DOE/EA-2115

FINAL ENVIRONMENTAL ASSESSMENT FOR THE COMMERCIAL DISPOSAL OF DEFENSE WASTE PROCESSING FACILITY RECYCLE WASTEWATER FROM THE SAVANNAH RIVER SITE

August 2020

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ACRONYMS AND ABBREVIATIONS

CEQ	Council on Environmental Quality
CFR	*Code of Federal Regulations*
DBA	design-basis accident
DSA	documented safety analysis
DOE	U.S. Department of Energy
DWPF	Defense Waste Processing Facility
SRS DWPF Recycle Wastewater EA	*Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site*
DWPF SEIS	*Final Supplemental Environmental Impact Statement—Defense Waste Processing Facility*
EA	environmental assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
ETF	Effluent Treatment Facility
FMCSA	Federal Motor Carrier Safety Administration
FR	*Federal Register*
FWF	WCS Federal Waste Facility
FY	fiscal year
HEU	highly enriched uranium
HLW	high-level radioactive waste
IAEA	International Atomic Energy Agency
IP-2	Industrial Package-2
LCF	latent cancer fatality
LLW	low-level radioactive waste
LSA	low specific activity
MEI	maximally exposed individual
MFFF	Mixed-Oxide Fuel Fabrication Facility
MLLW	mixed low-level radioactive waste
mrem	millirem
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act of 1969*
NNSA	National Nuclear Security Administration
NRC	Nuclear Regulatory Commission
PCB	Polychlorinated biphenyl
PM_n	particulate matter less than or equal to n microns in aerodynamic diameter
RCRA	*Resource Conservation and Recovery Act*
RCT	Recycle Collection Tank
ROD	Record of Decision
SEIS	supplemental environmental impact statement
SNF	spent nuclear fuel
SOF	sum of fractions
SPRU	Separations Process Research Unit

SRS HLW Tank Closure EIS	*High-Level Waste Tank Closure Final Environmental Impact Statement*
SRS Salt Processing Alternatives SEIS	*Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement*
SWM	solid waste management
SWPF	Salt Waste Processing Facility
Tank Farm DSA	*Concentration, Storage, and Transfer Facilities Documented Safety Analysis*
TRU	transuranic waste
U.S.C.	United States Code
USDOT	U.S. Department of Transportation
WAC	waste acceptance criteria
WCS	Waste Control Specialists, LLC
WIPP	Waste Isolation Pilot Plant
WM PEIS	*Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*

1 INTRODUCTION

1.1 Introduction

The Savannah River Site (SRS) occupies approximately 300 square miles primarily in Aiken and Barnwell counties in South Carolina (Figure 1-1). Over the years, a primary SRS mission has been the production of special radioactive isotopes to support national defense programs, including reprocessing of spent nuclear fuel (SNF) and target materials. More recently, the SRS mission has also emphasized waste management, environmental restoration, and the decontamination and decommissioning of facilities that are no longer needed for SRS's traditional defense activities. SRS generated large quantities of liquid radioactive waste as a result of reprocessing activities associated with its nuclear materials production mission. This liquid radioactive waste has historically been managed as high-level radioactive waste (HLW). The waste was placed into underground storage tanks at SRS and consists primarily of three physical forms: sludge, saltcake, and liquid supernatant.[1] The sludge portion in the underground tanks is being transferred on-site to the Defense Waste Processing Facility (DWPF) for vitrification in borosilicate glass to immobilize the radioactive constituents, as described in the *Final Supplemental Environmental Impact Statement—Defense Waste Processing Facility* (DOE/EIS-0082-S) (DWPF SEIS) (DOE 1994) and subsequent Record of Decision (ROD) (Volume 60 of the *Federal Register*, page 18589 [60 FR 18589]). The resulting vitrified waste form is poured as molten glass into production canisters where it cools into a solid glass-waste and is securely stored at SRS until the U.S. Department of Energy (DOE) establishes a final disposition path.

DWPF operations generate recycle wastewater. The DWPF recycle wastewater is a combination of several dilute liquid waste streams consisting primarily of condensates from the vitrification processes. Other components of the DWPF recycle wastewater include process samples, sample line flushes, sump flushes, and cleaning solutions from the decontamination and filter dissolution processes. Currently, the DWPF recycle wastewater is returned to the tank farm for volume reduction by evaporation or is beneficially reused in saltcake dissolution or sludge washing.

To analyze capabilities of a potential alternative treatment and disposal method at the end of the liquid waste mission life, DOE is proposing to dispose of up to 10,000 gallons of stabilized (grouted[2]) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial low-level radioactive waste (LLW) facility outside of South Carolina, licensed by either the U.S.

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[1] Sludge components of radioactive liquid waste consist of the insoluble solids that have settled to the bottom of the waste storage tanks. Radionuclides present in the sludge include fission products (such as strontium-90) and long-lived actinides. Supernatant is the liquid portion of the waste stored with the sludge and saltcake. The combination of supernatant and saltcake is referred to as salt waste.

[2] Grout is a proven safe and effective technology that continues to be used by DOE and other national and international parties to stabilize radioactive wastes, including certain tank wastes, for disposal. Use of stabilization agents for this purpose is consistent with the NRC's *Concentration Averaging and Encapsulation Branch Technical Position, Revision 1* (https://www.nrc.gov/docs/ML1225/ML12254B065.pdf), which allows mixing of nonradioactive constituents with radioactive waste (e.g., solidification, encapsulation, or additives used in thermal processing), provided the mixing has a purpose other than reducing the waste classification, such as waste stabilization or process control. Furthermore, the addition of stabilization agents to the waste prior to disposal is often necessary to meet the NRC requirements in 10 CFR 61.56, "Waste Characteristics" (e.g., to ensure stability of the waste form).

Nuclear Regulatory Commission (NRC) or an Agreement State[3] under Title 10 of the *Code of Federal Regulations* (10 CFR) Part 61. If implemented, this proposal would provide alternative treatment and disposal options for DWPF recycle wastewater—through the use of existing, licensed, off-site commercial treatment and disposal facilities.

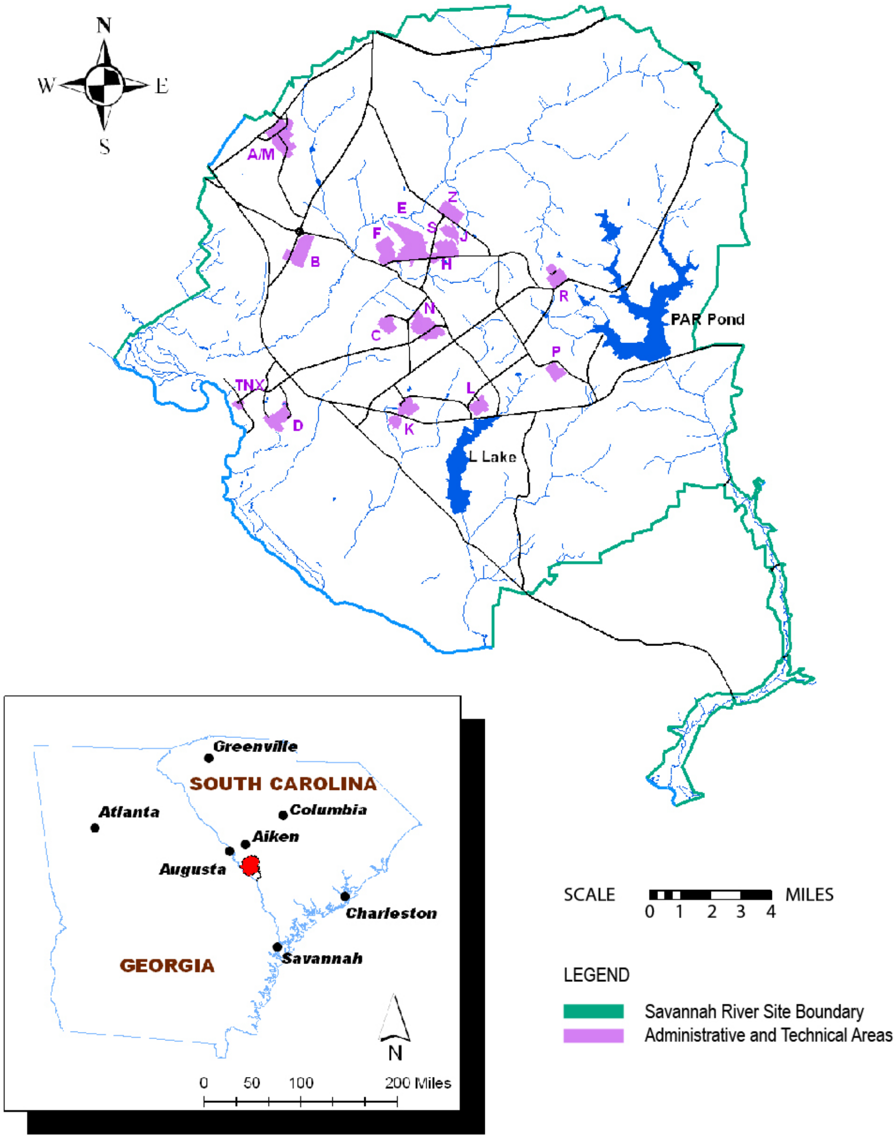

Figure 1-1. Location of Savannah River Site

In accordance with the *National Environmental Policy Act* (Volume 42 of the United States Code, Section [U.S.C. §] 4321 et seq.) (NEPA) and DOE's implementing regulations at 10 CFR

[3] Congress authorized the NRC to enter into Agreements with states that allow the states to assume, and the NRC to discontinue, regulatory authority over source, byproduct, and small quantities of special nuclear material. The states, known as Agreement States, can then regulate byproduct, source, and small quantities of special nuclear materials that are covered in the Agreement, using its own legislation, regulations, or other legally binding provisions. (Section 274b of the *Atomic Energy Act of 1954*, as amended).

Part 1021, DOE is preparing this *Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (SRS DWPF Recycle Wastewater EA) to assess whether the potential environmental impacts of the Proposed Action and alternatives would be significant to human health and the environment and determine whether to prepare an environmental impact statement or a finding of no significant impact.

1.2 Background

On October 10, 2018, DOE published a notice in the *Federal Register* requesting public comment on its interpretation of the definition of the statutory term, "high-level radioactive waste," as set forth in the *Atomic Energy Act of 1954*, as amended, and the *Nuclear Waste Policy Act of 1982*, as amended (83 FR 50909). In that notice, DOE explained the history and basis for its interpretation to classify the waste based on its radiological contents and not on the origin of the waste. Subsequently, on June 10, 2019, DOE published a supplemental notice in the *Federal Register* that provided additional explanation of DOE's interpretation as informed by public review and comment and further consideration by DOE (84 FR 26835). DOE revised its interpretation after consideration of public comments, which included comments from the NRC, affected states and Native American tribes, and other stakeholders, in order to clarify its meaning and import. This interpretation intends to facilitate the safe disposal of defense reprocessing waste if the waste meets either of the following two criteria:

1. Does not exceed concentration limits for Class C LLW as set out in 10 CFR 61.55 and meets the performance objectives of a disposal facility, or

2. Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.

NRC's performance objectives for commercial LLW disposal facilities are specified in 10 CFR Part 61, Subpart C, "Performance Objectives." Performance objectives are the quantitative radiological standards set by the NRC or DOE to ensure protection of the health and safety of individuals and the environment during operation, and after permanent closure of the disposal facility. Performance assessments quantitatively evaluate a disposal facility's ability to protect human health and the environment by evaluating potential radiological human exposure after disposal facility closure. Performance assessments evaluate risk by analyzing the long-term evolution of the waste forms and engineered features and the effect such changes could have on the performance of a waste disposal system. As part of its normal process for analyzing waste for management, stabilization, and disposition, sampling of the waste is performed which provides DOE with the necessary assurance that the waste would meet the commercial disposal facility requirements. DOE will apply this process to the stabilization and disposal of the DWPF recycle wastewater.

As stated in the supplemental notice, DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways.

1.3 Purpose and Need for Agency Action

DOE's purpose and need for action is to analyze capabilities for alternative treatment and disposal options for DWPF recycle wastewater through the use of existing, licensed, off-site commercial treatment and disposal facilities. When DOE prepared the 1994 DWPF SEIS (DOE 1994), the *Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement* (SRS Salt Processing Alternatives SEIS; DOE 2001), and the *High-Level Waste Tank Closure Final Environmental Impact Statement* (SRS HLW Tank Closure EIS; DOE 2002), DOE did not analyze the potential environmental impacts associated with potential commercial treatment and disposal options for DWPF recycle wastewater. DOE now proposes to use commercial LLW disposal facilities for up to 10,000 gallons of DWPF recycle wastewater to inform planning activities on treatment and disposal options for completion of the tank closure program.

The 10,000-gallon amount is reasonable to enable a representative volume of DWPF recycle wastewater to be collected and stabilized to evaluate commercial disposal capabilities for this waste stream. Any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review. Treatment or disposal of this waste at a commercial LLW facility would help to inform planning activities for the three years between the completion of the Salt Waste Processing Facility (SWPF) mission (estimated 2031) and DWPF mission completion (estimated 2034) (SRR 2019).[4] During this period, DOE will not have the option of returning DWPF recycle wastewater to the tank farm (which is how SRS presently addresses DWPF recycle wastewater) and SWPF for processing because SWPF will have completed its mission of treating salt waste from the tank farms and will undergo closure and tanks will be operationally closed. The analysis in this Final EA enables DOE to develop an alternative capability for stabilization and disposal of DWPF recycle through the use of a licensed commercial disposal facility.

1.4 Proposed Action Evaluated in this Environmental Assessment

DOE's Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. If implemented, this proposal would provide alternative treatment and disposal options for certain reprocessing waste—namely, DWPF recycle wastewater[5]—through the use of existing, licensed, off-site commercial treatment and disposal facilities.

The Proposed Action would inform future planning to determine whether off-site disposition is the only option, one of multiple options, or not a viable option for larger expected volumes of

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[4] As described in the *Liquid Waste System Plan, Revision 21* (System Plan) (SRR 2019), it is estimated that approximately 380,000 gallons of DWPF recycle wastewater could be generated during the three-year period following planned SWPF shutdown in 2031. Potential cumulative impacts associated with this volume of DWPF recycle wastewater are described in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA.

[5] DOE's HLW interpretation would not impact practices for the management of other reprocessing waste at SRS, which include stabilization and disposal of treated liquid radioactive waste at the Saltstone Production Facility and F and H farm tank closures as non-HLW under Section 3116 of the *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005* (Public Law 108-375).

this waste stream for the three years between the completion of SWPF mission (estimated 2031) and DWPF mission (estimated 2034). The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years.

DOE has developed three alternatives for accomplishing this Proposed Action.

- **Alternative 1** would deploy a treatment capability at SRS to stabilize up to 10,000 gallons of DWPF recycle wastewater and then transport the grouted waste form to a licensed commercial disposal facility.

- **Alternative 2** would transport up to 10,000 gallons of DWPF recycle wastewater to a licensed commercial disposal facility with the capability to stabilize and dispose of the final waste form.

- **Alternative 3** would transport up to 10,000 gallons of DWPF recycle wastewater to a licensed commercial treatment facility with the capability to stabilize the liquid into a grouted waste form, and then transport the final waste form to a licensed commercial disposal facility.

DOE on-site (i.e., E Area) and off-site (e.g., Nevada Nuclear Security Site) radioactive waste disposal facilities are not included in the alternatives analysis because the purpose of the proposed action is to evaluate the capability to dispose of DWPF recycle wastewater (up to 10,000 gallons) as LLW at a licensed commercial facility outside the state of South Carolina. DOE on-site and off-site disposal of LLW has been analyzed in previous NEPA documents (e.g., SRS Salt Processing Alternatives SEIS [DOE 2001] and the *Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* [WM PEIS; DOE 1997]). Any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal.

The analyzed alternatives are discussed in more detail in Section 2.1 of this Final SRS DWPF Recycle Wastewater EA. DOE also evaluates a No-Action Alternative, as required by 10 CFR 1021.321(c).

1.5 National Environmental Policy Act Documents Related to the Proposed Action

This section identifies and discusses other NEPA documents that are relevant to this Final SRS DWPF Recycle Wastewater EA. Decisions as a result of these other NEPA documents have affected (or will affect) operations/activities related to SRS tank waste management.

- **Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste** (WM PEIS) (DOE/EIS-0200; DOE 1997). In the 1990s, DOE anticipated a need for managing wastes at locations other than where the waste was generated. In order to address this need, DOE conducted analyses for management of radioactive and hazardous wastes, including LLW. The WM PEIS analyzed the transportation of large volumes of

LLW across the country for treatment and disposal. This SRS DWPF Recycle Wastewater EA summarizes and incorporates by reference some of the analyses used to determine potential health and safety impacts resulting from transportation of LLW on the Nation's highways.

- **Final Environmental Impact Statement for the Defense Waste Processing Facility, Savannah River Plant, Aiken, South Carolina** (DOE/EIS-0082; DOE 1982). This EIS provided environmental input into both the selection of an appropriate strategy for the permanent disposal of HLW stored at SRS and the subsequent decision to construct and operate the DWPF. Following the ROD (47 FR 23801, June 1, 1982), construction of DWPF began in late 1983, and radioactive operations began in March 1996. One of the dilute secondary aqueous radioactive waste streams associated with DWPF is referred to as DWPF recycle wastewater. This waste stream is the subject of the Proposed Action in this SRS DWPF Recycle Wastewater EA.

- **Final Supplemental Environmental Impact Statement for the Defense Waste Processing Facility, Savannah River Site, Aiken, South Carolina** (DOE/EIS-0082-S1; DOE 1994). This SEIS evaluated the ongoing construction of DWPF and changes that had occurred in the design since issuance of the Final EIS in 1982. This SEIS analyzed the current practice of returning the DWPF recycle wastewater to the tank farm for reduction by evaporation or reuse in saltcake dissolution or sludge washing. That process constitutes the No-Action Alternative evaluated in this SRS DWPF Recycle Wastewater EA. As described in Section 2.1.1, the Proposed Action in this EA would change that process for up to 10,000 gallons of DWPF recycle wastewater to provide alternative treatment and disposal options for DWPF recycle wastewater following closure of the SWPF through the use of existing, licensed, off-site commercial treatment and/or disposal facilities.

- **Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement, Aiken, South Carolina** (DOE/EIS-0082-S2; DOE 2001). DOE prepared this SEIS to evaluate alternatives for separating the high-activity fraction from the low-activity fraction of the salt solutions stored in underground tanks at SRS with the high-activity fraction vitrified in the DWPF and currently stored as HLW and the lower-activity fraction disposed of as grouted LLW (saltstone) at SRS. This SEIS also analyzed the current practice of returning the DWPF recycle wastewater to the tank farm for reduction by evaporation or reuse in saltcake dissolution or sludge washing. That process constitutes the No-Action Alternative evaluated in this SRS DWPF Recycle Wastewater EA. As described in Section 2.1.1, the Proposed Action in this EA would change that process for up to 10,000 gallons of DWPF recycle wastewater.

- **High-Level Waste Tank Closure Final Environmental Impact Statement, Aiken South Carolina** (DOE/EIS-0303; DOE 2002). DOE prepared this EIS to evaluate the proposed action to close the tanks at SRS in accordance with applicable laws and regulations, DOE orders, and the *Industrial Wastewater Closure Plan for F- and H-Area High-Level Waste Tank Systems* (SRR 2011) (approved by the South Carolina Department of Health and Environmental Control), which specifies the management of residuals as waste incidental to reprocessing. The EIS evaluated three alternatives regarding the tanks at SRS: the Stabilize Tanks Alternative, the Clean and Remove Tanks Alternative, and the No-Action Alternative. Under the Stabilize Tanks Alternative, the EIS considered three options for tank stabilization: Fill with Grout (Preferred Alternative), Fill with Sand, and Fill with Saltstone. The HLW Tank Closure EIS included evaluation of accident scenarios associated with waste retrieval that are applicable to the Proposed Action in this EA.

1.6 Scope of this Environmental Assessment and Organization

In accordance with the Council on Environmental Quality (CEQ) regulations at 40 CFR Parts 1500−1508 and DOE NEPA implementing procedures at 10 CFR Part 1021, DOE has prepared this Final SRS DWPF Recycle Wastewater EA to assess the potential impacts of implementing the Proposed Action and alternatives for the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from SRS at a commercial LLW disposal facility. As such, this Final SRS DWPF Recycle Wastewater EA:

- Provides an introduction and background discussion of the Proposed Action and the purpose and need for the DOE action (Chapter 1);
- Describes the Proposed Action and the alternatives analyzed (Chapter 2);
- Describes the existing environment relevant to potential impacts of the alternatives and analyzes the potential direct and indirect environmental impacts that could result from the alternatives (Chapter 3);
- Identifies and characterizes cumulative impacts that could result in relation to past, present, and other reasonably foreseeable actions within the surrounding area of the alternatives (Chapter 4);
- Identifies Federal and state agencies consulted during the preparation of this Final SRS DWPF Recycle Wastewater EA (Chapter 5);
- Presents a bibliographic listing of the references cited in this Final SRS DWPF Recycle Wastewater EA (Chapter 6);
- Provides radionuclide concentrations from a representative sample of DWPF recycle wastewater (Appendix A);
- Presents a transportation accident consequence assessment involving DWPF recycle wastewater (Appendix B);
- Includes a sensitivity analysis to evaluate how potential environmental impacts would be affected if technical parameters (small-quantity shipments, radionuclide concentration, and package size and type) varied during implementation of the Proposed Action (Appendix C); and
- Includes images of the comment documents received on the Draft EA and DOE’s responses to those comments (Appendix D).

Certain aspects of the Proposed Action and alternatives have a greater potential for creating adverse environmental impacts than others. For this reason, CEQ regulations (40 CFR 1502.1 and 1502.2) recommend that agencies “focus on significant environmental issues and alternatives,” and discuss impacts “in proportion to their significance.” Section 3.2 of this Final SRS DWPF Recycle Wastewater EA presents the resource screening review that DOE used to determine which resources required the most detailed analysis.

1.7 Public Involvement

On December 10, 2019, DOE published a *Federal Register* notice to announce the availability of the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (SRS DWPF Recycle Wastewater EA; 84 FR 67438). The notice provided details regarding the scope of the Draft EA and the Proposed Action, as well as details related to the public review of the document. The notice included information about the 30-day public comment period, an informational meeting that occurred on December 17, 2019, in Augusta, Georgia, and an informational WebEx presentation that occurred on December 19, 2019.

On December 30, 2019, DOE published another *Federal Register* notice to extend the public comment period for an additional 32 days (85 FR 71909). The public comment period on the Draft SRS DWPF Recycle Wastewater EA ended on February 10, 2020.

In addition to publishing the two *Federal Register* notices, DOE posted the Draft SRS DWPF Recycle Wastewater EA on the DOE NEPA website at https://www.energy.gov/nepa/doe-environmental-assessments.

Appendix D to this Final SRS DWPF Recycle Wastewater EA includes images of the comment documents received on the Draft SRS DWPF Recycle Wastewater EA and DOE's responses to those comments. Changes made to the Draft EA in response to public comments and internal reviews are indicated with a vertical line in the document margin.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 Proposed Action

As documented in section 1.4, DOE's Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61.[6,7] As part of this process, DOE would verify with the licensee of the disposal facility that the stabilized waste meets the facility's waste acceptance criteria (WAC) including additional confirmatory characterization, and all other requirements of the disposal facility, including any applicable regulatory requirements (e.g., the *Resource Conservation and Recovery Act* [RCRA; 42 U.S.C. § 6901]) for stabilization of the waste and applicable U.S. Department of Transportation (USDOT) requirements for packaging and transportation from SRS to the commercial facility.

Section 2.1.1 of this Final SRS DWPF Recycle Wastewater EA provides a description of the DWPF recycle wastewater. As discussed in Sections 2.1.2 through 2.1.4, DOE has identified three alternatives for implementing the Proposed Action. Section 2.1.5 provides a high-level summary of the three alternatives, highlighting their differences.

2.1.1 DWPF Recycle Wastewater

Under normal operations, DWPF produces a liquid radioactive waste stream known as DWPF recycle wastewater. This recycle wastewater resulting from DWPF vitrification operations is ultimately collected in the DWPF Recycle Collection Tank (RCT), located inside the DWPF building, and subsequently transferred to Tank 22 located in the SRS H-Area Tank Farm. While a small percentage of DWPF recycle wastewater has beneficial reuse in saltcake dissolution or sludge washing prior to vitrification, the majority is transferred to the 2H Evaporator system, which separates the concentrates (evaporator bottoms) from the condensates (overheads) reducing the volume necessary for tank farm storage. The concentrates are stored in the tank farm for future salt waste processing and the condensates are routed to the Effluent Treatment Facility (ETF) for further processing prior to release to a permitted outfall. Figure 2-1 illustrates the relationship between DWPF recycle wastewater and the other facilities and processes.

[6] Or the equivalent Agreement State regulations.

[7] DOE's Proposed Action is for 10,000 gallons. However, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A) and prepared a technical evaluation (DOE 2020a) and an official Waste Determination (DOE 2020b) for a small quantity (up to 8 gallons) that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. This small quantity would enable DOE to initiate the transportation, stabilization, and disposal within the next 12 months. Supporting technical documents are available at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

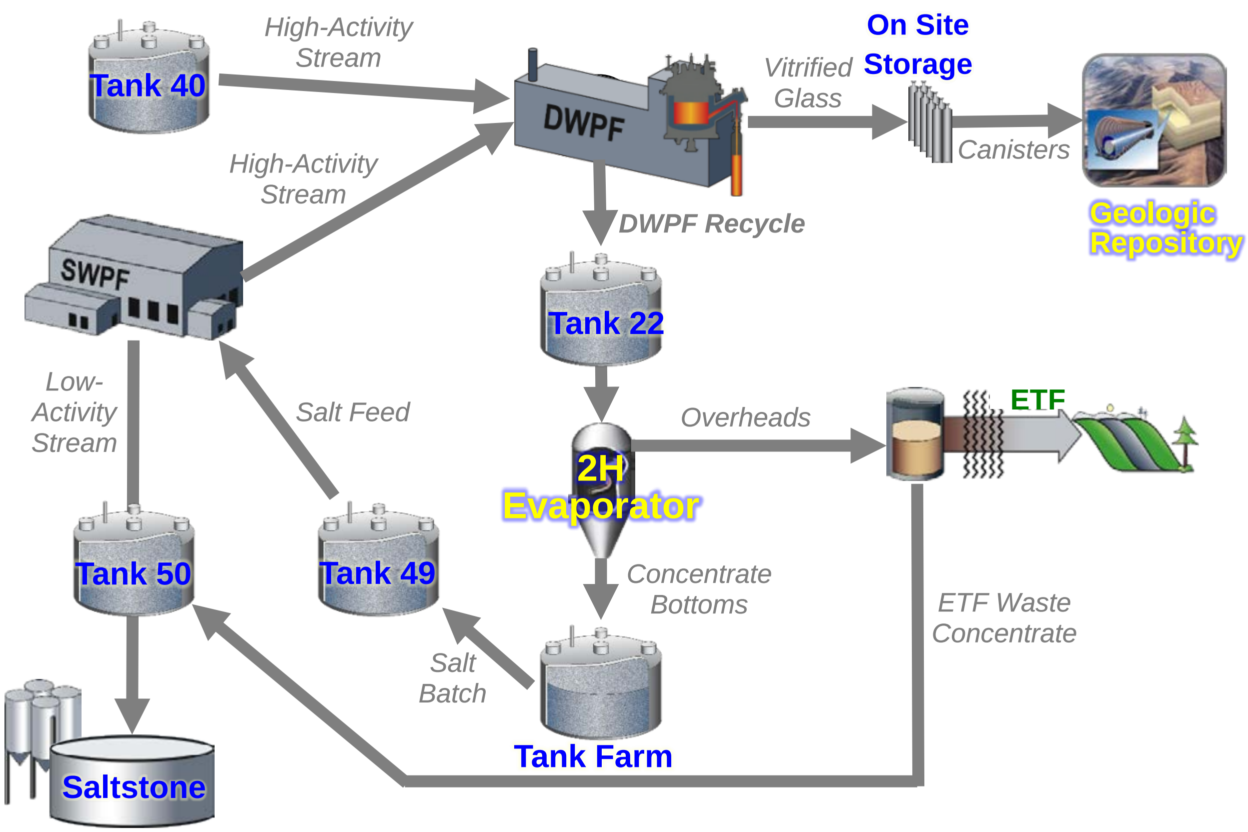

Figure 2-1. Current Process Flow for DWPF Recycle Wastewater

There are several DWPF processes that generate secondary aqueous radioactive waste as contributors to DWPF recycle wastewater. Contributors to this waste stream include:

- **Major Contributors:** There are two major contributors (in terms of volume) to the DWPF recycle wastewater stream. The first major contributor is condensate from processing the tank sludge and salt waste prior to vitrification.[8] Vapors from the processing operations are cooled, condensed, and eventually transferred to the RCT. The second major contributor is condensate from the melter off-gas system. Off-gases from the melter are treated in an off-gas system composed of quenchers, steam atomized scrubbers, condensers, and filters; all of which remove radioactive particulate matter and volatile components before exhausting gases under an approved air permit. Condensate from the off-gas system is also collected and eventually transferred to the RCT.

- **Minor Contributors:** The four minor contributors are the sample flushes, sump flushes, decontamination solutions, and high-efficiency mist eliminator dissolution solution. These aqueous streams are collected in the RCT. Decontamination solutions are acidic solutions used to reduce radiation rates on equipment prior to work in a maintenance cell

[8] Processing prior to vitrification includes steps to neutralize, boil, and blend the tank waste at the DWPF Sludge Receipt and Adjustment Tank and then transfer the slurry to the Slurry Mix Evaporator, where a borosilicate frit is added and the slurry is concentrated to produce melter feed.

and rinse water, which can be pumped from a sump if necessary. Any collected solutions are neutralized to a pH greater than 7 and then sampled to confirm pH prior to transfer of the liquids to the RCT.

The radionuclides (see Appendix A to this Final SRS DWPF Recycle Wastewater EA) from the major and minor contributors may vary in concentration depending on the contributing process, but all result from the same waste materials in the facility. The major and minor contributors are consolidated (blended) in the same tank—first the RCT, which then transfers the consolidated recycle wastewater to Tank 22 on a batch basis. It is from Tank 22 that the up to 10,000 gallons of DWPF recycle wastewater would be retrieved, stabilized, and disposed of as non-HLW at a licensed commercial LLW facility.[7] Because recycle wastewater is routinely transferred into and out of Tank 22 on a batch basis, there may be some variability in the individual batch radionuclide properties. Although the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium. Appendix C provides a sensitivity analysis on radionuclide concentration variations.

The DWPF recycle wastewater collected in the RCT is treated for neutralization and corrosion protection. The treated DWPF recycle wastewater is then pumped to Tank 22 for storage and future processing. Figure 2-2 provides an aerial view of the area around Tank 22.

Figure 2-2. Aerial View Tank 22 and Surrounding Area

Tank 22 is a Type IV tank constructed between 1958 and 1962, with a capacity of approximately 1.3 million gallons. Figure 2-3 provides a graphical depiction of the construction of a typical Type IV tank.

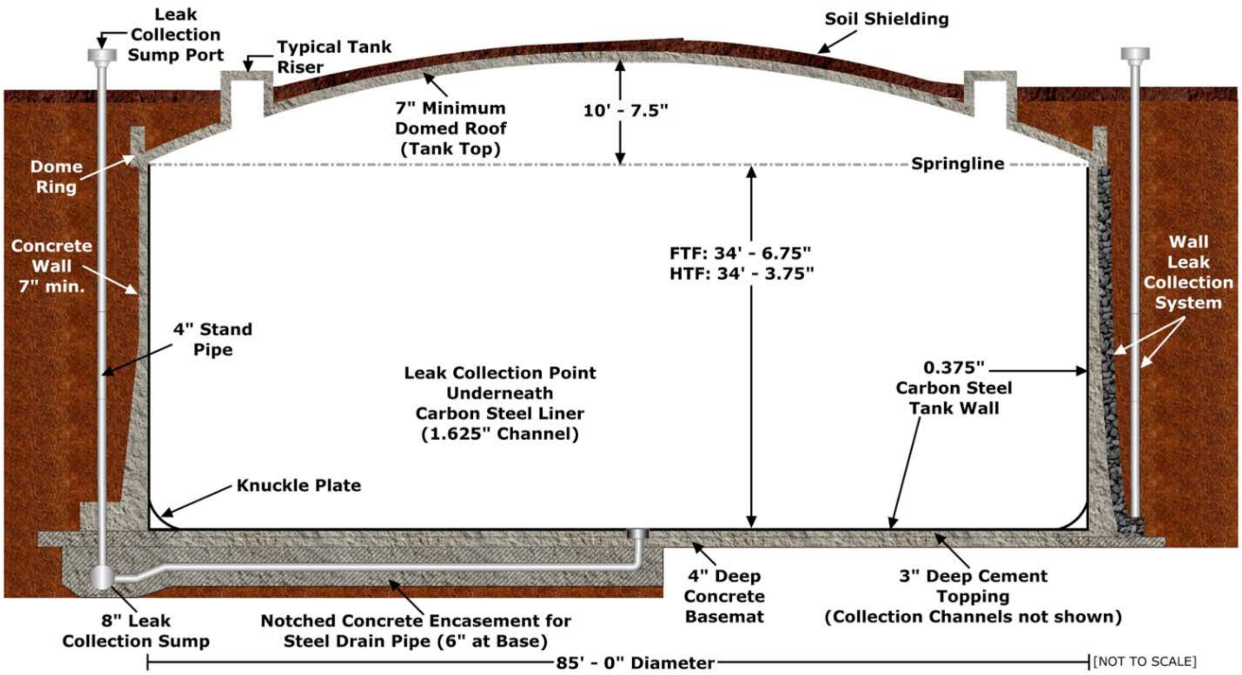

Figure 2-3. Typical Construction of Type IV Tanks (i.e., Tank 22)

The amount of DWPF recycle wastewater required to be managed increases with every gallon of tank waste treated and immobilized at DWPF. For every gallon of tank waste treated at the DWPF, more than one gallon of DWPF recycle wastewater is returned to Tank 22. The volume of DWPF recycle wastewater is expected to increase from approximately 1.5 million gallons per year to as high as 3.2 million gallons per year with the additional salt waste processing associated with SWPF operations (SRR 2019). From Tank 22, DWPF recycle wastewater, in excess of what can be beneficially reused, is routed to the 2H Evaporator system, where it is mixed with other waste streams in the evaporator feed tank. The overheads from the evaporator are routed to the ETF for further processing prior to release to a permitted outfall or disposal in the Saltstone Disposal Facility. Concentrated evaporator bottoms are returned to the tank farm for future salt waste processing. While Tank 22 had other waste streams transferred to it in the past, its primary function for many years has been receipt of the DWPF recycle wastewater stream.

Based on sample data, the profile of the DWPF recycle wastewater in Tank 22 would not exceed Class C LLW limits, in accordance to NRC waste classification tables (10 CFR 61.55).[9] This assumption was verified by laboratory analysis (see Appendix A to this Final SRS DWPF Recycle Wastewater EA). Appendix A also includes information about nonradiological, hazardous constituents that would be present in the DWPF recycle wastewater.

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[9] *Texas Administrative Code* (30 TAC 336.362) and *Utah Administrative Code* (R313-15-1009) include radium-226 as an additional radionuclide for determining LLW classification. A waste stream must meet all regulatory requirements (NRC and State) prior to disposal in that state. The Texas concentration limits are found at https://texreg.sos.state.tx.us/fids/30_0336_0362-1.html, and the Utah concentration limits are found at https://rules.utah.gov/publicat/code/r313/r313-015.htm#T47.

DOE would also determine (and validate with the licensee of the disposal facility) that the DWPF recycle wastewater would meet the facility's WAC. The WAC are the technical and administrative requirements a waste must meet to be accepted at a disposal facility (e.g., waste characterization, waste form acceptability, quality assurance) and are established to ensure the disposal facility, in total, meets its performance objectives. Each disposal facility has its own WAC, which are dictated in part by the physical characteristics of a site. The performance objectives (10 CFR Part 61, Subpart C) are central to the level of health and safety and environmental protection that a commercial LLW disposal facility must satisfy. These objectives address protection from releases of radioactivity, operations, inadvertent intrusion, and long-term stability.

2.1.2 Alternative 1: Treatment at the Savannah River Site and Disposal at a Commercial LLW Facility

Under Alternative 1, DOE would deploy treatment capability at SRS to stabilize (grout) up to 10,000 gallons of DWPF recycle wastewater. Depending upon whether the final packaged waste form is classified as Class A, B, or C LLW,[10] it would then be shipped for disposal to either the Waste Control Specialists LLC (WCS) site near Andrews, Texas (if determined to be Class A, B or C LLW)[11] and/or the Energy*Solutions* site near Clive, Utah (if determined to be Class A LLW),[12] depending upon waste content and facility WAC. Sampling results conducted have indicated that the DWPF recycle wastewater would be Class B LLW. Alternative 1 includes the following activities:

- Deploy the retrieval and on-site treatment capability at SRS and stabilize up to 10,000 gallons of DWPF recycle wastewater. It is assumed that upon stabilization, the solid waste form would meet appropriate packaging and transportation requirements.[13]
- Transport the stabilized waste form to either the WCS site or the Energy*Solutions* site, in accordance with final waste classification and WAC.
- Dispose of the stabilized waste form.

2.1.2.1 Retrieval and On-Site Treatment

DWPF recycle wastewater would be retrieved from Tank 22 (or from the transfer system between the RCT and Tank 22) and stabilized in close proximity to the tank. Pretreatment to remove radionuclides would not be required to meet disposal facility WAC or USDOT requirements to ship the final stabilized waste form as Low Specific Activity Group II (LSA-II)

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[10] In its 10 CFR Part 61 regulations, NRC has identified classes of LLW—Class A, B, or C—for which near-surface disposal is protective of human health and the environment. This waste classification regime is based on the concentration levels of a combination of specified short-lived and long-lived radionuclides in a waste stream, with Class C LLW having the highest concentration levels.

[11] WCS is licensed by the Texas Commission on Environmental Quality for the disposal of Class A, B, and C LLW that meets specified WAC. Disposal of the stabilized waste at the WCS site would be conducted in accordance with the facility's operating license (Radioactive Material License No. 04100).

[12] Energy*Solutions* is licensed by the Utah Department of Environmental Quality for the disposal of Class A LLW that meets specified WAC. Disposal of the stabilized waste at the Energy*Solutions* site would be conducted in accordance with the facility's operating license (Radioactive Material License No. UT 2300249).

[13] Packages intended for transport of radiological materials must meet USDOT requirements provided in 49 CFR Subchapter C, "Hazardous Materials Regulations."

in an Industrial Package-2 (IP-2) or Type A package.[14] The DWPF recycle wastewater in Tank 22 would be extracted from the tank via an available tank penetration riser with a low volume pump. The suction leg of the pump would enter the riser and end slightly below the surface of the liquid in Tank 22. The pump would discharge into a small-diameter hose-in-hose transfer line (to provide secondary containment) to deliver the DWPF recycle wastewater to the solidification equipment/container located in a temporary radiological enclosure (enclosure or hut) in proximity to Tank 22, thus minimizing the amount of liquid outside the tank at any one time.

