaho \$60,000 for each day such requirement has not been met.

3. **Prior Orders, Agreements and Decisions.** The terms of this Agreement shall supersede all rights, duties and obligations set forth in any prior orders, agreements or decisions entered in this litigation, captioned Public Service Company of Colorado v. Batt, and United States of America v Batt, Nos. CV 91-0035-S-EJL and CV 91-0054-S-EJL, except for the provisions of paragraph 4 of the December 22, 1993 Court Order.
 4. **Dispute Resolution.** In the event that any party to this Agreement contends that any other party has violated any terms of the Agreement, the parties shall seek to resolve their differences informally before asking for resolution by the Court.
- L. Consent Order
1. The parties agree they shall jointly present this Agreement to the U.S. District Court with a proposed Consent Order which will provide for the incorporation of this Agreement, continuing jurisdiction of the Court and the administrative termination of this action without prejudice to the right of the parties to reopen the proceedings for good cause shown. This Agreement and Consent Order shall not preclude any party from applying to the Court under Rule 60, of the Federal Rules of Civil Procedure, or the Court from granting relief thereunder.
 2. If the Consent Order is not entered by the Court, in accordance with Section L.1 above, within 45 days of lodging with the Court, then either party to this Agreement may elect to terminate this Agreement, in which case this Agreement becomes null and void, and of no force or effect.

For the Federal Parties:

Robert R. Nordhaus
Thomas P. Grumbly
General Counsel Assistant Secretary
Department of Energy for Environmental Management

Department of Energy
Steven S. Honigman
Admiral Bruce DeMars
General Counsel Director, Naval Nuclear
Department of the Navy Propulsion Program

For the State of Idaho:

Philip E. Batt
Governor, State of Idaho

Alan G. Lance
State Attorney General, State of Idaho

APPENDIX B:

2011 MEMORANDUM OF AGREEMENT

MEMORANDUM OF AGREEMENT CONCERNING RECEIPT, STORAGE, AND HANDLING OF RESEARCH QUANTITIES OF COMMERCIAL SPENT NUCLEAR FUEL AT THE IDAHO NATIONAL LABORATORY

This Memorandum of Agreement (Agreement) is entered this ^{6th} day of January 2011 between the United States Department of Energy (DOE) by and through the Manager and Designated Head of Contracting Activity for the DOE Idaho Operations Office and the State of Idaho by and through the Governor of the State of Idaho and the Idaho Attorney General (Idaho).

PURPOSE:

Consistent with the principles set forth in that certain Settlement Agreement and Order dated October 13, 1995 in the matter of Public Service Co. of Colorado v. Batt, No. CV 91-0035-S-EJL (D. Id.) and United States v. Batt, No. CV-91-0054-S-EJL (D. Id.) ("1995 Agreement"), the purpose of this Agreement is to provide for efficient and safe development of research capacities at the Idaho National Laboratory (INL) related to the next generation of nuclear reactor fuels while continuing to ensure Idaho does not become a defacto repository for the Nation's spent nuclear fuel from commercial nuclear power plants. For this reason the DOE and Idaho (collectively "the Parties") agree as follows:

RECITALS

WHEREAS, the United States is pursuing energy independence and research on energy processes which will reduce the amount of carbon dioxide generated in the energy cycle and it is anticipated that, to some degree, these goals will involve increased reliance on nuclear power; and

WHEREAS, the United States' ability to increase its reliance upon nuclear energy will, in turn, be dependent upon development of the next generation of nuclear fuels which will provide greater energy efficiency, reduced lifecycle costs and the generation of less waste; and

WHEREAS, the 1995 Agreement provides in section F that the INL is designated as the DOE Spent Fuel Lead Laboratory for the "research development and testing of treatment, shipment and disposal technologies for all DOE spent fuel" and provides for the receipt of DOE spent nuclear fuel for research purposes; and

WHEREAS, in furtherance of this mission, the INL has developed and possesses unique technologies and capabilities which will further the research development and testing of new fuel types and technologies; and

WHEREAS, in 2002 the DOE designated the INL as the Nation's lead laboratory for nuclear energy research; and

WHEREAS, section D.2.e of the 1995 Agreement restricts the INL from accepting any shipments of "spent fuel from commercial nuclear power plants" (Commercial Power SNF) impeding INL from utilizing its unique capabilities and technologies to assist in the important work of research and development of the next generation of commercial fuel technology, slowing that development and making it more costly to the American public; and