The enclosure would house any necessary radiological supplemental containments, shielding, containment ventilation, and/or access controls for protection of the workers and the environment as appropriate based on the final equipment configuration. Secondary containment would also be provided by radiological enclosures as appropriate based on the final equipment configuration. Figure 2-4 depicts the likely location of the on-site treatment capability. The temporary enclosure would house the container that would receive the DWPF recycle wastewater from Tank 22 and dry feed materials for mixing within the container. Typical cementitious material components, such as cement, fly ash and slag, would be mixed with the DWPF recycle wastewater and cured to a stabilized waste form (i.e., grout).

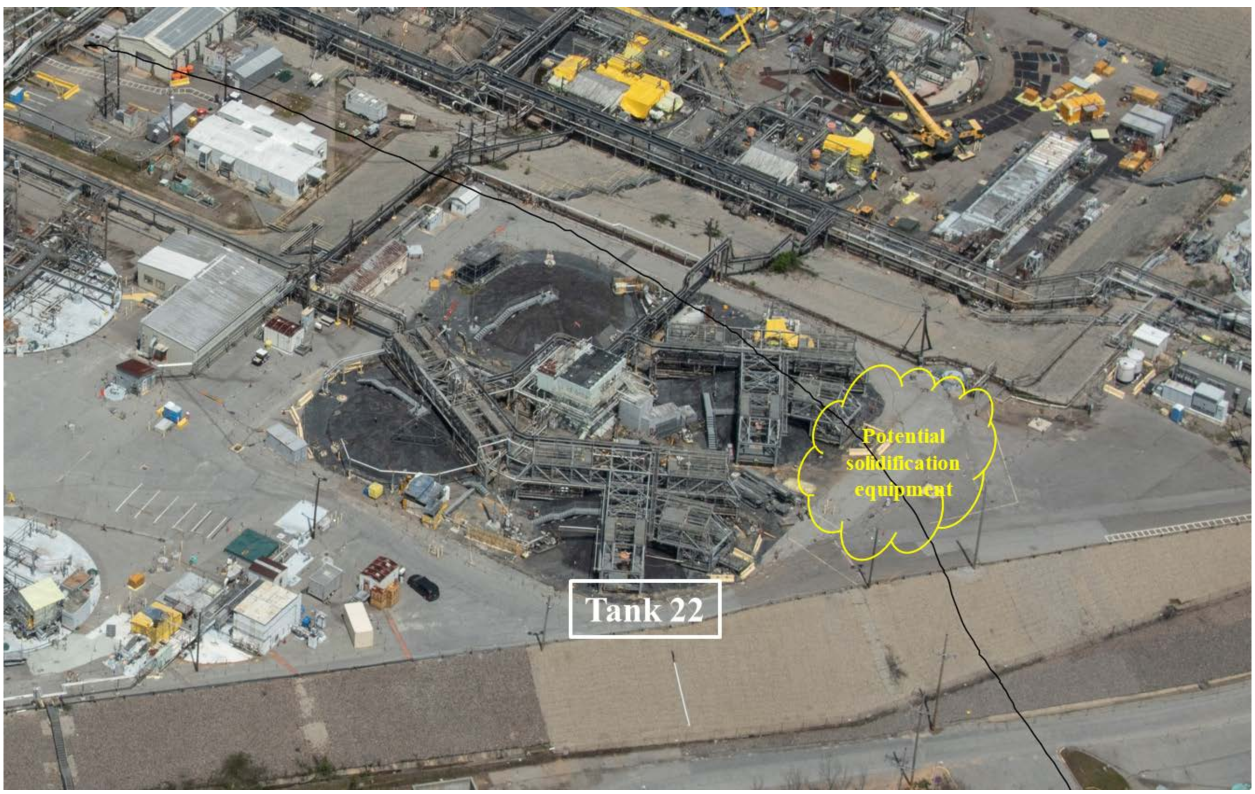

Figure 2-4. Potential Location of On-Site Treatment Capability

For this analysis, it is assumed that the waste would be grouted in a 1,200-gallon container and that this container would also serve as the disposal package for the stabilized waste form. Other

[14] LSA-II material (as defined in 49 CFR 173.403) can be transported in an Industrial Package Type 2 (IP-2) transportation package (as defined in 49 CFR 173.403/410/411). An IP-2 package must meet a subset of the Type A packaging tests as defined in 49 CFR 173.411 and 465). See Appendix A for more details.

containers that meet IP-2 or Type A USDOT requirements could also be used. The container would include an internal paddle that would be used for mixing the liquid and the grout materials; the paddle would remain in the stabilized waste form. The analysis in this Final SRS DWPF Recycle Wastewater EA assumes that the volume of the waste in the stabilized matrix would be no larger than twice the volume of the liquid, prior to stabilization.[15] Therefore, 600 gallons of DWPF recycle wastewater would be grouted in each 1,200-gallon transportation and disposal container.

Following an appropriate grout curing period (to be determined based on the specific characteristics of the waste), the container would be sealed and radiologically surveyed to accommodate off-site shipment.

The on-site treatment of up to 10,000 gallons of DWPF recycle wastewater would occur in batches and would not necessarily be done consecutively. The retrieval and stabilization is assumed to require two weeks for each 1,200-gallon batch. Most of that time would be associated with staging the equipment, materials, packages, and truck. The actual retrieval, transfer, and grouting would likely be done within a four-day period.

2.1.2.2 Transportation and Disposal

The final, stabilized waste form would be shipped in an IP-2 or Type A package approved for transport under USDOT requirements, as provided in 49 CFR Subchapter C, "Hazardous Materials Regulations," to an off-site, licensed disposal facility. The specific packaging assumed for the analysis in this Final SRS DWPF Recycle Wastewater EA is the same IP-2 used for transportation and disposal of the stabilized sludge waste form from the Separations Process Research Unit (SPRU) in New York from 2013 to 2014.[16] Figure 2-5 is a photograph of the SPRU IP-2 package. These particular packages are approximately six feet tall by six feet in diameter.

Figure 2-5. IP-2 Transportation Package Used at SPRU

The final stabilized waste form shipments would be made by truck in accordance with USDOT requirements. The loaded IP-2 package can contain 600 gallons of liquid mixed with cement, fly ash, and slag to form 1,200 gallons of a stabilized waste form. Each loaded package would weigh approximately 10 tons. A semi-truck is able to carry two packages per shipment; therefore, the analysis in this Final SRS DWPF Recycle Wastewater EA assumes approximately nine truck shipments from SRS to a LLW disposal facility. The approximate highway distance

[15] For example, at the SRS Saltstone Production Facility, nominally 1.76 gallons of grout is produced for each gallon of decontaminated salt solution feed (SRR 2019).
[16] Information about the SPRU campaign is available online: : https://www.ncbi.nlm.nih.gov/books/NBK441730/pdf/Bookshelf_NBK441730.pdf [pages 48-53].

between SRS and the WCS site is 1,400 miles. The highway distance between SRS and the Energy*Solutions* site is approximately 2,200 miles.

The stabilized waste form would be evaluated while still at the SRS H-Area Tank Farm to determine whether its radiological and hazardous constituents are within the bounds of the WAC for the identified LLW disposal facility. As described above, LLW that meets requirements in 10 CFR 61.55 for Class A LLW could be accepted at both the WCS site and Energy*Solutions* site for disposal. At the time of publication of this Final SRS DWPF Recycle Wastewater EA, LLW that exceeds the criteria for Class A LLW but is within the requirements for Class C LLW could only be accepted at the WCS site for disposal. Disposal of the stabilized waste form at either facility would be conducted in accordance with the facility's operating license. The potential impacts at these commercial disposal facilities were considered as part of the licensing process for these sites.

2.1.3 Alternative 2: Treatment and Disposal at a Commercial LLW Facility

Alternative 2 would extract up to 10,000 gallons of DWPF recycle wastewater at SRS and ship the DWPF recycle wastewater to either the WCS site (near Andrews, Texas) or the Energy*Solutions* site (near Clive, Utah) for treatment into a stabilized waste form and disposal as LLW, depending upon waste content and facility WAC. Alternative 2 includes the following activities:

- Deploy the retrieval equipment at SRS, retrieve up to 10,000 gallons of DWPF recycle wastewater and fill approved transportation packages with liquid from Tank 22.
- Transport the DWPF recycle wastewater to either the WCS site or the Energy*Solutions* site.
- Stabilize and dispose of the waste form at the WCS site or the Energy*Solutions* site in accordance with final waste classification and WAC.[17]

2.1.3.1 On-Site Retrieval and Packaging

For retrieval, DOE would extract the DWPF recycle wastewater from Tank 22 in the same manner as described for Alternative 1. However, the DWPF recycle wastewater would not be stabilized in proximity to Tank 22. Instead, it would be loaded into packages designed and approved for transport of radioactive liquids under applicable requirements to an off-site, commercial treatment and disposal facility. The extraction of up to 10,000 gallons of DWPF recycle wastewater would occur in batches and would not necessarily be done continuously. The retrieval of each batch (approximately 690 gallons per batch) is assumed to require two weeks. Most of that time would be associated with staging the equipment, materials, packages, and truck. The actual retrieval and transfer to the transportation container would likely be done within approximately two days. For Alternatives 2 and 3 (see also Section 2.1.4), each batch is assumed to be equivalent to a single truck load (see Section 2.1.3.2).

[17] Relevant licenses and permits authorizing WCS and Energy*Solutions* to treat and/or dispose of radioactive waste can be found at http://www.wcstexas.com/facilities/licenses-and-permits/ and https://customerportal.energysolutions.com/Content/ViewContent?ContentId=3991e385-ec8d-4416-8512-e98a081a7127, respectively.

2.1.3.2 Transportation, Treatment, and Disposal

Based on representative Tank 22 sample data (see Appendix A to this Final SRS DWPF Recycle Wastewater EA), DWPF recycle wastewater would likely meet the USDOT requirements for transportation in a Type A package (that has satisfied the additional requirements for transporting liquids). Examples of existing packages for Type A quantities of liquid radioactive waste are the LQ-375 and various other commercially available USDOT 7A packages. In the event final characterization of the DWPF recycle wastewater indicates Type B packaging would be required, alternative packaging options would be considered and adopted to ensure safe transportation. An evaluation of the DWPF recycle wastewater against any selected packaging would be required, along with potential updates to the package design, testing, and certification. Use of Type B packages would require DOE to ensure that the Certificate of Compliance for a specific package authorized the shipment of the specified radionuclides in the waste stream.

The analysis in this Final SRS DWPF Recycle Wastewater EA assumes a per-package volume of approximately 230 gallons of liquid waste. The final loading configuration would depend primarily on the radiological inventory in each package and the resulting external radiation dose rate. For the purpose of this Final SRS DWPF Recycle Wastewater EA, the analysis assumes that each truck shipment would include three packages. Therefore, completion of the Proposed Action would require 15 truck shipments from SRS to a facility licensed for the treatment and disposal of LLW (i.e., WCS site or Energy*Solutions* site). The approximate highway distance between SRS and the WCS site is 1,400 miles. The highway distance between SRS and the Energy*Solutions* site is approximately 2,200 miles.

Prior to shipment and stabilization, the DWPF recycle wastewater would be evaluated to determine whether its radiological and hazardous constituents (once stabilized) would be within the bounds of the WAC for the commercial disposal LLW facility. As described in Section 1.1 of this Final SRS DWPF Recycle Wastewater EA, LLW that meets 10 CFR 61.55 requirements for Class A LLW could be accepted at both the WCS site and the Energy*Solutions* site for disposal. At the time of publication of this Final SRS DWPF Recycle Wastewater EA, LLW that exceeds the criteria for Class A LLW but is within the requirements for Class C LLW could be accepted at the WCS site for disposal. Both the WCS and Energy*Solutions* sites are licensed to accept liquid LLW (assuming it meets the site-specific criteria above), stabilize it, and dispose of the LLW. Stabilization would be accomplished using existing capabilities at either the WCS site or the Energy*Solutions* site. As mentioned earlier, the analysis assumes that the volume of the waste in the stabilized matrix would be approximately twice the volume of the liquid prior to stabilization. Disposal of the stabilized waste form at either facility would be conducted in accordance with the facility's operating license. The potential impacts (including environmental impacts) at these commercial disposal facilities were considered as part of the licensing process for these sites. The NRC and/or the Agreement State regulator must complete an environmental analysis as part of the licensing process for commercial disposal facilities. This process was completed as part of the licensing process for the WCS and Energy*Solutions* disposal facilities. Because analysis of the environmental impacts of the commercial facilities are analyzed by the cognizant regulators,[18] DOE does not analyze such impacts. Rather DOE relies upon the determinations made by the appropriate regulators.

2.1.4 Alternative 3: Treatment at a Commercial Treatment Facility, Disposal at a Commercial LLW Facility

Alternative 3 would extract up to 10,000 gallons of DWPF recycle wastewater at SRS and transport the DWPF recycle wastewater for treatment to a commercial treatment facility with appropriate environmental permits and/or licenses. Following treatment, the stabilized waste form would be transported for disposal at either the WCS site (near Andrews, Texas) or the Energy*Solutions* site (near Clive, Utah) depending upon waste content and facility WAC. Alternative 3 includes the following activities:

- Deploy the retrieval equipment at SRS, retrieve up to 10,000 gallons of DWPF recycle wastewater, and fill approved transportation packages with liquid from Tank 22.
- Transport the DWPF recycle wastewater to a commercial treatment facility with appropriate environmental permits and/or licenses for stabilization.
- Transport the stabilized waste form to either the WCS site or the Energy*Solutions* site in accordance with final waste classification and WAC.
- Dispose of the waste form.

2.1.4.1 On-Site Retrieval and Packaging

Alternative 3 would extract the DWPF recycle wastewater from Tank 22 in the same manner as described for Alternative 2.

2.1.4.2 Transportation and Treatment

Alternative 3 would transport the DWPF recycle wastewater in the same manner as described for Alternative 2. As discussed in Section 2.1.3.2 of this Final SRS DWPF Recycle Wastewater EA, this analysis assumes approximately 15 truck shipments from SRS to a LLW treatment facility. There are several treatment facilities in the United States permitted and/or licensed to receive liquid LLW and stabilize it. For purposes of this Final SRS DWPF Recycle Wastewater EA, DOE is analyzing the transportation of the DWPF recycle wastewater to a commercial treatment facility as far as Richland, Washington.[19] Because this location is the farthest from SRS (compared to the other potential treatment locations), use of this location in the analysis results in

[18] For example, environmental impacts at the WCS facility were analyzed by the Texas Commission on Environmental Quality in the *Draft Environmental and Safety Analysis of a Proposed Low-Level Radioactive Waste Disposal Facility in Andrews County, Texas*, August 2008, and environmental impacts at the Energy*Solutions* facility were analyzed in the report prepared by the URS Corporation for the Utah Division of Radiation Control titled *EnergySolutions LLRW Disposal Facility Class A West Amendment Request Safety Evaluation Report*, June 2012. The former report can be obtained online at: http://www.wcstexas.com/pdfs/forms-and-docs/Final%20Draft%20Environmental%20Analysis.pdf, and the latter report can be obtained from the Utah Department of Environmental Quality.

[19] DOE has existing basic ordering agreements with a variety of commercial companies that have treatment capabilities located across the United States. These basic ordering agreements can be found at: https://www.emcbc.doe.gov/About/PrimeContracts. The commercial location in Richland, Washington, is analyzed solely for the purposes of providing an upper bound estimate of the potential transportation impacts.

a conservative estimate of the potential transportation impacts compared to other possible treatment facilities.[20] The approximate highway distance between SRS and Richland, Washington, is 2,655 miles. The commercial facility location in Richland, Washington, is analyzed solely for the purposes of providing an upper bound estimate of the potential transportation impacts. DOE will not ship DWPF recycle wastewater from SRS to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS. The DWPF recycle wastewater would be evaluated while still at the SRS H-Area Tank Farm to determine whether its radiological and hazardous constituents are within the bounds of the WAC for the identified treatment facility. Stabilization would be accomplished using existing capabilities. Treatment of the waste would be conducted in accordance with the facility's environmental permits and/or operating license. The potential impacts at these commercial disposal facilities were considered as part of the licensing process for these sites.

2.1.4.3 Transportation and Disposal

The stabilized waste form would be packaged and shipped by truck in accordance with USDOT and commercial disposal facility requirements. Packaging options are assumed to be similar to Alternative 1. This Final SRS DWPF Recycle Wastewater EA assumes that the treatment facility would use a Type A package similar to a 55-gallon drum. Therefore, treatment of up to 10,000 gallons of DWPF recycle wastewater would fill approximately 400, 55-gallon drums. Because the batches of 690 gallons of DWPF recycle wastewater (in three 230-gallon packages) would be mixed with another 690 gallons of stabilizing material at the treatment facility, each batch would be expected to result in approximately 26, 55-gallon drums, which could all be carried on a single truck shipment to the disposal facility. To accommodate the full 10,000 gallons of DWPF recycle wastewater evaluated in this Final SRS DWPF Recycle Wastewater EA, Alternative 3 would require about 15 truck shipments of stabilized waste form from the commercial treatment facility to the disposal facility.

The approximate highway distance between the analyzed commercial treatment location and the WCS site is 1,475 miles. The highway distance between the analyzed commercial treatment location and the Energy*Solutions* site is approximately 644 miles. As described in Section 2.1.2 of this Final SRS DWPF Recycle Wastewater EA, LLW that meets requirements in 10 CFR 61.55 for Class A LLW could be accepted at both the WCS site and the Energy*Solutions* site for disposal. At the time of publication of this Final SRS DWPF Recycle Wastewater EA, LLW that exceeds the criteria for Class A LLW but is within the requirements for Class C LLW could be accepted at the WCS site for disposal. Disposal of the stabilized waste form at either facility would be conducted in accordance with the facility's operating license. The potential impacts at these commercial disposal facilities were considered as part of the licensing process for these sites.

[20] As presented in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA, the primary health and safety impacts are those associated with shipment miles (i.e., dose to crew and potential for injuries associated with mechanical accidents).

2.1.5 Summary of Alternatives 1, 2, and 3

Table 2-1 presents a high-level summary of the actions associated with Alternatives 1, 2, and 3.

Table 2-1. Summary of Actions for Alternatives 1, 2, and 3

Alternative	Liquid Waste Retrieval	Transport of Liquid LLW Required	Location of Waste Stabilization	Location of Off-Site Permanent Disposal	Number of Potential Shipments
1	SRS (Tank 22)	No	SRS	WCS (Andrews County, Texas) – 1,400 miles or Energy*Solutions* (Clive, Utah) – 2,200 miles	9
2	SRS (Tank 22)	Yes	WCS (Andrews County, Texas) – 1,400 miles or Energy*Solutions* (Clive, Utah) – 2,200 miles	WCS (Andrews County, Texas) or Energy*Solutions* (Clive, Utah)	15
3[a]	SRS (Tank 22)	Yes	Liquid LLW Treatment Facility (assumes permitted and licensed facility in Richland, WA) –2,655 miles[b]	WCS (Andrews County, Texas) – 1,475 miles or Energy*Solutions* (Clive, Utah) – 644 miles[b]	30

a. Alternative 3 assumes 15 shipments (liquid waste) from SRS to a permitted and/or licensed treatment facility and 15 shipments of the stabilized waste form from the treatment facility to a LLW disposal facility, for a total of 30 shipments.
b. Miles shown correspond to the distances from SRS to the permitted and/or licensed treatment facility (2,655 miles) (assumed to be in Richland, Washington) and from Richland, Washington to either the WCS (1,475 miles) or Energy*Solutions* (644 miles) disposal facility. As mentioned in Section 2.1.4.2, the commercial facility location in Richland, Washington, is analyzed solely for the purposes of providing an upper bound estimate of the potential transportation impacts. DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS.

2.2 No-Action Alternative

Under the No-Action Alternative, the up to 10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs using the systems described in Section 2.1.1. The No-Action Alternative would require another, as yet determined, process to handle the DWPF recycle wastewater during the final years of the DWPF mission (2031–2034), when DOE will no longer have the option of returning DWPF recycle wastewater to the tank farm and SWPF for processing.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

There are two additional commercial LLW disposal facilities in the United States—the Barnwell, South Carolina, facility and the U.S. Ecology facility near Richland, Washington. However, these facilities were eliminated from detailed NEPA analysis because these facilities only accept waste from their approved state compact members and SRS is not a member of those compacts.[21]

[21] The *Low-Level Radioactive Waste Policy Act of 1980* (as amended in 1986) gives the states the responsibility for the disposal of LLW generated within their borders (except for certain waste generated by the Federal Government). The Act authorized the states to enter into compacts that would allow them to dispose of waste at a common disposal facility.

DOE on-site (i.e., E Area) and off-site (e.g., Nevada Nuclear Security Site) radioactive waste disposal facilities are not included in the alternatives analysis because the purpose of the Proposed Action is to evaluate the capability to dispose of DWPF recycle wastewater (up to 10,000 gallons) as LLW at a licensed commercial facility outside the state of South Carolina. DOE on-site and off-site disposal of LLW has been analyzed in previous NEPA documents (e.g., SRS Salt Processing Alternatives SEIS, WM PEIS). Any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal.

2.4 DWPF Recycle Wastewater Disposal under the HLW Interpretation

DOE has analyzed the disposal of the up to 10,000 gallons of DWPF recycle wastewater as non-HLW under DOE's HLW interpretation, which states that a reprocessing waste may be determined to be non-HLW if it meets either of the following criteria:

1. Does not exceed concentration limits for Class C LLW as set out in 10 CFR 61.55 and meets the performance objectives of a disposal facility, or

2. Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.

As shown in Appendix A, sample analyses indicate the up to 10,000 gallons of DWPF recycle wastewater would meet the HLW interpretation's criterion 1 requirement that radionuclide concentrations "not exceed limits for Class C LLW as set out in 10 CFR 61.55." Under Criterion 1, DOE will also evaluate whether disposal of the wastewater "meets the performance objectives of a disposal facility." In this regard, commercial licensees of the LLW disposal facility have the responsibility for health and safety of the public, workers, and the environment by demonstrating that the disposal facility complies with specified dose limits and performance objectives. Performance objectives are the quantitative radiological standards set by the NRC or DOE to ensure protection of the health and safety of individuals and the environment during operation, and after permanent closure of the disposal facility. Commercial LLW disposal facilities are located in, licensed, and regulated by Agreement States. Agreement States have incorporated compatible 10 CFR Part 61, Subpart C, LLW disposal performance objectives into their corresponding regulations and as conditions for LLW disposal facility licenses.

The technical means to demonstrate compliance with performance objectives are through a modeling and analytical tool commonly referred to as a performance assessment. A performance assessment is an internationally accepted risk-informed approach to evaluating whether a waste disposal facility protects human health and the environment.

The WAC are the technical and administrative requirements a waste must meet to be accepted at a disposal facility (e.g., waste characterization, waste form acceptability, quality assurance), and are established to ensure the disposal facility, in total, meets its safety-based performance objectives. WAC are required by all regulators as part of the licensing process for a facility. WAC identify the requirements, terms, and conditions under which the facilities will accept wastes for disposal. The criteria specify, among other things, the allowable types and quantities of radioactive materials; the types of containers required; and any restrictions on specific wastes, materials, or containers. The technical criteria define the physical, chemical, and radiological characteristics of a waste form, integrated closely with the performance assessment for the entire facility, to ensure that the performance objectives and measures to protect the public and workers will be met.

DOE would work within the NRC and/or Agreement State regulatory framework for commercial LLW disposal and specific licensing conditions of the disposal site destination. DOE would work closely with the disposal site licensee and the NRC and/or Agreement State regulator to ensure compliance with disposal requirements. General steps in this process are summarized below and illustrated in Figure 2.6.

- Waste Generator certification – Waste generators are required to obtain certification from the disposal facility prior to shipping waste to the facility. Elements of the certification include the waste classification/characterization program (e.g., sampling and analytical procedures), personnel training program, and other requirements.

- Waste profile approval – Waste generators prepare a waste profile to demonstrate that the waste is compliant with regulatory requirements, the facility's WAC, and other applicable requirements. As part of the waste profile process, the disposal facility will review the waste profile and verify waste profile compliance with the facility's waste acceptance plan, the LLW license, and applicable regulations. This review will focus on ensuring the waste profile, supporting documentation, and disposal plans are complete and compatible, and that there are no discrepancies. Once the final reviews are complete and the waste is found to be in compliance, the waste stream is considered approved.

- Waste shipment request, approval, and verification – After generator certification and waste profile approval, the waste generator must submit shipping documentation to the disposal facility for approval prior to shipment. Once the disposal facility is satisfied with the shipping documentation, the disposal facility will provide authorization to ship the waste for disposal. The disposal facility then performs waste verification steps (e.g., inspection) on the incoming shipments.

Figure 2-6. General Overview of Waste Acceptance Process for Disposal at LLW Facility

DOE has included a sensitivity analysis in this Final SRS DWPF Recycle Wastewater EA (Appendix C) to demonstrate how potential environmental impacts could be affected by variations in technical parameters associated with implementation of the Proposed Action.[7]

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter includes an analysis of the potential environmental consequences or impacts that could result from the Proposed Action and alternatives. The affected environment is the result of past and present activities at SRS and provides the baseline from which to compare impacts from the Proposed Action and alternatives; as well as the baseline to which past, present, and reasonably foreseeable future actions and the incremental impact of the Proposed Action and alternatives are added for the cumulative impacts analysis.

Section 3.2 identifies the environmental resource areas that were considered and eliminated from detailed analysis. Sections 3.3 through 3.7 present the affected environment and potential environmental consequences for each of the resource areas analyzed in detail. This Final SRS DWPF Recycle Wastewater EA considers the potential direct, indirect, and cumulative impacts associated with the Proposed Action and alternatives. Direct impacts are those that would occur as a direct result of the Proposed Action or alternatives. Indirect impacts are those that are caused by the Proposed Action but would occur later in time and/or farther away in distance; perhaps outside of the study area. Cumulative impacts, which are presented in Chapter 4, are impacts that result when the incremental impacts on resources from the Proposed Action and alternatives are added to impacts that have occurred or could occur to that resource from other actions, including past, present, and reasonably foreseeable future actions.

3.2 Resource Screening Review

The impact analyses in this Final SRS DWPF Recycle Wastewater EA have been prepared specifically for this project in order to provide sufficient information to support a decision regarding the potential environmental impacts of the Proposed Action. In further effort to reduce excessive paperwork (in accordance with 40 CFR 1500.4[j]) and consistent with CEQ and DOE NEPA implementing regulations and guidance, the analysis in this Final SRS DWPF Recycle Wastewater EA focuses on the subjects that are relevant to the Proposed Action and its impacts. As stated in the CEQ regulations regarding EISs:

> "Impacts shall be discussed in proportion to their significance. There shall be only brief discussion of other than significant issues. As in a finding of no significant impact, there should be only enough discussion to show why more study is not warranted (40 CFR 1502.2(b))."

Table 3-1 presents the rationale for resource areas eliminated from detailed analysis.

As a result of the screening review presented in Table 3-1, this Final SRS DWPF Recycle Wastewater EA analyzes the following resource areas in detail: (1) air quality, (2) human health (normal operations), (3) human health (accidents and intentional destructive acts), (4) waste management, and (5) transportation. Sections 3.3 through 3.7 present these analyses.

Table 3-1. Resource Areas Not Requiring Additional Detailed Analysis

Resource Area	Rationale
Land	Proposed Action and alternatives would not involve any substantial land disturbance activities and would not affect current land uses. Retrieval activities (for all alternatives) in the SRS H-Area Tank Farm would occur within existing paved areas. Stabilization activities (Alternative 1) would also occur in existing paved areas.
Visual	Proposed Action and alternatives would only involve temporary scaffolding and work areas. None of these temporary structures would be visible from off-site locations nor would they be any different than existing structures in the tank farm.
Geology and soils	Proposed Action and alternatives would not involve any substantial land disturbance activities and would therefore not affect geology or soils in the area. There would be no changes to existing facilities that would affect their ability to withstand a design-basis seismic event.
Water resources (surface, groundwater, wetlands)	Proposed Action and alternatives would not involve any substantial land disturbance activities and would not affect any surface waters, groundwater, or wetlands. Retrieval activities (for all alternatives) in the SRS H-Area Tank Farm would occur within existing paved areas. Stabilization activities (Alternative 1) would also occur in existing paved areas. Secondary containment would be provided during retrieval and stabilization activities to catch any inadvertent spills and to prohibit introduction of contaminants in the storm drains.
Cultural and paleontological resources	Proposed Action and alternatives would not involve any substantial land disturbance activities and would therefore not affect any potential cultural or paleontological resources. The SRS H-Area Tank Farm is an industrial area and has been actively used since the 1950s.
Ecological resources (biota, threatened and endangered species)	Proposed Action and alternatives would not involve any substantial land disturbance activities and would not affect any ecological resources. The SRS H-Area Tank Farm is an industrial area and has been actively used since the 1950s.
Noise	The SRS H-Area Tank Farm is a highly industrialized area with ongoing noise sources. The Proposed Action and alternatives would not substantively contribute to the current noise profile at the site. The SRS H-Area Tank Farm is approximately seven miles from the closest site boundary at the Savannah River; therefore, noise from the tank farm is not noticeable from off-site locations.
Socioeconomics and environmental justice	Proposed Action and alternatives would be a temporary activity using existing on-site personnel. No new jobs or workers would be required. There would be no disproportionately high and adverse human health impacts on minority or low-income populations.
Infrastructure and utilities	Proposed Action and alternatives would not result in any measurable infrastructure and utility changes compared to existing requirements. The increase in truck traffic for the limited duration of the Proposed Action would be negligible.
Industrial safety	Proposed Action and alternatives would not require additional workers or introduce new types of operations that would result in additional occupational injuries.

Under the No-Action Alternative, the potential impacts identified for the Proposed Action related to these five resource areas may not be realized as analyzed in this Final SRS DWPF Recycle Wastewater EA. However, the 10,000 gallons of DWPF recycle wastewater would still be processed for ultimate disposition at some point in the future. Therefore, there would be impacts associated with treatment and disposition of the 10,000 gallons of DWPF recycle wastewater; these impacts would occur at a future date and would be similar to the impacts evaluated in the SRS Salt Processing Alternatives SEIS (DOE 2001) and the SRS HLW Tank Closure EIS (DOE 2002).

3.3 Air Quality

3.3.1 Affected Environment

SRS is near the center of the Augusta (Georgia)–Aiken (South Carolina) Interstate Air Quality Control Region Code No. 53. None of the areas within SRS or the surrounding counties is designated as non-attainment with respect to the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants (EPA 2019). The nearest areas with non-attainment status (eight-hour ozone) are in counties near Atlanta, Georgia, approximately 150 miles west of SRS (EPA 2019).

The primary sources of air pollutants at SRS are the biomass boilers in K Area and L Area, diesel-powered equipment throughout SRS, DWPF, soil vapor extractors, groundwater air strippers, the Biomass Cogeneration Facility and back-up oil-fired boiler on Burma Road, and various other processing facilities. Other sources of emissions include vehicle traffic and controlled burning of forested areas, as well as temporary emissions from various construction-related activities. Table 3-2 gives the potential annual air emissions from SRS based on 2018 operations (SRNS 2019a). SRS operates under a Title V operating permit (SRNS 2019a).

The *Clean Air Act* Prevention of Significant Deterioration regulations (40 CFR 51.166) designate the Augusta–Aiken Air Quality Control Region as a Class II area. The Prevention of Significant Deterioration regulations were developed to manage air resources in areas that are in attainment of the NAAQS. Class II areas have sufficient air quality to support industrial growth. Class I areas are areas in which very little increase in air pollution is allowed due to the pristine nature of the area. There are no Prevention of Significant Deterioration Class I areas within approximately 60 miles of SRS (SCDHEC 2019a).

Table 3-2. 2018 Potential Annual Air Emissions from SRS

Pollutant Name	Potential Emissions (tons/year)
Sulfur dioxide	571
Total particulate matter	386
Particulate matter <10 microns	272
Particulate matter <2.5 microns	248
Carbon monoxide	660
Ozone (volatile organic compounds)	228
Nitrogen oxides	822
Nitrogen dioxide	661
Lead	0.239
Sulfuric acid mist	5.64

Source: SRNS 2019a

3.3.1.1 Nonradiological Air Emissions

Table 3-3 presents the applicable regulatory ambient standards and ambient air pollutant concentrations attributable to sources at SRS. These concentrations are based on potential emissions (SRNS 2019a). Concentrations shown in Table 3-3 attributable to SRS are in compliance with applicable guidelines and regulations. Data from nearby ambient air monitors in Aiken, Barnwell, and Richland counties in South Carolina are presented in Table 3-4. The data indicate that the NAAQS for particulate matter, lead, ozone, sulfur dioxide, and nitrogen dioxide are not exceeded in the area around SRS.

Table 3-3. Comparison of Ambient Air Concentrations from Existing Savannah River Site Sources with Applicable Standards or Guidelines

Criteria Pollutant	Averaging Period	More Stringent Standard or Guideline (micrograms per cubic meter)[a]	Ambient Air Concentration (micrograms per cubic meter)[b]
Carbon monoxide	8 hours	10,000[c]	292
	1 hour	40,000[c]	1,118.2
Nitrogen dioxide	Annual	100[c]	42.1
Ozone	8 hours	0.07 ppm[c]	(d)
PM_{10}	24 hours	150[c]	50.7
$PM_{2.5}$	24 hours	35[c]	(d)
	Annual	12[c]	(d)
Sulfur dioxide	3 hours	1300[c]	723
	1 hour	75 ppb	(d)
Lead	Rolling 3-month	0.15[c]	0.11

PM_n = particulate matter less than or equal to n microns in aerodynamic diameter; ppm = parts per million; ppb = parts per billion.

a. The more stringent of the Federal or state standard is presented if both exist for the averaging period. The computations for determining if the applicable standard is met are found in appendices to 40 CFR Part 50. Source: EPA 2019.

b. Source: DOE 2015a.

c. Federal and state standard.

d. No concentration reported.

Table 3-4. Ambient Air Quality Standards and Monitored Levels in the Vicinity of the Savannah River Site

Criteria Pollutant	Averaging Period	More Stringent Standard or Guideline (micrograms per cubic meter)[a]	Ambient Air Concentration (micrograms per cubic meter)	Location (South Carolina)
Carbon monoxide	8 hours	10,000	2,863[b]	Richland County
	1 hour	40,000	3,350[b]	Richland County
Nitrogen dioxide	Annual	100	6.6[b]	Aiken County
Ozone	8 hours	0.070 ppm	0.059 ppm[c]	Aiken County
PM_{10}	24 hours	150	61[b]	Aiken County
$PM_{2.5}$	24 hours	35	17[c]	Richland County
	Annual	12	8.10[c]	Richland County
Sulfur dioxide	3 hours	1300	39.3[b]	Barnwell County
	1 hour	75 ppb	4 ppb[c]	Richland County
Lead	Rolling 3-month	0.15	0.002[b]	Richland County

PM_n = particulate matter less than or equal to n microns in aerodynamic diameter; ppb = parts per billion.

a. Source: SCDHEC 2019b.

b. 2007 data; source DOE 2015a.

c. 2017 data; source DOE 2015a.

3.3.1.2 Radiological Air Emissions

Atmospheric radionuclide emissions from SRS are limited under the U.S. Environmental Protection Agency's (EPA's) National Emissions Standards for Hazardous Air Pollutants regulations in 40 CFR Part 61, Subpart H. The EPA annual effective dose equivalent limit to members of the public is 10 millirem (mrem) per year. The total effective dose for 2018 at SRS was 0.088 mrem per year, two orders of magnitude below the 10-mrem-per-year limit (SRNS 2019a). Nearly 80 percent of the radionuclides emitted at SRS are tritium compounds.

3.3.2 Alternative 1 Impacts

DOE would retrieve up to 10,000 gallons of DWPF recycle wastewater from Tank 22 and transfer that recycle wastewater through a hose-in-hose to a temporary enclosure for stabilization. The riser penetration to the Tank 22 head space would be sealed to prohibit release of emissions to the air. The liquid would be discharged into the IP-2 container located within the enclosure. At the same time, cementitious materials (grout) would be added to the package and an internal paddle would thoroughly combine the mixture to the required specifications. The container inlet would be outfitted with a ventilation hose that captured any vapors or particulates that were discharged from the inlet as a result of the filling and stabilization actions. The ventilation hose would be routed through high-efficiency particulate air filters on the exhaust side to prevent entrained radiological materials from being released to the atmosphere. The filters are more than 99.95 percent effective in containing radionuclides. The resultant emissions outside of the temporary enclosure would contain negligible concentrations of radionuclides. Air sampling is performed as part of routine operating procedures at the SRS tank farms and would be used to monitor and verify these conditions during implementation of the Proposed Action. There would be no substantial greenhouse gas emissions from any of the activities at SRS. Once the packages were filled and mixed, the lid would be installed for lifting, transportation, and disposal.

The stabilized waste form would be shipped from SRS to WCS or Energy*Solutions* (approximately 1,400 or 2,200 miles, respectively) in about nine total truck shipments of up to two IP-2 packages each, for a total of 17 packages. These nine trucks would produce negligible air emissions, including greenhouse gases, relative to the overall vehicle emissions associated with interstate trucking and other private and commercial vehicles on the highways.

Disposal of the 17 packages at the WCS site near Andrews, Texas, or the Energy*Solutions* site near Clive, Utah, would not cause any additional air emissions beyond those already expected and evaluated from their ongoing disposal operations.

3.3.3 Alternative 2 Impacts

The potential air quality impacts at SRS associated with the DWPF recycle wastewater retrieval and filling of the transportation packages would be the same as discussed in Section 3.3.2. Under Alternative 2, however, the packages would contain DWPF recycle wastewater and are assumed to be transported to WCS or Energy*Solutions* for stabilization. Because the package assumed in the analysis for this Final SRS DWPF Recycle Wastewater EA has a capacity of 230 gallons of liquid and the analysis assumes three packages per truck shipment, the transportation of 10,000 gallons of DWPF recycle wastewater would require approximately 15 truck shipments. The air emissions associated with this transportation would be slightly larger than that expected for Alternative 1; however, the 15 shipments would still result in negligible vehicle air emissions, including greenhouse gases, relative to the overall vehicle emissions associated with interstate trucking and other private and commercial vehicles on the highways.

Stabilization actions are typically performed at WCS and Energy*Solutions* under their respective licenses. The containers of stabilized waste form would be disposed of at the WCS site or the Energy*Solutions* site. This stabilization and disposal would not cause any additional air emissions beyond those already expected and evaluated from the respective ongoing treatment and disposal operations.

3.3.4 Alternative 3 Impacts

The potential air quality impacts at SRS associated with the DWPF recycle wastewater retrieval and filling of the transportation packages would be the same as discussed in Section 3.3.2. Under Alternative 3, however, the packages would contain DWPF recycle wastewater and are assumed to be transported to a permitted and/or licensed treatment facility in Richland, Washington, for stabilization.[22] Section 2.1.4.2 of this Final SRS DWPF Recycle Wastewater EA identifies that transportation of 10,000 gallons of DWPF recycle wastewater would require approximately 15 truck shipments from SRS to the treatment facility (approximately 2,655 miles per shipment). The air emissions, including greenhouse gases, associated with this portion of the transportation would be higher than under Alternative 2 because the material would travel more miles, but still would be negligible overall.

Stabilization actions are typically performed at treatment facilities under their respective environmental permits and/or licenses. The analysis in this Final SRS DWPF Recycle Wastewater EA assumes that approximately 400, 55-gallon waste drums would result from stabilization at the commercial treatment facility, which would then be transported from the treatment facility to be disposed of at the WCS site or the Energy*Solutions* site. The 15 shipments of 26 drums each would result in negligible vehicle emissions, including greenhouse gases, relative to the overall vehicle emissions associated with interstate trucking and other private and commercial vehicles on the highways. Similar to Alternatives 1 and 2, the treatment and disposal actions at WCS or Energy*Solutions* would not cause any additional air emissions beyond those already expected from their respective ongoing disposal operations.

3.3.5 No-Action Alternative Impacts

Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, DOE would maintain the status quo, which is represented by the continued management of tank wastes and eventual closure of the tanks in accordance with the System Plan (SRR 2019), the SRS Salt Processing Alternatives SEIS (DOE 2001), and the SRS HLW Tank Closure EIS (DOE 2002). There would be additional, incremental air emissions associated with the eventual treatment and

[22] As mentioned in Section 2.1.4.2, the commercial facility location in Richland, Washington, is analyzed solely for the purposes of providing an upper bound estimate of the potential transportation impacts. DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS.

disposal of the 10,000 gallons of DWPF recycle wastewater. These impacts were addressed in the existing NEPA analyses (DOE 2001, 2002).

3.4 Human Health – Normal Operations

3.4.1 Affected Environment

Primary sources and levels of background radiation exposure to individuals in the vicinity of SRS are assumed to be the same as those to an average individual in the U.S. population. These exposures are shown in Table 3-5. Background radiation doses are unrelated to SRS operations.

Table 3-5. Radiation Exposure of Individuals in the Savannah River Site Vicinity Unrelated to Savannah River Site Operations[a]

Source	Effective Dose (millirem per year)
Natural background radiation	
Cosmic and external terrestrial radiation	54
Internal terrestrial radiation	29
Radon-220 and -222 in homes (inhaled)	228
Other background radiation	
Diagnostic x-rays and nuclear medicine	300
Occupational	0.5
Industrial, security, medical, educational, and research	0.3
Consumer products	13
Total (rounded)	**620**

a. An average for the United States.
Source: NCRP 2009

Releases of radionuclides to the environment from SRS operations provide another source of radiation exposure to individuals in the vicinity of SRS. Types and quantities of radionuclides released from SRS operations are listed in the annual SRS environmental reports. The annual doses to the public from recent releases of radioactive materials (2013–2017) and the average annual doses over this 5-year period are presented in Table 3-6. These doses fall within radiological limits established per DOE Order 458.1 and are much lower than background radiation.

Using a risk estimator of 600 latent cancer fatalities (LCF) per 1 million person-rem (or 0.0006 LCF per rem) (DOE 2003), the annual average LCF risk to the maximally exposed member of the public due to radiological releases from SRS operations from 2013 through 2017 is negligible (0.0000001). That is, the estimated probability of this person developing a fatal cancer at some point in the future from radiation exposure associated with one year of SRS operations is about 1 in 10 million.

LATENT CANCER FATALITY

A death resulting from cancer that has been caused by exposure to ionizing radiation. For exposures that result in cancers, the generally accepted assumption is that there is a latent period between the time an exposure occurs and the time a cancer becomes active.

RADIATION DOSE UNITS

Individual doses from radiation are most often expressed in "mrem." Collective doses, which represent more than one person, are most often expressed in "person-rem." One person-rem equals 1,000 person-mrem.

Table 3-6. Annual Radiation Doses to the Public from Savannah River Site Operations for 2013–2017 (total effective dose)

Members of the Public	Year	Atmospheric Releases[a]	Total Liquid Releases[b] (all liquid + irrigation)	Total[c]
Maximally exposed individual (mrem)	2013	0.052	0.14	0.19
	2014	0.044	0.12	0.16
	2015	0.032	0.15	0.18
	2016	0.038	0.15	0.19
	2017	0.027	0.22	0.25
	2013–2017 average	0.039	0.16	0.20
Population within 50 miles (person-rem)[d]	2013	2.2	2.5	4.7
	2014	1.7	2.0	3.7
	2015	1.1	2.6	3.7
	2016	1.4	3.5	4.9
	2017	0.97	3.4	4.4
	2013–2017 average	1.5	2.8	4.3
Average individual within 50 miles[e] (mrem)	2013	0.0028	0.0091	0.012
	2014	0.0022	0.0064	0.0086
	2015	0.0014	0.0088	0.01
	2016	0.0018	0.0091	0.011
	2017	0.0012	0.01	0.011
	2013–2017 average	0.0019	0.0087	0.011

a. DOE Order 458.1 and *Clean Air Act* regulations in 40 CFR Part 61, Subpart H, establish a compliance limit of 10 millirem per year to a maximally exposed individual for airborne releases.
b. Includes all water pathways, not just the drinking water pathway. Though not directly applicable to radionuclide concentrations in surface water or groundwater, an effective dose equivalent limit of four mrem per year for the drinking water pathway only is frequently used as a measure of performance.
c. DOE Order 458.1 establishes an all-pathways dose limit of 100 mrem per year to individual members of the public.
d. About 781,060, based on 2010 Census data. For liquid releases occurring from 2013 through 2017, an additional 161,300 water users in Port Wentworth, Georgia, and Beaufort, South Carolina (about 98 river miles downstream), are included in the assessment.
e. Obtained by dividing the population dose by the number of people living within 50 miles of SRS for atmospheric releases; for liquid releases, the number of people includes water users who live more than 50 miles downstream of SRS.

Note: Sums and quotients presented in the table may differ from those calculated from table entries due to rounding.
Sources: SRNS 2014, 2015, 2016a, 2017, and 2019b.

No excess fatal cancers are projected in the population living within 50 miles of SRS from one year of normal operations from 2013 through 2017. To put this number in perspective, it may be compared with the number of fatal cancers expected in the same population from all causes. The average annual mortality rate associated with cancer for the entire U.S. population from 2013 through 2016 (the last four years for which final data are available) was 185 per 100,000 (HHS 2016a, 2016b, 2017, 2018). Based on this national mortality rate, the number of fatal cancers expected to occur in 2017 in the population of 781,060 people (SRNS 2019b) living within 50 miles of SRS would be 1,445.

SRS workers receive the same dose as the general public from background radiation, but they also receive an additional dose from working in facilities with nuclear materials. Table 3-7 presents the annual average individual and collective worker doses from SRS operations from 2013 through 2017. These doses fall within the regulatory limits of 10 CFR Part 835. Statistically, the average total worker dose of 112.1 person-rem per year translates to a worker population LCF risk of 0.067.

Table 3-7. Radiation Doses to Savannah River Site Workers from Operations 2013–2017 (total effective dose equivalent)

Occupational Personnel	From Outside Releases and Direct Radiation by Year					
	2013	2014	2015	2016	2017	Average
Average radiation worker dose (mrem)[a]	60	59	51	40	39	50
Total worker dose (person-rem)	88.6	93.0	95.1	111.3	172.5	112.1
Number of workers receiving a measurable dose	1,472	1,584	1,884	2,799	4,411	2,430

a. No standard is specified for an "average radiation worker"; however, the maximum dose to a worker is limited as follows: the radiological limit for an individual worker is 5,000 mrem per year (10 CFR Part 835). However, DOE's goal is to maintain radiological exposure as low as reasonably achievable. DOE has, therefore, established the administrative control level of 2,000 mrem per year; the site contractor sets facility administrative control levels below the DOE level (DOE 2017a).

Sources: DOE 2014, 2015b, 2016, 2017b, 2018a

3.4.2 Alternative 1 Impacts

DOE would retrieve up to 10,000 gallons of DWPF recycle wastewater from Tank 22 and transfer that waste to the solidification equipment/container located in a temporary radiological enclosure in proximity to Tank 22. Because there would be no radiological emissions or effluents associated with Alternative 1, and no direct radiation dose off-site, there would be no doses to the public.

The retrieval and stabilization is assumed to require two weeks for each 1,200-gallon batch. Most of that time would be associated with staging the equipment, materials, packages, and truck. The actual retrieval, transfer, and grouting would likely be done within a four-day period. Approximately 25 to 30 workers would be involved in the operation, but only approximately 10 workers would be involved in radiological operations that could result in doses. Based on actual exposure data for 2017 (see Table 3-7), the average dose to an SRS tank farm worker that receives a dose is approximately 50 mrem per year, which equates to 0.2 mrem per day (assuming 250 days of work per year). Consequently, under Alternative 1, the average SRS tank farm worker would be expected to receive a dose of approximately 0.8 mrem for each 1,200-gallon batch, and the total worker dose for each 1,200-gallon batch would be approximately 0.008 person-rem. The retrieval and stabilization of 10,000 gallons of DWPF recycle wastewater would require nine, 1,200-gallon batches, which would result in an average worker dose of 7.2 mrem and a total worker dose of 0.072 person-rem. Table 3-8 presents the LCF risk associated with these worker doses. All doses are well within the administrative control level for SRS workers (500 mrem per year). During all operations, DOE would implement measures to minimize worker exposures and maintain doses as low as reasonably achievable. Measures to be implemented could consist of the use of shielding, personal protective equipment, and training mock-ups to improve the efficiency of operations and reduce exposure times.

Table 3-8. Worker Radiological Risk from Normal Operations: Alternative 1

Receptor	Dose for Project	Radiological Risk (LCF)[a]
Average worker	7.2 mrem	0.0000043
Total workers	0.072 person-rem	0.000043

LCF = latent cancer fatality.

a. The LCF risk is based on a dose-to-risk conversion factor of 0.00060 per rem (DOE 2003).

Under Alternative 1, the final, stabilized waste form would be contained within an IP-2 or Type A package approved for transport under USDOT requirements, as provided in 49 CFR Subchapter C, "Hazardous Materials Regulations," for transport of the waste to an off-site, licensed disposal facility (WCS or Energy*Solutions*). Section 3.7.2 of this Final SRS DWPF Recycle Wastewater EA presents the radiological impacts associated with this transport.

The stabilized waste form would be evaluated while still at the SRS H-Area Tank Farm to determine whether its radiological and hazardous constituents are within the bounds of the WAC for the planned LLW disposal facility. As described in Section 1.1 of this Final SRS DWPF Recycle Wastewater EA, LLW that meet requirements in 10 CFR 61.55 for Class A LLW could be accepted at both the WCS site and Energy*Solutions* site for disposal. As of the publication of this Final SRS DWPF Recycle Wastewater EA, LLW that exceeds the criteria for Class A LLW but is within the requirements for Class C LLW could only be accepted at the WCS site for disposal.

Because the final, stabilized waste form would be verified to meet the appropriate disposal facility's waste classification and acceptance criteria (derived for compliance with performance objectives) prior to transport, there would be no additional radiological exposures to the off-site public or the disposal facility workforce than expected under their existing license for LLW disposal. The stabilized waste form would meet the criteria in DOE's HLW interpretation discussed in Section 1.2 of this Final SRS DWPF Recycle Wastewater EA. This would ensure that the disposal of the stabilized waste form would not cause an increase to the long-term radiological health impacts at the disposal facility beyond those identified during the licensing process.

3.4.3 Alternative 2 Impacts

Alternative 2 would transfer up to 10,000 gallons of DWPF recycle wastewater from SRS into an approved transportation package (assumed to be 230-gallon packages) and ship the waste to either the WCS site or the Energy*Solutions* site for treatment into a stabilized waste form and disposal as LLW, depending upon waste content and facility WAC. For retrieval, DOE would extract the DWPF recycle wastewater in the same manner as described for Alternative 1. However, the DWPF recycle wastewater would not be stabilized in proximity to Tank 22. Instead, the DWPF recycle wastewater would be loaded into containers designed and approved for transport. The extraction of up to 10,000 gallons of DWPF recycle wastewater would occur in batches and would not necessarily be done continuously. The retrieval of each batch (which is assumed to be equivalent to a single truck load (see Section 2.1.3.2) is assumed to require two weeks. Most of that time would be associated with staging the equipment, materials, packages, and truck. The actual retrieval and transfer would likely be done within two days, limiting radioactive exposure to workers. Approximately 15 batches would be required to package the entire 10,000 gallons of DWPF recycle wastewater into approved transportation packages.

Approximately 25 to 30 workers would be involved in the operation, but only approximately 10 workers would be involved in radiological operations that could result in measurable doses. Based on actual exposure data for 2017 (see Table 3-7), the average dose to an SRS tank farm worker that receives a dose is approximately 50 mrem per year, which equates to 0.2 mrem per day (assuming 250 days of work per year). Consequently, under Alternative 2, the average worker would be expected to receive a dose of approximately 0.4 mrem for each batch, and the total worker dose for each batch would be approximately 0.004 person-rem. The retrieval and packaging of 10,000 gallons of DWPF recycle wastewater (15 batches) would result in an average worker dose of 6 mrem and a total worker dose of 0.06 person-rem. Table 3-9 presents the LCF risk associated with these worker doses. All doses are well within the administrative control level for SRS workers (500 mrem per year). As explained in Section 3.4.2, DOE would implement measures to minimize worker exposures.

Table 3-9. Worker Radiological Risk from Normal Operations: Alternatives 2 and 3

Receptor	Dose for Project	Radiological Risk (LCF)[a]
Average worker	6 mrem	0.0000036
Total workers	0.06 person-rem	0.000036

LCF = latent cancer fatality; mrem = millirem.

a. The LCF risk is based on a dose-to-risk conversion factor of 0.0006 per rem (DOE 2003).

The transportation of 10,000 gallons of DWPF recycle wastewater would require approximately 15 shipments. Section 3.7.3 of this Final SRS DWPF Recycle Wastewater EA presents the radiological impacts associated with this transport.

Stabilization actions are performed regularly at WCS and Energy*Solutions* under their respective licenses. The potential impacts from stabilization would not result in any notable increase in human health impacts beyond those already expected from ongoing LLW treatment operations, as stabilization of waste is integral to facility operations at those sites. Approximately 400, 55-gallon waste drums would result from the stabilization, which would be disposed of at the WCS site or the Energy*Solutions* site. This disposal would not result in any notable human health impacts beyond those already expected from their ongoing disposal operations.

The potential health impacts from disposal of the stabilized waste form under Alternative 2 would be the same as discussed for Alternative 1 in Section 3.4.2.

3.4.4 Alternative 3 Impacts

Alternative 3 would extract the DWPF recycle wastewater in the same manner as described for Alternative 2. Consequently, the potential human health impacts at SRS associated with waste retrieval and filling of the transportation packages would be the same as discussed in Section 3.4.3 (see Table 3-9). As explained in Section 3.4.2, DOE would implement measures to minimize worker exposures.

Under Alternative 3, the packages would contain DWPF recycle wastewater and are assumed to be transported to a commercial treatment facility for stabilization. Section 2.1.4.2 of this Final SRS DWPF Recycle Wastewater EA identifies that transportation of 10,000 gallons of DWPF recycle wastewater would require 15 shipments from SRS to the commercial treatment facility (assumed to be in Richland, Washington, approximately 2,655 miles per shipment). Section 3.7.4 of this Final SRS DWPF Recycle Wastewater EA presents the radiological impacts associated with this transport.

Stabilization actions are performed regularly at commercial treatment facilities under their environmental permits and/or licenses. The potential impacts from stabilization would not result in any notable increase in human health impacts beyond those already expected from ongoing LLW treatment operations, as stabilization of waste is integral to facility operations at these facilities. Treatment of up to 10,000 gallons of DWPF recycle wastewater would fill approximately 400, 55-gallon drums. Because the batches of 690 gallons of DWPF recycle wastewater (in three 230-gallon packages) would be mixed with another 690 gallons of stabilization material at the treatment facility, each batch would be expected to result in approximately 26, 55-gallon drums, which could all be carried on a single truck shipment to the disposal facility (e.g., the WCS site or the Energy*Solutions* site). Section 3.7.4 of this Final SRS DWPF Recycle Wastewater EA presents the radiological impacts associated with this transport. The potential health impacts from disposal of the stabilized waste form for Alternative 3 would be the same as discussed for Alternative 1 in Section 3.4.2.

3.4.5 No-Action Alternative Impacts

Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, the up to 10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs using the systems described in Section 2.1.1. Under the No-Action Alternative, DOE would not provide alternative treatment and disposal options for up to 10,000 gallons of DWPF recycle wastewater at an off-site, licensed commercial facility. As a result, the No-Action Alternative would impact planning activities to develop a disposal capability for DWPF recycle wastewater for the three years between the completion of SWPF mission (estimated 2031) and DWPF mission (estimated 2034) (SRR 2019), when DOE will no longer have the option of returning DWPF recycle wastewater to the SWPF for processing. The minimal worker doses attributable to retrieval and stabilization resulting from the Proposed Action would be partially or completely offset by worker doses resulting from similar activities under the No-Action Alternative, which were analyzed in the SRS Salt Processing Alternative SEIS (DOE 2001) and the SRS HLW Tank Closure EIS (DOE 2002).

3.5 Human Health – Accidents and Intentional Destructive Acts

3.5.1 Affected Environment

An accident is a sequence of one or more unplanned events with potential outcomes that endanger the health and safety of workers or the public. An accident can involve a combined release of energy and hazardous substances (radiological or nonradiological) that might cause prompt or latent health effects. The sequence begins with an initiating event, such as human error, equipment failure, or earthquake, followed by a succession of other events that could be dependent or independent of the initiating event and that dictate the accident progression and extent of materials released.

In preparing this Final SRS DWPF Recycle Wastewater EA, DOE reviewed the *Concentration, Storage, and Transfer Facilities Documented Safety Analysis* (Tank Farm DSA; WSRC 2017), which provides a detailed analysis of potential accidents that could occur in this area (including Tank 22). Additionally, DOE reviewed previous NEPA analyses of the potential impacts from accidents for similar operations involving the retrieval of waste from the SRS H-Area Tank Farm (DOE 1994, 2001, 2002). Information from the Tank Farm DSA and the previous NEPA analyses are both referenced above and are utilized in the accident analysis included in this Final

SRS DWPF Recycle Wastewater EA. Sections 3.5.2 through 3.5.4 summarize the impacts to the public and workers from potential accidents associated with the three alternatives for implementing the Proposed Action.

3.5.2 Alternative 1 Impacts

3.5.2.1 Accidents

DOE would retrieve up to 10,000 gallons of DWPF recycle wastewater from Tank 22 and transfer that recycle wastewater to the solidification equipment/container located in a temporary radiological enclosure in proximity to Tank 22. The DWPF recycle wastewater would be extracted from the tank via an available tank penetration riser with a low-volume pump. The suction leg of the pump would enter the riser and end slightly below the surface of the liquid in Tank 22. The pump would discharge into a small-diameter hose-in-hose transfer line (to provide secondary containment) to deliver the DWPF recycle wastewater to the solidification equipment/container located in the temporary radiological enclosure in proximity to Tank 22, thus minimizing the amount of liquid outside the tank at any one time. The enclosure would house the container that would receive DWPF recycle wastewater from Tank 22 and dry feed materials for mixing within the container. Typical cementitious material components (i.e., cement, fly ash, and slag) would be mixed with the DWPF recycle wastewater and cured to a stabilized waste form (i.e., grout).

For this analysis, it is assumed that the DWPF recycle wastewater would be grouted in a 1,200-gallon container and that this container would also serve as the disposal package for the stabilized waste form. Other containers that meet IP-2 or Type A USDOT requirements could also be used. The container would include an internal paddle that would mix the DWPF recycle wastewater and the grout materials; the paddle would remain in the stabilized waste form. A loss of primary containment or incorrect transfer of DWPF recycle wastewater could lead to material release, including leaks, spills, sprays, and overflows (WSRC 2017).

For this Final SRS DWPF Recycle Wastewater EA, the transfer error/waste release design-basis accident (DBA) includes a large number of initiating events and slightly different accident progressions. However, these events are similar in that they could all lead to a release of DWPF recycle wastewater from primary containment. This Final SRS DWPF Recycle Wastewater EA presents the consequences of a transfer error/waste release DBA as well as the risks. The consequence analysis conservatively assumes the accident occurs without regard to the probability of the initiating event. If the consequences of a potential accident are not significant, the risks would be even less significant. Risks, which take into account the probability of an accident occurring, are obtained by multiplying the consequences and the probability. Transfer error/waste release accidents are estimated to have a probability of occurrence of 0.01 to 0.001 per year (WSRC 2017; DOE 2002).

The general progression for all initiators is as follows (derived from WSRC 2017):

1. Core pipe containment is lost, releasing DWPF recycle wastewater.
2. Up to 600 gallons of DWPF recycle wastewater is released to the environment.
3. Workers in proximity of the release are exposed to direct radiation exposure.

4. The off-site exposure time for the release is assumed to be eight hours.
5. The on-site exposure time for the release is assumed to be three hours.

Consequences and Risks. In the Tank Farm DSA, conservative values for the source term (see text box for further discussion) were chosen to ensure a bounding analysis (WSRC 2017). The analysis in this Final SRS DWPF Recycle Wastewater EA shows that the unmitigated and mitigated off-site consequences to the maximally exposed individual (MEI) would be less than or equal to 17 to 28 mrem for the bounding transfer error/waste release DBA scenario (derived from WSRC 2017). These consequences are approximately 1,000 times below the DOE evaluation guideline of 25 rem for a member of the public at the nearest site boundary (see DOE-STD-3009-2014). Statistically, the MEI's chance of developing an LCF would be 0.00001 to 0.000017. When probability is taken into account, the risk to the MEI of developing an LCF from a transfer error/waste release would be a maximum of 0.0000001 to 0.00000017.

SOURCE TERM

Source term refers to the amount of radiological material released to the environment with a potential for harm to the public and onsite workers. The radiological source term is calculated by the following equation:

Source Term = MAR × ARF × RF × DR × LPF

Where,

- **MAR is Material-at-Risk:** the amount and form of radioactive material at risk of being released to the environment under accident conditions. The material evaluated in the Tank Farm DSA would be the sludge solution expected to occur during tank closure activities, which would contain significantly higher concentrations of radionuclides as compared to DWPF recycle wastewater.
- **ARF is Airborne Release Fraction:** the fraction of MAR that becomes airborne as a result of the accident.
- **RF is Respirable Fraction:** the fraction of airborne radioactive material that is small enough to be inhaled by a human.
- **DR is Damage Ratio:** the fraction of MAR that is damaged in the accident and available for release to the environment.
- **LPF is Leak Path Factor:** the fraction of respirable radioactive material that has a pathway out of the facility for dispersal in the environment.

Although the Tank Farm DSA did not evaluate consequences to the population within a 50-mile radius of SRS, the SRS HLW Tank Closure EIS (DOE 2002) evaluated these consequences for a similar accident.[23] Based on a 600-gallon transfer error/waste release, the potential dose to the 50-mile population surrounding SRS would be approximately 265 person-rem. Statistically, this means that 0.16 LCF could be expected if such an accident occurred. When probability is taken into account, the risk that an LCF would occur within the 50-mile population from a transfer error/waste release would be a maximum of 0.0016.

With regard to potential on-site impacts, for the transfer error/waste release DBA scenario, the potential consequences to the maximally exposed worker would be less than or equal to 30 to 38 mrem (derived from WSRC 2017). These consequences are well below DOE's administrative

[23] The SRS HLW Tank Closure EIS (DOE 2002) evaluated a transfer error/waste release involving 15,600 gallons of tank waste. To correlate those results to the Proposed Action in this Final SRS DWPF Recycle Wastewater EA, the results from DOE (2002) were scaled to account for a 600-gallon release. In addition, the results were scaled to account for the current population surrounding the site. The population impacts in DOE (2002) were based on 620,000 persons; the current population estimate is 781,060 persons.

control level of 2,000 mrem per year for a worker, and below the SRS contractor's administrative control level of 500 mrem per year. Statistically, the maximally exposed worker's chance of developing an LCF would be 0.000018 to 0.000023. When probability is taken into account, the risk to the maximally exposed worker of developing an LCF from a transfer error/waste release would be a maximum of 0.00000018 to 0.00000023. No more than two workers are likely to receive such a maximum dose. Table 3-10 presents the DBA consequences for Alternative 1.

Table 3-10. Potential Consequences Associated with Transfer Error/Waste Release DBA[a]

MEI Dose (mrem)	MEI LCF	Population Dose (person-rem)	Population LCF	Maximally Exposed Worker (mrem)	Maximally Exposed Worker LCF
17–28	0.00001–0.000017	265	0.16	30–38	0.000018–0.000023

LCF = latent cancer fatality; MEI = maximally exposed individual; mrem = millirem.

a. Risks can be obtained by multiplying these consequences and the accident probability (0.01–0.001).

The disposal of the stabilized waste form at either the WCS or Energy*Solutions* site would not change the accident impacts at those sites compared to their ongoing disposal operations.

3.5.2.2 Intentional Destructive Acts

With regard to intentional destructive acts (i.e., acts of sabotage or terrorism), security at its facilities is a major priority for DOE. 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 continues to identify and implement measures to defend and deter attacks. The safeguards applied to protecting SRS involve a dynamic process of enhancement to meet threats; these safeguards will evolve over time. 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 postulated terrorist actions.

There is no accepted basis for determining the probability of intentional attacks at any site, or the nature or types of such attacks. In general, the potential consequences of intentional destructive acts are highly dependent on distance to the site boundary and size of the surrounding population—the closer and higher the surrounding population, the higher the consequences. Impacts from intentional destructive acts are also largely based on the amount of material that could be released (i.e., the material at risk) in the event of such an act. The conservative assumptions inherent in the accidents analyzed in this Final SRS DWPF Recycle Wastewater EA assume initiation by natural events, equipment failure, or inadvertent worker actions. These same events could be caused by intentional malevolent acts by saboteurs or terrorists. For example, high explosives could be used to damage buildings in the same way as an earthquake. However, the resulting radiological release and consequences to workers and the public would be similar, regardless of the nature of the initiating event. Therefore, the accident impacts presented for each of the alternatives in this Final SRS DWPF Recycle Wastewater EA are representative of the types of impacts that could result from an intentional destructive act. This is true for all three alternatives.

3.5.3 Alternative 2 Impacts

The potential human health impacts to the public and workers at SRS associated with accidents and intentional destructive acts related to DWPF recycle wastewater retrieval and filling of the transportation packages under Alternative 2 would be bounded by the impacts under Alternative 1. This conclusion is supported by the fact that only 230 gallons of waste could be released under Alternative 2 versus the 600 gallons per container in Alternative 1.

Stabilization actions are performed regularly at WCS and Energy*Solutions* under their respective licenses. The potential accident impacts from stabilization would not result in any notable increase in human health impacts beyond those already expected from ongoing waste treatment operations, as stabilization of waste is integral to facility operations at those sites. Approximately 400, 55-gallon waste drums would result from the stabilization and would be disposed of at the WCS site or the Energy*Solutions* site. The disposal of stabilized waste form at either the WCS or Energy*Solutions* site would not change the accident impacts at those sites compared to their ongoing disposal operations.

3.5.4 Alternative 3 Impacts

The potential human health impacts to the public and workers at SRS associated with accidents and intentional destructive acts related to DWPF recycle wastewater retrieval and filling of the transportation packages under Alternative 3 would be bounded by the impacts under Alternative 1. This conclusion is supported by the fact that only 230 gallons of waste could be released under Alternative 3 versus the 600 gallons per container in Alternative 1.

Under Alternative 3, the packages would contain DWPF recycle wastewater and are assumed to be transported to the commercial treatment facility for stabilization. Stabilization actions are performed regularly at treatment facilities under their existing environmental permits and licenses. The potential accident impacts from stabilization would not result in any notable increase in human health impacts beyond those already expected from ongoing waste treatment operations, as stabilization of waste is integral to facility operations at these sites. Similar to Alternatives 1 and 2, the disposal of stabilized waste form at WCS or Energy*Solutions* would not result in any notable accident impacts beyond those already expected from their ongoing disposal operations.

3.5.5 No-Action Alternative Impacts

Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, the up to 10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs using the systems described in Section 2.1.1. Under the No-Action Alternative, DOE would not provide alternative treatment and disposal options for up to 10,000 gallons of DWPF recycle wastewater at an off-site, licensed commercial facility. As a result, the No-Action Alternative would impact planning activities to develop a disposal capability for DWPF recycle wastewater for the three years between the completion of the SWPF mission (estimated 2031) and the DWPF mission (estimated 2034) (SRR 2019), when DOE will no longer have the option of returning DWPF recycle wastewater to the tank farm and SWPF for processing. The potential accident consequences of the No-Action Alternative would still include the possible transfer error DBA that was analyzed in the SRS HLW Tank Closure EIS (DOE 2002).

3.6 Waste Management

This section presents waste management activities for the Proposed Action and alternatives. This section also describes the management and disposal of the secondary waste streams from the Proposed Action.

Transportation of wastes could include both solid wastes (Alternatives 1 and 3; post-stabilization) and DWPF recycle wastewater (Alternatives 2 and 3; prior to stabilization) and would be conducted using standard, regulated, and approved truck transport of approved packages. Under normal operations, there would be no additional waste generated from these transportation activities. The health impacts associated with the transportation actions are described in Section 3.7.

3.6.1 Affected Environment

3.6.1.1 Savannah River Site

SRS generates and manages the following waste types:

- HLW
- Transuranic (TRU) waste (including mixed TRU waste)
- LLW
- MLLW
- Hazardous waste
- Solid (sanitary) waste

High-Level Radioactive Waste: The *Atomic Energy Act of 1954*, as amended, and the *Nuclear Waste Policy Act of 1982*, as amended, define HLW as:

> "(A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, 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 [Nuclear Regulatory] Commission, consistent with existing law, determines by rule requires permanent isolation."

In an October 10, 2018, *Federal Register* notice (83 FR 50909) and a June 10, 2019, supplemental notice (84 FR 26835), DOE issued its interpretation that the HLW definition means that some reprocessing waste may properly be classified as non-HLW "where the radiological characteristics of the waste in combination with appropriate disposal facility requirements for safe disposal demonstrate that disposal of such waste is fully protective of human health and the environment." Specifically, it is DOE's interpretation that a reprocessing waste may be determined to be non-HLW if the waste meets either of the following two criteria (from 84 FR 26835):

> "(I) does not exceed concentration limits for Class-C low-level radioactive waste as set out in section 61.55 of title 10, Code of Federal Regulations, and meets the performance objectives of a disposal facility; or
>
> (II) does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements."

As described in Section 2.1.1 of this Final SRS DWPF Recycle Wastewater EA, under the Proposed Action, up to 10,000 gallons of DWPF recycle wastewater would be retrieved from the SRS liquid waste system, and DOE would dispose of the stabilized waste at a commercial LLW facility outside of South Carolina, licensed by either the NRC or an Agreement State under 10 CFR Part 61. Prior to a disposal decision, DOE would characterize the DWPF recycle wastewater to verify with the licensee of the commercial LLW disposal facility whether the waste meets DOE's HLW interpretation for disposal as non-HLW. No HLW is expected to be generated as a result of the Proposed Action or alternatives.

Transuranic Waste: DOE defines TRU waste as radioactive waste containing more than 100 nanocuries (3,700 Becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) HLW; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the EPA, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. TRU waste generated at SRS typically consists of items with trace amounts of plutonium, such as clothing, tools, rags, residues, and debris. SRS packages its TRU waste for transport to WIPP near Carlsbad, New Mexico, for disposal. WIPP is DOE's deep geologic repository established for permanent disposal of TRU waste and was established under the *WIPP Land Withdrawal Act* (Public Law 102-579). No TRU waste is expected to be generated as a result of the Proposed Action or alternatives.

Low-Level Radioactive Waste: DOE defines LLW as radioactive waste that is not HLW, SNF, TRU waste, byproduct material (as defined in Section 11e.(2) of the *Atomic Energy Act of 1954*, as amended), or naturally occurring radioactive material. At SRS, LLW produced by most generators typically consists of such items as miscellaneous job control waste, equipment, plastic sheeting, gloves, and soils that are contaminated with radioactive materials. The LLW category also includes several waste streams from large-scale waste management operations. Miscellaneous job control waste incidental to the DWPF recycle wastewater stream could include personal protective equipment (e.g., gloves, booties) and is expected to be generated as a result of the Proposed Action. These waste quantities would be negligible compared with existing LLW quantities generated by existing operations at SRS and would be disposed of in existing facilities in E Area.

Based on Tank 22 sample data (see Appendix A to this Final SRS DWPF Recycle Wastewater EA), DOE has a reasonable basis to anticipate that the DWPF recycle wastewater will meet the first criterion of the HLW interpretation. As such, the DWPF recycle wastewater could be managed and disposed of in a commercial LLW facility. At the time of implementing any of the alternatives, additional characterization would be performed to confirm compliance with the first criterion and that disposal facility requirements are met.

The SRS Solid Waste Management (SWM) group is responsible for receiving LLW from site generators and, in some cases, from off-site generators, primarily the Naval Reactors Program. SWM is also responsible for verifying the waste received is as characterized by the generator and that the waste meets the receiving facility's WAC. In most cases, newly generated LLW accepted by SWM is taken directly to one of the disposal units shown in Table 3-11. In general, trenches are opened as needed, and there could be more than one trench of a single type open at any given time. Over the five-year period from fiscal year (FY) 2011 through FY 2015, LLW managed by the SRS SWM group averaged about 19,000 cubic yards per year (SRNS 2016b, p. 14). In addition to the solid LLW Disposal Units listed in Table 3-11, SRS also operates Saltstone Disposal Units, which are permanent disposal units, to contain solidified (grouted) liquid LLW at SRS. A total of 13 Saltstone Disposal Units are planned, ranging in size from approximately 2.8 million gallons of grout capacity to over 32 million gallons of grout capacity (SRR 2019).

Table 3-11. Types of Solid LLW Disposal Units Used at SRS

Disposal Unit Type	Typical Capacity per Unit[a]	Description
Engineered trenches	Total: 61,200 yd^3 Effective: 46,200 yd^3	Used primarily for disposal of LLW in B-12 and B-25 boxes and sea lands. Once full, it is backfilled and covered with a minimum of four feet of clean soil.
Slit trenches	Total: 37,800 yd^3 per set of five segments Effective: 21,500 yd^3 per set of five segments	Designated for construction/decontamination and decommissioning debris, contaminated vegetation, and contaminated soil disposal. Once full, it is backfilled and covered with a minimum of four feet of clean soil.
Component-In-Grout trenches	Total: 21,600 yd^3 Effective: 8,500 yd^3	Similar to slit trenches, but once waste components are in place, they are encapsulated in grout. Used to dispose of bulky and containerized LLW that has higher radioactive inventories than LLW going to standard slit trenches.
Low-activity waste vault	Total: 40,000 yd^3	The at-grade concrete structure's capacity is equivalent to about 12,000 B-25 boxes. It is designed to receive, store, and dispose of LLW radiating less than or equal to 200 mrem per hour at five centimeters from the box surface.
Intermediate level vault	Total: 5,600 yd^3	Subsurface concrete structure designed for LLW that radiates greater than 200 mrem per hour at five centimeters from the unshielded container, or LLW that contains significant amounts of tritium. The vault has a removable cover to allow top loading, and the cells are encapsulated with grout as the waste is placed for disposal.
Naval reactor component disposal area	Total: 4,400 yd^3	At-grade laydown area designed for permanent disposal of activated metal or surface-contaminated Naval reactor program components (e.g., care barrels, adapter flanges, closure heads, and pumps). There are two Naval reactor component disposal areas, each with capacity shown, but one has been closed to further component placement.

yd^3 = cubic yard.

a. Typical trench capacities are presented with two values: total and effective. The "total" value represents the typical design size of the trench, and the "effective" value represents an approximate value for the maximum volume of waste and waste containers that can be disposed of in the trench.

Source: SRNS 2016b, pp. 21–25.

Mixed LLW: MLLW is LLW that contains source, special nuclear, or byproduct material subject to the *Atomic Energy Act of 1954*, as amended, and a hazardous component subject to RCRA. MLLW is generated by various SRS activities and operations, including environmental cleanup, decontamination and decommissioning, and construction. This waste typically includes materials such as solvent-contaminated wipes, cleanup and construction debris, soils from spill remediation, RCRA metals, and laboratory samples. MLLW is sent off-site to RCRA-regulated treatment, storage, and disposal facilities, such as those operated by WCS or Energy*Solutions*, but may first be held in one of several SRS on-site storage facilities that have the necessary permits to accept the waste. One of the permitted storage sites for both MLLW and hazardous waste is a section of the TRU storage pads, which has a storage capacity of 390 cubic yards.

Over the five-year period from FY 2011 through FY 2015, MLLW managed by the SRS SWM group averaged about 210 cubic yards per year (DOE 2015a, p. 3-51). No additional MLLW waste is expected to be generated as a result of the Proposed Action or alternatives.

Hazardous Waste: Hazardous waste is generated by multiple SRS activities and operations, including those noted above for MLLW. Typical hazardous waste at SRS includes materials such as RCRA metals, solvents, paints, pesticides, and hydrocarbons. Polychlorinated biphenyl (PCB) wastes, though regulated under the *Toxic Substances Control Act* rather than RCRA, are managed under the hazardous waste program. As with MLLW, hazardous waste is generally sent off-site to commercial RCRA-regulated treatment, storage, and disposal facilities, but may first be held in one of several SRS on-site storage facilities that have the necessary permits to accept the waste. Certain hazardous wastes are recycled, including metals, excess chemicals, solvent, and chlorofluorocarbons. PCB wastes are generally sent off-site for commercial treatment and disposal, but some meet regulatory standards to be disposed of in the local Three Rivers Landfill.

Over the five-year period from FY 2011 through FY 2015, hazardous waste managed by the SRS SWM group averaged about 52 cubic yards per year (SRNS 2016b, p. 14). No hazardous waste is expected to be generated as a result of the Proposed Action or alternatives.

Solid (sanitary) Waste: Solid waste refers to waste that is neither hazardous nor radioactive and consists of two categories: (1) municipal and (2) construction and demolition. Municipal-type waste is generally referred to as sanitary waste on the SRS and is commonly disposed of in municipal sanitary landfills. Construction and demolition waste consists of bulky debris- and rubble-type waste. No substantial quantities of solid waste are expected to be generated as a result of the Proposed Action or alternatives.

3.6.1.2 Waste Control Specialists

WCS is licensed by the Texas Commission on Environmental Quality for the disposal of Class A, B, and C LLW that meets specified WAC. Disposal of the stabilized waste at the WCS Federal Waste Facility (FWF) would be conducted in accordance with the facility's operating license (Radioactive Material License No. 04100).

The FWF opened on June 6, 2013, and has a current licensed capacity of up to 26,000,000 cubic feet and 5,600,000 curies. The FWF footprint that has been evaluated as part of the current license is approximately 80 acres. The design and license allow the disposal facility to be developed in phases consistent with the need to dispose of the volume of LLW received. Additional phases of the disposal facility will be constructed as needed and within the licensed capacity requirements. The 10,000 gallons of DWPF recycle wastewater, when stabilized, would represent approximately 2,700 cubic feet of stabilized waste, or 0.01 percent of the WCS licensed capacity.