WHEREAS, the Parties concur that legitimate research conducted at the INL in furtherance of safe and efficient nuclear power production, including research on commercial spent nuclear fuel, is consistent with the spirit and intent of the 1995 Agreement; and

WHEREAS, section J.1 of the 1995 Agreement provides that Idaho, in its sole discretion, may waive portions of the 1995 Agreement; and

WHEREAS, Idaho will continue to insist upon the safe management of spent nuclear fuel and nuclear waste and the ultimate disposition of such materials outside of the State of Idaho;

NOW THEREFORE IT IS HEREBY AGREED:

1. This Agreement is terminable at will in the sole and exclusive discretion of the State of Idaho upon written notice to the DOE and no implied covenant of good faith and fair dealing shall be applicable to Idaho's decision to exercise this right.
2. Pursuant to the terms and conditions of this Agreement and solely for the purpose of research conducted at the INL; Idaho in its sole and exclusive discretion, grants a conditional waiver of the section D.2.e prohibition on the shipment of spent nuclear fuel from commercial nuclear power plants to the INL.

Specific Conditions

3. Limits and Material Management:

(a) INL may receive for the purpose of research and examinations conducted at the INL research quantities of Commercial Power SNF. For purposes of this Agreement "research quantities" shall mean only those quantities of Commercial Power SNF necessary for the specific research project for which the shipment to INL is made. This will be documented pursuant to paragraph 6 below.

(b) As further limitation, not more than 400 kilograms total heavy metal content of Commercial Power SNF may be received in any calendar year. This will be documented pursuant to paragraph 6 below.

(c) A shipment of Commercial Power SNF to INL will count as a shipment of DOE SNF for purposes of the annual shipment limits contained in section D.2.f of the 1995 Agreement for each calendar year in which such shipment occurs.

(d) The amount of Commercial Power SNF, measured in fractions of metric tons heavy metal (MTHM), including the equivalent amount contained in any wastes generated during research, remaining on site at the end of each calendar year will count toward the total metric tonnage limits for DOE SNF contained in section D.2.c of the 1995 Agreement. However, equivalent amounts of MTHM contained in any wastes generated during research that are shipped off-site in subsequent years may be deducted from the total metric tonnage limits for DOE SNF contained in section D.2.c of the 1995 Agreement.

(e) The Commercial Power SNF will be stored in appropriate SNF storage and will be managed as SNF until shipped off-site in compliance with the 2035 shipment deadline of the 1995 Agreement.

(f) Nothing in this Agreement shall be construed to allow DOE to exceed the 55 MTHM limit for SNF allowed by the 1995 Agreement.

4. Management of wastes generated during examination: Wastes generated during the research activity will be managed dependent upon the nature of research conducted in the form of destructive or non-destructive examination. Material that is classified as transuranic or low level waste may be consolidated with other laboratory wastes and managed appropriately.

5. Library Storage for Future Research: DOE shall further be permitted to keep a library of spent fuel types at the INL consisting of materials brought to INL under Paragraph 3. At no time shall the library contain an amount more than ten (10) kilograms total heavy metal which shall be documented pursuant to paragraph 6 of this Agreement.

(a) Said library of materials shall be solely for the purpose of retaining existing samples for future research at the INL.

(b) All materials kept in library storage shall count towards the over-all limit established by Section D.2.c of the 1995 Settlement Agreement and nothing in this Agreement shall be construed to allow DOE to exceed that limit.

(c) Library storage of the research quantities of SNF at the INL shall be permitted only for the duration of this Agreement and only so long as INL continues to be designated as the DOE lead laboratory for nuclear energy research.

6. Notification and Reporting:

(a) Prior to January 1 of each calendar year the DOE will notify Idaho of potential receipts of Commercial Power SNF to be shipped to the INL during the following calendar year pursuant to this Agreement. Such notification will specify:

- (i) the source of Commercial Power SNF,
- (ii) the amount of MTHM contained in each shipment,
- (iii) the research purpose for each shipment including documentation showing that a research project has been authorized, contracted or funded,
- (iv) the schedule for completion of the research project,
- (v) the anticipated volume of waste to be generated by the research, and
- (vi) The potential disposition path for remaining SNF material.