3.6.1.3 Energy*Solutions*

Energy*Solutions* operates a LLW disposal facility west of the Cedar Mountains in Clive, Utah. Clive is located along Interstate-80, approximately 60 miles west of Salt Lake City, Utah. The facility is accessed by both road and rail transportation. The Clive LLW disposal facility is licensed by the Utah Department of Environmental Quality for the disposal of Class A LLW that meets specified WAC. Disposal of the stabilized waste at the Energy*Solutions* site would be conducted in accordance with the facility's operating license (Radioactive Material License No. UT 2300249). The currently licensed waste disposal capacity is about 5.04 million cubic yards (136 million cubic feet). The 10,000 gallons of DWPF recycle wastewater, when stabilized, would represent approximately 2,700 cubic feet of stabilized waste, or 0.002 percent of the Energy*Solutions* licensed capacity.

3.6.2 Alternative 1 Impacts

The retrieval and stabilization of up to 10,000 gallons of DWPF recycle wastewater would produce an estimated 17 IP-2 containers of stabilized waste form, which would be expected to meet the disposal criteria for LLW as defined in 10 CFR 61.55.

The actions at SRS would generate standard job control waste that would include items such as personal protective equipment (e.g., gloves, booties), the in-tank pump and hose, and the temporary radiological enclosure. This job control waste would be classified as LLW and would be disposed of on site in E Area. These waste quantities (probably less than 10 cubic yards) would be negligible compared with LLW quantities generated by existing operations at SRS.

The transport of the stabilized waste form to WCS or Energy*Solutions* would not generate any additional waste quantities.

Based on sampling data (presented in Appendix A to this Final SRS DWPF Recycle Wastewater EA), DOE has a reasonable basis to anticipate that this waste will meet the first criterion of the HLW interpretation. At the time of implementing any of the alternatives, additional characterization would be performed to confirm compliance with the first criterion and that disposal facility requirements are met.

After verification that the final, stabilized waste form met the WAC for the particular disposal facility, these containers would be transported to either WCS or Energy*Solutions* for disposal. The wastes would only be accepted for disposal if their volume and radiological and hazardous constituents fell within the bounds of the facilities' existing licenses. As a result, the LLW would result in negligible waste management impacts for the disposal facilities. The NRC and/or the Agreement State regulator must complete an environmental analysis as part of the licensing process for commercial disposal facilities. This process was completed as part of the licensing process for the WCS and Energy*Solution*s disposal facilities. Because analysis of the environmental impacts of the commercial facilities are analyzed by the cognizant regulators, DOE does not analyze such impacts. Rather DOE relies upon the determinations made by the appropriate regulators.

3.6.3 Alternative 2 Impacts

The waste management impacts at SRS for Alternative 2 would be similar to those for Alternative 1. Alternative 2 would not include the stabilization actions at SRS, so there could be slightly less job control waste associated with this alternative produced at SRS, however, there would still be personal protective equipment, pumps and hoses, and a temporary radiological enclosure that would require disposal as LLW on site in E Area. These waste quantities would be negligible compared with LLW quantities generated by existing operations at SRS.

The transport of the DWPF recycle wastewater to WCS or Energy*Solutions* would not generate any additional waste quantities.

The stabilization of the liquid at either WCS or Energy*Solutions* would be within the facilities' existing licenses for these actions and would not generate additional waste types beyond those already expected and associated with their licenses. The wastes would only be accepted for treatment and disposal if their volume and radiological and hazardous constituents fell within the bounds of the facility's existing licenses. As a result, the LLW would result in negligible waste management impacts for the disposal facilities.

3.6.4 Alternative 3 Impacts

The waste management impacts at SRS for Alternative 3 would be identical to those for Alternative 2.

The transport of the DWPF recycle wastewater to a commercial treatment facility would not generate any additional waste quantities.

The stabilization of the DWPF recycle wastewater at a commercial treatment facility would be within the facility's existing environmental permits and/or license for these actions and would not generate additional waste types beyond those already expected and associated with the license.

The transport of the stabilized waste form to WCS or Energy*Solutions* would not generate any additional waste quantities.

The stabilized wastes would only be accepted for disposal at WCS or Energy*Solutions* if their volume and radiological and hazardous constituents fell within the bounds of the facilities' existing licenses. As a result, the LLW would result in negligible waste management impacts for the disposal facilities.

3.6.5 No-Action Alternative Impacts

Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, DOE would maintain the status quo, which is represented by the continued management of tank wastes and eventual closure of the tanks in accordance with the 2001 ROD to the SRS Salt Processing Alternatives SEIS (DOE 2001) and as addressed in the SRS HLW Tank Closure EIS (DOE 2002). Waste management would continue as planned by the System Plan (SRR 2019). Under the No-Action Alternative, DOE would not provide alternative treatment and disposal options for up to 10,000 gallons of DWPF recycle wastewater at an off-site, licensed commercial facility. As a result, the No-Action Alternative would impact planning activities to develop a disposal capability for DWPF recycle wastewater for the three years between the completion of the SWPF mission (estimated 2031) and the DWPF mission (estimated 2034) (SRR 2019), when DOE will no longer have the option of returning DWPF recycle wastewater to the tank farm and SWPF for processing.

3.7 Radiological Transportation

3.7.1 Affected Environment

Transportation of LLW is strictly regulated. USDOT regulates packaging, labeling, preparation of shipping papers, handling, marking, and placarding of shipments and establishes standards for personnel as well as conveyance (e.g., truck and train) performance and maintenance (49 CFR 173.401). USDOT and the NRC set radioactive material packaging standards (10 CFR Part 71). In addition, in accordance with DOE Order 460.2A, DOE LLW shipments must comply with all internal DOE requirements.

Proper packaging is a key element in transport safety. LLW must be packaged to protect workers, the public, and the environment during transport. Often, the same package is used for both transport and disposal. This would be the case for Alternative 1, which would use an IP-2 or Type A package for transportation and disposal. Selection of appropriate packaging is based on the level and form of radioactivity. The expected level of radioactivity from the Proposed Action and alternatives would be consistent and no more than that allowed under the regulatory limits associated with the chosen package (i.e., IP-2, Type A, or Type B). For incident-free transportation, the potential radiological exposure of workers and the public is directly related to the external dose rates associated with the LLW packages.

Under the Proposed Action, the liquid DWPF recycle wastewater or stabilized waste form would be transported by truck. Vehicle and loads would be inspected by DOE and State inspectors (where required) before shipment. States may also inspect shipments to confirm regulatory compliance. The shipments would use the most direct routes that minimize radiological risk. The DWPF recycle wastewater or stabilized waste form shipments would be transported over Federal highways for the majority of the route.

Data from the Federal Motor Carrier Safety Administration (FMCSA) for 2017 indicate that large trucks are involved in 35.9 accidents per 100 million miles traveled (FMCSA 2019). From 2001 to 2010, USDOT reported 75 transportation-related radioactive waste incidents, or seven to eight per year. No transportation incident resulted in radiation exposure (WCS 2019). In the event an accident involving a shipment of LLW occurs, a response system is in place. DOE supports training and emergency planning through its Transportation Emergency Preparedness Program. State, Tribal, and local government officials respond to any such accident within their jurisdictions. DOE also responds to transport emergencies at the request of States and Tribes.

Radiological assistance program teams are available to provide field monitoring, sampling, decontamination, communications, and other related services.

3.7.2 Alternative 1 Impacts

The nine shipments that each contain two IP-2 packages loaded with stabilized waste form would be shipped from SRS to WCS (approximately 1,400 miles) or to Energy*Solutions* (approximately 2,200 miles). The packages (49 CFR 178.350) would meet all appropriate USDOT requirements for the transport of the stabilized waste to an off-site disposal facility, in accordance with 49 CFR Subchapter C, "Hazardous Materials Regulations." In 2017, DOE conducted 7,700 radioactive waste and materials shipments, traveling more than 2.6 million miles, with no USDOT recordable accidents (DOE 2018b). The impacts of transporting LLW have been analyzed in numerous NEPA documents. The WM PEIS (DOE 1997) includes a comprehensive analysis of LLW transportation impacts.

The WM PEIS found that transporting the large volumes of LLW analyzed in the WM PEIS has the potential to affect the health of the truck crew and the public along the transportation route. These health effects include both radiological and nonradiological impacts. The radiological impacts are the result of radiation received during normal operations and accidents in which the waste containers are assumed to fail. Nonradiological impacts could occur as a result of exposure to vehicle exhaust and physical injury from vehicle accidents. In the WM PEIS, DOE determined that the impacts of transporting approximately 25,000 shipments of LLW (over a distance of approximately nine million miles) would be as follows (DOE 1997, Section 7.4.2):

- Less than 0.5 fatality from radiological doses to either the truck crews or the public along the transportation route;[24]
- Less than 0.5 fatality from vehicle emissions; and
- One fatality resulting from physical injuries from traffic accidents.

Consistent with the CEQ's instruction to discuss potential impacts "in proportion to their significance" (40 CFR 1502.2[b]), DOE determines the appropriate level of detail of impact analysis, including transportation impact analysis, on a case-by-case basis. This determination is based on the nature of the proposed action and alternatives and the potential significance of potential impacts as discussed in 40 CFR 1508.27.

DOE analyses have consistently shown that the impacts of the transportation of radioactive materials are generally small and often overwhelmed by the nonradiological impacts of that same transportation. For DOE actions where only minimal impacts are expected from the transportation of radioactive materials, completely new quantitative analysis may not be necessary to assess the potential impacts of transporting radioactive materials or waste. Instead, DOE may use a simple screening analysis with appropriately conservative estimates to identify an upper bound on potential impacts, show whether potential impacts would be significant, and determine the need for further analysis.

[24] The WM PEIS (DOE 1997) analyses reflect a lower dose-to-LCF risk factor than DOE uses today. The updated factor reflects an increase of approximately 20 percent over the impacts calculated in 1997.

Similar analyses (e.g., similar material, packaging, start points, and end points) may be incorporated by reference (40 CFR 1502.21) and used to develop an estimate for use in a screening analysis. Combining aspects of previously existing analysis and new analysis can help reduce duplicative effort and paperwork (40 CFR 1506.4).

The results of this screening approach can be used to determine if more substantial analysis is necessary. If the results of this analysis show that the potential risk is small or non-existent, further analysis may not be helpful to decision-makers or the public. In such cases, DOE may include a negative declaration of significant impact, accompanied by a brief explanation of the methodology and sources relied upon in arriving at conclusions regarding potential risks (see 40 CFR 1502.24).

Considering the potential impacts identified in the WM PEIS to the public along the route for 25,000 shipments of LLW, the potential incident-free impacts to the public from nine shipments under Alternative 1 in this Final SRS DWPF Recycle Wastewater EA would be negligible. The majority of the potential incident-free transportation-related impacts to health and safety would be borne by the workers involved in the transportation activities.

The incident-free analysis summarized in Table E-5 of the WM PEIS assumed an external dose rate from LLW packages of one mrem per hour at 3.3 feet. The driver and backup driver (i.e., crew) would be the closest workers to the package for any substantial length of time during the transport. Dose rate intensity decreases as a function of increased distance from the source. The ratio of dose rate intensity decreases by the square of the ratio of the increased distance. For instance, if the crew is about 10 feet from the package on the bed of the truck, the expected dose rate to the crew from that package would be 1/9th (11 percent) of the dose rate at 3.3 feet. Therefore, the expected dose rate to the crew would be approximately 0.11 mrem per hour during the time of transport from SRS to the disposal facility. This is still a conservative assumption because it takes no credit for any shielding, such as that provided by the truck cab, between the package and the crew.[25]

Assuming the farthest distance from SRS (2,200 miles to Clive, Utah), the analysis assumes a 44-hour duration per shipment and that a crew of two would conduct all nine trips over the life of the project. The total worker dose to a driver for a single shipment would be 4.84 mrem. The total crew dose for the nine trips would be approximately 0.087 person-rem for Alternative 1. The potential for an LCF associated with this level of radiation exposure is 0.000052.

With respect to accidents, per FMCSA statistics (FMCSA 2019), the probability that a crash would occur during the 19,800 miles (2,200 miles times nine trips) would be about one chance in 140. Since the WM PEIS determined that one nonradiological fatality could occur as a result of LLW shipments of approximately nine million miles, there would be less than 0.25-percent chance of a traffic fatality associated with Alternative 1. In the event an accident did occur, release of radiological material also would be unlikely. IP-2 and Type A packages must pass various tests, and only one percent of those involved in accidents have failed; of those, only 39 percent have released their contents (NRC 2003). Additional data from the International Atomic

[25] Even if the potential dose rate to the driver and crew approached the USDOT limit, DOE would have options to limit worker exposure (e.g., move the packages closer to the rear of the truck bed or add temporary shielding).

Energy Agency indicate that Type A packages perform well in many accident conditions. Combining event data from the United States and the United Kingdom over a period of about 20 years identified information on 22 accidents involving consignments of multiple Type A packages on a single conveyance. There was a release of radioactive contents in only two of these events, and those releases were small (IAEA 2012, p. 52). In the very unlikely event the IP-2 or Type A container failed, the contents would be a stabilized waste form that would not be dispersible. Because the stabilized waste is not dispersible, impacts to water and ecological resources would also be unlikely. Consistent with the studies of LLW transportation impacts by DOE (DOE 1997), the transportation of the stabilized LLW in an IP-2 or Type A package would result in negligible impacts.

3.7.3 Alternative 2 Impacts

For Alternative 2, the transportation of liquid DWPF recycle wastewater would involve 15 truck shipments. Much of the same information provided in Section 3.7.2 for Alternative 1 impacts applies to the shipment of DWPF recycle wastewater for Alternative 2.

The 15 shipments loaded with liquid DWPF recycle wastewater would be shipped from SRS to WCS (approximately 1,400 miles) or to Energy*Solutions* (approximately 2,200 miles) under Alternative 2. The packages would be demonstrated suitable for transportation of the specific waste forms in accordance with USDOT requirements.

Considering the potential impacts identified in the WM PEIS to the public along the route for 25,000 shipments of LLW, the potential incident-free impacts to the public from 15 shipments under Alternative 2 in this Final SRS DWPF Recycle Wastewater EA would be negligible. The majority of the potential incident-free transportation-related impacts to health and safety would be borne by the workers involved in the transportation activities.

The potential dose rate to workers (the crew) from transportation of the packages to the farthest distance (Clive, Utah) would be similar to that described for Alternative 1; however, for Alternative 2, there would be 15 shipments instead of 9. Under Alternative 2, each trip is also assumed to take 44 hours. The total worker dose to a single driver for a single shipment would be 4.84 mrem. The total crew dose for the 15 trips would be approximately 0.145 person-rem for Alternative 2. The potential for an LCF for this level of radiation exposure to anyone on the crew associated with the transportation is 0.000088.

With respect to accidents, according to FMCSA (2019), the probability that a crash would occur during the 33,000 miles (2,200 miles times 15 trips) would be about one chance in 84. Since the WM PEIS determined that one nonradiological fatality could occur as a result of LLW shipments of approximately nine million miles, there would be less than 0.4-percent chance of a traffic fatality associated with Alternative 2. In the event an accident did occur, the probability of a release of radiological material also would be extremely unlikely.

As reported in Section 2.1.3.2, based on representative Tank 22 sample data (see Appendix A to this Final SRS DWPF Recycle Wastewater EA), DWPF recycle wastewater would likely meet the USDOT requirements for transportation in a Type A liquid package. Type A packages for liquid must pass more stringent tests than IP-2 or Type A packages for solids. Specifically, for liquid Type A packages, USDOT requires a free-drop test from a height of at least 30 feet and a penetration test from a distance of at least 5.5 feet. Non-liquid Type A packages require a drop test from a height of 1 to 4 feet and penetration test from a distance of 3.3 feet. When evaluated against these tests and other requirements for Type A packages, the packaging will prevent loss or dispersal of radioactive contents (49 CFR Part 173).

Additionally, IAEA (2012, p. 273) reports that the radionuclide activity limits (A_1 and A_2) found in 49 CFR Part 173 were developed to ensure that members of the public or first responders to an accident involving a transportation container would not be subject to radiological exposures that would result in impacts greater than five rem, which corresponds to the annual exposure limit for radiation workers. The accident scenario that formed the basis of the activity limits assumed that an exposed person was within one meter of the release for 30 minutes, which is highly unlikely.

Appendix B to this SRS DWPF Recycle Wastewater EA provides a detailed evaluation of a potential transportation accident scenario associated with a shipment of liquid DWPF recycle wastewater in a Type A package. DOE performed a conservative analysis to estimate the potential impacts that could occur from the release and aerosolization of the entire contents of a Type A package of liquid DWPF recycle wastewater to the atmosphere (exposure to downwind receptors) in the event of a maximum reasonably foreseeable accident during transport. The severe accident considered in this consequence assessment is characterized by extreme mechanical (impact) and thermal (fire) forces. Appendix B (Table B-2) lists the estimated population exposure doses and LCF risks over the short and long term under neutral and stable weather conditions for generic rural, suburban, and urban population zones. The highest estimated radiological dose, for a hypothetical accident in an urban area under stable weather conditions, was reported as 143 mrem (0.00009 LCF) for the maximally exposed individual, and 5,260 person-rem (3.2 LCFs).

Accidents of this severity are expected to be extremely rare. The release of a Type A container's entire contents is estimated to occur approximately 0.4 percent of the time given that a truck accident does occur (NRC 1977), with about a 10-percent release of its contents estimated 1.6 percent of the time given that a truck accident does occur (NRC 1977). Incorporating the frequency of a truck accident during the shipments of liquid DWPF recycle wastewater under Alternative 2 (one chance in 84, or 0.012), the probability that a severe accident causes the release of all of a container's contents would be approximately 0.0000476, or one in 21,000. Appendix B (Table B-3) also presents the population risk of contracting a fatal cancer when both the consequence and probability of a maximum reasonably foreseeable accident are considered using conservative assumptions (e.g., urban environment). For Alternative 2, the risk is approximately 0.000152.

In the event final characterization of the DWPF recycle wastewater indicates Type B packaging would be required, liquid DWPF recycle wastewater shipments under Alternative 2 would be in a Type B package. Type B packages must pass more stringent tests than IP-2 or Type A packages and are expected to survive accident conditions without losing their integrity. Type B packages are strictly designed to contain their contents under accident as well as non-accident conditions. Type B packaging must withstand severe puncture, drop, thermal, and water immersion tests simulating transportation accident conditions (FEMA 2013). While the consequence of release from a Type B package would be similar to that of a release from a

Type A package, these additional requirements mean that the probability of release, and thus overall risk, would be lower.

3.7.4 Alternative 3 Impacts

For Alternative 3, the transportation of liquid DWPF recycle wastewater would involve 15 truck shipments from SRS to a commercial treatment facility and 15 truck shipments of the treated (stabilized) DWPF recycle wastewater from the commercial treatment facility to the commercial disposal facility. Much of the same information provided in Section 3.7.2 for Alternative 1 and Section 3.7.3 for Alternative 2 impacts applies to the transportation activities for Alternative 3. The packages would be demonstrated suitable for transportation of the specific waste forms in accordance with USDOT requirements.

3.7.4.1 Liquid DWPF Recycle Wastewater Shipments from SRS to Commercial Treatment Facility

The 15 shipments loaded with liquid DWPF recycle wastewater are analyzed to be shipped from SRS to a commercial treatment facility (analyzed to be in Richland, Washington, approximately 2,655 miles) for Alternative 3. As stated in Section 2.1.4.2 of this Final SRS DWPF Recycle Wastewater EA, the commercial facility location in Richland, Washington, is analyzed solely for the purposes of providing an upper bound estimate of the potential transportation impacts. DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS. Considering the potential impacts identified in the WM PEIS to the public along the route for 25,000 shipments of LLW, the potential incident-free impacts to the public from 15 shipments under Alternative 3 in this Final SRS DWPF Recycle Wastewater EA would be negligible. The majority of the potential incident-free transportation-related impacts to health and safety would be borne by the workers involved in the transportation activities.

The potential dose rate to workers (the crew) from transportation of the packages to the commercial treatment facility would be similar to Alternative 1; however, for Alternative 3 there would be 15 shipments instead of nine, and the shipments would be longer. Under Alternative 3, each trip is assumed to take about 53 hours. The total worker dose to a single driver for a single shipment to the commercial treatment facility would be 5.83 mrem. The total crew dose for the 15 trips would be approximately 0.175 person-rem for the first portion of the transportation for Alternative 3. With respect to accidents, according to FMCSA (2019), the probability that a crash would occur during the 39,825 miles (2,655 miles times 15 trips) to the commercial treatment facility would be about one chance in 70. Since the WM PEIS determined that one nonradiological fatality could occur as a result of LLW shipments of approximately 9 million miles, there would be less than 0.45-percent chance of a traffic fatality associated with the shipment of DWPF recycle wastewater in Alternative 3. In the event a severe accident did occur, the consequences of a release of radioactive material would be similar to those identified for Alternative 2 in Section 3.7.3 and further described in Appendix B. The probability of a severe accident involving liquid DWPF recycle wastewater under Alternative 3 would be slightly different than under Alternative 2. Incorporating the frequency of a truck accident during the shipments of liquid DWPF recycle wastewater under Alternative 3 (one chance in 70, or 0.014), the probability that a severe accident causes the release of all of a container’s contents would be approximately 0.0000571, or one in 18,000. The population risk of contracting a fatal cancer when both the consequence and probability of a maximum reasonably foreseeable accident are considered using conservative assumptions (e.g., urban environment) for Alternative 3, is approximately 0.000183.

3.7.4.2 Treated (Stabilized) DWPF Recycle Wastewater Shipments from the Commercial Treatment Facility to the Commercial Disposal Facility

After the DWPF recycle wastewater was stabilized at the commercial treatment facility, it would be shipped to either WCS (1,475 miles per shipment) or Energy*Solutions* (644 miles per shipment) for disposal. As identified in Section 2.1.4.3 of this Final SRS DWPF Recycle Wastewater EA, Alternative 3 would require 15 shipments from the commercial treatment facility to the disposal facility. Each shipment is assumed to contain 26, 55-gallon containers. Using the farthest distance for analytical conservatism, the 15 shipments to WCS would result in a total shipment distance of 22,145 miles. Each trip is assumed to take approximately 30 hours. The total worker dose to a driver for a single shipment would be 3.3 mrem. The total crew dose for the 15 trips would be approximately 0.099 person-rem for the second portion of the transportation for Alternative 3. The total worker impacts associated with Alternative 3 would be the combination of the impacts of transporting the DWPF recycle wastewater to the commercial treatment facility and the drums of the stabilized waste form from the commercial treatment facility to the disposal facility. These totals are provided in Table 3-12 as a comparison to the potential impacts of the other alternatives. With respect to accidents during the shipment of the stabilized waste form between treatment facility and disposal facility under Alternative 3, according to FMCSA (2019), the probability that a crash would occur in the 22,145 miles to the disposal facility would be about one chance in 126. Since the WM PEIS determined that one nonradiological fatality could occur as a result of LLW shipments of approximately nine million miles, there would be less than 0.25-percent chance of a traffic fatality associated with the stabilized waste form associated under Alternative 3. In the event an accident did occur, the probability of a release of radiological material also would be unlikely, as described in Alternative 1. Consistent with the studies of LLW transportation impacts in DOE (1997), the transportation of the stabilized LLW in an IP-2 or Type A package would result in negligible impacts.

3.7.5 Summary of Potential Transportation-Related Impacts for Alternatives 1-3

The potential incident-free impacts to the public from shipments under Alternatives 1, 2, and 3 in this Final SRS DWPF Recycle Wastewater EA would be negligible. Table 3-12 summarizes the potential transportation-related impacts for workers for Alternatives 1, 2, and 3. Table 3-13 summarizes the potential transportation accident-related impacts for Alternatives 1, 2, and 3.

Table 3-12. Potential Transportation-Related Impacts to Workers

Alternative	Waste Form Transported	Driver Dose per Shipment (mrem)	Total Worker Dose (person-rem)	Total Worker LCF Risk
1	Solid	4.84	0.087	0.000052
2	Liquid	4.84	0.145	0.000088
3[a]	Liquid (from SRS to commercial treatment)	5.83	0.175	0.00011
	Solid (from commercial treatment to commercial disposal)	3.3	0.099	0.000059
	Total Alternative 3	N/A[b]	0.274	0.000169

LCF = latent cancer fatality; N/A = not applicable.

a. Alternative 3 is subdivided to illustrate the shipment of liquid waste from SRS to a permitted and/or licensed treatment facility and the shipment of the stabilized waste form from the licensed treatment facility to a LLW disposal facility.

b. It would be very unlikely that the same driver would transport both the liquid waste from SRS to the commercial treatment facility and the stabilized waste form from the commercial treatment facility to the disposal facility. Therefore the "per shipment" entries are "not applicable." All of the crew doses for all shipments are included in the total worker dose column.

Table 3-13. Potential Transportation-Related Impacts to the Population from Severe Transportation Accident[a]

Alternative	Dose	Consequence[a]	Probability[b]	Risk[c]
1	Liquid waste shipments would not occur. The stabilized waste form would not be dispersible.			
2	5,260 person-rem	3.2 LCF	0.0000476	0.000152 LCF
3	5,260 person-rem	3.2 LCF	0.0000571	0.000183 LCF

LCF = latent cancer fatality.

a. For purposes of analysis, the dose, long-term consequence, probability, and risk values are based on the conservative assumption that the accident occurs in an urban environment under stable weather conditions.

b. Calculated by multiplying the probability that a crash would occur during transport—one chance in 84 for Alternative 2 during the 33,000 miles traveled (2,200 miles times 15 trips) and one chance in 70 for Alternative 3 during the 39,825 miles traveled (2,655 miles times 15 trips) (FMCSA 2019)—by the probability of 0.4 percent (NRC 1977) that the entire contents of a Type A container would be released during the truck accident.

c. Risk equals consequence times probability.

3.7.6 No-Action Alternative Impacts

Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, DOE would maintain the status quo, which is represented by the continued management of tank wastes and eventual closure of the tanks in accordance with the System Plan (SRR 2019), the 2001 ROD for the SRS Salt Processing Alternatives SEIS (DOE 2001), and the SRS HLW Tank Closure EIS (DOE 2002). There would not be any off-site radiological transportation associated with the No-Action Alternative.

4 CUMULATIVE IMPACTS

This chapter presents an analysis of the potential cumulative impacts resulting from the Proposed Action evaluated in this Final SRS DWPF Recycle Wastewater EA. 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."

4.1 Incremental Impacts of Proposed Action

As noted in Chapter 3 of this Final SRS DWPF Recycle Wastewater EA, the implementation of the Proposed Action has some potential for impacts in air quality, human health (under both normal operations and facility accident conditions), waste management, and radiological transportation. These potential impacts, however, were demonstrated to be minor.

4.2 Evaluation of Past, Present, and Reasonably Foreseeable Future Actions

As part of the analysis of cumulative impacts for this Final SRS DWPF Recycle Wastewater EA, DOE considered both the timing and the region of influence for each environmental resource area that could be affected by implementation of the Proposed Action. The timing considered for the implementation of the proposal is within 12 months after a decision is made to move forward. This Final SRS DWPF Recycle Wastewater EA focuses on SRS. The other areas involving the Proposed Action include the national highway system for transporting from 9 to 15 truck shipments and the area surrounding WCS and Energy*Solutions* LLW disposal facilities near Andrews, Texas, and Clive, Utah, respectively. The Proposed Action would have a miniscule,[26] incremental impact on total radioactive material shipments on the national highway system; therefore, a detailed cumulative impacts analysis of radiological transportation is not warranted. Additionally, since the stabilized LLW would only be accepted at WCS or Energy*Solutions* if its volume and radiological characteristics were demonstrably within the WAC and allowable volumes, the waste would be consistent with other wastes accepted by the facilities. There would be no incremental impact to be evaluated.

The reasonably foreseeable actions identified for consideration in this Final SRS DWPF Recycle Wastewater EA include:

- Continued closure of waste tanks at SRS,
- Proposed plutonium pit production at SRS,
- Potential processing of surplus plutonium at SRS,
- Potential acceptance of SNF from foreign and domestic research reactors and processing of material through H Canyon,
- Initial operations of the SWPF, and

[26] According to the NRC (https://www.nrc.gov/materials/transportation.html), about three million packages of radioactive materials are shipped each year in the United States.

- Potential long-term commercial treatment and disposal of DWPF recycle wastewater for three years between the completion of the SWPF mission (estimated 2031) and the DWPF mission (estimated 2034).

These reasonably foreseeable actions are discussed separately below.

4.2.1 Continued Closure of Waste Tanks

As detailed in the System Plan (SRR 2019), as of 2019, DOE has grouted and operationally closed eight waste tanks. Five additional tanks have had the bulk of their waste removed. The System Plan identifies several goals and priorities over the next two decades. A couple of these include the complete operational closure of the F-Area Tank Farm by FY 2028; the removal of all bulk waste from old-style tanks in the SRS H-Area Tank Farm that are below the water table by FY 2023; closure of 44 of the 51 tanks by FY 2035; and closure of the last of the H-Tank Farm tanks by FY 2037. Overall, these activities would continue to lower the overall health and safety risk at SRS; however, these closure activities would be concurrent with the Proposed Action. As described in Section 1.5 of this Final SRS DWPF Recycle Wastewater EA, the potential environmental impacts of these tank closure activities are provided in the SRS HLW Tank Closure Final EIS (DOE 2002).

The Proposed Action would be implemented in a single location in the SRS H-Area Tank Farm (see Figures 2-2 and 2-4 in Chapter 2 of this Final SRS DWPF Recycle Wastewater EA). The implementation of the Proposed Action would also be limited to two weeks per batch, and its total duration would depend on how many batches DOE elected to process at any one time. Considering the limited space available in the SRS H-Area Tank Farm, the activities related to the Proposed Action and alternatives would be closely coordinated with the tank farm operating contractor to ensure they would not interfere with ongoing tank closure activities. This coordination of scheduled activities would minimize the potential for additional cumulative human health impacts to the involved and noninvolved workers.

4.2.2 Proposed Plutonium Pit Production at SRS

On June 10, 2019, the National Nuclear Security Administration (NNSA), a semi-autonomous agency within DOE, announced its intent to prepare an EIS for plutonium pit production at SRS (84 FR 26849). NNSA's proposed action is to produce a minimum of 50 pits per year at a repurposed Mixed-Oxide Fuel Fabrication Facility (MFFF) at SRS, with additional surge capacity, if needed, to enable NNSA to meet the requirements of producing pits at a rate of no fewer than 80 pits per year by 2030 for the nuclear weapons stockpile.

The MFFF is a partially constructed building in F Area, and the pit production mission is proposed to be constructed totally within its previously disturbed footprint. Considering that the Proposed Action in this Final SRS DWPF Recycle Wastewater EA would be focused around the immediate area of the SRS H-Area Tank Farm, it is unlikely that any cumulative impacts would occur between these two projects.

4.2.3 Potential Processing of Surplus Plutonium at SRS

In the *Surplus Plutonium Disposition Final Supplemental Environmental Impact Statement* (DOE/EIS-0283-S2; DOE 2015a), DOE analyzed the environmental impacts of alternatives for the disposition of 13.1 metric tons of surplus plutonium for which a disposition path is not assigned, including 7.1 metric tons of surplus pit plutonium and 6 metric tons of surplus non-pit plutonium. In its ROD, DOE announced its decision to prepare and package the six metric tons of surplus non-pit plutonium using facilities at SRS to meet the Waste Isolation Pilot Plant (WIPP) WAC and ship the surplus non-pit plutonium to WIPP for disposal. DOE has not made a decision on the other surplus plutonium. The associated activities at SRS would occur mostly in K Area, with additional TRU storage in E Area. The potential timing associated with these actions is uncertain and would likely occur after the Proposed Action has been completed. Therefore, cumulative impacts are unlikely.

4.2.4 Potential Acceptance of SNF from Foreign and Domestic Research Reactors and Processing of Material through H Canyon

SRS manages SNF (including target materials) originated from the Atomic Energy Commission and DOE production activities, as well as SNF from foreign and domestic research reactors. The SNF currently is safely stored pending disposition at SRS. The receipt, storage, and disposition of SNF supports programmatic missions of the DOE's Office of Nuclear Energy, Office of Science, and NNSA.

The environmental impacts of the SNF management at SRS were analyzed in the *Savannah River Site, Spent Nuclear Fuel Management Final Environmental Impact Statement* (DOE/EIS-0279; DOE 2000) and associated supplement analyses. This EIS included future receipts of SNF for foreign and domestic research reactors and evaluated conventional processing of SNF through H Canyon. The cumulative impacts from these activities are described in Section 5 of DOE/EIS-0279 and in the *Environmental Assessment for the Acceptance and Disposition of Spent Nuclear Fuel Containing U.S.-Origin Highly Enriched Uranium from the Federal Republic of Germany* (DOE/EA-1977; DOE 2017c). The small population health effects associated with the Proposed Action of this SRS DWPF Recycle Wastewater EA would not appreciably contribute to the cumulative impacts from the SNF management activities at SRS.

4.2.5 Initial Operations of SWPF

DOE is currently completing the tie-ins and testing associated with processing salt waste through the SWPF. According to the System Plan (SRR 2019), the SWPF is scheduled to begin hot commissioning in 2020. The initiation of operations of the SWPF is not expected to have any impact on the ability to access the SRS H-Area Tank Farm. As described in Section 1.5 of this Final SRS DWPF Recycle Wastewater EA, the potential environmental impacts of operating the SWPF are provided in the SRS Salt Processing Alternatives SEIS (DOE 2001). Similar to tank closure activities (see Section 4.2.1, above), the activities related to the Proposed Action of this SRS DWPF Recycle Wastewater EA would be closely coordinated with the tank farm operating contractor to ensure they would not interfere with SWPF startup activities. This coordination of scheduled activities would minimize the potential for additional cumulative human health impacts to the involved and non-involved workers.

4.2.6 Long-Term Commercial Treatment and Disposal of DWPF Recycle Wastewater

Currently, DWPF recycle wastewater is returned to the tank farm (Tank 22) for volume reduction by evaporation or is beneficially reused in tank closure activities (i.e., saltcake dissolution or sludge washing). As DOE completes tank closure activities in the future, DOE will not have the capability to beneficially reuse the DWPF recycle wastewater. The up to 10,000-gallon volume proposed in this Final SRS DWPF Recycle Wastewater EA would inform DOE planning efforts on disposal options for the latter stages of tank closure (2031–2034), when facilities and systems currently used for reuse and management of DWPF recycle wastewater would no longer be operational. Therefore, it is reasonably foreseeable that, depending on the outcome of this proposal, DOE could elect to implement commercial treatment and disposal of a larger volume of DWPF recycle wastewater in the future. In any event, if DOE proposed to commercially treat and dispose of more than 10,000 gallons of DWPF recycle wastewater, it would perform a separate NEPA evaluation for that proposal.

The potential volume that DOE considers reasonably foreseeable would be the total volume of DWPF recycle wastewater that is estimated to be produced after the SWPF mission is complete, but before the DWPF mission is complete (2031–2034). According to the System Plan (SRR 2019, p. 41), this value is approximately 380,000 gallons, or approximately 38 times the volume considered in this Final SRS DWPF Recycle Wastewater EA.

The potential impacts to air quality for the Proposed Action are provided in Sections 3.3.2, 3.3.3, and 3.3.4 of this Final SRS DWPF Recycle Wastewater EA for the three action alternatives. Because the Proposed Action would have only minor contributions to air quality impacts in the region, the potential cumulative impacts of on-site stabilization of approximately 38 times the volume considered in this Final SRS DWPF Recycle Wastewater EA would also likely be minimal.

The potential impacts to human health for normal operations for the Proposed Action are provided in Sections 3.4.2, 3.4.3, and 3.4.4 of this Final SRS DWPF Recycle Wastewater EA for the three action alternatives. The potential health impacts at SRS are highest for Alternative 1 because it is assumed to take twice as long as Alternatives 2 and 3. The estimated total worker dose for stabilizing 10,000 gallons of DWPF recycle wastewater is 0.072 person-rem. If 38 times this volume were processed, using the same assumptions, the resultant total worker dose would be 2.74 person-rem. The corresponding risk of an LCF in the exposed worker population would be 0.00164 LCF, or essentially zero.

The potential impacts to human health under accident conditions for the Proposed Action are provided in Sections 3.5.2, 3.5.3, and 3.5.4 of this Final SRS DWPF Recycle Wastewater EA for the three action alternatives. The potential health impacts at SRS are equivalent for all alternatives. The primary accident scenario would be associated with a transfer error resulting in a spill of DWPF recycle wastewater on the ground. Increasing the potential volume of DWPF recycle wastewater to be processed by a factor of 38 would not change the source term for the accident, which is the contents of a 600-gallon batch. It would, however, increase the probability or risk of such an event occurring.

The potential impacts to waste management for the Proposed Action are provided in Sections 3.6.2, 3.6.3, and 3.6.4 of this Final SRS DWPF Recycle Wastewater EA for the three action alternatives. The potential impacts to waste management are equivalent for all alternatives. Increasing the potential volume by a factor of 38 would increase the potential LLW generated as job control waste by the same amount; however, since job control waste is typically generated every day as a part of tank farm operations, and there is adequate on-site disposal capacity at SRS, cumulative impacts are not expected. Because of the extremely small volume of waste relative to the disposal capacity at WCS and Energy*Solutions*, as reported in Sections 3.6.1.2 and 3.6.1.3, respectively, an increase by a factor of 38 would not create cumulative impacts on the disposal facilities' capacities.

The potential impacts to radiological transportation for the Proposed Action are provided in Sections 3.7.2, 3.7.3, and 3.7.4 of this Final SRS DWPF Recycle Wastewater EA for the three action alternatives. If DOE were to implement a campaign for approximately 380,000 gallons of DWPF recycle wastewater, it would select an alternative and optimize the approach to shipments of LLW to a treatment or treatment/disposal facility. Simply based on an increase by a factor of 38, the potential impacts to the transportation workforce would be as shown in Table 4-1.

Considering the potential impacts identified in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA (derived from the WM PEIS) to the public along the route for 25,000 shipments of LLW, the potential incident-free impacts to the public from 38 times the potential shipments (9 to 15) under the Proposed Action would still be negligible.

The potential consequences from a severe accident that resulted in a release of radioactive material from a Type A package would be similar to those identified for Alternative 2 in Section 3.7.3 and further described in Appendix B. The probability of a severe accident would increase by a factor of 38 above those probabilities identified for Alternatives 2 and 3.

Table 4-1. Potential Cumulative Transportation Impacts for a Larger DWPF Recycle Wastewater Volume

Alternative	Total Worker Dose (person-rem)	LCF Risk
1	3.31	0.0020
2	5.52	0.0033
3[a]	10.4	0.0062

LCF = latent cancer fatality.

a. Alternative 3 impacts reflect a combination of transportation impacts from SRS to the commercial treatment facility and from the treatment facility to the commercial disposal facility.

5 AGENCIES CONSULTED

Consultations with other agencies (e.g., State Historic Preservation Officer, U.S. Fish and Wildlife Service) were not required or undertaken in connection with this Final SRS DWPF Recycle Wastewater EA because the Proposed Action would not impact cultural resources, historic properties, or threatened or endangered species. The following agencies were individually notified of the preparation of this Final SRS DWPF Recycle Wastewater EA:

- U.S. Environmental Protection Agency
- South Carolina Department of Health and Environmental Control
- Texas Commission on Environmental Quality
- Utah Department of Environmental Quality

6 REFERENCES

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Appendix A: Representative Tank 22 Sample Data

In December 2018, Savannah River Remediation, SRS Tank Farm contractor, retrieved a sample of the DWPF recycle wastewater currently contained in Tank 22. This sample was transferred to Savannah River National Laboratory for analyses to determine the concentrations of radionuclides present in the wastewater.

Based upon these sample analyses, the following tables present the radionuclide concentrations in representative DWPF recycle wastewater in Tank 22 (*Tank 22 Supernate Sample Characterization for Select Radionuclides*, SRNL-STI-2019-00604, Revision 0) (SRNS 2019) in order to provide reasonable assurance for the assumptions presented in this SRS DWPF Recycle Wastewater EA. Although the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium; for example, based on recent operations of DWPF, cesium concentrations in Tank 22 may increase by as much as 2 to 3 times the values shown in Tables A-1 and Table A-2. This variation of cesium is also described in the following report referenced in Appendix C of this EA, *Concentrations of Tank 22 Defense Waste Processing Facility Recycle Wastewater for Phase 1 Off-site Disposition Activities* (SRR-CWDA-2020-00025) (SRR 2020a). Appendix C provides a sensitivity analysis on radionuclide concentration variations.

Table A-1, "DWPF Recycle Wastewater in Solid Form," presents the expected concentrations for a stabilized waste form relevant to any of the analyzed alternatives and compares these concentrations to Class A, B, and C limits from 10 CFR Part 61 to demonstrate that the stabilized waste form is likely able to be disposed of as non-HLW.[27] Table A-1 also compares these expected concentrations of the stabilized waste form to the activity limits for each radionuclide from 49 CFR Part 173 to demonstrate that the stabilized waste form should be able to be shipped as LSA-II material in an IP-2 transportation package. An IP-2 package must meet a subset of the Type A packaging tests as defined in 49 CFR 173.411 and 465.

Table A-1 demonstrates that a solid waste form resulting from stabilization of the material currently in Tank 22 would be significantly below the Class C LLW concentration limits (Class C sum of fractions [SOF] approximately 0.001), below the Class B LLW concentration limits (Class B SOF approximately 0.2), and above Class A LLW concentration limits (Class A SOF approximately 7). Therefore, the stabilized waste form would be Class B LLW. Table A-1 also demonstrates that the stabilized waste form could be shipped as LSA-II material in an IP-2 package (LSA-II SOF approximately 0.002).

Table A-2, "DWPF Recycle Wastewater in Liquid Form," presents concentrations for a potential liquid shipment and compares the concentrations to Class A, B, and C limits from 10 CFR Part 61 and transportation A_2 values from 49 CFR Part 173. Table A-2 demonstrates that the material in Tank 22 would be significantly below the Class C LLW concentration limits (Class C SOF approximately 0.003), below the Class B LLW concentration limits (Class B SOF approximately

[27] *Texas Administrative Code* (30 TAC 336.362) and *Utah Administrative Code* (R313-15-1009) include radium-226 as an additional radionuclide for determining LLW classification. A waste stream must meet all regulatory requirements (NRC and State) prior to disposal in that state. The Texas concentration limits are found at https://texreg.sos.state.tx.us/fids/30_0336_0362-1.html, and the Utah concentration limits are found at https://rules.utah.gov/publicat/code/r313/r313-015.htm#T47.

0.3), and above Class A LLW concentration limits (Class A SOF approximately 13) and would therefore be considered Class B LLW. Table A-2 also demonstrates that the material tested would meet limits for a Type A package as a normal form material (A_2 SOF approximately 0.72). DOE would re-evaluate the isotopic concentrations prior to implementation of the Proposed Action and select a transportation package appropriate for the specific activity of the DWPF recycle wastewater.

The results presented in Tables A-1 and A-2 provide reasonable assurance that the waste classification and shipment package types assumed in the EA are appropriate. As noted earlier in the EA, additional DWPF recycle wastewater characterization would be performed when implementing any of the potential alternatives to confirm all requirements would be met for shipment and at the disposal facility.

The liquid DWPF recycle wastewater in Tank 22 exhibits the RCRA hazardous waste characteristic of corrosivity (D002 waste code) because its pH is greater than or equal to 12.5. The DWPF recycle wastewater also exhibits the RCRA hazardous waste characteristic for toxicity due to mercury (D009) and selenium (D010). Stabilization is an acceptable treatment method for waste exhibiting the RCRA toxicity characteristic (40 CFR 268.48). Treatment and disposal would be in accordance with applicable environmental permits and regulations.

Table A-1. DWPF Recycle Wastewater in Solid Form****

DWPF Recycle Wastewater in Solid Form

	Tank 22	Solid		Class A	Class A	Class B	Class B	Class C	Class C				LSA-II	Fraction
Radionuclide	dpm/ml	Ci/m^3	nCi/g*	Limit	Fraction	Limit	Fraction	Limit	Fraction	Total Ci**	Ci/g***	A_2	1E-4 A_2/g	LSA-II
10CFR61 Table 1														
C-14	1.61E+02	3.63E-05		0.8	4.53E-05	N/A	N/A	8	4.53E-06	1.65E-04	2.13E-11	8.10E+01	8.10E-03	2.63E-09
Ni-59	<6.72E+01	1.51E-05		22	6.88E-07	N/A	N/A	220	6.88E-08	6.88E-05	8.90E-12	N/A	N/A	N/A
Nb-94	<1.62E+00	3.65E-07		0.02	1.82E-05	N/A	N/A	0.2	1.82E-06	1.66E-06	2.15E-13	1.90E+01	1.90E-03	1.13E-10
Tc-99	6.77E+03	1.52E-03		0.3	5.08E-03	N/A	N/A	3	5.08E-04	6.93E-03	8.97E-10	2.40E+01	2.40E-03	3.74E-07
I-129	<2.43E+00	5.47E-07		0.008	6.84E-05	N/A	N/A	0.08	6.84E-06	2.49E-06	3.22E-13	N/A	N/A	N/A
Np-237	<1.75E+01		2.32E-03	10	2.32E-04	N/A	N/A	100	2.32E-05	1.79E-05	2.32E-12	5.40E-02	5.40E-06	4.30E-07
Pu-238	<1.21E+02		1.60E-02	10	1.60E-03	N/A	N/A	100	1.60E-04	1.24E-04	1.60E-11	2.70E-02	2.70E-06	5.94E-06
Pu-239	<9.34E+01		1.24E-02	10	1.24E-03	N/A	N/A	100	1.24E-04	9.56E-05	1.24E-11	2.70E-02	2.70E-06	4.58E-06
Pu-240	<9.34E+01		1.24E-02	10	1.24E-03	N/A	N/A	100	1.24E-04	9.56E-05	1.24E-11	2.70E-02	2.70E-06	4.58E-06
Pu-242	<9.49E+01		1.26E-02	10	1.26E-03	N/A	N/A	100	1.26E-04	9.71E-05	1.26E-11	2.70E-02	2.70E-06	4.66E-06
Pu-244	<4.41E-01		5.84E-05	10	5.84E-06	N/A	N/A	100	5.84E-07	4.51E-07	5.84E-14	2.70E-02	2.70E-06	2.16E-08
Am-241	<1.43E+01		1.89E-03	10	1.89E-04	N/A	N/A	100	1.89E-05	1.46E-05	1.89E-12	2.70E-02	2.70E-06	7.02E-07
Am-242m	<1.08E-01		1.43E-05	10	1.43E-06	N/A	N/A	100	1.43E-07	1.10E-07	1.43E-14	2.70E-02	2.70E-06	5.30E-09
Am-243	<3.10E+00		4.11E-04	10	4.11E-05	N/A	N/A	100	4.11E-06	3.17E-06	4.11E-13	2.70E-02	2.70E-06	1.52E-07
Cm-243	<9.04E+00		1.20E-03	10	1.20E-04	N/A	N/A	100	1.20E-05	9.25E-06	1.20E-12	2.70E-02	2.70E-06	4.44E-07
Cm-244	1.34E+02		1.78E-02	10	1.78E-03	N/A	N/A	100	1.78E-04	1.37E-04	1.78E-11	5.40E-02	5.40E-06	3.29E-06
Cm-245	<7.39E+00		9.79E-04	10	9.79E-05	N/A	N/A	100	9.79E-06	7.56E-06	9.79E-13	2.40E-02	2.40E-06	4.08E-07
Cm-247	<9.12E+00		1.21E-03	10	1.21E-04	N/A	N/A	100	1.21E-05	9.33E-06	1.21E-12	2.70E-02	2.70E-06	4.48E-07
Cm-248	<1.21E+01		1.60E-03	10	1.60E-04	N/A	N/A	100	1.60E-05	1.24E-05	1.60E-12	8.10E-03	8.10E-07	1.98E-06
Cf-249	<9.80E+00		1.30E-03	10	1.30E-04	N/A	N/A	100	1.30E-05	1.00E-05	1.30E-12	2.20E-02	2.20E-06	5.90E-07
Cf-251	<8.76E+00		1.16E-03	10	1.16E-04	N/A	N/A	100	1.16E-05	8.96E-06	1.16E-12	1.90E-02	1.90E-06	6.11E-07
Pu-241	<1.72E+02		2.28E-02	350	6.51E-05	N/A	N/A	3500	6.51E-06	1.76E-04	2.28E-11	1.60E+00	1.60E-04	1.42E-07
Cm-242	<1.98E+00		2.62E-04	2000	1.31E-07	N/A	N/A	20000	1.31E-08	2.03E-06	2.62E-13	2.70E-01	2.70E-05	9.72E-09
				SOF Table 1	1.36E-02	N/A	N/A	SOF Table 1	1.36E-03					
10CFR61 Table 2														
Ni-63	<7.67E+01	1.73E-05		3.5	4.94E-06	70	2.47E-07	700	2.47E-08	7.85E-05	1.02E-11	8.10E+02	8.10E-02	1.25E-10
Sr-90	2.45E+04	5.52E-03		0.04	1.38E-01	150	3.68E-05	7000	7.88E-07	2.51E-02	3.25E-09	8.10E+00	8.10E-04	4.01E-06
Cs-137	2.90E+07	6.53E+00		1	6.53E+00	44	1.48E-01	4600	1.42E-03	2.97E+01	3.84E-06	1.60E+01	1.60E-03	2.40E-03
				SOF Table 2	6.67E+00	SOF Table 2	1.48E-01	SOF Table 2	1.42E-03					
Transportation														
Cl-36	<1.20E+02									1.23E-04	1.59E-11	1.60E+01	1.60E-03	9.94E-09
U-233	<2.40E+02									2.45E-04	3.17E-11	1.60E-01	1.60E-05	1.98E-06
U-234	<1.55E+02									1.59E-04	2.05E-11	1.60E-01	1.60E-05	1.28E-06
U-235	1.66E-01									1.70E-07	2.20E-14	N/A	N/A	N/A
U-236	<1.61E+00									1.65E-06	2.13E-13	1.60E-01	1.60E-05	1.33E-08
U-238	3.72E+00									3.81E-06	4.93E-13	N/A	N/A	N/A
Th-232	<4.09E-02									4.18E-08	5.42E-15	N/A	N/A	N/A
													SOF LSA-II	2.44E-03

*Uses a solid specific gravity of 1.7 g/cc and liquid dry feed volume ratio of 1:1 for unit conversions.

**Assumes use of package with volume equivalent of 1,200 gallons of stabilized waste form.

***1,200 gal grout at 1.7 g/cc equals 7.722E+6 g.

****The Tank 22 radionuclide concentrations in this table are based on December 2018 sample analyses. Additional sample analyses for the characterization, stabilization, and disposal of up to 8 gallons of DWPF recycle wastewater have shown a concentration fluctuation of certain radionuclides and in particular cesium-137, with the highest cesium-137 concentration value of 33.7 curies per cubic meter (7.49E+07 dpm/ml), as documented in *Concentrations of Tank 22 Defense Waste Processing Facility Recycle Wastewater for Phase 1 Off-site Disposition Activities* (SRR-CWDA-2020-00025) and *Characterization of Tank 22 DWPF Recycle Wastewater* (Q-CLC-H-00601) (SRR 2020a, 2020b). Appendix C of this EA addresses the variability in radionuclide concentrations and the potential effects that it could have on the environmental impacts presented in Chapter 3. Potential concentration fluctuations of key radionuclides are considered during the selection of transportation packages and implementation of the HLW interpretation.

Note: The Texas Administrative Code (30 TAC 336.362) and the Utah Administrative Code (R313-15-1009) include radium-226 as an additional radionuclide for determining LLW classification. A waste stream must meet all regulatory requirements (NRC and Agreement State) prior to disposal in that state. The Texas concentration limits are found at https://texreg.sos.state.tx.us/fids/30_0336_0362-1.html, and the Utah concentration limits are found at https://rules.utah.gov/publicat/code/r313/r313-015.htm#T47. Therefore, in addition to the Table A-1 radionuclides, the DWPF recycle wastewater would be evaluated for the radium-226.

Table A-2. DWPF Recycle Wastewater in Liquid Form***

DWPF Recycle Wastewater in Liquid Form

Radionuclide	Tank 22 dpm/ml	Liquid Ci/m³	Liquid nCi/g*	Class A Limit	Class A Fraction	Class B Limit	Class B Fraction	Class C Limit	Class C Fraction	Total Ci**	A_2	Fraction A_2
10CFR61 Table 1												
C-14	1.61E+02	7.25E-05		0.8	9.07E-05	N/A	N/A	8	9.07E-06	6.31E-05	8.10E+01	7.80E-07
Ni-59	<6.72E+01	3.03E-05		22	1.38E-06	N/A	N/A	220	1.38E-07	2.64E-05	N/A	
Nb-94	<1.62E+00	7.30E-07		0.02	3.65E-05	N/A	N/A	0.2	3.65E-06	6.35E-07	1.90E+01	3.34E-08
Tc-99	6.77E+03	3.05E-03		0.3	1.02E-02	N/A	N/A	3	1.02E-03	2.66E-03	2.40E+01	1.11E-04
I-129	<2.43E+00	1.09E-06		0.008	1.37E-04	N/A	N/A	0.08	1.37E-05	9.53E-07	N/A	
Np-237	<1.75E+01		7.82E-03	10	7.82E-04	N/A	N/A	100	7.82E-05	6.87E-06	5.40E-02	1.27E-04
Pu-238	<1.21E+02		5.41E-02	10	5.41E-03	N/A	N/A	100	5.41E-04	4.75E-05	2.70E-02	1.76E-03
Pu-239	<9.34E+01		4.17E-02	10	4.17E-03	N/A	N/A	100	4.17E-04	3.66E-05	2.70E-02	1.36E-03
Pu-240	<9.34E+01		4.17E-02	10	4.17E-03	N/A	N/A	100	4.17E-04	3.66E-05	2.70E-02	1.36E-03
Pu-242	<9.49E+01		4.24E-02	10	4.24E-03	N/A	N/A	100	4.24E-04	3.72E-05	2.70E-02	1.38E-03
Pu-244	<4.41E-01		1.97E-04	10	1.97E-05	N/A	N/A	100	1.97E-06	1.73E-07	2.70E-02	6.41E-06
Am-241	<1.43E+01		6.39E-03	10	6.39E-04	N/A	N/A	100	6.39E-05	5.61E-06	2.70E-02	2.08E-04
Am-242m	<1.08E-01		4.83E-05	10	4.83E-06	N/A	N/A	100	4.83E-07	4.24E-08	2.70E-02	1.57E-06
Am-243	<3.10E+00		1.39E-03	10	1.39E-04	N/A	N/A	100	1.39E-05	1.22E-06	2.70E-02	4.50E-05
Cm-243	<9.04E+00		4.04E-03	10	4.04E-04	N/A	N/A	100	4.04E-05	3.55E-06	2.70E-02	1.31E-04
Cm-244	1.34E+02		5.99E-02	10	5.99E-03	N/A	N/A	100	5.99E-04	5.26E-05	5.40E-02	9.73E-04
Cm-245	<7.39E+00		3.30E-03	10	3.30E-04	N/A	N/A	100	3.30E-05	2.90E-06	2.40E-02	1.21E-04
Cm-247	<9.12E+00		4.08E-03	10	4.08E-04	N/A	N/A	100	4.08E-05	3.58E-06	2.70E-02	1.32E-04
Cm-248	<1.21E+01		5.41E-03	10	5.41E-04	N/A	N/A	100	5.41E-05	4.75E-06	8.10E-03	5.86E-04
Cf-249	<9.80E+00		4.38E-03	10	4.38E-04	N/A	N/A	100	4.38E-05	3.84E-06	2.20E-02	1.75E-04
Cf-251	<8.76E+00		3.91E-03	10	3.91E-04	N/A	N/A	100	3.91E-05	3.44E-06	1.90E-02	1.81E-04
Pu-241	<1.72E+02		7.69E-02	350	2.20E-04	N/A	N/A	3500	2.20E-05	6.75E-05	1.60E+00	4.22E-05
Cm-242	<1.98E+00		8.85E-04	2000	4.42E-07	N/A	N/A	20000	4.42E-08	7.77E-07	2.70E-01	2.88E-06
				SOF Table 1	3.87E-02	N/A	N/A	SOF Table 1	3.87E-03			
10CFR61 Table 2												
Ni-63	<7.67E+01	3.45E-05		3.5	9.87E-06	70	4.94E-07	700	4.94E-08	3.01E-05	8.10E+02	3.71E-08
Sr-90	2.45E+04	1.10E-02		0.04	2.76E-01	150	7.36E-05	7000	1.58E-06	9.61E-03	8.10E+00	1.19E-03
Cs-137	2.90E+07	1.31E+01		1	1.31E+01	44	2.97E-01	4600	2.84E-03	1.14E+01	1.60E+01	7.11E-01
				SOF Table 2	1.33E+01	SOF Table 2	2.97E-01	SOF Table 2	2.84E-03			
Transportation												
Cl-36	<1.20E+02									4.71E-05	1.60E+01	2.94E-06
U-233	<2.40E+02									9.40E-05	1.60E-01	5.87E-04
U-234	<1.55E+02									6.08E-05	1.60E-01	3.80E-04
U-235	1.66E-01									6.51E-08	N/A	
U-236	<1.61E+00									6.31E-07	1.60E-01	3.95E-06
U-238	3.72E+00									1.46E-06	N/A	
Th-232	<4.09E-02									1.60E-08	N/A	
											SOF A_2	7.22E-01

*Uses a liquid specific gravity of 1.0008 g/cc for unit conversions.

**Assumes package volume of 230 gallons of liquid.

***The Tank 22 radionuclide concentrations in this table are based on December 2018 sample analyses. Additional sample analyses were conducted for the characterization, stabilization, and disposal of up to 8 gallons of DWPF recycle wastewater. These additional analyses, specific to the up to 8 gallons, have shown a concentration fluctuation of certain radionuclides and in particular cesium-137, with the highest cesium-137 concentration value of 33.7 curies per cubic meter (7.49E+07 dpm/ml), as documented in *Concentrations of Tank 22 Defense Waste Processing Facility Recycle Wastewater for Phase 1 Off-site Disposition Activities* (SRR-CWDA-2020-00025) and *Characterization* *of Tank 22 DWPF Recycle Wastewater* (Q-CLC-H-00601) (SRR 2020a, 2020b). The latter report indicates that the additional sample analyses for the up to 8 gallons of DWPF recycle wastewater support a Class B LLW classification and use of a Type A package for the up to 8 gallons of DWPF recycle wastewater. Appendix C of this EA addresses the variability in radionuclide concentrations and the potential effects that it could have on the environmental impacts presented in Chapter 3. Potential concentration fluctuations of key radionuclides are considered during the selection of transportation packages and implementation of the HLW interpretation.

Note: The Texas Administrative Code (30 TAC 336.362) and the Utah Administrative Code (R313-15-1009) include radium-226 as an additional radionuclide for determining LLW classification. A waste stream must meet all regulatory requirements (NRC and Agreement State) prior to disposal in that state. The Texas concentration limits are found at https://texreg.sos.state.tx.us/fids/30_0336_0362-1.html, and the Utah concentration limits are found at https://rules.utah.gov/publicat/code/r313/r313-015.htm#T47. Therefore, in addition to the Table A-2 radionuclides, the DWPF recycle wastewater would be evaluated for the radium-226.

References

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49 CFR Part 173 "Transportation, Shippers—General Requirements for Shipments and Packagings." *Pipeline and Hazardous Materials Safety Administration*. Department of Transportation. Available online at: https://www.ecfr.gov/cgi-bin/text-idx?SID=123841ac65aa8da9bd303517605f15cc&mc=true&node=pt49.2.173&rgn=div5

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SRR (Savannah River Remediation) 2020a. *Concentrations of Tank 22 Defense Waste Processing Facility Recycle Wastewater for Phase 1 Off-site Disposition Activities*. SRR-CWDA-2020-00025. Revision 0. March 2020.

SRR (Savannah River Remediation) 2020b. *Characterization of Tank 22 DWPF Recycle Wastewater*. Q-CLC-H-00601. Revision 0. March 2020.

Appendix B: Transportation Accident Consequence Assessment for Alternatives 2 and 3

Shipment of the liquid DWPF recycle wastewater under Alternatives 2 and 3 may qualify for the use of Type A packages. This type of packaging must withstand the conditions of normal transportation without the loss or dispersal of the radioactive contents, as specified in 49 CFR 173.412, "Additional Design Requirements for Type A Packages." Packaging for shipping liquid radioactive material must also meet additional performance requirements as specified in 49 CFR 173.466, "Additional Tests for Type A Packagings Designed for Liquids and Gases." "Normal" transportation refers to all transportation conditions except those resulting from accidents or sabotage. Approval of Type A packaging is obtained by demonstrating that the packaging can withstand specified testing conditions intended to simulate normal transportation. Type A packaging usually does not require special handling, packaging, or transportation equipment.

DOE performed a conservative analysis to estimate the potential impacts from the release of the liquid DWPF recycle wastewater to the atmosphere (exposure to downwind receptors) should a worst-case-type accident occur during transport. The severe accident considered in this consequence assessment is characterized by extreme mechanical (impact) and thermal (fire) forces. This accident represents any low-probability, high-consequence events that could lead to the release of the entire liquid cargo to the environment. Therefore, accidents of this severity are expected to be extremely rare. However, the overall probability that such an accident could occur depends on the potential accident rates for such a severe accident and the shipping distance for each case.

Important for the purposes of risk assessment are the fraction of the released material that can be entrained in an aerosol (part of an airborne contaminant plume) and the fraction of the aerosolized material that is also respirable (of a size that can be inhaled into the lungs). These fractions depend on the physical form of the material. Compared to solid materials, liquid materials are relatively easy to release if the container is breached in an accident. Once released, the liquid waste could become aerosolized and dispersed downwind. Generally, aerosolized liquids are readily respirable (i.e., the respirable fraction is equal to one).

Because predicting the exact location of a severe transportation-related accident is impossible when estimating population impacts, separate accident consequences are calculated for accidents occurring in three population density zones: rural, suburban, and urban. Moreover, to address the effects of the atmospheric conditions existing at the time of an accident, two atmospheric conditions are considered: neutral and stable.[28]

[28] Neutral weather conditions constitute the most frequently occurring atmospheric stability condition in the United States. These conditions are represented by Pasquill stability Class D with a wind speed of 4 9 miles per hour in the air dispersion model used in this consequence assessment. Observations at National Weather Service surface meteorology stations at more than 300 U.S. locations indicate that on a yearly average, neutral conditions (Pasquill Classes C and D) occur about half (50%) of the time, stable conditions (Classes E and F) occur about one-third (33%) of the time, and unstable conditions (Classes A and B) occur about one-sixth (17%) of the time (Doty et al. 1976).

RISKIND (Yuan et al. 1995) is a model used to calculate the accident consequences for local populations and for the highest-exposed individual. The population dose includes the population within 50 miles of the accident site. The analysis considered the following exposure pathways:

- External exposure to the passing radioactive cloud (plume),
- External exposure to contaminated ground,
- Internal exposure from inhalation of airborne contaminants, and
- Internal exposure from the ingestion of contaminated food. (rural zone only)

Although remedial activities after the accident (e.g., evacuation or ground cleanup) would reduce the consequences, these activities are not considered in the consequence assessment with one exception. In a rural zone, crops contaminated immediately after an accident were assumed to be removed and not considered for ingestion. However, no remediation measures were assumed for subsequent growing seasons in the long term.

The highest-exposed individual for severe transportation accidents would be located at the point that would have the highest concentration of hazardous material that would be accessible to the general public. This location is assumed to be 100 feet or farther from the release point at the location of highest air concentration. For purposes of this analysis, the location of the highest-exposed individual was estimated to be at a downwind distance of approximately 500 feet for neutral-weather conditions and approximately 1,000 feet for stable-weather conditions.

This accident consequence assessment assumes that the entire contents of the Type A package would be released and aerosolized. For perspective, the release of a Type A container's entire contents could potentially occur approximately 0.4 percent of the time, given that a truck accident does occur (NRC 1977), with about a 10-percent release of its contents estimated 1.6 percent of the time, given that a truck accident does occur (NRC 1977). The aerosolized fraction of the released liquid contents under severe accident conditions could range from about 0.0001 to 0.1 (NRC 1998; DOE 2013), depending on potential over-pressurization and/or explosive and thermal stresses that might result.

Table B-1 lists the estimated radionuclide inventory released and Table B-2 lists the resultant population doses over the short and long term under neutral and stable weather conditions for generic rural, suburban, and urban population zones. Table B-2 also provides a conservative estimate of the potential resultant LCFs. Table B-3 presents the population-level risk when both the consequence and probability of a maximum reasonably foreseeable accident are considered for each of the three alternatives analyzed in this Final SRS DWPF Recycle Wastewater EA. The associated chances of contracting a fatal cancer in that individual's lifetime are 0 under Alternative 1 (for which liquid shipments would not occur), 0.000152 under Alternative 2, and 0.000183 under Alternative 3. The highest potential doses for an individual under neutral and stable weather conditions are estimated at 45 and 143 mrem, respectively. The associated chances of contracting a fatal cancer in that maximally exposed individual's lifetime is approximately 0.00003 and 0.00009. The analysis in this appendix conservatively assumes 100 percent of the release is aerosolized.

Of the radionuclides in the DWPF recycle wastewater, the dominant dose from the aerosolized fraction transported downwind is from cesium-137. Any portion of the released liquid that does not become aerosolized and airborne would spill on the ground at the accident location. Cesium is highly soluble in water, but once in ground contact, it frequently does not travel far because it binds tightly to the clay minerals in the surface soil (EPA 2018). Thus, external exposure from contaminated ground and re-suspended material would be possible in the immediate area. Long-term dose and LCF estimates provided in Table B-2 do not account for any cleanup over a 50-year period. Prompt cleanup of the spill on the ground would greatly reduce these conservative estimates. Similarly, should the wastewater spill into a waterbody, dilution would occur to the extent of water flow and volume of water present, but over time, the cesium, like other radionuclides, begins to accumulate in bottom sediments and organic matter (EPA 2018).

Table B-1. Estimated Radionuclide Inventory of One Shipping Container Filled with 230 Gallons of DWPF Recycle Wastewater in Liquid Form

Radionuclide[a]	Activity (Curies)
Americium-241	5.61E-06
Americium-242M	4.24E-08
Americium-243	1.22E-06
Carbon-14	6.31E-05
Curium-242	7.77E-07
Curium-243	3.55E-06
Curium-244	5.26E-05
Curium-245	2.90E-06
Curium-247	3.58E-06
Curium-248	4.75E-06
Cesium-137	1.14E+01
Iodine-129	9.53E-07
Niobium-94	6.35E-07
Nickel 59	2.64E-05
Nickel 63	3.01E-05
Neptunium-237	6.87E-06
Plutonium-238	4.75E-05
Plutonium-239	3.66E-05
Plutonium-240	3.66E-05
Plutonium-241	6.75E-05
Plutonium-242	3.72E-05
Plutonium-244	1.73E-07
Strontium-90	9.61E-03
Technetium-99	2.66E-03
Uranium-233	9.40E-05
Uranium-234	6.08E-05
Uranium-235	6.51E-08
Uranium-236	6.31E-07
Uranium-238	1.46E-06

a. Based on December 2018 sample analyses, as shown in Appendix A, Table A-2. Additional sample analyses for the characterization, stabilization, and disposal of up to 8 gallons of DWPF recycle wastewater have shown a concentration fluctuation of certain radionuclides; in particular, cesium-137, with the highest cesium-137 concentration value of 33.7 curies per cubic meter (7.49×10^7 dpm/ml), as documented in *Concentrations of Tank 22 Defense Waste Processing Facility Recycle Wastewater for Phase 1 Off-site Disposition Activities* (SRR-CWDA-2020-00025) and *Characterization of Tank 22 DWPF Recycle Wastewater* (Q-CLC-H-00601) (SRR 2020a, 2020b). Appendix C of this EA analyzes potential impacts on the transportation accident analyses from a variation in radionuclide concentrations.

Table B-2. Potential Radiological Consequences to the Population from Severe Transportation Accidents[a]

	Neutral Weather Conditions[b]		Stable Weather Conditions[b]	
	Short-Term[c]	**Long-Term[c]**	**Short-Term**	**Long-term**
Dose (person-rem)				
Rural	0.0534	592	0.0931	1,030
Suburban	6.40	1,360	11.2	2,360
Urban[d]	14.2	3,020	24.8	5,260
Dose Risk (LCF)[e]				
Rural	0.000032	0.36	0.000056	0.62
Suburban	0.0038	0.85	0.0067	1.4
Urban	0.0085	1.8	0.015	3.2

LCF = latent cancer fatality; km^2 = square kilometers.

a. National average population densities were used for the accident consequence assessment, corresponding to densities of 6 persons/km^2, 719 persons/km^2, and 1,600 persons/km^2 for rural, suburban, and urban zones, respectively. Potential impacts were estimated for the population within a 50-mile radius, assuming a uniform population density for each zone.

b. For the accident consequence assessment, doses were assessed under neutral atmospheric conditions (Class D with winds at nine miles per hour) and under stable conditions (Class F with winds at 2.2 miles per hour). The results for neutral conditions represent the most likely consequences, given a severe accident occurs. The results for stable conditions represent weather in which the least amount of dilution is evident; the air has the highest concentrations of radioactive material, which leads to the highest doses.

c. Short-term impacts are from exposure within the first two hours of an accident, including plume passage. Long-term impacts are from exposure over a 50-year period following an accident without consideration for decontamination or cleanup efforts.

d. It is important to note that the urban population density generally applies to a relatively small urbanized area; very few, if any, urban areas have a population density as high as 1,600 persons/km^2 extending as far as 50 miles (DOE 2002; Weiner et al. 2006). The urban population density corresponds to approximately 32 million people within the 50-mile radius—well in excess of the total populations along most of the routes considered in this assessment.

e. LCFs were calculated by multiplying the dose by the health risk conversion factor of 0.0006 fatal cancers per person-rem (ISCORS 2002).

Table B-3. Radiological Risk to the Population from Severe Transportation Accident[a]

	Dose	Consequence[b]	Probability[c]	Risk[d]
Alternative 1	Liquid waste shipments would not occur. The stabilized waste form would not be dispersible.			
Alternative 2	5,260 person-rem	3.2 LCF	0.0000476	0.000152 LCF
Alternative 3	5,260 person-rem	3.2 LCF	0.0000571	0.000183 LCF

LCF = latent cancer fatality.

a. For purposes of analysis, the dose, long-term consequence, probability, and risk values are based on the conservative assumption that all travel from SRS to the commercial treatment and/or disposal facility is through an urban environment under stable weather conditions.

b. LCF value based on Table B-2, “Stable Weather Conditions, Long-term Urban” column.

c. Calculated by multiplying the probability that a crash would occur during transport—one chance in 84 for Alternative 2 during the 33,000 miles traveled (2,200 miles times 15 trips) and one chance in 70 for Alternative 3 during the 39,825 miles traveled (2,655 miles times 15 trips) (FMCSA 2019)—by the probability of 0.4 percent (NRC 1977) that the entire contents of a Type A container would be released during the truck accident.

d. Risk equals consequence times probability.

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Appendix C: Sensitivity Analysis

During implementation of the Proposed Action, there could be variation in some of the parameters used for analysis in this SRS DWPF Recycle Wastewater EA. This appendix considers each of the following potential variations and discusses the effects that they could have on the environmental impacts presented in Chapter 3.

The parameters that could vary during the implementation of the Proposed Action include:

1. **Potential Small Quantity Shipments.** As discussed in Sections 1 and 2.1, DOE is evaluating initiation of the Proposed Action within the next 12 months. Initial planning indicates that a small quantity of DWPF recycle wastewater could be retrieved and shipped to a commercial treatment and/or disposal facility and would utilize a Type A package. Any subsequent actions for the remaining balance (not to exceed 10,000 gallons) would be informed by the results of the retrieval, transportation, stabilization, and disposal of this small volume and SRS liquid waste mission needs.

2. **Radionuclide Concentration Variation.** The primary mission of Tank 22 is to receive and store recycle wastewater from DWPF and transfer the material to the 2H Evaporator system for volume reduction (or other beneficial uses). Because recycle wastewater is routinely transferred into and out of Tank 22 on a batch basis, there may be some variability in the individual batch radionuclide properties. Although the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium. Potential fluctuations with key radionuclides are considered during the selection process of transportation packages and implementation of the HLW interpretation.

3. **Package Sizes and Types.** As radionuclide concentrations may vary, the potential volume of candidate packages for radioactive material transport could also change to ensure that USDOT and NRC requirements are met. If radionuclide concentrations dictate, DOE would use Type B transportation packages to transport liquids in larger volumes.

Chapter 3 of this Final SRS DWPF Recycle Wastewater EA provides a detailed analysis of the potential environmental impacts for the following resource areas:

- Air quality
- Human health – normal operations
- Human health – accidents
- Waste management
- Transportation

The sections below describe the potential effects that the parameter variations identified above would have on these resource area impacts.

C.1 Analysis for Potential Small Quantity Shipments

As discussed Chapter 2 of this Final SRS DWPF Recycle Wastewater EA, DOE would retrieve a small quantity (up to 8 gallons) of DWPF recycle wastewater from Tank 22 (using existing practices at SRS for collecting 3-liter samples) for shipment to a commercial treatment facility and/or disposal facility with the appropriate environmental permits and/or licenses. If DOE executes this approach, the small quantity of DWPF recycle wastewater would be packaged in a Type A container (each container holding one sample). A single truck shipment could carry up to eight of these Type A containers. DOE's initial planning assumes that there could be one to three of these small-quantity shipments. Processing (retrieval, packaging, transportation, stabilization, and disposal) of these small quantities would inform DOE's decision on whether it intends to address the balance of the Proposed Action (not to exceed 10,000 gallons), which would utilize the packages described in Section 2.1 of this SRS DWPF Recycle Wastewater EA.

Air Quality: There would be no expected change to potential air emissions from the small quantity of the DWPF recycle wastewater retrieval(s) from Tank 22. If executed, these activities would be accomplished using existing plans and procedures. The only difference in air emissions for the Proposed Action would be a negligible increase in nonradiological emissions due to the one to three truck shipments from SRS to the licensed commercial treatment and/or disposal facility.

Human Health – Normal Operations: If executed, the retrieval actions in H-Area for the small quantity of the DWPF recycle wastewater would follow existing plans and procedures and be accomplished by existing workers on the tank farm. The radiological exposures associated with the retrieval would be an incremental addition to the exposure estimates provided in Section 3.4 of this Final SRS DWPF Recycle Wastewater EA. This small increment would not substantively increase the potential health impact to workers from normal operations.

The handling, stabilization, and disposal of these small quantities at a disposal facility would be within its existing licenses and permits. Consistent with the Proposed Action, if executed, the shipped material would be verified to meet the appropriate disposal facility's waste classification and acceptance criteria prior to transport, and there would be no additional radiological exposures to the off-site public or the disposal facility workforce than expected under the existing license for LLW treatment and disposal.

Human Health – Accidents: If executed, the retrieval actions in H-Area for the small quantity of the DWPF recycle wastewater would involve much smaller volumes than estimated for the design-basis accident (DBA) described in Section 3.5 of this Final SRS DWPF Recycle Wastewater EA. Therefore, the small quantity of the DWPF recycle wastewater would not cause any increase in the potential accident impacts or introduce any unique accident scenarios that were not evaluated as part of the Proposed Action.

Waste Management: If executed, the retrieval actions for the small quantity of the DWPF recycle wastewater would produce the same types of job control waste as identified in Section 3.6 of this Final SRS DWPF Recycle Wastewater EA under the Proposed Action. The additional increment of job control waste (i.e., LLW) would be negligible compared with LLW quantities generated by existing operations at SRS.

The handling, stabilization, and disposal of these small volumes at the commercial treatment and/or disposal facility would be within its existing licenses and permits. There would be no differences from the potential waste management impacts identified in Section 3.6 for the Proposed Action.

Transportation: A potential small-quantity shipment of the DWPF recycle wastewater could carry up to eight Type A packages, each containing three liters of DWPF recycle wastewater. As reported in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA, there would be negligible impacts to members of the public from incident-free transportation under any of the alternatives.

The expected doses to workers (driver and crew) could increase by a very small increment compared to the total worker dose presented in Sections 3.7.3 and 3.7.4 of this Final SRS DWPF Recycle Wastewater EA since these would be additional radiological shipments; however, the small-quantity shipment dose rates to the crew would be lower than those used in the analysis for the Proposed Action because the small quantity of liquid in the shipments would be less than one percent of the volume of the shipments assumed under the Proposed Action. (i.e., 690 gallons per shipment).

Potential radiological impacts associated with a transportation accident for a small-quantity shipment would also be less than one percent of those presented in Section 3.7.3 of this Final SRS DWPF Recycle Wastewater EA.

C.2 Radionuclide Concentration Variation

The primary mission of Tank 22 is to receive and store recycle wastewater from DWPF and transfer the material to the 2H Evaporator system for volume reduction or beneficially reuse the wastewater. Because recycle wastewater is routinely transferred into and out of Tank 22 on a batch basis, there may be some variability in the individual batch radionuclide properties. Although the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium. There is the possibility that prior to implementation of the Proposed Action, concentrations of some key radionuclides (those radionuclides that substantially contribute to potential impacts) could fluctuate. Cesium-137 in particular could fluctuate by a two- to three-fold increase in concentration.

Air Quality: There would be no expected change to impacts presented in Section 3.3 from a variation of key radionuclide concentrations in DWPF recycle wastewater.

Human Health – Normal Operations: The incident-free impacts presented in Section 3.4 of this Final SRS DWPF Recycle Wastewater EA are based on historical dose rates to tank farm workers. The variation in key radionuclide concentrations in DWPF recycle wastewater would have a negligible impact on the individual or collective worker dose under the Proposed Action.