(b) By not later than January 31 of each calendar year Idaho will be notified of the amounts of Commercial Power SNF actually received in the previous calendar year. The DOE will further provide a report updating the information concerning previous shipments and research projects including the information contained in paragraph 6.a.(i-vi) above related to each shipment.

(c) By not later than January 31 of each calendar year the DOE will provide a report on the status of the library of Commercial Power SNF kept at INL pursuant to paragraph 5 above, including the following:

- (i) The total amount of material in library storage;
- (ii) The source of each material in library storage;
- (iii) The amount of each material in library storage specific to each source or fuel type;
- (iv) The anticipated future research related to each type and amount of material in library storage; and
- (v) The anticipated date upon which research related to each type and amount of material in library storage will occur.

(d) A separate copy of all reports and or notifications required by this Agreement shall be submitted to Idaho at the following addresses:

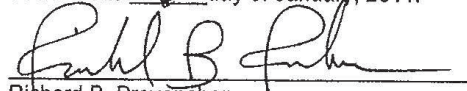
Idaho Department of Environmental Quality
Attn: Director
1410 N. Hilton
Boise Idaho 83706

Idaho Department of Environmental Quality
Attn: INL Oversight Program
1410 N. Hilton
Boise Idaho 83706

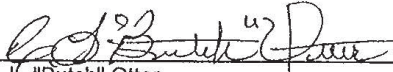
Office of the Idaho Attorney General,
Natural Resources Section
700 W. State Street
P.O. Box 83720
Boise Idaho 83720-0010

7. This Agreement reflects a conditional waiver of section D.2.e of the 1995 Agreement related to the shipment of research quantities of Commercial Power SNF to Idaho. This Agreement shall not be construed to alter or amend any provisions of the 1995 Agreement.
8. All Commercial Power SNF shipped to Idaho pursuant to this Agreement and stored at the INL for any reason shall be removed from Idaho in accordance with the deadline set forth in section C.1 of the 1995 Agreement.
9. If for any reason this Agreement is terminated by either party or if the mission of the INL is changed and it loses its lead laboratory for nuclear energy status, shipments of research quantities of Commercial Power SNF shall cease immediately and all SNF stored or otherwise located at the INL shall be removed from Idaho in accordance with the deadline set forth in section C.1 of the 1995 Agreement.


DATED this 6 day of January, 2011.


Richard B. Provencher
Manager, Idaho Operations Office
United States Department of Energy

DATED this 6 day of January, 2011.


C. L. "Butch" Otter
Governor of Idaho

DATED this 6th day of January, 2011.


Lawrence Wasden
Idaho Attorney General

APPENDIX C:

2019 SUPPLEMENTAL AGREEMENT

**SUPPLEMENTAL AGREEMENT CONCERNING CONDITIONAL WAIVER OF
SECTIONS D.2.e and K.1 OF 1995 SETTLEMENT AGREEMENT**

This Supplemental Agreement is entered this 6th day of November 2019 between the United States Department of Energy (DOE), by and through the Assistant Secretary for Environmental Management and the Assistant Secretary for Nuclear Energy, and the State of Idaho by and through the Governor of the State of Idaho and the Idaho Attorney General (Idaho).

PURPOSE:

Consistent with the principles set forth in the Settlement Agreement and Order dated October 13, 1995 in the matter of Public Service Co. of Colorado v. Batt, No. CV 91-0035-S-EJL (D. Id.) and United States v. Batt, No. CV-91-0054-S-EJL (D. Id.) ("1995 Agreement"), this Supplemental Agreement to the 1995 Agreement provides a one-time conditional waiver of Sections D.2.e. and K.1 of the 1995 Agreement relating to receipt for research purposes of 25 spent nuclear fuel (SNF) rods from the Byron Nuclear Generating Station and for the conditional renewal of the January 6, 2011 Memorandum of Agreement Concerning Receipt, Storage, and Handling of Research Quantities of Commercial Spent Nuclear Fuel at the Idaho National Laboratory). DOE and Idaho (collectively "the Parties") agree as follows:

RECITALS:

WHEREAS, the 1995 Agreement provides in Section F that the Idaho National Laboratory (INL) is designated as the DOE Spent Fuel Lead Laboratory for the "research development and testing of treatment, shipment and disposal technologies for all DOE spent fuel" and provides for the receipt of DOE SNF for research purposes; and

WHEREAS, in 2002 the DOE designated the INL as the Nation's lead laboratory for nuclear energy research; and