Human Health – Accidents: The DBA used to represent the potential accident under the Proposed Action included a highly conservative source term. The DBA assumed the waste stream involved in the transfer error was a bounding sludge slurry (WSRC 2017, p 3.4-173), which would have radionuclide concentrations significantly higher than DWPF recycle wastewater. Therefore, any variation in key radionuclide concentrations in DWPF recycle wastewater would not have any effect on the accident consequences presented in Section 3.5 of this Final SRS DWPF Recycle Wastewater EA.

Waste Management: Variation in the radionuclide concentrations of DWPF recycle wastewater would only affect the impacts presented in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA if the concentrations caused the final waste form to exceed the concentration limits in 10 CFR 61.55 (or additional State concentration limits). In this case, DOE would not implement the Proposed Action. Otherwise, the impacts of stabilization and disposal of the DWPF recycle wastewater at a commercially licensed and permitted LLW disposal facility would be unaffected by the variation in radionuclide concentration of DWPF recycle wastewater. As shown in Appendix A (Tables A-1 and A-2), cesium-137 is the key radionuclide that contributes to the concentration limits for LLW classification. These tables also indicate that a two- to three-fold increase in the cesium-137 concentration would not result in the DWPF recycle wastewater exceeding Class B or C LLW concentration limits, which would be verified prior to shipment from SRS.

The variation of radionuclide concentrations of DWPF recycle wastewater would have no effect on the generation and on-site disposal of job control waste (LLW) at SRS.

Transportation: Variation in the radionuclide concentrations of DWPF recycle wastewater could affect several aspects related to transportation (e.g., packaging selection); however, it would be unlikely to affect the potential impacts presented in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA.

The waste characterization process conducted prior to shipment of DWPF recycle wastewater would determine the allowable volume of liquid that could be placed in a USDOT-approved transportation package. For instance, if the concentration of cesium-137 was three times higher than that presented in Appendix A of this Final SRS DWPF Recycle Wastewater EA, DOE could choose to use a Type B package (230-gallon capacity as analyzed in this Final SRS DWPF Recycle Wastewater EA) or reduce the volume of a Type A package from 230-gallons to less than 100 gallons. Use of a smaller sized Type A package, could increase the number of shipments or DOE could increase the number of packages shipped on a single truck (see Section 2.1.3.2; a truck can carry up to nine LQ-375 Type A packages). DOE would re-evaluate the isotopic concentrations prior to implementation of the Proposed Action and select a transportation package appropriate for the specific activity of the DWPF recycle wastewater.

For accident considerations, if the concentration of key radionuclides increased such that the volume of a Type A package was reduced, it would have a corresponding reducing effect on the potential amount of radiological material that could be released in a severe transportation accident. However, the potential impacts presented in Appendix B would still be representative because the total radioactivity placed in a 230-gallon package (analyzed in Appendix B) or a smaller volume package Type A package would likely be the same under each scenario (i.e., smaller package volumes with higher concentrations up to A_2 values from 49 CFR Part 173 or larger package with lower concentrations up to the transportation A_2 values from 49 CFR Part 173). Additionally, if a Type B package were used, no release would be expected in a severe transportation accident, as reported in Section 3.7.3 of this Final SRS DWPF Recycle Wastewater EA.

C.3 Package Sizes and Types

DOE could, for a variety of reasons, elect to use different sizes or types of transportation packages than analyzed in Section 3.7 of this Final SRS DWPF Recycle Wastewater EA. Some of the reasons for different package sizes have already been discussed in this appendix (i.e., smaller volumes and potential variation in radionuclide concentrations). Others could include cost and schedule impacts associated with package availability. Use of Type B packages would require DOE to ensure that the Certificate of Compliance for a specific package authorized the shipment of the waste form (e.g., liquid or solid) and specified radionuclides in the waste form. Updating Certificates of Compliance could have schedule impacts on the implementation of the Proposed Action, but otherwise would not affect potential health and safety impacts other than reducing the potential impacts associated with accidents.

If DOE used smaller packages, there could be an overall increase in the number of shipments; however, DOE would have the flexibility to include more packages in the same truck shipment, thereby countering the potential increased number of shipments. Additionally, the smaller volumes of each individual package would have a reducing effect on the potential impacts associated with potential releases in the event of a severe transportation accident.

Changes in package sizes or types would not have any effect on impacts presented in Chapter 3 of this Final SRS DWPF Recycle Wastewater EA for air quality or waste management.

References

WSRC (Westinghouse Savannah River Corporation) 2017. *Concentration, Storage, and Transfer Facilities Documented Safety Analysis.* Volume 1. Revision 20. WSRC-SA-2002-00007. August 2017.

Appendix D: Comment Response Document

D.1 Introduction

D.1.1 Draft EA Public Comment Period

On December 10, 2019, DOE published a *Federal Register* notice to announce the availability of the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (SRS DWPF Recycle Wastewater EA; 84 FR 67438). The notice provided details regarding the scope of the Draft EA and the Proposed Action, as well as details related to the public review of the document. The notice included information about the 30-day public comment period; an informational meeting that occurred on December 17, 2019, in Augusta, Georgia; and an informational WebEx presentation that occurred on December 19, 2019.

On December 30, 2019, DOE published another *Federal Register* notice to extend the public comment period for an additional 32 days (85 FR 71909). The public comment period on the Draft SRS DWPF Recycle Wastewater EA ended on February 10, 2020.

In addition to publishing the two *Federal Register* notices, DOE posted the Draft SRS DWPF Recycle Wastewater EA on the DOE NEPA website at https://www.energy.gov/nepa/doe-environmental-assessments.

This appendix consists of responses to public comments received on the Draft SRS DWPF Recycle Wastewater EA through the end of the extended public comment period. No late comment documents were received. Although pertinent regulations do not require public review of an EA, DOE determined that public review in this instance would be beneficial.

D.1.2 Comment Documents Received

In response to the *Federal Register* notice announcing the availability of the Draft SRS DWPF Recycle Wastewater EA, DOE received 19 comment documents from Federal and state agencies, interested organizations, and members of the public. Table D-1 lists the commenters and their affiliation, as applicable.

Table D-1. Index of Commenters and Affiliation

Comment Document #	Name	Affiliation (if provided)
1	Susan Fulmer	South Carolina Department of Health and Environmental Control (SC DHEC)
2	Geoffrey Fetus et al.	National Resources Defense Council (NRDC)
3	Toby Baker	Texas Commission on Environmental Quality (TCEQ)
4	Louis Centofanti, Ph.D.	Perma-Fix Environmental Services, Inc.
5	Anonymous	N/A
6	Ken Miles	Oregon Department of Energy
7	Rick McLeod	SRS Community Reuse Organization

Comment Document #	Name	Affiliation (if provided)
8	Larry Long	U.S. Environmental Protection Agency (EPA)
9	James Marra, Ph.D.	Citizens for Nuclear Technology Awareness
10	Tom Clements	Savannah River Site Watch
11	Anonymous	N/A
12	Vern Rogers	Energy*Solutions*
13	Kendall Taylor	SC DHEC
14	Tiffany Drake	Missouri Department of Natural Resources
15	Kara Colton	Energy Communities Alliance
16	Alexandra Smith	Washington Department of Ecology
17	Toby Baker	TCEQ
18	Geoffrey Fetus et al.	NRDC
19	Anonymous	N/A

D.1.3 Comment Response Process

DOE reviewed and addressed all comment documents (e.g., e-mail, letter) received. The comment document images are on the left side of each page and DOE's response to each delineated comment is on the right side of each page. Each specific comment is marked with a vertical bar in the margin and assigned a unique comment number that associates with the comment document. The comment documents were generally numbered in the order in which they were received by DOE.

D.2 Comment Documents and DOE Responses

The following pages provide the comment document images and DOE's comment responses. The comment documents are numbered as provided in Table D-1. Given that disposal of the DWPF recycle wastewater covered by the Proposed Action would be DOE's first application of its HLW Interpretation, DOE's comment responses should be read in conjunction with that document (see https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation).

Comment 1: Susan B. Fulmer, P.G., South Carolina Department of Health & Environmental Control

From: Fulmer, Susan
To: DWPFEA
Cc: Porter, Henry; Taylor, G. Ken
Subject: Comment Period Extension for the Draft EA for the Commercial Disposal of DWPF Recycle Wastewater from the SRS
Date: Thursday, December 19, 2019 4:26:07 PM

Due to the public comment period falling over the holidays, the South Carolina Department of Health and Environmental Control (SCDHEC) requests the public comment period for the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site be extended in order for the public to have adequate time to review and comment on the document. *1-1*

Thank you for your consideration.

Susan B. Fulmer, P.G.
Manager
Federal Remediation Section, Division of Site Assessment, Remediation & Revitalization
S.C. Dept. of Health & Environmental Control
Office: (803) 898-4331
Connect: www.scdhec.gov Facebook Twitter

dhec
Healthy People. Healthy Communities.

1-1 DOE extended the public comment period through February 10, 2020. A *Federal Register* notice announcing the extension was published on December 30, 2019 (84 FR 71909). This information can be viewed on DOE's website at https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

Comment 2: Natural Resources Defense Council

December 12, 2019

Via E-mail to: James Joyce
U.S. Department of Energy
Office of Environmental Management
Office of Waste and Materials Management
DWPFEA@em.doe.gov

Theresa Kliczewski
U.S. Department of Energy
Office of Environmental Management
Office of Waste and Materials Management
Theresa.Kliczewski@em.doe.gov

Re: Request for 45 Day Extension of Comment Period for Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site (DOE/EA–2115)

Dear Mr. Joyce and Ms. Kliczewski:

We write regarding matters of importance for assuring meaningful opportunity for public comment. Based on our concerns below, we respectfully request that the Department of Energy (DOE) extend the deadline for public comment on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site*, 84 Fed. Reg. 67,438 (Dec. 10, 2019), for an additional forty-five (45) days. *2-1*

This proposed action is of great significance, as it is the first time DOE has proposed using its new, and deeply controversial, "reinterpretation of the definition of high-level radioactive waste." We believe that DOE's proposal requires thorough and thoughtful consideration by all affected states, tribes, and the public. Adequately responding in a constructive and meaningful fashion will require a significant investment of time, energy, and will also require technical experts to analyze the documents closely. The current thirty-day public comment period falls directly over the holiday season. Our attorneys and scientists – and likely those of many others – already have extensive travel plans over these weeks. Our small staff and minor resources compared to those of the Energy Department are stretched thin and a mere forty-five day extension will provide the time necessary for us to provide constructive comments.

In light of the importance and controversial nature of this proposed action, the potential need to obtain the assistance of experts, and the upcoming holidays, a thorough response cannot be

1

2-1 DOE extended the public comment period through February 10, 2020. A *Federal Register* notice announcing the extension was published on December 30, 2019 (84 FR 71909). This information can be viewed on DOE's website at https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

accomplished by January 9, 2019. We urge a forty-five-day extension of the current deadline. Please do not hesitate to contact us if you have questions or concerns. Thank you for your attention and consideration of this matter. We look forward to your timely reply.

Sincerely,

Geoffrey H. Fettus

Geoffrey H. Fettus
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/s/ Don Hancock
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/s/ Simone Anter
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simone@columbiariverkeeper.org

2

Response side of this page intentionally left blank.

Comment 3: Toby Baker, Executive Director, Texas Commission on Environmental Quality

Jon Niermann, *Chairman*
Emily Lindley, *Commissioner*
Bobby Janecka, *Commissioner*
Toby Baker, *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

December 11, 2019

The Honorable Dan Brouillette
Secretary
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, D.C. 20585

Subject: Request to Extend Comment Period on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site.*

Dear Secretary Brouillette:

The Texas Commission on Environmental Quality (TCEQ) respectfully requests that the Department of Energy (DOE) extend the public comment period on the above-referenced, *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site,* by a minimum of 30 days beyond the currently scheduled public comment deadline of January 9, 2020. This report was published in the *Federal Register* on December 10, 2019, and considering the upcoming holidays, only provides for 20 business days to review and provide comments. *3-1*

The TCEQ would appreciate the opportunity to conduct a thorough review of the report and to provide meaningful comments to the DOE. An extension of the public comment period will also allow time for other Texas stakeholders to review the report and provide comments.

Sincerely,

Toby Baker
Executive Director

cc: James Joyce, Office of Environmental Management, Department of Energy
Theresa Kliczewski, Office of Environmental Management, Department of Energy

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3-1 DOE extended the public comment period through February 10, 2020. A *Federal Register* notice announcing the extension was published on December 30, 2019 (84 FR 71909). This information can be viewed on DOE's website at https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

Comment 4: Dr. Louis F. Centofanti, Executive Vice President of Strategic Initiatives, Perma-Fix Environmental Services, Inc.

PermaFix
environmental services
A Nuclear Services and Waste Management Company

January 9, 2020

James Joyce
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Subject: Written Comments on the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site, (DOE/EA-2115) (Draft SRS DWPF Recycle Wastewater EA); 37438 Federal Register / Vol. 84, No. 237 / Tuesday, December 10, 2019 / Notices

Mr. Joyce,

Perma-Fix Environmental Services, Inc. (Perma-Fix) is pleased to provide comments on the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site.

Perma-Fix has done an initial review of the data on the proposed 10,000 gallons of recycle wastewater from Savannah River Site. Perma-Fix can accept this material at any of our three commercial treatment facilities for disposal of the final waste form at a commercial disposal facility. *4-1*

We have received and treated over 40 million gallons of mixed- and low-level radioactive liquid waste at our facilities for commercial disposal over the past 27 plus years. All liquid shipments were compliant with applicable state Department of Transportation regulations. Let us know if you have any questions pertaining to our waste transportation, treatment, and disposal capabilities. *4-2*

Sincerely,

Louis Centofanti

Dr. Louis F. Centofanti
Executive Vice President of Strategic Initiatives
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4-1 DOE acknowledges Perma-Fix's review of the draft environmental assessment (EA). DOE acknowledges that Perma-Fix can receive the material at three facilities.

4-2 DOE acknowledges that Perma-Fix has experience receiving and treating mixed low-level radioactive waste (MLLW) and low-level radioactive waste (LLW) that is liquid.

Comment 5: Anonymous

December 12, 2019

Mr. James Joyce
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585

Dear Mr. Joyce:

Following are comments on the Draft DWPF SRS Recycle Wastewater Environmental Assessment, which was released for public review per Federal Register Volume 84, No. 237, on December 10, 2019. I would appreciate if the Department of Energy will consider the following:

1. The introduction to the EA notes that the purpose of the proposed action is to analyze capabilities of one potential alternative treatment and disposal method, with the action to address 10,000 gallons of contaminated wastewater. Ordinarily, in keeping with the tenets of DOE's Project Management Order, DOE O 413.3B, an evaluation of mission need should be prepared, followed by an Independent Analysis of Alternatives. In the current action, a decision to test a single alternative has been made without assessing what the other alternatives might be. One of the other alternatives could be much better than off-site processing and disposal, such that the Department might not want to spend money on a premature process test. Why spend money on one alternative without looking at the cost and risks of all of the alternatives first? *5-1*

2. The draft EA states that " ...it is reasonably foreseeable that, **depending on the outcome of this proposal**, *DOE could elect to implement commercial treatment and disposal of a larger volume of DWPF recycle wastewater in the future.* In any event, if DOE proposed to commercially treat and dispose of more than 10,000 gallons of DWPF recycle wastewater, it would perform a separate NEPA evaluation for that proposal. Again, this seems to be work performed out of order that could result in needless rework. *5-2*

3. In 2005, the National Academy of Sciences[1] wrote that DOE said that *"the Savannah River Site has no way to get the DWPF recycle stream directly to the Saltstone Production Facility (Triay, 2005). Upon further discussion with DOE, the statement was clarified to mean that currently there is no way to bypass the tank farm entirely. In fact, an option explored by Mahoney and d'Entremont (2004) is to send a portion of the DWPF recycle stream to Tank 50, which is the feed tank for the Saltstone Production Facility. DOE did not select this option.* ***In short, DOE can send the DWPF recycle stream to saltstone.*** *However, without a new transfer line, DOE cannot avoid neutralizing the waste stream because it has to go through the tank farm to get to the saltstone facility."* As a result, it would seem *5-3*

[1] *Tank Waste Retrieval, Processing, and On-Site Disposal at Three Department of Energy Sites: Final Report (2006)*, The National Academies Press. http://nap.edu/11618.

1

5-1 The Proposed Action of this Final SRS DWPF Recycle Wastewater EA is the disposal of up to 10,000 gallons of stabilized (grouted) Defense Waste Processing Facility (DWPF) recycle wastewater from the Savannah River Site (SRS) H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State under Title 10 of the *Code of Federal Regulations* (CFR) Part 61. Therefore, non-commercial treatment and disposal alternatives were not considered in the analysis. DOE has proven other capabilities to treat and/or dispose of liquid radioactive wastes from SRS tank closures, including ongoing treatment (evaporation) of DWPF recycle wastewater at the 2H Evaporator, stabilization of decontaminated salt solution into saltstone and on-site disposal at the Saltstone Disposal Units, and vitrification of high-activity tank wastes at the DWPF. Demonstrating commercial disposal capabilities for up to 10,000 gallons of DWPF recycle wastewater would inform potential treatment and disposal options for larger volumes of this waste stream for the three years between the completion of the Salt Waste Processing Facility (SWPF) mission (estimated 2031) and DWPF mission (estimated 2034), when DOE will no longer have the option of returning DWPF recycle wastewater to the tank farms and SWPF for processing.

Additionally, this Final SRS DWPF Recycle Wastewater EA was prepared to satisfy the regulations established by the Council on Environmental Quality (CEQ) (40 CFR Parts 1500–1508) and the DOE National Environmental Policy Act (NEPA) implementing procedures (10 CFR Part 1021). DOE has developed three action alternatives for accomplishing this Proposed Action. This Final SRS DWPF Recycle Wastewater EA also evaluated the No Action alternative.

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- Alternative 1: Deploy retrieval and on-site treatment capability at SRS to stabilize up to 10,000 gallons of DWPF recycle wastewater and then transport the solid waste form to a licensed commercial LLW disposal facility. The stabilization technology planned for the DWPF recycle wastewater is grout. Depending upon whether the final packaged waste form is classified as Class A, B, or C LLW, it would then be shipped for disposal to either WCS in Texas and/or the Energy*Solutions* in Utah.

- Alternative 2: Retrieval and transport of up to 10,000 gallons of SRS DWPF recycle wastewater to a licensed commercial LLW disposal facility (WCS or Energy*Solutions* site) with the capability to stabilize and dispose of the final waste form.

- Alternative 3: Retrieval and transport of up to 10,000 gallons of SRS DWPF recycle wastewater to a permitted and/or licensed commercial treatment facility for stabilization and then transport the final solidified waste form to a licensed commercial LLW disposal facility (WCS or Energy*Solutions*).

  Under the No Action Alternative, up to 10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs.

Further, DOE Order 413.3B, "Program and Project Management for the Acquisition of Capital Assets," does not apply to this activity, and hence, this Final SRS DWPF Recycle Wastewater EA, as there is no capital asset needed or envisioned.

5-2 DOE's Proposed Action is described in Response 5-1. DOE is not presupposing the outcome of the Proposed Action but does acknowledge the possibility that DOE could use this approach for more than 10,000 gallons of recycle wastewater; this is discussed in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA. DOE has committed to performing additional NEPA analyses, if this separate action is proposed.

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5-3 DOE's Proposed Action is described in Response 5-1 (…commercial LLW disposal facility located outside of South Carolina…). Therefore, non-commercial treatment and disposal alternatives were not considered in this Final SRS DWPF Recycle Wastewater EA. The demonstration will inform subsequent analysis of potential treatment and disposal options for the larger volume of DWPF recycle wastewater that will require a treatment and disposal capability during the 2031–2034 timeframe when DOE will no longer have the option of returning DWPF recycle wastewater to the SWPF and when no material will be sent back to the tank farms (including Tank 50). The Proposed Action will inform planning efforts to decide if off-site disposition is the only option, one of multiple options, or not a viable option for recycle wastewater generated during the later stages of tank closure.

appropriate to look at the costs to provide a new transfer line and enhanced saltstone capacity, instead of using funds to ship liquid waste or to ship grouted waste. This could reduce doses to ALARA.

4. In support of the evaluation of mission need – it would be important to determine the root cause of the excessive volumes of wastewater. A recent SRNL report, SRNL-RP-2018-00687, states that the DWPF returns 5 gallons of liquid to the tank farm for each gallon of sludge vitrified. On November 24, 2010, the Secretary of Energy wrote to the DNFSB regarding Recommendation 2001-1, including a commitment to reduce the DWPF recycle to the Tank Farms by 1.25 Million Gallons per year, by December 2013. The volume of DWPF recycle to the tank farms was far in excess of the volumes predicted by the design authority. DWPF has not achieved the throughput or the water conservation that was advertised. As a result, before applying an expansion of the flow sheet to truck waste to commercial vendors, a root cause analysis is needed. The DWPF is a canyon building. Can equipment be improved? Was the contractor held accountable for the plant performance after startup? *5-4*

5. What is the technical readiness level of each component of the proposed process/transport? What data will be acquired in this test to improve readiness? Surely over the road transport of radioactive liquids and solids is already at TRL 9, and does not need to be evaluated, so that a process test or demonstration is not needed. Grouting waste is similarly at TRL 9. Have the commercial vendors been lobbying DOE to perform this test and acquire government waste? *5-5*

6. If DOE does not look at a reasonable range of alternatives, it is not easy to see how this activity supports a risk-based decision. GAO has recommended that DOE develop a program-wide strategy of how it will balance risks and costs across sites. How this limited-scope draft EA supports a risk based decision process is not clear. See GAO-19-28, for example: Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability, January 2019. *5-6*

7. The EA does not provide a chemical composition range for the waste water. Is this solution designated as a Hazardous Waste? Is it derived from a Hazardous Waste? There could be hidden liability costs to the taxpayer due to the "cradle to grave" liability for hazardous wastes. The Government could become liable for operations or cleanup costs at the commercial vendors in the future, even for non-government wastes. The choice of "make" or "buy" needs to be made formally according to the Federal Acquisition Regulations. DOE needs to make a formal, risk based, acquisition review, before sending any defense waste to commercial vendors. Further, the Appendix A radionuclide composition data are limited to a single sample and do not provide a range or uncertainty for composition. What are the Data Quality parameters for a single sample? What is the upper limit expected? *5-7*

Thank you for considering these comments.

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5-4 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The Proposed Action has been identified to satisfy the agency's purpose and need.

5-5 DOE's Proposed Action is described in Response 5.1. Although DOE is confident there are no significant technical obstacles associated with the Proposed Action, treatment and disposal for up to 10,000 gallons of DWPF recycle wastewater through the use of existing, licensed, off-site commercial treatment and disposal facilities has not been demonstrated at SRS. DOE has, however, demonstrated past successes in managing liquid LLW and transportation of radioactive materials. Technology Readiness Levels as discussed by the commentor pertain to implementing guidance associated with DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets*, which as discussed in the response 5-1, is not applicable to this Final SRS DWPF Recycle Wastewater EA.

5-6 DOE's Proposed Action is described in Response 5-1. The recommendations contained in the GAO report do not preclude this analysis or approach. This Final SRS DWPF Recycle Wastewater EA evaluates a range of reasonable alternatives to satisfy DOE's purpose and need (see Response 5-1).

5-7 Appendix A, "Representative Tank 22 Sample Data," of this Final SRS DWPF Recycle Wastewater EA has been revised to include information on the chemical properties of the DWPF recycle wastewater. Appendix C, "Sensitivity Analysis" discusses the potential implications of potential radionuclide concentration variation in Tank 22.

Comment 6: Ken Niles, Assistant Director for Nuclear Safety, Oregon Department of Energy

Oregon

Kate Brown, Governor

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January 24, 2020

James Joyce
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

Dear Mr. Joyce,

We appreciate the opportunity to provide comments on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (EA). This evaluation is of particular interest to Oregon because the U.S. Department of Energy's (DOE) actions on high-level radioactive waste (HLW) will likely affect more decisions on the Hanford Site than on any other site in the country. These actions will in turn affect the real and perceived safety and value of the Columbia River, in which we have a permanent interest.

The action evaluated in the EA is DOE's first attempt to apply its new interpretation of the definition of HLW. DOE has selected a waste for first use of this new interpretation that effectively illustrates that not all waste currently managed as HLW requires deep geologic disposal in order to achieve the same standard of protection as that for low-level radioactive waste (LLW). This is not a new revelation. The DOE and U.S. Nuclear Regulatory Commission (NRC), with support from Congress, have for years implemented a rigorous method to define and evaluate which wastes are worthy of being classified as "other than HLW." What is different now is a new method and a new process by which DOE wishes to arrive at this determination alone.

6-1

This EA uses present-day data on a waste stream in order to anticipate its constituents 12 years[1] in the future when DOE is actually prepared to make a waste determination decision. Based on the prospective description of the recycle waste stream in the EA, it appears this waste could most likely be safely disposed in a LLW disposal facility. Our evaluation of the EA found that the total activity of the anticipated 10,000-gallon waste stream would be approximately 495 Curies of Cs-137, 0.5 Curies of Sr-90, and 0.11 Curies of Tc-99, plus potentially trace quantities of actinides below the current analytical detection limit. If concentrated into a single cubic meter of waste, this amount of radioactivity would not rise to the level of Class C LLW. Spread across the entirety of the grouted waste volume, these radionuclides would present a manageable hazard if disposed in a LLW disposal facility that has been verified to meet the 10 CFR 61 performance objectives for wastes with these characteristics.

DOE's proposed action is not taking place in a policy vacuum, however. The method and process by which DOE makes this non-HLW determination could have broader effects for other future reprocessing wastes within Oregon's sphere of interest. More than a year after the first notice regarding this new

[1] There is some confusion as to when this waste will actually be disposed, as described in our technical comments.

6-1 DOE's Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in 2031–2034 timeframe and additional NEPA analyses would be performed. Other reprocessing waste is outside the scope of this Final SRS DWPF Recycle Wastewater EA. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

As noted by the commenter, DOE expects that the radiological constituents of the 10,000 gallons of DWPF recycle wastewater to be within the limits contained in 10 CFR 61.55 and present a manageable hazard when disposed of in a licensed LLW disposal facility. As noted in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE would determine (and validate with the licensee of the commercial off-site disposal facility) that the DWPF recycle wastewater would meet the facility's waste acceptance criteria. The waste acceptance criteria are the technical and administrative requirements a waste must meet to be accepted at a disposal facility (e.g., waste characterization, waste form acceptability, quality assurance) and are established to ensure the disposal facility, in total, meets its performance objectives.

The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. Any future evaluation of wastes at Hanford are outside the scope of this Final SRS DWPF Recycle Wastewater EA.

interpretation, we are still in the dark regarding how it will affect the final form and resting place of many Hanford wastes for which the expectation has long been deep geologic disposal. If we have one overarching comment, it is that DOE should communicate its full intentions for how it will implement its new interpretation. This reluctance to be transparent will only damage trust in the communities that stand to ultimately host these wastes for the long term. *6-1 Cont'd*

We do not view this NEPA analysis as written to be a sufficient process vehicle by which DOE can or should make a formal non-HLW classification determination. DOE has not identified the formal process by which future determinations will be made, nor has DOE been willing to say whether the public and interested stakeholders will have a formal opportunity beyond the NEPA process to participate in future non-HLW classification decisions. While we acknowledge a formal waste determination evaluation is not part of this NEPA analysis, we are taking this opportunity to document our comments on the waste determination method because it has not been made clear whether the public and interested stakeholders will get another chance. *6-2*

Our most significant technical concern in the EA is the inability for a reader to follow how the evaluated waste meets the performance objectives of the disposal facility, as required by DOE's new interpretation of HLW. We are not suggesting that disposal of the DWPF recycle wastewater at the Waste Control Specialists (WCS) facility would fail to meet performance objectives or otherwise be unacceptably dangerous. Our concern is that an excessively streamlined analysis for this waste may set a precedent of inadequate analysis and traceability for future waste classification determinations – especially for more complex or uncertainty-laden wastes such as found at Hanford. *6-3*

As we said in our formal comments on the HLW interpretation Federal Register Notice, we agree that the decision where and how to dispose of a long-lived hazard can be based on the safety needs of that particular hazard – so long as uncertainty is responsibly managed and public trust is upheld. *6-4*

Where we primarily took issue with DOE's proposed interpretation regarded when it is wise to take the extra precautionary step of removing key radionuclides to the maximum extent practical. We also differed on the most durable process for verifying that waste classification decisions are justified. We believe in the value of concurrence from an external (non-DOE) technical peer whose responsibility does not include cost effectiveness; to build trust that each decision is rich in the quality of thought that went behind it. If the future of radioactive waste management lies in mathematical models of near-surface disposal facility performance, we believe it is vital to share responsibility for the quality and completeness of those models. This includes the public and other stakeholders – the people who stand to lose if your best estimate is wrong.

Our specific technical comments on the EA follow.

Sincerely,

Ken Niles
Assistant Director for Nuclear Safety

2

6-2 This Final SRS DWPF Recycle Wastewater EA was prepared to satisfy the regulations established by CEQ (40 CFR Parts 1500–1508) and the DOE NEPA implementing procedures (10 CFR Part 1021). Any waste determination under the HLW interpretation would require approval from the authorized DOE official and be supported by technical documentation (this documentation would be in addition to, and separate from, the NEPA analysis). The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis as appropriate, to ensure compliance with applicable programmatic requirements and regulatory agreements. As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

6-3 As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation. As part of this process, DOE would verify with the licensee of the disposal facility that the stabilized waste meets the facility's WAC including additional confirmatory characterization, and all other requirements of the disposal facility, including any applicable regulatory requirements (e.g.,RCRA) for stabilization of the waste and applicable U.S. Department of Transportation (USDOT) requirements for packaging and transportation from SRS to the commercial facility.

Cc: Brian Vance, U.S. Department of Energy
Alex Smith, Washington Department of Ecology
Dave Einan, U.S. Environmental Protection Agency
Matt Johnson, Confederated Tribes of the Umatilla Indian Reservation
Laurene Contreras, Yakama Nation
Jack Bell, Nez Perce Tribes
Oregon Hanford Cleanup Board
Hanford Advisory Board
National Governors' Association Federal Facilities Task Force

3

6-3 (Cont'd) The WAC are the technical and administrative requirements a waste must meet to be accepted at a disposal facility (e.g., waste characterization, waste form acceptability, quality assurance) and are established to ensure the disposal facility, in total, meets its performance objectives.

DOE is conducting this NEPA analysis on the SRS DWPF recycle wastewater and, at this time, no decisions have been made to analyze additional waste streams at other sites.

6-4 DOE acknowledges the comments from the state of Oregon regarding the October 10, 2018, *Federal Register* notice (83 FR 50909). Public comments, including Oregon's, were carefully considered in the preparation and issuance of the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019). Additional discussion on this topic is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

Oregon Technical Comments on the *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site* (EA).

Clarify how a classification determination will be made (including public process and technical evaluation requirements)

6-5

As mentioned previously, we recognize that this NEPA analysis is not the process vehicle for making a non-HLW classification determination. Because this decision process has national significance, we request additional information about how the actual determination decision will be made.

It is critical to understand what additional evaluation process DOE intends to implement for non-HLW determinations; the level of documented technical support required to make such determinations; and what role the public will be able to have to review that technical data prior to DOE making a waste determination. We are concerned that the cursory level of analysis in this EA could set a dangerous precedent for the quality and completeness of future waste determination evaluations for more complex or less certain wastes such as those at Hanford.

Clarify when this classification determination will be made

6-6

The liquid waste management plan described in the EA appears to be at odds with the Savannah River Site (SRS) Liquid Waste Management System Plan, Rev. 21[2].

The EA states:

> *Treatment or disposal of this waste at a commercial LLW facility would help to inform planning activities for the three years between the completion of the Salt Waste Processing Facility (SWPF) mission (estimated 2031) and DWPF mission completion (estimated 2034) (SRR 2019). During this period, DOE will not have the option of returning DWPF recycle wastewater to SWPF for processing because SWPF will have completed its mission of treating salt waste from the tank farms and will undergo closure.*

This passage implies that the waste stream under consideration is limited to the wastewater that will remain to be managed following completion of the SWPF mission in 2031. This implication is further supported by the fact that the EA later considered the cumulative effects of disposing of 380,000 gallons of wastewater representing the total estimated wastewater volume in need of management between 2031 and 2034.

Despite these suggestions in the EA, DOE demurred when asked directly about the timeline of an actual waste determination and disposal action[3]. While the EA claims that the waste in question will not be ready for at least 12 years (when the SWPF has been shut down), the most recent liquid waste management system plan for SRS states that DOE will be looking for alternative treatment options for

[2] https://www.energy.gov/sites/prod/files/2019/05/f62/SRS-Liquid-Waste-System-Plan-January-2019-0.pdf
[3] Question from Oregon to DOE during the December 17, 2019 webinar on the EA.

6-5 See Response 6-2.

6-6 DOE's Proposed Action is described in Response 6-1. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume of DWPF recycle wastewater in the 2031–2034 timeframe. Additional NEPA analyses would be conducted to evaluate the disposal of more than 10,000 gallons of DWPF recycle wastewater. As discussed in Section 2 of the Final SRS DWPF Recycle Wastewater EA, DOE plans to initiate the Proposed Action within the next 12 months. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

DWPF recycle wastewater starting in 2023[4]. Further clarification is needed on when this waste would actually be disposed.

Subject waste sources are not well defined

6-7

The EA states that its scope encompasses a waste called "DWPF Recycle Wastewater," but there are many sources and processes associated with this waste stream that are not well defined in the EA.

- The EA states, "DWPF produces a dilute secondary aqueous radioactive waste stream known as DWPF recycle wastewater." This sentence implies a single generating process, but that is not the case. Multiple contributors to "DWPF recycle wastewater" are claimed. These contributers are separated into "major" and "minor" categories by volume.
    - The major contributors are listed as 1) condensates from processing tank sludge and salt waste prior to vitrification, and 2) condensed offgas from the vitrification melters. The term "processing" requires further clarification. What processing action prior to vitrification results in offgases that can be condensed as recycle wastewater?
    - Are the two listed "Major Contributors by volume" also the major contributors of radionuclides? If they are not, where are the radionuclides in the waste stream coming from, and in what proportion?
    - The "Minor Contributors" category contains names of waste types that are not defined, particularly "decontamination solutions" and "sump flushes." What has been decontaminated and what is the known radionuclide inventory resulting from this activity? Similarly, what sumps are flushed, and what constituents do those sumps contain?
    - The EA and the SRS Liquid Waste System Plan Rev 21 both describe, "beneficial reuse of DWPF recycle for waste removal and tank cleaning." The EA should make clear whether the DWPF recycle wastewater being considered for offsite disposal was used for tank cleaning, as this could introduce greater uncertainty in the inventory of radioactive constituents in the waste stream. If DWPF recycle is reused for tank cleaning, the contents may change over time, requiring additional characterization. A more variable waste stream would warrant more data than the limited sampling that supports this EA.

Given the uncertainties described above, the EA does not currently provide technical support for the implicit assertion that the sampling conducted to support this EA will be representative of the actual waste DOE proposes to dispose offsite in the future. DOE should provide additional quantitative information and process history related to the DWPF recycle wastewater composition expected at the time DOE plans to dispose of this waste.

[4] The SRS Liquid Waste System Plan Rev 21 states, "This System Plan assumes that in FY23, the DWPF recycle stream will be diverted for treatment outside of the Tank Farm, but a specific treatment path has not yet been selected. (Page 7)" This statement suggests that DOE may elect to implement the proposed action before 2031.

5

6-7 Further description of DWPF recycle wastewater has been added to Section 2 of this Final SRS DWPF Recycle Wastewater EA.

Regarding "major contributors," the term "processing the tank sludge and salt waste prior to vitrification" refers to steps to neutralize, boil, and blend the tank waste at the DWPF Sludge Receipt and Adjustment Tank and then transfer the slurry to the Slurry Mix Evaporator where a borosilicate frit is added and the slurry is concentrated to produce melter feed. The radionuclides from the major and minor contributors may vary in concentration depending on the contributing process but all result from the same waste materials in the facility. The six contributors are consolidated (blended) in the same tank – first the Recycle Collection Tank, which then transfers the consolidated recycle wastewater to Tank 22 (1.3 million-gallon capacity) at the SRS H Tank Farm on a batch basis. It is from Tank 22 that the up to 10,000 gallons of DWPF recycle wastewater would be retrieved, stabilized, and disposed of as non-HLW at a licensed commercial LLW facility. Although, the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium. Appendix C provides a sensitivity analysis on radionuclide concentration variations. DOE would appropriately characterize each proposed waste shipment of the up to 10,000 gallons of DWPF recycle wastewater to ensure it meets DOE's HLW interpretation for disposal as non-HLW and all other applicable requirements.

Decontamination solutions are acidic solutions used to reduce radiation rates on equipment prior to work in a maintenance cell and rinse water, which can be pumped from a sump if necessary. Any collected solutions are neutralized to a pH greater than 7 and then sampled to confirm pH. The sampler is flushed, prior to transfer of the liquids to the Recycle Collection Tank. While concentrations may vary depending on the source of the solutions within the facility, such as laboratory discharges and remote equipment decontamination, all radioactivity results from the same waste stream feed materials and, therefore, have similar radionuclide distributions. The DWPF recycle wastewater being considered for off-site disposal has not been used for tank cleaning.

<u>**Environmental Impact Statement not needed, but greater traceability of disposal impacts is needed**</u>

6-8

Our view is that this particular proposed action does not constitute a major federal action warranting a full Environmental Impact Statement. In the case of a predominantly cesium-137 waste stream, disposal in a facility licensed to accept waste in these concentrations is a relatively simple prospect. However, it is critical to make the full basis for a waste determination available to the public as reprocessing wastes around the nation, long managed as HLW, begin to shift into a waste class destined for near-surface disposal.

We note that we can find no record of a final NEPA analysis for the Federal Waste Facility disposal cell at Waste Control Specialists (WCS) in Texas[5]. The need for such an analysis is supported by the fact that DOE performed a supplemental analysis to its Greater-than-Class-C (GTCC) EIS that specifically evaluated the disposal impacts associated with GTCC disposal at WCS. Further, the EA's stated purpose is to, "evaluate the capability to dispose DWPF recycle wastewater . . . at a licensed commercial facility," yet the environmental impacts associated with disposal in a commercial facility are not included in the EA.

Therefore, the existing EA does need to incorporate any existing Performance Assessment and NEPA analysis for the WCS and EnergySolutions facilities by reference and make them available in the Administrative Record.

<u>**Demonstrate attainment of performance objectives to satisfy the new HLW interpretation**</u>

6-9

Because this is DOE's first attempt to use its new interpretation of HLW, now is the time to establish that DOE will clearly document that each non-HLW determination will be accompanied by a full waste determination evaluation. This should encompass the generation of the waste through a traceable demonstration that the waste will meet the performance objectives of the disposal facility.

DOE's new HLW interpretation states that in order to classify a reprocessing waste as "non-HLW" one of two criteria need to apply:

1. Does not exceed concentration limits for Class C LLW as set out in 10 CFR 61.55 and meets the performance objectives of a disposal facility, or
2. Does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.

Between the initial Federal Register notice and the supplemental notice, DOE added the phrase "and meets the performance objectives of a disposal facility," to the first criterion. This addition is explicit recognition that merely meeting the concentration limits for Class C LLW is not sufficient to demonstrate compliance with DOE's new interpretation.

[5] The 2008 Draft Environmental Assessment that was contemporary to the initial WCS permit application contained several deficiencies identified by TCEQ, which resulted in license conditions requiring additional analysis. No follow-up environmental analysis can be found to exist. Similarly, no versions of the WCS license application or performance assessment are discoverable via the web.

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6-8 DOE acknowledges the comment that the Proposed Action does not constitute a major Federal aciton. Any waste determination under the HLW interpretation would require approval from the authorized DOE official and be supported by technical documentation (this documentation would be in addition to, and separate from, the NEPA analysis). As discussed in Response 6-3, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation. The Federal Waste Facility was licensed by the Texas Commission on Environmental Quality (TCEQ) as an Agreement State under Radioactive Material License R04100. Because the licensing of this facility was not a Federal action, a NEPA evaluation was not required. Greater-than-Class C (GTCC) LLW is outside the scope of this Final SRS DWPF Recycle Wastewater EA. Any questions related to the licensing of the WCS and Energy*Solutions* facilities, including their performance assessments, should be directed to TCEQ and Utah Department of Environmental Quality, respectively.

6-9 This Final SRS DWPF Recycle Wastewater EA was prepared to evaluate the potential environmental impacts of DOE's Proposed Action described in Response 6-1. This Final SRS DWPF Recycle Wastewater EA evaluates the potential environmental impacts of a single waste stream, DWPF recycle wastewater. Future NEPA actions would be implemented to analyze potential environmental impacts for any other waste streams. Any waste determination under the HLW interpretation would require approval from the authorized DOE official and be supported by technical documentation (this documentation would be in addition to, and separate from, the NEPA analysis). The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis, to ensure compliance with applicable programmatic requirements and regulatory agreements, as appropriate.

See also Responses 6-2 and 6-3.

This EA does not demonstrate to the public that disposal of the identified waste stream will meet the performance objectives of 10 CFR 61. Instead it is assumed that if the disposal facility has been licensed by its Agreement State and has Waste Acceptance Criteria (WAC), then any waste with concentrations that meet the WAC will automatically meet the 10 CFR 61 objectives. This is in contradiction to the FR Supplemental Notice, which states, "The technical means to demonstrate compliance with performance objectives are through a modeling and analytical tool commonly referred to as a performance assessment. Safe disposal also entails compliance with *other* facility requirements, such as waste acceptance criteria." (emphasis added) (FR 26835, p.5)

We can appreciate the attempt to streamline the regulatory process by not including the full cradle to grave analysis in this EA (represented by a waste- and facility-specific evaluation of disposal performance). However, if this is the only publicly available window into DOE's new non-HLW classification process, then as interested stakeholders we are not able to trace a technical basis for how this waste meets DOE's new criteria. A waste-specific analysis showing how the waste will meet the performance objectives of the disposal facility is necessary.

In order to complete the implementation of DOE's new HLW interpretation, DOE should trace the attainment of performance objectives for the target disposal facility and incorporate by reference the performance assessment that supports the claim. This performance assessment must also be readily available for public review[6].

DOE's new simplified non-HLW determination analysis so far appears to rest on the judgment by the Agreement State as represented by the Waste Acceptance Criteria. If the Agreement State has not made the basis for their judgment publicly available, then DOE should do so both to satisfy NEPA and to demonstrate compliance with their own new interpretation of HLW. The EA (or future formal waste determination evaluation) should also include a waste-specific justification connecting the DWPF recycle wastewater to the performance assessment and clearly explaining why this disposal environment will be safe for the duration of the radiation hazard.

6-10

Cross-country transport of liquid waste to be solidified does not pass the common sense test

We recognize that the evaluation of transporting the liquid waste to a commercial treatment facility in Richland, Washington is characterized as a "bounding analysis" of transportation impacts. Nevertheless, we would be remiss not to comment that the transportation of a liquid waste from South Carolina to Washington for solidification, then back to Utah or Texas for disposal, would be a nonsensical journey. Further, we perceive that the analysis leans too heavily on a low estimated probability of a fatal accident or an associated release of waste into the environment, without proper consideration of whether the consequence of misfortune is warranted.

6-11

[6] Our research found that the Performance Assessment and associated analysis supporting WCS is not available for public review without submitting a public records request to the State of Texas, subjecting the requested records to a confidentiality evaluation by the state Attorney General's office, and paying associated fees.

7

6-10 DOE's Proposed Action is described in Response 6-1. As discussed in Response 6-3, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

Additionally, the intent of this Final SRS DWPF Recycle Wastewater EA is to satisfy the regulations established by CEQ (40 CFR Parts 1500–1508) and DOE NEPA implementing procedures (10 CFR Part 1021). Any comment beyond NEPA is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

6-11 As clarified in Sections 2.1.4.2, 2.1.5, and 3.3.4, DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS. This is a bounding analytical construct only, as the commenter recognized, and clearly demonstrates that the potential impacts of Alternative 3 would be minor for transportation scenarios that result in shorter shipment distances.

The transportation analysis for all of the alternatives included an evaluation of the probability of a truck accident based on existing highway accident statistics. This approach is used to present potential risks of the transportation actions.

Management of all reprocessing wastes as HLW until otherwise classified

We wholeheartedly support the statements made in the EA and during the December webinar that, "DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways." We interpret the phrase "all its reprocessing wastes" to include tank wastes that leaked or were otherwise released into the environment.

We interpret that the definition of HLW in the Nuclear Waste Policy Act of 1982 applies as soon as material "results" from reprocessing activities. It does not indicate that the definition ever ceases to apply, or only applies once waste has been exhumed for disposal. We strongly encourage the DOE to formally document that this practice applies across the EM complex. *6-12*

Removal of Key Radionuclides to the Maximum Extent Practical

Under the Waste Incidental to Reprocessing classification structure that preceded DOE's new interpretation, the first criterion for making a determination that a waste is not HLW required removal of key radionuclides to the maximum extent practical. While DOE has proposed to make this criterion no longer relevant, we will evaluate DOE's proposed action against it anyway. *6-13*

As previously stated, the wastewater in question is expected to contain approximately 500 Curies of Cs-137, which has been historically treated as a "key radionuclide" pertinent to the HLW definition. DOE's argument has been that if a disposal facility's Waste Acceptance Criteria would already cover a waste containing cesium-137 in this concentration, it is inefficient to conduct further removal. In the case evaluated here, we agree, although we believe DOE could also have made a defensible justification within the structure of the existing WIR process. We see a defensible argument under the WIR process that further Cs-137 removal would not pass the test of "practicality" given the low relative risk, the high cost of additional pretreatment, and the consequent creation of a new, more concentrated Cs-137 waste stream that would present a relatively greater risk to a future intruder. In this instance, additional pretreatment would also not provide additional certainty about the composition of the waste prior to final disposal.

Where we continue to see a useful role for the "key radionuclides" criterion is for the in-place closure of tanks or contaminated soil sites in future waste classification determinations. We perceive the classification of waste to be sufficiently different when contemplating a well-characterized and packaged waste for disposal in an engineered facility versus a poorly or incompletely characterized waste residual that DOE may propose to leave behind in a makeshift environmental remediation context (e.g., placing a cap over a tank with no liner). The "key" aspect to the "key radionuclides" in this case is the uncertainty regarding their concentration and distribution, and consequently the nature of the long-term hazard that must be managed. Therefore, additional precautionary preventative measures to remove as many of these radionuclides as practical may be warranted.

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6-12 Reprocessing waste that has leaked or were otherwise released into the environment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. Comments on the definition of HLW are outside the scope of this Final SRS DWPF Recycle Wastewater EA. In its Supplemental Notice, DOE explains its interpretation of the term HLW, as defined in the Atomic Energy Act of 1954, as amended (AEA, 42 U.S.C. 2011 et seq.) and the Nuclear Waste Policy Act of 1982, as amended (NWPA, 42 U.S.C. 10101 *et seq.*). DOE has the long-standing authority and responsibility under the AEA to ensure that all radioactive waste from the United States' defense program—including reprocessing waste—is managed and disposed of in a safe manner. DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed technical assessments of its characteristics and an evaluation of potential disposal pathways.

6-13 Removal of key radionuclides is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835) addresses DOE Manual 435.1–1's requirement to remove key radionuclides to the maximum extent technically and economically practical. Additional discussion on this topic is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

Our views are consistent with those of the Nuclear Regulatory Commission (NRC) in their comments on DOE's Federal Register Notice[7]. The NRC also discriminated between a waste packaged for offsite disposal versus an in-situ waste management decision when determining the benefit to human health and the environment from additional removal of key radionuclides. *6-13*

We also want to point out that the interpretation of what constitutes "key radionuclides" may be changing with time and greater experience, much like the HLW definition itself. The original HLW definition from Congress includes the term, "any solid material derived from such liquid waste that contains fission products in sufficient concentrations." At a recent meeting of the National Academies of Sciences, one of the panel members made the observation that the lesson from the Yucca Mountain licensing experience was that, "we were focusing on the wrong radionuclides," and the long-lived mobile radionuclides tend to be the key drivers of long-term risk[8]. Oregon will continue to interpret the definition of HLW to include any waste with "sufficient concentrations" of those isotopes such as Tc-99 and I-129 that could pose a long-term threat to groundwater, and we will continue to advocate for their removal from reprocessing wastes to the maximum extent practical before disposing them in a near-surface environment.

<u>We continue to see value in an NRC review of non-HLW determinations</u>

In 2015, the NRC performed a preliminary review of the WCS GoldSim Performance Assessment model on behalf of the Texas Commission on Environmental Quality (TCEQ)[9]. Their preliminary review of this model – developed to support the potential disposal of depleted uranium at WCS and the removal of disposal limits for technetium-99 and carbon-14 – found many areas of potential concern in the model methodology. Among these concerns were the degradation rate of grout, the starting inventory of waste, and the distribution coefficients for radionuclide transport. The resolution of the NRC's comments has apparently been recently completed to the satisfaction of Texas and the NRC (TCEQ, Pers. Comm.), but the documentation of this resolution is not readily available for public review. *6-14*

The NRC's preliminary review is further evidence of Oregon's repeated point that an independent review by a technical peer organization is an essential check on the quality and safety of a disposal decision. This review also highlights the importance of having a documented technical justification in order to demonstrate that a waste can meet the performance objectives of a disposal facility as required in DOE's new interpretation of the HLW definition.

In DOE's Supplemental Notice Concerning its interpretation of HLW (84 FR 26835), we and others stated a concern that implementation of the proposed new interpretation would not have rigorous independent oversight of DOE's waste determination evaluations. Specifically, we objected to the lack of required involvement by the NRC in non-HLW determinations. In their response, DOE stated that they are a member of a community of radioactive waste management professionals, and they would not easily deviate from the norms and standards of that community. DOE also stated that they would

[7] https://www.nrc.gov/docs/ML1901/ML19010A136.pdf

[8] Comment by a member of the National Academies of Science, Engineering, and Medicine at a public meeting for the project "Supplemental Treatment of Low-Activity Waste at the Hanford Nuclear Reservation". http://dels.nas.edu/Study-In-Progress/Supplemental-Treatment-Activity-Waste/DELS-NRSB-17-02

[9] https://www.nrc.gov/docs/ML1219/ML12198A060.pdf

9

6-14 Independent oversight is outside the scope of this Final SRS DWPF Recycle Wastewater EA. As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the Department fully supports the NRC in its statutory and regulatory role with respect to regulating commercial nuclear activities (including licensing disposal facilities), as well as its historical and established consultative role to DOE on the disposal of its reprocessing wastes determined to not be HLW under DOE Order 435.1, "Radioactive Waste Management." DOE's interpretation does not change the NRC's existing authorities. DOE intends to maintain its strong relationship with the NRC and will engage with the NRC on the best way to continue that relationship when and as it applies its HLW interpretation in the future. Additional discussion on this topic is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

continue to maintain a strong relationship with the NRC regarding waste classification and disposal issues.

With these previous responses in mind, we request that DOE identify how it will involve independent third parties in the evaluation and classification determination for the waste stream subject to this NEPA analysis.

6-14 Cont'd

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Comment 7: Rick McLeod, President/CEO, Savannah River Site Community Reuse Organization

SRS
COMMUNITY REUSE ORGANIZATION
two states, one future

January 27, 2020

Mr. James Joyce
U.S. Department of Energy
Office of Environmental Management
1000 Independence Avenue SW
Washington, DC 20585

(email: DWPFEA@em.doe.gov)

RE: Draft Environmental Assessment (EA) for the Commercial Disposal of Defense Waste Processing Facility (DWPF) Recycle Wastewater from the Savannah River Site

Dear Mr. Joyce:

Our organization – the Savannah River Site Community Reuse Organization (SRSCRO) is the U. S. Department of Energy's designated Community Reuse Organization. We are charged with developing and implementing a comprehensive strategy to diversify the economy of a five-county region in the Central Savannah River Area (CSRA) of Georgia and South Carolina.

The SRSCRO is governed by a 22-member Board of Directors composed of business, government and academic leaders from both Georgia and South Carolina. Initially, its mission was to develop and implement a regional economic development plan utilizing technology-based facilities at the Savannah River Site. Today, SRSCRO remains focused on diversifying the region's economy by supporting new business ventures that create new jobs in our region.

The SRSCRO Board of Directors recognizes that the Savannah River Site has a major impact on our region's economy as the principal employer, a major purchaser of goods and services and an institution with technical capabilities that can serve as the basis for the development and/or expansion of private employment in the region.

The SRSCRO is very interested in moving forward with the way we as a nation interpret and define high-level waste (HLW). Only the U.S. classifies some of its nuclear waste by origin. In most major nuclear countries, wastes are categorized by their content, not their source. The current HLW definition is rooted in origin and the radiological concentrations for the classification have never been quantified.

The SRSCRO has been actively involved in this discussion over 7 years. In 2013, representatives of the five counties surrounding the SRS and of the Carlsbad

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Serving the Counties of Aiken SC, Allendale SC, Barnwell SC, Columbia GA, and Richmond GA

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community began a discussion of using the Waste Isolation Pilot Plant (WIPP) to dispose of the HLW currently stored at SRS that meet the technical definition of TRU waste.

Since then, the SRSCRO has continued its grassroots efforts and established outreach efforts to other potentially affected communities through collaboration with the Energy Communities Alliance (ECA). We believe the recent actions by DOE to offer its interpretation of HLW is an excellent first step.

With this environmental assessment (EA), DOE is planning to analyze up to 10,000 gallons of Defense Waste Processing Facility (DWPF) recycle wastewater from the Savannah River Site (SRS) for potential disposal at a commercial low-level radioactive waste (LLW) disposal facility located outside of South Carolina licensed by either the Nuclear Regulatory Commission (NRC) or an Agreement State.

As reported in the EA, laboratory analysis indicates the sample profile of the DWPF recycle wastewater would not exceed Class C limits in its current chemical composition state. Normal Class C waste is currently allowed to be disposed of in a low-level waste disposal facility, but because of the origin of the DWPF wastewater it is currently defined as HLW. Implementing the DOE HLW interpretation has the potential to look at actual risk and chemical composition to determine the best treatment and disposal options for this waste stream, which we agree with.

DOE has identified three action alternatives for the proposed action, ultimately each option will stabilize (grout) the liquid wastewater before disposal. The EA will also analyze a no-action alternative under which the DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs.

We offer the following specific comments on the proposed action and alternatives for your consideration.

- In general, we understand, as the EA states, the timeline and implications of getting this waste stream treated and disposed before competition of the Salt Waste Processing Facility (SWPF) mission and the closure of DWPF (estimated 2031 and 2034, respectively). However, the EA does not appear to address DOE's intended timeline to make a decision or an ultimate target date to begin and end any wastewater extraction and shipments. How soon can the public expect this removal action to start and how long will it last? We believe the EA should address these points. In our opinion, urgency in resolving this matter is of paramount importance and DOE should move forward as quickly as possible with this matter. *7-1*
- Under Alternative 1, DOE would deploy treatment capability at SRS, and it appears this would take approximately 9 months. It would be very helpful to the reader if the EA specifically stated the total time for the retrieval and stabilization process. In addition, the EA assumes approximately 9 truck shipments, but the *7-2*

7-1 DOE's Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in 2031–2034 timeframe. The Proposed Action is expected to begin within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

7-2 The Proposed Action is expected to begin within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts.

DOE would not implement the Proposed Action if the final waste form would not meet the commerical disposal facility's WAC. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

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schedule of the shipments is not provided. Will the transportation schedule occur all at once or over weeks or months? This should be clearly stated in the EA. The EA should also clearly state what happens to the stabilized waste if the disposal facility WAC is not met. Does the stabilized waste stay at SRS, and is disposal in the E-Area trenches? *7-2 Cont'd*

- Alternative 2 would extract up to 10,000 gallons of DWPF recycle wastewater at SRS and ship the wastewater to either WCS near Andrews, Texas or the Energy Solutions site near Clive, Utah. Once again, the EA states this action would require 15 truck shipments from SRS but the schedule of the shipments, as noted above, is not provided, nor is the total timeframe from start to finish. *7-3*
- Alternative 3 would extract up to 10,000 gallons of DWPF recycle wastewater at SRS and transport the wastewater for treatment to a commercial permitted treatment facility. Once treated the stabilized waste form would be transport the ultimate disposal facility. This alternative presents an unnecessary double handling and transportation. Although not provided in the EA, it would seem to increase the total time for the process as well as the cost. This should be addressed in the final EA analysis. In addition, is the total radiation dose to all the workers (at SRS, at treatment facility, and at disposal facility) adequately addressed in this EA? *7-4*

We applaud DOE's efforts to examine alternative disposal pathways for waste in our communities that, under the previous interpretation, could only go to an HLW repository. As the first step, this EA has the potential of changing the interpretation of the high-level waste (HLW) definition and opens new avenues for disposition of wastes currently stored at SRS and expedites SRS cleanup. We wholeheartedly support the EA efforts and look forward to the results and actions to move waste out of SRS and South Carolina as quickly as possible.

Thank you for the opportunity to voice our concerns.

Sincerely,

R.V. McLeod

Rick McLeod
President/CEO, SRSCRO

7-3 The Proposed Action is expected to begin within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

7-4 Chapter 3 of this Final SRS DWPF Recycle Wastewater EA presents the potential direct and indirect environmental impacts that could result from the alternatives, including Alternative 3, which includes retrieval and transport up to 10,000 gallons of SRS DWPF recycle wastewater to a permitted and/or licensed commercial treatment facility for stabilization and then transport the final solidified waste form to a licensed commercial LLW disposal facility (WCS or Energy*Solutions*). Human health impacts and transportation impacts associated with Alternative 3 are presented in Sections 3.4.4 and 3.4.7, respectively. This Final SRS DWPF Recycle Wastewater EA includes the analysis of Alternative 3 in order to provide flexibility for DOE to implement the proposal and to demonstrate that the potential environmental impacts would be minor under a range of reasonable alternatives. Costs and schedules for the alternatives are beyond the scope of this Final SRS DWPF Recycle Wastewater EA, but would be considered by DOE in the decision-making process.

Comment 8: Larry Long, Regional Mining Expert, NEPA Section/Strategic Programs Office, Office of the Regional Administrator, U.S. Environmental Protection Agency

RE: Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility (DWPF) Recycle Wastewater from the Savannah River Site.

Mr. Joyce:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Environmental Assessment (DEA) for the Defense Waste Processing Facility Recycle wastewater from the Savannah River Site (SRS). On December 10, 2019, the Department of Energy submitted a Public Notice (PN) in the Federal Register[1] for the proposed action to retrieve, stabilize, and dispose of up to 10,000 gallons of low-level radioactive recycled wastewater from the SRS using existing Nuclear Regulatory Commission (NRC) permitted off-site commercial facilities.

The purpose of this DEA is to analyze capabilities of off-site facilities' alternative treatment and disposal options for Low-level wastewater to complete the tank closure program for DWPF. The EPA appreciates the complexity and significance of the process. The EPA has identified some relevant environmental issues of interest associated with this project.

The DEA states that three proposed action alternatives were considered. The DEA advances four (4) alternatives. Three action alternatives address different transport methods of the 10,000 gallons of DWPF recycle wastewater as a stabilized grouted waste or treat the wastewater at other locations in a commercial treatment facility. The DEA addresses the "No Build or No Action" alternative as the fourth alternative. However, the EPA recommends that the Final Environmental Assessment (FEA) discuss the No Action Alternative prior to the proposed action alternatives because it provides a basis for understanding what will happen with the waste material if no action is taken. The No Action Alternative can then be compared with the effects of implementing the proposed action alternatives. *8-1*

The DEA references past Programmatic Environmental Impact Statement (PEIS) documents, all of which are important to the decision-making process. The Department of Energy may want to include a statement in the Final EA as to the National Environmental Policy Act (NEPA)tiering process and how the process will be used as part of the agency's decision-making process. The conditions and methods of interstate transportation systems may have changed significantly from the some of the older referenced NEPA documents. The EPA is aware of the Department of Energy's (DOE)efforts to assess the transportation infrastructure (e.g., functioning rail networks, low overhead crossings and clearance) required to move spent fuel from storage to disposal sites. *8-2*
The DEA is not clear as to whether infrastructure requirements are the same for the vitrified waste, nor does the DEA include information about what, if any, transportation upgrades are required to transport material along the selected routes. The FEA should include updated information regarding the decision-making process in relationship to transportation and long-term storage pursuant to the Nuclear Regulatory Commission's 2014, Waste Confidence Rule. An analysis of the current infrastructure conditions (bridges, rail crossings, and roadways) along the corridor and identification of any potential risks and associated environmental impacts may be needed to insure protection of human health and the environment. The FEA should include rail and road infrastructure upgrades required for transport, if any.

The EPA is encouraged by the DOE's and SRP's efforts regarding vitrification of low-level radioactive material. The EPA appreciates the opportunity to work with the DOE and SRP and we look forward to continuing the collaboration process. If you wish to discuss this project further, please contact Mr. Larry Long, at (404) 562-9460, or by email at long.larry@epa.gov.

Larry Long
Regional Mining Expert
Physical Scientist/Sr. Principle Reviewer
NEPA Section/Strategic Programs Office
Office of the Regional Administrator
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9460

2

8-1 DOE has retained the order of the action alternatives and the no action alternative in Chapter 3 to maintain formatting consistency between the Draft and Final SRS DWPF Recycle Wastewater EA and to avoid potential confusion to the reader that could be caused by re-ordering the presentation.

8-2 This Final SRS DWPF Recycle Wastewater EA does not tier off any Programmatic Environmental Impact Statements. It incorporates selected information from those documents by reference. The transportation of the radioactive material evaluated in this Final SRS DWPF Recycle Wastewater EA would not require rail networks or overweight truck shipments and therefore the referenced evaluation of transportation infrastructure is not a necessary action before the implementation of this proposal.

Neither the NRC's Continued Storage Rule (fomerly the Waste Confidence Rule) nor the storage and transportation of spent nuclear fuel or vitrified waste are related to the scope of this Final SRS DWPF Recycle Wastewater EA.

Comment 9: James Marra, Ph.D., Executive Director, Citizens for Nuclear Technology Awareness

Environmental Assessment of Impacts of Treating and Disposing DWPF Wastewater

Residents of South Carolina are generally in agreement that moving radioactive waste out of the state is the right thing to do. We support the Department of Energy steps in expediting the process by considering an interpretation change to what actually is classified as high level waste (HLW). This would allow for more expeditious treatment and disposal of waste not considered HLW, and most importantly, removal of wastes from states, like South Carolina, where it has been stored for decades. *9-1*

The revised interpretation of HLW would allow DOE to dispose of wastes based on the radiological characteristics and ability to meet appropriate disposal facility requirements. As it exists today, the US classifies high level waste based on origin, that is, high level waste is any waste that results from spent nuclear fuel processing. No other country in the world uses a definition based solely on origin but more appropriately makes the determination based on risk.

We appreciate the efforts of DOE to provide public comment periods on policy changes. The public comment period on the HLW definition interpretation resulted in over 5000 comments from the public, Native American tribes, members of Congress, numerous state and local governments, and the Nuclear Regulatory Commission. We are confident that these comments were reviewed and considered in formulating a decision to move forward with this approach.

We applaud DOE's efforts to examine alternative disposal pathways for waste in our communities that, under the previous interpretation, could only go to a HLW repository. As a first step, we support the analysis that DOE is conducting to analyze the potential environmental impacts of treating and disposing of up to 10,000 gallons of recycled wastewater from the Defense Waste Processing Facility at the Savannah River Site. We support moving forward with treatment and disposition of this waste if the evaluation proves favorable.

We are hopeful that these first steps will lead to further cost effective waste treatment and disposition using approaches based on risk to the public and environment.

James Marra, PhD
Executive Director
Citizens for Nuclear Technology Awareness
1204 Whiskey Road, Suite B
Aiken, SC 29803
CNTAware.org

9-1 The comments are acknowledged.

Comment 10: Tom Clements, Director, Savannah River Site Watch

SRS WATCH

Savannah River Site Watch

February 7, 2020

Mr. James Joyce
U.S. Department of Energy
Office of Environmental Management
Office of Waste and Materials Management (EM–4.2)
1000 Independence Avenue, SW
Washington, DC 20585
DWPFEA@em.doe.gov
James.Joyce@em.doe.gov

Comments on "Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site"

(For non-DOE readers: pertinent documents linked at: https://www.energy.gov/nepa/doeea-2115-commercial-disposal-defense-waste-processing-facility-recycle-wastewater-savannah)

To Whom it Concerns:

These comments are formally submitted to the U.S. Department of Energy on behalf of the non-profit public-interest organization Savannah River Site Watch (SRS Watch), based in Columbia, South Carolina.

These comments are informed by monitoring SRS high-level waste issues for 30 years, including the start-up of the Defense Waste Processing Facility (DWPF) in 1996 and its subsequent operation, the passage of the U.S. law related to Waste Incidental to Reprocessing (WIR) in 2005, monitoring tank closure activities and much-delayed efforts to construct and operate the Salt Waste Processing Facility (SWPF) and efforts by some to illegally (under German law) import and reprocess and dump highly radioactive German experimental reactor graphite spent fuel at SRS.

I request that every point or citation that is raised in these comments be addressed both in any final Environmental Assessment (EA) and in any associated Record of Decision (ROD), if such documents can indeed be issued in spite of insufficiencies in the draft EA and the overall proposal. *10-1*

Thank you for extending the comment period so that SRS Watch, a key public interest organization working on SRS issues, and others might submit comments. I underscore that unlike DOE contractors that would carry out any "proposed action" in the draft EA, SRS Watch has absolutely no financial interest in any SRS or DOE projects or proposals.

1

10-1 This Final SRS DWPF Recycle Wastewater EA has been revised, as appropriate, in response to public comments. Public comments are addressed in this Final SRS DWPF Recycle Wastewater EA's Comment Response Document. Consistent with NEPA requirements, DOE will prepare an environmental impact statement or a finding of no significant impact.

1. Of prime concern is that "need" for the proposed action has not been established.

The draft EA outlines various options for disposal of the 10,000 gallons of liquid waste, via disposal of grouted material in a commercial low-level waste facility, but no case is made for why there is a "need" to do this, especially at this time. *10-2*

The document does not establish that operations of the HLW system are dependent on the "proposed action" or that a need for proposed disposal options currently exist. The draft EA fails to make a case that the "proposed action" will enable more efficient HLW management and clean-up at SRS.

Likewise, no reasons have been given as to why the "no action" option can't continue to be utilized. There appears to be no urgency, reason or need to vary from the status quo.

Is the proposed disposal of the 10,000 gallons in an off-site commercial facility an action that could have implications for "need" for disposal of similar grouted liquid waste materials at other DOE sites, such as the Idaho National Lab or Hanford?

Why can't the volume of the 10,000 gallons be reduced via "volume reduction by evaporation" at SRS?

Is cost a factor in the "need" for the proposed action? Would off-site disposal be cheaper than processing the waste into a grouted form on site and how that might figure into decision making?

Thus, please more fully explain why there is a "need" for this action and why that "need" must be determined now.

2. No time-line for processing the 10,000 gallons of waste is mentioned and no time is given for when this waste could be processed under current operational methods. *10-3*

The document states that "Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, the up-to-10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs..." Further, the documents states that "To analyze capabilities of a potential alternative treatment and disposal method at the end of the liquid waste mission life..."

Yet, DOE has affirmed that "the current practice of returning the DWPF recycle wastewater to the tank farm for reduction by evaporation or reuse in saltcake dissolution or sludge washing" is the guiding procedure. Thus, the 10,000 gallons in question would seem to have other uses and/or undergo evaporation, and be replaced as necessary as time goes on for reuse.

The draft document makes it look like the very same 10,000 gallons would be present at time of DWPF closure in the 2031-2034 timeframe. Is the 10,000 gallons "fungible," or mutually

2

10-2 The Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. Treatment or disposal of this waste at a commercial LLW facility would help to inform planning activities for the three years between the completion of the SWPF mission (estimated 2031) and DWPF mission completion (estimated 2034). During this period, DOE will not have the option of returning DWPF recycle wastewater to the tank farms or SWPF for processing because SWPF will have completed its mission of treating salt waste from the tank farms and will undergo closure. The Proposed Action would inform future planning to decide if off-site disposition is the only option, one of multiple options, or not a viable option for larger expected volumes of this waste stream for the three years between the completion of SWPF mission (estimated 2031) and DWPF mission (estimated 2034). DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal. Any future actions at the Idaho National Laboratory or at Hanford are beyond the scope of this Final SRS DWPF Recycle Wastewater EA.

DWPF recycle wastewater is currently evaporated on site at the 2H Evaporator and, therefore, is part of the No Action alternative in Section 2.

Costs and schedules for the alternatives are beyond the scope of this Final SRS DWPF Recycle Wastewater EA but would be considered by DOE in the decision-making process.

10-3 The Proposed Action is expected to begin within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in the 2031-2034 timeframe. This Final EA has been modified for additional clarity of the proposed timing of the proposal.

interchangeable with liquid that will actually be present at the end of DWPF operations? Please clarify.

10-3 Cont'd

After the 10,000 gallons in question comes in contact with high-level waste forms and possibly becomes highly radioactive, does it, or any portion of it, become classified at any point as high level nuclear waste, especially when dumped into a tank with other liquid waste that may be HLW?

The document calls the 10,000 gallons of "DWPF recycle wastewater" as "reprocessing waste," which may be, by definition, be HLW. Please clarify. What is the current definition per DOE regulations and U.S. law applied to the 10,000 gallons of waste water?

Would any solids in the 10,000 gallons settle to the bottom of Tank 22? How is waste at the bottom of the tank classified? Would any solids be in the chosen 10,000 gallons?

I note that DOE states in the document that a "the sample profile of the DWPF recycle wastewater in Tank 22 would not exceed Class C limits, in accordance to NRC waste classification tables (10 CFR 61.55)." How has this determination been made? Is any waste in Tank 22 defined as HLW?

The draft document states that "As stated in the supplemental notice, DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways." Thus, it is unclear as DOE either defines the liquid waste as HLW or not. The language "managing all its reprocessing wastes as if they were HLW" is vague and needs clarification in order to make a definitive statements as to what the current definition of the waste is.

Would the 10,000 gallons continue to be managed as HLW until such time it's extracted from Tank 22 for disposal via the proposed action?

If DOE does not define the waste water as HLW and it is <u>all</u> Class C waste, then, after volume reduction, why can't the waste water either be removed and grouted for disposal on site at SRS or remaining residue grouted in place in Tank 22?

3. Waste Incidental to Reprocessing (WIR)

10-4

DOE states in "Liquid Waste System Plan Revision 21," of January 2019, (https://www.energy.gov/sites/prod/files/2019/05/f62/SRS-Liquid-Waste-System-Plan-January-2019-0.pdf), the following about Waste Incidental to Reprocessing (WIR):

> The *Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005* (NDAA) Section 3116 (NDAA §3116) allows determinations by the Secretary of Energy, in consultation with the NRC, that certain radioactive waste from reprocessing is not high-level waste and may be disposed of in South Carolina pursuant to a State-approved closure plan or State-issued permit. For salt waste, DOE contemplates removing targeted fission products

3

10-3 (Cont'd) Evaporation at the 2H Evaporator and beneficial re-use apply while salt feed is prepared for SWPF. These options would not be available for the 3-year time period between SWPF (2031) and DWPF (2034) mission completion, when approximately 380,000 gallons of DWPF recycle wastewater are expcted to be generated. The Proposed Action would inform future planning to decide if off-site disposition is the only option, one of multiple options, or not a viable option for larger expected volumes of this waste stream for the 3-year period.

Regarding the "fungible" comment, DWPF recycle wastewater generated today and in the future originates from the same processes at DWPF. Therefore, DOE believes the potential impacts of any future proposed action to dispose of more than 10,000 gallons of DWPF recycle wastewater at a licensed off-site commercial facility would be similar. The Proposed Action is expected to begin within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal. Any decision to dispose of more than 10,000 gallons of DWPF recycle wastewater would require additional NEPA analysis. DOE would characterize each proposed waste shipment of DWPF recycle wastewater to ensure it meets DOE's HLW interpretation for disposal as non-HLW and all other applicable requirements. As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

The 10,000 gallons evaluated in this Final SRS DWPF Recycle Wastewater EA is currently being managed as HLW and, as stated in Section 1.2 of this Final SRS DWPF Recycle Wastewater EA, "DOE will continue its current practice of managing all its reprocessing wastes as if

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10-3 (Cont'd) they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways." Any waste determination under the HLW interpretation would require approval from the authorized DOE official and be supported by technical documentation (this documentation would be in addition to, and separate from, the NEPA analysis). The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis, to ensure compliance with applicable programmatic requirements and regulatory agreements, as appropriate.

Appendix A of this Final SRS DWPF Recycle Wastewater EA compares the concentration of radionuclides in the tank to the NRC waste classification table in 10 CFR 61.55 based on representative sampling and analysis. The results indicate that the wastewater would not exceed Class C limits. If DOE were to implement the Proposed Action, DOE would make a determination on whether the up to 10,000 gallons of DWPF recycle wastewater meets DOE's HLW interpretation for disposal as non-HLW. As discussed in the Response 10-3, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW.

While there may be some solids or particulates entrained in the 10,000 gallons of DWPF recycle wastewater when received in Tank 22, it is not DOE's intent to re-suspend and extract any settled solids from Tank 22. These solids would typically be removed for inclusion in sludge batches or during heel removal for the tank closure processes in the future. The HLW interpretation does not differentiate between solid and liquid materials when applying the criteria that must be met when determining whether a material qualifies as non-HLW. Satisfaction of the performance objectives of the criteria will, as a practical matter, often require that the liquid be solidified prior to disposal.

DOE's Proposed Action is described in Response 10-2. Therefore, other treatment and disposal alternatives (e.g., disposal on site at SRS) were not considered in the analysis.

10-4 Cont'd

> and actinides using a variety of technologies and combining the removed fission products and actinides with the metals being vitrified in DWPF. NDAA §3116 governs solidifying the remaining low-activity salt stream into saltstone for disposal in the SDF. For tank removal from service activities, NDAA §3116 governs the Waste Determinations for the Tank Farms that demonstrate that the tank residuals, the tanks, and ancillary equipment (evaporators, diversion boxes, etc.) at the time of removal from service and stabilization can be managed as non-high-level waste. (page 9)

Concerning "Waste Incidental to Reprocessing" (WIR), see NRC website at https://www.nrc.gov/waste/incidental-waste.html):

> The U.S. Nuclear Regulatory Commission (NRC) has a non-regulatory role in WIR as defined in Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA). The NDAA covers the DOE sites in Idaho and South Carolina (i.e., NDAA-Covered States). The NRC has two functions under the NDAA. Under NDAA Section 3116(a), the DOE must consult with the NRC prior to making the final waste determination. Under NDAA Section 3116(b), following the Secretary of Energy's final determination that the waste is WIR, the NRC monitors the DOE disposal actions in coordination with the NDAA-Covered State. The NRC and NDAA-Covered State assesses the DOE disposal actions to determine compliance with the performance objectives set forth in Subpart C of Title 10, Part 61, of the *Code of Federal Regulations* (10 CFR Part 61, "Licensing Requirements for Land Disposal of Radioactive Waste." Also under NDAA Section 3116(b), if the NRC considers any disposal actions taken by the DOE under the NDAA to be not in compliance with those performance objectives, then the NRC must, as soon as practicable after discovery of the noncompliant conditions, inform the DOE, NDAA-Covered State, and specific committees in Congress.

Is the proposal to send 10,000 gallons to a commercial low-level waste facility being informed in any way by Section 3116 mentioned above?

Even though this "reprocessing waste" addressed in the draft EA would be disposed of outside the boundaries of South Carolina, would the waste be determined to be WIR, or something legally equivalent to WIR when at SRS? If not, why not? If the waste were stabilized at SRS before off-site shipment, the WIR definition could apply and the NRC would then have an oversight and monitoring role when at SRS, correct?

What is the legal justification that the waste water in question if it is not determined not to be HLW or WIR? Why is "reprocessing waste" not HLW?

If the material in question is WIR, either in a liquid or grouted form, what would it become once it has passed the Georgia or North Carolina borders (to the west and northwest of SRS)?

4

10-4 NDAA Section 3116 and WIR are outside the scope of this Final SRS DWPF Recycle Wastewater EA. As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the HLW interpretation does not impact DOE's obligation to comply with Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005. In addition, Section 3116 does not limit DOE's long-standing authority under the AEA to interpret the definition of HLW or to apply that interpretation to reprocessing wastes that are not covered by Section 3116. Section 3116 sets forth a process for determining that specified DOE reprocessing waste is not HLW. This Section 3116 process is similar to the process in DOE's Order 435.1, *Radioactive Waste Management*, the accompanying DOE Manual 435.1–1, *Radioactive Waste Management Manual*, (Manual), and the accompanying DOE Guide 435.1–1, *Implementation Guide* for use with DOE M 435.1–1 (Implementation Guide) for determining whether certain reprocessing wastes are "wastes incidental to reprocessing." See Public Law 108–375, 2004, Section 3116(a). Section 3116 applies to two "covered States"—South Carolina and Idaho. However, Section 3116 does not apply to reprocessing wastes that are transported out of South Carolina or Idaho and disposed of in a different state. Section 3116 also specifies that "nothing in this section establishes any precedent or is binding" outside of South Carolina and Idaho. In short, in enacting Section 3116, Congress did not limit DOE's long-standing authority under the AEA to interpret the term HLW or to apply this interpretation to reprocessing wastes that are disposed of in states other than Idaho and South Carolina.

As discussed in Response 10-3, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW.