WHEREAS, in furtherance of its research mission, the INL has developed and possesses unique technologies and capabilities which will further the research development and testing of new fuel types and technologies; and

WHEREAS, Section D.2.e of the 1995 Agreement restricts the INL from accepting any shipments of "spent fuel from commercial nuclear power plants" (Commercial Power Spent Nuclear Fuel [SNF]); and

WHEREAS, on July 1, 2008, the Parties executed the Agreement to Implement the U.S. District Court Order dated May 25, 2006 ("2008 Agreement"), regarding the interpretation of Paragraph B.1 of the 1995 Settlement Agreement; and

WHEREAS, on January 6, 2011, the Parties executed a Memorandum of Agreement ("2011 Memorandum of Agreement") allowing INL to accept limited quantities of

Commercial Power SNF so long as DOE was in compliance with other terms and conditions of the 1995 Agreement; and

WHEREAS, on January 1, 2013, the DOE failed to meet its obligation under Section E.5 of the 1995 Agreement to have treated all of the Sodium Bearing Liquid High Level Waste (HLW); and

WHEREAS, in February 2014, two unrelated events occurred at the Waste Isolation Pilot Plant (WIPP) resulting in a halt of WIPP operations; and

WHEREAS, subsequent to re-opening in January 2017, WIPP has been operating at limited throughput capacity pending completion of improvements to its ventilation system; and

WHEREAS, as a result of the events and subsequent slowing of shipment volumes to WIPP DOE has failed to meet the requirements of Sections B.1 and B.1.c of the 1995 Agreement, and Section VIII of the 2008 Agreement to Implement U.S. District Court Order Dated May 25, 2006 (“2008 Agreement”); and

WHEREAS, DOE remains in non-compliance with the 1995 Agreement, and Section VIII of the 2008 Agreement; and

WHEREAS, because DOE is in non-compliance of the 1995 Agreement and Section VIII of the 2008 Agreement the 2011 Memorandum of Agreement is not operative; and

WHEREAS, because DOE is in non-compliance with the 1995 Agreement, and Section VIII of the 2008 Agreement , shipments of DOE SNF to INL are suspended pursuant to Section K.1.a.; and

WHEREAS, prior to the 2014 closure of WIPP, DOE had shipped 30,089 cubic meters of transuranic waste from Idaho to WIPP; and

WHEREAS, since the re-opening of WIPP, DOE has shipped 1,492 cubic meters of transuranic waste from Idaho to WIPP; and

WHEREAS, since 2005, DOE has exhumed 5.01 acres and packaged 9,020 cubic meters of buried transuranic waste from the Subsurface Disposal Area pursuant to the 2008 Agreement; and

WHEREAS, since 2005, DOE has shipped 13,882 cubic meters of mixed Alpha-low level waste historically managed by DOE as transuranic waste to disposal facilities outside of Idaho.

WHEREAS, since December 31, 2014, DOE has shipped over 330,000 pounds of *heavy*

*metal*¹ nuclear material from the state of Idaho; and

WHEREAS, since December 31, 2014, DOE has shipped from Idaho a volume of TRIGA SNF equaling 29.3 pounds of *heavy metal*; and

WHEREAS, on December 31, 2014, DOE requested permission to receive 25 SNF rods from the Byron Nuclear Generating Station at INL for use in the High Burnup Fuel Testing and Fuel Cycle Research Development and Demonstration Project (research project); and

WHEREAS, to date Idaho has not allowed such shipment to proceed due to DOE's non-compliance; and

WHEREAS, DOE anticipates future needs to receive SNF in furtherance of INL's SNF and nuclear energy research missions, as recognized by the parties in their 2011 Memorandum of Agreement; and

WHEREAS, the Parties agree INL research has significant value to the national security interests of the United States and will provide valuable information regarding nuclear waste reduction and non-proliferation; and

WHEREAS, the State of Idaho has determined that acceptance of shipments at the INL for research purposes, subject to the terms and conditions of this Supplemental Agreement, will provide valuable benefit to both Idaho and the nation in the form of increased knowledge concerning the safe and efficient generation of nuclear energy, nuclear waste reduction technology and the nonproliferation of nuclear weapons; and

WHEREAS, implementation of this Supplemental Agreement will result in a further net reduction in the amount of SNF stored at the INL; and

WHEREAS, Section J.1 of the 1995 Agreement provides that Idaho, in its sole discretion, may waive performance by DOE of any terms, conditions, and obligations contained in the 1995 Agreement; and

WHEREAS, Idaho will continue to insist upon the safe management of SNF, HLW, and transuranic waste and disposition of such materials outside of the State of Idaho.

NOW THEREFORE IT IS HEREBY AGREED:

Pursuant to the following terms and conditions of this Supplemental Agreement and solely for the purpose of research conducted at the INL, Idaho in its sole and exclusive discretion, hereby grants a one-time waiver of the Section D.2.e prohibition on the

¹ For purposes of this Supplemental Agreement the Parties agree that the term "heavy metal" refers to all uranium, plutonium, and thorium and trace amounts of additional elements having an atomic number greater than or equal to 90, contained within materials such as SNF. Other SNF materials, such as cladding, alloys and structural materials are not included.

shipment of commercial SNF to INL and a one-time waiver of the State's invocation of Section K.1 arising from the above described non-compliance for the receipt of 25 SNF rods from Byron Nuclear Generating Station. Idaho further agrees that if DOE meets the terms and conditions of this Supplemental Agreement contained in paragraph 7, DOE may resume and plan for future receipts of SNF pursuant to the 2011 Memorandum of Agreement between Idaho and DOE.

1. Prior to receipt at the INL of the Byron Nuclear Generating Station SNF rods for research purposes, DOE shall have achieved radioactive operations of the Integrated Waste Treatment Unit and have provided verified notice to Idaho of attaining such radioactive operation. For purposes of this paragraph “radioactive operations” shall mean the introduction of sodium-bearing HLW to the treatment unit and successful treatment of sodium-bearing HLW resulting in at least one (1) full canister of dry solid sodium-bearing HLW.
2. After the effective date of this Supplemental Agreement and by not later than December 31, 2021, DOE agrees to ship not less than 300 pounds of special nuclear material² out of the State of Idaho.
3. DOE agrees to treat all Sodium Bonded EBR II Driver Fuel Pins into product material for High Assay Low Enriched Uranium (HALEU) fuel production as follows:
 - a. DOE shall commence treatment by no later than thirty (30) days after the effective date of this Supplemental Agreement; and
 - b. DOE shall treat at least 165 pounds heavy metal of Sodium Bonded EBR II Driver Fuel Pins per year on a three year rolling average basis; and
 - c. DOE shall complete treatment of all Sodium Bonded EBR II Driver Fuel Pins by December 31, 2028; and
 - d. Except for HLW, DOE shall dispose of any waste materials, including but not limited to fuel pin cladding material generated during treatment outside of the State of Idaho by not later than January 1, 2035; and
 - e. Any HLW generated during treating shall be treated so as to put it into a form suitable for transport to a permanent repository or interim storage facility outside the State of Idaho by a target date of December 31, 2035; and
 - f. If DOE has not put all the treated product material to beneficial use DOE

² For purposes of this Supplemental Agreement the Parties agree that the term “Special Nuclear Material” is defined as plutonium, uranium-233, or uranium enriched in the isotopes uranium-233 or uranium-235, but does not include source material.

will remove all treated product material from the State of Idaho by January 1, 2035.

4. Transuranic Waste Shipments to WIPP:

- a. Commencing on the effect date of this Supplemental Agreement, DOE will allocate to and make from the State of Idaho at least fifty-five percent (55%) of all transuranic waste shipments received at WIPP for INL transuranic waste, including retrieved buried waste, each year until shipments from INL are complete. This percentage will be calculated on a three year running average, beginning with Calendar Year 2019 (total number of shipments over any period of three years, divided by three)
- b. In addition to the fifty-five percent (55%) allocation of shipments of INL transuranic waste to WIPP, DOE will give INL transuranic waste priority for shipments to WIPP. Priority means that if a shipment allotted to a generator site other than INL is not made, such shipment allotment will be made available to INL, subject to consideration of national security mission and nonproliferation matters, other DOE legal and site cleanup commitments, WIPP operational concerns, and safety and security operations. In making the determinations above related to national security mission and nonproliferation considerations, the State recognizes the authority of DOE and its sole discretion regarding the same. With respect to decisions on the other considerations listed in this section, the State and DOE reserve their respective rights under section K.1.a. of the 1995 Agreement. In furtherance of this provision DOE agrees as follows:
 - i. DOE shall provide to Idaho on the first of each month the eight week rolling shipment schedule for WIPP.
 - ii. DOE shall maintain at the INL a quantity of packaged WIPP certified waste, and logistical resources sufficient to utilize any shipment allocations that become available to INL.
 - iii. On a quarterly basis, DOE shall provide Idaho with access to DOE shipment tracking records, which document DOE shipment allocations to WIPP, subject to any security requirements limiting the manner of access.

5. Except for buried transuranic waste that has not been exhumed and is governed under the 2008 Agreement, DOE shall have all but 1,200 cubic meters of pre-1995 transuranic waste located at INL treated and packaged for shipment out of the State of Idaho on or by November 1, 2019.

6. Limits and Material Management – Byron Shipment:

- a. INL may receive for the purpose of research and examinations conducted

at the INL 25 SNF rods from the Byron Nuclear Generating Station for purposes of the Byron Rods for High Burnup Fuel Testing and Fuel Cycle RD&D Project, the total estimated weight of which is 100 pounds *heavy metal*.

- b. The 25 SNF rods from the Byron Nuclear Generating Station will count as a shipment of DOE SNF for purposes of the annual shipment limits contained in Section D.2.f of the 1995 Agreement.
- c. The amount of SNF from the Byron Nuclear Generating Station, measured in fractions of metric tons *heavy metal* (MTHM), including the equivalent amount contained in any wastes generated during research, remaining on site at the end of each calendar year will count toward the total metric tonnage limits for DOE SNF contained in Section D.2.c of the 1995 Agreement.
- d. The SNF from the Byron Nuclear Generating Station will be stored and managed as SNF until shipped off-site in compliance with the 2035 shipment deadline of the 1995 Agreement.
- e. Any transuranic waste and low-level waste resulting from the research on the SNF from the Byron Nuclear Generating Station may be consolidated with other laboratory waste and managed appropriately.
- f. Nothing in this Supplemental Agreement shall be construed to allow DOE to exceed the 55 MTHM limit for SNF allowed by the 1995 Agreement.

7. Additional Shipments of Research Quantities of SNF under the 2011 Memorandum of Agreement.

- a. DOE may resume the receipt of and plan for additional research quantities of commercial SNF pursuant to the 2011 Memorandum of Agreement, the terms and conditions of which will govern such additional shipments, upon successful production of at least 100 canisters of treated sodium-bearing HLW located at INL and so long as:
 - i. DOE is not in breach of any terms and conditions of the 1995 Agreement, or the 2008 Agreement other than those described in this Supplemental Agreement; and
 - ii. The Integrated Waste Treatment Unit is continuing sustained operations³ to treat the remaining Sodium Bearing HLW located at


³ For purposes of this paragraph only the term "Sustained Operations" shall mean the continuous operation of the Integrated Waste Treatment Unit to treat the remaining Sodium Bearing HLW exclusive of normal operating shutdowns for maintenance and repairs of less than twenty-four (24) months in duration.


INL.

8. This Supplemental Agreement reflects a conditional waiver of Sections D.2.e and K.1 of the 1995 Agreement related to a single shipment of research quantities of Commercial Power SNF to Idaho. This Supplemental Agreement further reflects terms and conditions under which DOE may resume and plan for additional shipments of Commercial SNF pursuant to the Parties 2011 Memorandum of Agreement. This Supplemental Agreement shall not be construed to alter or amend any provisions of the 1995 Agreement, the 2008 Agreement or the 2011 MOA.
9. This Supplemental Agreement shall not relieve the Parties from their obligation to comply with any applicable federal, state, or local law.
10. Nothing in this Supplemental Agreement shall be admissible in any judicial proceeding other than one for the enforcement of this Supplemental Agreement.

DATED this 6th day of November, 2019.

SO AGREED:

SIGNED: 
WILLIAM I. WHITE
SENIOR ADVISOR FOR ENVIRONMENTAL MANAGEMENT
TO THE UNDER SECRETARY FOR SCIENCE
U.S. DEPARTMENT OF ENERGY

SIGNED: 
HONORABLE DR. RITA BARANWAL
ASSISTANT SECRETARY FOR NUCLEAR ENERGY
U.S. DEPARTMENT OF ENERGY

SIGNED: 
HONORABLE BRAD LITTLE, GOVERNOR
STATE OF IDAHO

SIGNED: 
HONORABLE LAWRENCE G. WASDEN, ATTORNEY GENERAL
STATE OF IDAHO