Because the waste would be classified as non-HLW under the HLW interpretation, waste incidental to reprocessing would not apply. The Department's legal authority for the HLW interpretation is explained in the Supplemental Notice (84 FR 26835) and is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

Comment	Response
Comment side of this page intentionally left blank	Additional discussion on NDAA Section 3116 and WIR is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

I note that in the "Acronyms and Abbreviations" section in the draft EA that WIR is not mentioned. Why is WIR left out and not discussed in the document? 10-4 Cont'd

4. **The draft EA mentions that for the named low-level waste disposal facilities that the applicable regulations, license requirements and Waste Acceptance Criteria will apply. What would be the role of the NRC in monitoring on-going disposal of this waste and its long-term status?** 10-5

As the waste may be determined to be WIR when still at SRS and within South Carolina, what laws allow such WIR-like waste to be shipped out of state for disposal? As the NRC would likely have an observational role while the waste is at SRS, what Nuclear Regulatory Commission (NRC) oversight would apply in transport and disposal?

Also, have the named facilities agreed to accept this waste form and does it, in fact, comply with all licensee requirements, performance objectives and NRC and state regulations that apply to the facilities in question? Please provide documentation.

If the waste acceptance and regulatory criteria above are not now met at what point would the chosen disposal facility make the required analysis for acceptance of the waste? What would happen if the facilities do not accept the grouted waste form or the grouted form does not meet regulatory requirements for those facilities? Likewise, what would happen if the grouted waste was rejected for receipt before all of it was disposed of?

If "Alternative 2: Treatment and Disposal at a Commercial LLW Facility" is chosen what ability do the disposal sites have to manage the liquid waste and grout it? Would this be an NRC-licensed operation and not covered by the general facility license?

The documents states "DOE on-site (i.e., E Area) and off-site (e.g., Nevada Nuclear Security Site) radioactive waste disposal facilities are not included in the alternatives analysis." Why not consider those options now?

The draft document says that "several treatment facilities in the United States permitted and/or licensed to receive liquid LLW and stabilize it." Please name them and please name those that would agree to accept the liquid waste in question and stabilize it.

5. **Segmentation under NEPA?** 10-6

The document states that "Any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review." The document goes on to reveal that "According to the System Plan (SRR 2019, p. 41), this value is approximately 380,000 gallons, or approximately 38 times the volume considered in this EA."

And, on page 4-4, it is stated that processing of larger amounts of waste is the goal: "Therefore,

5

10-5 Discussion of NRC's statutory and regulatory role regarding the HLW interpretation is outside the scope of this Final SRS DWPF Recycle Wastewater EA. As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the Department fully supports the NRC in its statutory and regulatory role with respect to regulating commercial nuclear activities (including licensing disposal facilities), as well as its historical and established consultative role to DOE on the disposal of its reprocessing wastes determined to not be HLW under DOE Order 435.1, "Radioactive Waste Management." DOE's interpretation does not change the NRC's existing authorities. DOE intends to maintain its strong relationship with the NRC and will engage with the NRC on the best way to continue that relationship when and as it applies its HLW interpretation in the future. Additional discussion on this topic is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

The 10,000 gallons of DWPF recycle wastewater evaluated in this Final SRS DWPF Recycle Wastewater EA would not be subject to Section 3116 or the DOE Manual 435.1 WIR process. As discussed in Response 10-3, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW.

The commercial LLW disposal sites are located in NRC Agreement States and thus the respective Agreement State regulatory oversight, inspection, and enforcement actions would be implemented by the States (i.e., Texas or Utah). As such, NRC's role would be oversight of an Agreement State and approval of certain radioactive material packages.

LLW disposal facilities, and specifically those mentioned in this Final SRS DWPF Recycle Wastewater EA, have licenses and permits to allow disposal of LLW that meet the applicable requirements in 10 CFR Part 61, or compatible Agreement State regulatory requirements. Operations at any commercial treatment facility would be carried out in accordance with the facility's operating license.

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10-5 Cont'd DOE, through coordination with the disposal facility(ies), would ensure that the WAC and other applicable requirements were met.

Disposal of LLW on site and at NNSS is out of the scope of this Final SRS DWPF Recycle Wastewater EA. DOE's Proposed Action is described in Response 10-2.

This Final SRS DWPF Recycle Wastewater EA analyzes reasonable treatment facilities. The analysis of a representative treatment facility far from SRS provides a conservative bounding estimate of potential transportation impacts. If DOE were to implement Alternative 3, the selection of the facility would be the subject of a procurement action.

10-6 Cont'd

it is reasonably foreseeable that, depending on the outcome of this proposal, DOE could elect to implement commercial treatment and disposal of a larger volume of DWPF recycle wastewater in the future."

Given that DOE has admitted that it might consider disposing of 380,000 gallons in a similar manner as proposed in the draft EA, please explain why the matter is not being "segemented," which is not allowed under NEPA.

Likewise, as disposal of the liquid waste in question from SRS may have implications for disposal of liquid tank waste at other DOE sites - Hanford and Idaho National Lab. Please explain if DOE is already looking at the same disposal techniques for those other sites. If DOE is looking at disposal of Hanford or INL liquid waste as grouted material at a commercial facility or DOE disposal site, please explain why "segmentation" of NEPA analyses concerning HLW disposal issues at Hanford and/or INL would not be occurring.

If, at such time in the future DOE proposes disposal of much more HLW liquid by grouting and dumping in a LLW facility the issue of segmentation could become an active legal point.

10-7

6. Please clarify the status of the 10,000 gallons now, over time and at the end of DWPF operation.

On Page 2-11, under "2.2 No-Action Alternative," it is stated that "Under the No-Action Alternative, the up-to-10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs using the systems described in Section 2.1.1. The No-Action Alternative would require another, as yet determined, process to handle the DWPF recycle wastewater during the final years of the DWPF mission (2031–2034), when DOE will no longer have the option of returning DWPF recycle wastewater to the SWPF for processing."

The above statement is confusing and unclear. Given the admission that 380,000 gallons of similar liquid would exist, please clarify how the 10,000 gallons, which the draft EA calls a "representative volume," proposed for initial treatment can be isolated or considered to be separate from the larger volume. If 10,000 gallons would be needed to be processed after DWPF is out of operation, why is this proposal being made now and not 10-15 years from now?

After evaporation (and subsequent disposal of concentrates) or other volume reduction techniques - not discussed in this document in that they may become known in the future - why can't the liquid waste streams be reduced in volume and vitrified in DWPF, even if SWPF is out of operation? Is this a cost issue to avoid making more vitrified canisters and to avoid geologic disposal?

If this 10,000 gallons discussed in the draft EA is only a representative of liquid recycle wastewater at the end of DWPF operations, please explain how 10,000 gallons will be chosen to be processed to go to a LLW facility.

6

10-6 DOE's Proposed Action is described in Response 10-2. DOE is conducting this NEPA analysis on the SRS DWPF recycle wastewater and, at this time, no decisions have been made to analyze additional waste streams at other sites.

DOE has analyzed this as a reasonably foreseeable future action in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA. Should DOE propose to use a similar approach for more than 10,000 gallons, DOE would conduct additional NEPA analysis, as appropriate. This review of a new proposal would be planned to minimize impacts on operational schedules. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal. This approach to DOE's NEPA evaluation is appropriate since the only proposal currently under considerationfor decision making is the analysis of 10,000 gallons. As discussed in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA, the potential impacts of processing the approximately 380,000 gallons of DWPF recycle wastewater were also shown to be minor with low risks to human health and the environment. Any future actions at the Hanford Site or the Idaho National Laboratory are beyond the scope of this Final SRS DWPF Recycle Wastewater EA.

10-7 It is not necessary for DOE to isolate the 10,000 gallons of DWPF recycle wastewater proposed for evaluation under this Final SRS DWPF Recycle Wastewater EA. DOE's Proposed Action is described in Response 10-2. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The Proposed Action would inform future planning to decide if off-site disposition is the only option, one of multiple options, or not a viable option for larger expected volumes of this waste stream for thethree years between the completion of SWPF mission (estimated 2031) and DWPF mission (estimated 2034).

Please clarify at what point in time the 10,000 gallons in questions were created or when will it be created. And, if HLW and Class C liquid waste were to exist together in Tank 22, how will DOE select liquid that does not meet a HLW or WIR definition?

What is the relationship to the "proposed action" and the larger issue of DOE's effort to reclassify HLW, as presented in a Federal Register notice of June 10, 2019 (Vol. 84, No. 111) and entitled "Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste?" If the new DOE interpretation of HLW is not fully implemented or is overturned, what impact will that have on the "proposed action?"

10-7 Cont'd

7. What is the Status of the Salt Waste Processing Facility (SWPF)?

10-8

The document says on page 4-3, in section "4.2.5 Initial Operations of SWPF," that "DOE is currently completing the tie-ins and testing associated with processing salt waste through the SWPF. According to the System Plan (SRR 2019), the SWPF is scheduled to begin hot commissioning in March 2020."

The March 2020 date may well be inaccurate as there seems to be problems with completing the hot operations phase of SWPF start-up. As is well known, SWPF has run far over budget and far behind schedule and it would be no surprise if there were more delays. DOE has rebaselined the cost and schedule of SWPF and attempts to act like the cost overruns and delays as not being as extensive as they are but the record shows otherwise.

We note that the delays are well documented, in this document, for example: "SWPF Design, Procurement, and Construction Lessons Learned and Best Practices P-RPT-J-00031, Rev. 0," dated February 10, 2017. The following is stated: "The DNFSB continued to raise concerns over the geotechnical investigation and the structural design's capacity to meet PC-3 standards. Enhanced Final Design addressed these concerns by increasing the thickness of the base mat. Enhanced Final Design completion was announced in December 2008. CD-3, Start of Construction, was approved on January 19, 2009 by the Deputy Secretary. The approved Total Project Cost increased from $900 million to $1,330 million and extended CD-4, Project Completion from November 2013 to October 2015. Delays thereafter were due primarily to supplier quality problems and late deliveries of equipment and materials."

The DOE's "Project Dashboard" for January 2020 lists a current "project budget" of $2.322 billion for SWPF, underscoring the large costs overruns from the "approved Total Project Cost" of $900 million. Correct? (See Project Dashboard, January 2020: https://www.energy.gov/sites/prod/files/2020/01/f70/January%202020%20Project%20Dashboard.pdf)

Thus, it appears that SWPF start-up is approaching 7 years beyond the original schedule and at least $1.4 billion over the original cost estimate, correct?

7

The DWPF recycle wastewater is currently, and would continue to be, managed as HLW until such time that it is determined to be another category of waste based on detailed assessments of its characteristics and an evaluation of potential disposal pathways.

The Proposed Action is related to DOE's HLW interpretation as evidenced by DOE's detailed explanation in this Final SRS DWPF Recycle Wastewater EA, Section 1.2. As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), it is within DOE's authority to interpret the definition of HLW and, therefore, DOE does not anticipate that its interpretation would be overturned. Completion of this Final SRS DWPF Recycle Wastewater EA and finding of no significant impact does not commit DOE to implementing the proposal, however. At any point, DOE could decide not to implement the Proposed Action or to implement only a portion of the proposal.

10-8 This Final SRS DWPF Recycle Wastewater EA discusses SWPF as a reasonably foreseeable future action for the purpose of evaluating cumulative impacts. The issues identified by the commenter (e.g., cost and schedule, content of SRS activity reports) do not have a bearing on the potential impacts of the Proposed Action and are outside the scope of this Final SRS DWPF Recycle Wastewater EA.

Will the March 2020 start date for SWPF hold? If not, what is the new date? What will be the actual cost of SWPF construction and start-up testing? *10-8 Cont'd*

Will the final EA and/or ROD be issued if SWPF has not started up or has operational problems once it has started up?

Various recent Defense Nuclear Facilities Safety Board (DNFSB) reports for SRS underscore SWPF issues that should be addressed and clarified in the final EA:

Savannah River Site Activity Report for Week Ending November 29, 2019:

Salt Waste Processing Facility (SWPF): Last Friday the contractor concluded the contractor Operational Readiness Review (CORR) and identified certain criteria that were not fully met. Notably, in their outbrief to SWPF personnel, the CORR team identified pre-start findings related to:

- lack of detail in the plan governing the startup of hot operations
- lack of technical basis for the radiological monitoring
- lack of plans and measures for applying the As Low as Reasonably Achievable concept
- improper Unreviewed Safety Question screening of changes
- lack of full implementation of activity-level hazards and controls as part of work planning and control

The demonstrations for the CORR did not include the Alpha Strike Process, Alpha Finishing Facility and transfers from SWPF to Saltstone or the Defense Waste Processing Facility. The issuance of the final CORR report is expected this week.

Savannah River Site Activity Report for Week Ending December 6, 2019

Salt Waste Processing Facility (SWPF): In the final report for the contractor Operational Readiness Review (ORR), three objectives (fire protection, radiation protection, work planning and control) were graded Not Met. These three objectives contain six criteria that were Not Met and three that were Partially Met. In addition to ten findings the report describes several dozen additional negative observations, many of which appear to be significant and several of which are related to Integrated Safety Management guiding principles and core functions. The report does not explain why these were not considered to be findings, but the ORR team used criteria in DOE-HDBK-3012, *Team Leader's Good Practices for Readiness Review*, and these tend to have a high threshold (e.g., unacceptable impact on safety of facility). Two days after approving the final report, Parsons declared to DOE that they were ready to start the DOE ORR. This was highly unusual since they had only completed 5 of the 21 pre-start corrective actions from their ORR and many of the open pre-start corrective actions are not due until the day before the DOE ORR or after it. The scope of the planned corrective actions are also very narrowly focused (e.g., revise two radiation protection plans). DOE management has expressed serious concerns with the above and plans to issue direction to Parsons imminently.

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Savannah River Site Activity Report for Week Ending December 13, 2019

Salt Waste Processing Facility (SWPF): DOE returned the Readiness to Proceed letter to Parsons without acceptance and for additional action. DOE noted that the contractor Operational Readiness Review (ORR) final report identified four key programs that had not yet been developed and implemented (Radiation Protection, Work Planning and Control, Fire Protection, and Emergency Preparedness) and weaknesses in the Integrated Safety Management System which must be address prior to the Declaration of Readiness for the DOE ORR. DOE directed Parsons to submit and execute a comprehensive Corrective Action Plan (CAP), including schedules and effectiveness reviews. In addition, DOE stated that the CAP must also provide sufficient time for DOE to assess the effectiveness and closure of the CAP actions. Parsons subsequently replied stating that they disagreed with DOE's conclusions and that they stand by their Declaration of Readiness. Parsons and DOE agreed to meet next week to develop a list of issues to address prior to the DOE ORR.

What is the confirmed schedule for long-term SWPF operations at the time of any final EA or ROD?

10-8 Cont'd

8. Tank 22 and closure plans & plans presented in 2019 "System Plan"

10-9

In DOE's "Liquid Waste System Plan Revision 21," January 2019, the most recent such plan that is public and that is mentioned in the draft EA, the estimated closure dates for Tank 22 are presented.

The plan for removal of an ill-defined 10,000 gallons for disposal off site is not clearly presented in the system plan document. Will it be discussed in the next revision of the system plan? When will that revision be made public? Will these system plan items be coordinated and presented in the final EA?

On page 24 in the system plan it is stated that "All tanks are operationally closed (FY37)." This would include Tank 22 and this indicates that there is indeed a plan to empty and close Tank 22 though details of that plan are not presented. Do such plans to empty Tank 22 exist or not?

In the system plan document, in "Appendix C—Bulk Waste Removal Complete" (page 42), emptying of Tank 22 is indicated for the end of FY 30. In "Appendix D—Tank Removal from Service," (page 43), Tank 22 is fully out of service - does this mean that the tank has been grouted by the end of FY 33? As far as the EA goes, are the FY 30 and FY 33 dates correct?

On pages 22-23 in the system plan there is the bulk of discussion in the system plan about Tank 22: "It is assumed that the 2H Evaporator will undergo a cleaning prior to being put in service as a general-purpose evaporator. Tank 22 will be depleted of the silica rich solution sent from the DWPF. The spent wash water from Tank 51 will be decanted to Tank 22 and either used for salt dissolution or sent for evaporation. Tank 22 contents will undergo evaporator feed qualification before processing in the evaporator. Since the system will no longer be receiving silica there should not be any concerns regarding sodium-aluminum-silicate formation within the evaporator

9

10-9 Specific comments and questions about the "System Plan" are beyond the scope of this Final SRS DWPF Recycle Wastewater EA. The timing of preparation and release of the next revision of the System Plan is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

Closure of Tank 22 and other features of the waste tank system are also outside the scope of this Final SRS DWPF Recycle Wastewater EA.

The DWPF recycle wastewater is currently received and stored in Tank 22, but may be received in a different location in the future to accommodate mission needs.

10-9 Cont'd

vessel and there should not be any solids formation related criticality concerns." As far as the draft EA goes, is this still correct?

The system plan does not indicate unique issues with Tank 22 closure. If such issues exist, why are they not more clearly discussed in the draft EA?

On page 2-2 of the draft EA it is stated that "The treated DWPF recycle wastewater is then pumped to Tank 22 for storage and future processing." Once in the tank is any of the recycle wastewater removed or does it under volume reduction?

On page 3-16, in the draft EA, in section "3.5.5 No-Action Alternative Impacts," it is stated: "Under the No-Action Alternative, DOE would not conduct the Proposed Action. Instead, the up to-10,000 gallons of DWPF recycle wastewater would remain in the SRS liquid waste system until disposition occurs using the systems described in Section 2.1.1. Under the No-Action Alternative, DOE would not provide alternative treatment and disposal options for up to 10,000 gallons of DWPF recycle wastewater at an off-site, licensed commercial facility. As a result, the No-Action Alternative would impact planning activities to develop a disposal capability for DWPF recycle wastewater for the three years between the completion of the SWPF mission (estimated 2031) and the DWPF mission (estimated 2034) (SRR 2019), when DOE will no longer have the option of returning DWPF recycle wastewater to the SWPF for processing. The potential accident consequences of the No-Action Alternative would still include the possible transfer error DBA that was analyzed in the SRS HLW Tank Closure EIS (DOE 2002)."

As Tank 22 closure issues were well known in January 2019, date of the most recent system plan, why haven't impacts to planning activities for this tank been discussed in the system plan? Will they be discussed in any new system plan and that information coordinated in the final EA?

To repeat, is the assumed closure of Tank 22 in FY33, the date in the system plan, been assumed in the draft EA? Would removal of an ill-defined 10,000 gallons from Tank 22 impact tank closure plans and dates as presented in "Liquid Waste System Plan Revision 21?" Why isn't management of the 380,000 gallons in Tank 22 at some point in the future not discussed in the system plan and why isn't a system plan discussion about this coordinated in the draft EA?

What is the relationship between the system plan and the 10,000 gallons covered in the draft EA and the 380,000 gallons and proposed for possible future off-site disposal (via grout)?

Also, please discuss the current condition of Tank 22 as well as its current volume and volume over time. When was the last time the tank was surveyed for leaks, cracks and stability? What was found? Is there a back-up tank that can be used if Tank 22 develops problems?

Other points to consider:

10-10

On page 2-5 & 6 it is stated that the actual volume of grouted waste is twice the liquid volume: volume: "The analysis in this EA assumes that the volume of the waste in the stabilized matrix would be no larger than twice the volume of the liquid, prior to stabilization. Therefore, 600

10

10-10 DOE's Proposed Action is described in Response 10-2. This Final SRS DWPF Recycle Wastewater EA describes the expected increased volume of the stabilized waste form, which is a very typical result of solidification.

gallons of DWPF recycle wastewater would be grouted in each 1,200-gallon transportation and disposal container." Thus, the draft EA is really about the volume of grouted waste and not just the 10,000 gallons mentioned early in the document. *10-10 Cont'd*

In footnote 2, page 1-1, it is stated that "grout is a proven safe and effective technology." Yet, there is contamination of ground water in the Z-Area at SRS, where grout is placed in "cells" at ground level. Please discuss the impacts of grouted waste disposed on SRS to ground water. Please clarify and justify the claim that grout is "safe and effective." Does this claim apply to grout fabrication only or also to transport and disposal of it? *10-11*

As DOE's budget request for Fiscal Year 2021 may terminate pursuit of the Yucca Mountain HLW dump, what impact might that have on the proposed action in the draft EA? Geologic disposal of HLW will still be the law even if Yucca Mountain is terminated. *10-12*

What will the role of the Defense Nuclear Facilities Safety Board (DNFSB) be in carrying out its oversight role of this project? *10-13*

- **In conclusion, as no need for the proposed action has been established, as many questions remain about the proposed action and given that the draft document is confused in its description of the proposed action and final closure of Tank 22, I request that the No-Action Alternative be adopted at this point and that the No-Action Alternative be embodied in any final EA and in any Record of Decision, if issued.** *10-14*
- **Additionally, given that what is presented in the draft EA does not clearly comport with the "Liquid Waste System Plan Revision 21" of January 2019, the proposed actions must not at this time be considered given this fact.** *10-15*

Please confirm receipt of these comments and that they have been entered into the formal EA record. And, please add me to any email list on this matter: srswatch@gmail.com.

Submitted via email and mail by: Tom Clements, Director, Savannah River Site Watch, 1112 Florence Street, Columbia, SC 29201, srswatch@gmail.com. These comments will also be posted on the SRS Watch website: www.srswatch.org.

SRS WATCH
Savannah River Site Watch

11

10-11 The evaluation of grouted cells at SRS is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The existing groundwater issue was associated with minor liquid operational, off-normal upsets, not grout releases. The application of cementitious waste forms to stabilize waste has been well documented and studied within the U.S., as well as internationally.

10-12 DOE's Proposed Action is described in Response 10-2. Development of a deep geologic disposal pathway for HLW is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

10-13 The DNFSB is an independent organization within the executive branch of the U.S. Government, chartered with the responsibility of providing recommendations and advice to the President and the Secretary of Energy regarding public health and safety issues at Department of Energy defense nuclear facilities. Whether, and how, the DNFSB carries out its responsibility regarding the Proposed Action is beyond the scope of this Final SRS DWPF Recycle Wastewater EA.

10-14 The comments are acknowledged.

10-15 The comments are acknowledged.

Comment 11: Anonymous

Page 1 of 1

PUBLIC SUBMISSION

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Submission Type: Web

Docket: DOE-HQ-2020-0009
Environmental Assessments; Availability, etc.: Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site

Comment On: DOE-HQ-2020-0009-0001
Environmental Assessments; Availability, etc.: Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site

Document: DOE-HQ-2020-0009-DRAFT-0001
Comment on FR Doc # 2019-26555

Submitter Information

Name: Anonymous Anonymous

General Comment

I recommend leaving the waste in South Carolina no other state should have to store this hazardous material. *11-1*

11-1 The Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. The WCS FWF site near Andrews, Texas, and the Energy*Solutions* site near Clive, Utah, are licensed and permitted to treat and/or dispose of LLW from DOE sites and other generators throughout the United States.

Comment 12: Vern C. Rogers, Director of Regulatory Affairs, Energy*Solutions*

ENERGYSOLUTIONS

February 10, 2020 CD20-0023

James Joyce
U.S. Department of Energy
Office of Environmental Management
EM-4.21
1000 Independence Avenue SW
Washington, DC 20585

Transmitted via Email: DWPFEA@em.doe.gov

Reference: Federal Register Notices December 10, 2019, 84 FR 67438 and December 30, 2019, 84 FR 71909

Subject: Comments on the "Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site" (DOE/ES-2115)

Energy*Solutions* appreciates the opportunity to provide comments in response to the *Federal Register* notice regarding the U.S. Department of Energy's (DOE) "Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site" (EA) to support the evaluation of alternative treatment and disposal options for the Defense Waste Processing Facility (DWPF) recycle wastewater through the use of existing, licensed, off-site commercial treatment and disposal facilities.

Energy*Solutions* has several licensed facilities that are capable of receiving, treating, and disposing of solidified radioactive liquids. Over the last 20 years, Energy*Solutions* has received over seven million gallons of radioactive liquids for processing and disposal at its facilities. These liquid waste streams have been shipped in various types of containers including small 5 gallon containers up to 5,000 gallon tanker trucks. With its experience and capabilities, Energy*Solutions* is providing comments for DOE to consider in the final EA document. Energy*Solutions* believes it is in the best interest of DOE to utilize commercial disposition options for several reasons including but not limited to creating more capacity for high level waste (HLW) processing at DOE sites, significantly lower costs and reduced schedule to complete projects, and further limits the long-term environmental liability under DOE management. *12-1*

Comment #1:
Page 1-1 (and throughout other sections in EA): It is unclear if DOE's desire to "analyze capabilities of a potential alternative treatment and disposal method at the end of the liquid waste mission life.… At a commercial low-level radioactive waste facility outside of South Carolina…" prohibits both treatment and disposal within the State of South Carolina outside of the Savannah River Site (SRS). Please adjust the text to clarify if commercial treatment at a licensed facility is authorized within the State of South Carolina – outside of SRS. *12-2*

Comment #2:
Page 1-4: In addition to or as part of the three proposed action alternatives, the alternatives should include consideration of a pre-treatment step at SRS where radionuclides constituents are removed through an ion-exchange (or similar) process in order to facilitate more efficient packaging and transportation options. Limiting the types of packaging options with higher activity liquids result in much higher costs that could be offset by relatively inexpensive radionuclide removal technologies. Lower *12-3*

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12-1 DOE acknowledges your comment.

12-2 The implementation of DOE's Proposed Action would not prohibit any future actions in any state.

12-3 For the specific waste stream evaluated in this Final SRS DWPF Recycle Wastewater EA, DOE does not need to remove key radionuclides in order to ship the waste off site for treatment and disposal; therefore, DOE has not included pretreatment as a condition of any of the analyzed alternatives.

Removal of key radionuclides is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835) addresses DOE Manual 435.1–1's requirement to remove key radionuclides to the maximum extent technically and economically practical. Additional discussion on this topic is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

Energy*Solutions*, LLC
CD20-0023
Page 2 of 2

activity liquids could be shipped in larger containers, emptied, and reused to significantly reduce packaging and transportation costs. *12-3 Cont'd*

Comment #3:
Page 1-1: DOE reports they are "proposing to dispose of up to 10,000 gallons of stabilized DWPF recycle wastewater from the SRS H-Area Tank Farm…" These criteria justifying DOE's selection of 10,000 gallons for pilot study should be presented. Alternatives with other sized pilots should be assessed. *12-4*

Comment #4:
Page 2-5: "For this analysis, it is assumed that the waste would be grouted in a 1,200-gallon container and that this container would also serve as the disposal package…" This EA should include dose and cost assessment of a variety of transport/disposal packages as discussed in Comment #2. *12-5*

Comment #5:
Page 2-7: "The final waste form shipments would be made by truck in accordance with USDOT requirements." The EA should examine the radiological and cost impact with rail transport and a combination of highway and rail transport. *12-6*

Comment #6:
Page 3-15: The claim is made that impacts from accident scenarios 2 and 3 are bounded by those projected to SRS workers under accident scenario 1. Additional evaluation should be included in the EA to allow comparison of the relative impacts of accident scenarios 2 with 3. *12-7*

Comment #7:
Page 3-15: Impacts from accidental release at the place of disposal should be quantified in the EA. *12-8*

Energy*Solutions* appreciates the opportunity to provide these comments to the DOE. Any questions regarding these comments may be directed to me at 801-649-2253 or vcrogers@energysolutions.com.

Sincerely,

Vern C. Rogers
Vern C. Rogers
Feb 10 2020 9:20 AM
cosign

Vern C. Rogers
Director of Regulatory Affairs

cc: Bret Rogers, Energy*Solutions*
Scott Dempsey, Energy*Solutions*

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12-4 As described in Section 1.3 of this Final SRS DWPF Recycle Wastewater EA, the "up to 10,000-gallon" amount referenced is reasonable to enable a representative volume of DWPF recycle wastewater to be collected and stabilized to evaluate commercial disposal capabilities for this waste stream. DOE utilizes the phrasing "up to 10,000 gallons" as DOE would not necessarily use the full 10,000 gallons to analyze the additional treatment and disposal options.

12-5 This EA evaluates a range of reasonable alternatives and uses conservative characteristics to provide perspective on the potential environmental impacts of the Proposed Action. For analysis of transportation-related impacts, DOE also used conservative assumptions that would tend to overestimate potential health impacts to workers and the public. Specific transport and disposal packaging decisions would consider applicable state and Federal requirements, radionuclide properties of the material, shielding requirements, packaging availability, and other factors. Cost estimates of disposal options are not required as part of the NEPA analysis and is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

12-6 The Proposed Action is limited to up to 10,000 gallons. DOE would not expect to use rail transportation for such a small volume.

12-7 The maximum reasonably foreseeable accident scenario for Alternatives 1, 2, and 3 would involve the potential uncontrolled release of liquid DWPF recycle wastewater during the transfer of the liquid to either a disposal package (Alternative 1) or a transportation package (Alternative 2 or 3). There would be no substantial difference in the potential impacts of these accident scenarios that warrant a separate evaluation.

12-8 The disposal facilities would receive, treat, and dispose of the DWPF recycle wastewater under their permits and licenses with their state regulator. The wastes would be demonstrated to meet the WAC for their permits and licenses prior to shipment from SRS. Since waste disposal operations at the licensed commercial disposal facilities would follow the same general processes as under the current, typical operations, the Proposed Action would not introduce any new, unique accident scenarios to the facilities beyond those considered as part of the licensing process for these sites.

Comment 13: G. Kendall Taylor, P.G., Director, Site Assessment, Remediation, and Revitalization Division, South Carolina Department of Health and Environmental Control

Healthy People. Healthy Communities.

February 10, 2020 VIA EMAIL

Mr. James Joyce
US Department of Energy
Office of Environmental Management
EM-4.21
1000 Independence Ave SW
Washington DC 20585

Re: Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site

Dear Mr. Joyce:

The South Carolina Department of Health & Environmental Control (SC DHEC) appreciates the opportunity to provide comments on DOE's draft "Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility (DWPF) Recycle Wastewater from the Savannah River Site." DOE is proposing to divert no more than 10,000 gallons of this low activity wastewater to be solidified (either onsite or at an offsite commercial facility) and then disposed of in a licensed commercial Low Level Radioactive Waste (LLRW) landfill outside the state of SC, to determine if this is a viable option for the end-of-cycle High Level Liquid Waste Tank closure process, when, sometime after 2031, the Salt Waste Processing Facility (SWPF, which has yet to be started) is closed. As described in the Liquid Waste System Plan, Revision 21, DOE estimates the DWPF recycle wastewater would continue to be created for an additional 3 years until DWPF closure.

Comment 1: *13-1*
The Department supports options which result in less radioactivity being permanently disposed of in South Carolina. The safe and permanent closure of the High-Level Waste tanks, as well as final disposition of the DWPF glass canisters (4,200 today growing to more than 6,000 by the completion of tank closure) in a deep geologic repository outside the State of South Carolina, remain the state's top priorities for the legacy radioactive waste at the Savannah River Site.

Comment 2: *13-2*
Based on Section 3116 of the 2005 National Defense Authorization Act, and the fact that this waste is proposed to be disposed of outside of the State of South Carolina, SCDHEC has no comment on the acceptability of this waste in any other state.

Comment 3: *13-3*
The current handling of the DWPF Recycle Wastewater results in a significant volume reduction through evaporation in the 2H Evaporator. The condensate from the 2H Evaporator is then either discharged through the Effluent Treatment Facility's (ETF) NPDES permit or, it could go to the Saltstone Disposal Facility for final disposition under the SC Solid Waste permit. Only a small portion of the DWPF Recycle

S.C. Department of Health and Environmental Control
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13-1 The comment is acknowledged.

13-2 The comment is acknowledged.

13-3 DOE acknowledges that the final waste form could approximately double in volume from the initial liquid waste form; however, for the Proposed Action, the increased volume requiring disposal would be small relative to existing disposal capacity at the commercial LLW facilities analyzed in this Final SRS DWPF Recycle Wastewater EA (see Sections 3.6.1.2, 3.6.1.3, and 4.2.6) and relative to the millions of gallons of recycle wastewater that is managed annually.

Mr. Joyce
Page 2
February 10, 2020

wastewater ends up back in DWPF. The proposed action would double the volume of waste to be disposed of (600 gallons of wastewater is proposed to be mixed with 600 gallons grout creating 1,200 gallons of waste.) DOE should evaluate whether other processing options would be more cost effective in transferring this waste out of state. *13-3 Cont'd*

I trust that the highest level of attention will be given to the health and safety of the citizens and the environment of South Carolina.

Sincerely,

G. Kendall Taylor

G. Kendall Taylor, P.G., Director
Site Assessment, Remediation, and Revitalization Division
Bureau of Land and Waste Management

Response side of this page intentionally left blank.

Comment 14: Tiffany Drake, Remediation and Radiological Assessment Unit Chief, Missouri Department of Natural Resources

Missouri Department of dnr.mo.gov
NATURAL RESOURCES
Michael L. Parson, Governor Carol S. Comer, Director

FEB 1 0 2020

James Joyce
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585-0002

RE: Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (DOE/EA-2115)

Dear James Joyce:

The Missouri Department of Natural Resources (Department) appreciates the opportunity to review the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (Draft SRS DWPF Recycle Wastewater EA). The Department offers the following comments for consideration.

- Section 2 reviews the proposed action alternatives of how to dispose of up to 10,000 gallons of stabilized wastewater from the Savannah River Site to a commercial Low Level Waste (LLW) facility. However, according to Table 2-1 in Section 2.1.5, Alternatives 2 and 3 would require the shipment of the liquid LLW a minimum of 1,400 miles. Section 2.1.3.2 references that Type A packaging would be used unless characterization indicates Type B packaging is needed. What does not appear in this environmental assessment is consideration of any potential impacts (environmental, emergency response, or other) of a potential accident along a shipping route that could result in the Type A packaging being breached and leaking its material while in transit. If DOE is considering shipping radioactive waste in solid versus liquid form, DOE should also consider a comparison of the potential impacts of shipping a solid versus a liquid, or cite a study that has already addressed this concern. *14-1*
- In Section 2.1.5, Table 2-1 summarizes the number of potential shipments for each alternative being considered. Based on a comparison of the number of shipments, Alternative 1 appears to be the most efficient method of shipment compared to the other alternatives. DOE should clarify why additional shipments would be required for the alternatives (i.e. is it related to levels of radioactivity that would be present, or does the on-site stabilization of waste result in consolidation of the shipped materials). *14-2*
- In Section 3.2 Table 3-1 identifies resource areas that the environmental assessment states there is no significant impact based on the activities proposed in this document. However, as mentioned in a previous comment, DOE should consider the transportation of the material to the LLW facility and include a discussion on the impact an incident in transit with release of a LLW solid or liquid could have on land and water resources. *14-3*

Recycled paper

14-1 The potential health impacts associated with a transportation accident are identified in Section 3.7 of this EA. Section 3.7.2 presents the potential radiological health impacts of a severe transportation accident involving a solid waste form in a Type A package (minimal), while Sections 3.7.3 and 3.7.4 present the potential radiological health impacts of a severe transportation accident involving a liquid waste form that is not in a Type B package (low risk) for Alternatives 2 and 3, respectively.

14-2 The estimated number of shipments for each alternative was determined based on the specific type of package considered for each analysis. Alternative 1 assumed a transportation package for a solidified waste form that could contain 1,200 gallons of grout. The analysis assumed two packages per shipment. Alternatives 2 and 3 assumed the use of an existing package that could transport a radioactive liquid. The package used in the analysis could contain 230 gallons of liquid in each package. This Final SRS DWPF Recycle Wastewater EA assumed three packages per truckload for analytical purposes. Additional shipments are also required for Alternative 3 because liquid must first be shipped to the treatment location, followed by shipment of treated waste to the disposal location. These analyses demonstrate that regardless of the alternative, the transportation actions associated with this proposal would only entail minor risks.

14-3 Sections 3.7.3 and 3.7.4 present the potential health impacts resulting from an accident involving a package containing radioactive liquid. Per Section 3.7.3 of this Final SRS DWPF Recycle Wastewater EA, accidents of this severity are expected to be extremely rare. The release of a Type A container's entire contents is estimated to occur approximately 0.4 percent of the time given that a truck accident does occur, with about a 10-percent release of its contents estimated 1.6 percent of the time given that a truck accident does occur. Incorporating the frequency of a truck accident during the shipments of liquid DWPF recycle wastewater under Alternative 2 (one chance in 84, or 0.012), the probability that a severe accident causes the release of all of a container's contents would be approximately 0.0000476, or one in 21,000.

James Joyce
Page Two

We appreciate the opportunity to provide comments for the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site. If you have any questions or need further clarification, please email me at tiffany.drake@dnr.mo.gov, or call at 573-751-3907. Address any written correspondence to my attention at Missouri Department of Natural Resources, P.O. Box 176, Jefferson City, MO 65102.

Sincerely,

DEPARTMENT OF NATURAL RESOURCES

Tiffany Drake
Remediation and Radiological Assessment Unit Chief

TD:lc

14-3 (Cont'd) Evaluating specific impacts to land or water resources along the route between SRS and the treatment or disposal facility would be impractical without knowing the specific accident location; however, the probability of such an accident would be very low and, if such an accident occurred, significant impacts to these resources would be unlikely.

Comment 15: Kara Colton, Director of Nuclear Policy, Energy Communities Alliance

Energy Communities Alliance
Local concerns. National impact.

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February 10, 2020

James Joyce
Office of Environmental Management (EM-4.21)
U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585

Via Email: DWPFEA@em.doe.gov

RE: Energy Communities Alliance Comments on Federal Register Notice - DOE's Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site

Dear Mr. Joyce,

The Energy Communities Alliance (ECA)[1] appreciates the opportunity to again provide comment on U.S. Department of Energy (DOE) efforts to evaluate its proposed interpretation of the definition of the statutory term "high-level radioactive waste" (HLW) as set forth in the Atomic Energy Act of 1954 and the Nuclear Waste Policy Act of 1982. **ECA supports the release of DOE's Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (Draft EA) as another step forward** in considering safe, risk-based alternative disposal paths for waste based on *actual radiological characteristics and risk to human health* arising from the waste, rather than artificial former policy standards that base waste classification on origin. *15-1*

[1] ECA is the national association of local governments of communities that host or are affected by DOE and National Nuclear Security Administration (NNSA) activities. ECA's mission is to bring together leadership from DOE-affected communities to share information, establish policy positions, and advocate for common interests to effectively address and increasingly complex set or environmental, regulatory, and economic development needs. ECA board members include local elected officials and community leaders from communities across the DOE complex.

4832-7755-1028.1

15-1 The comment is acknowledged.

Furthermore, DOE's proposed HLW interpretation is not a new concept, but consistent with the International Atomic Energy Agency's (IAEA) activity-based waste classification scheme and safety standards which call for the specific types and properties of waste to be considered when making disposal decisions.

As ECA has commented previously, our members expect the proposed HLW interpretation, if implemented, could ultimately:

- Reduce years of DOE operations and risks to current host communities;
- Accelerate Hanford, Idaho, and Savannah River tank retrievals and closures[2] – which decreases risk (moving more waste out of those sites more quickly – thereby decreasing risk to the people that live in the communities);
- Decrease the number, size and duration of storage facilities pending availability of a permanent deep geologic HLW repository; and
- Save taxpayers an estimated $40 billion or more on DOE's Office of Environmental Management program's remaining lifecycle costs.

Like DOE, our local governments are responsible for the health and safety of the communities that currently host the Department's federal facilities. ECA believes DOE must consider technically-defensible alternatives based on science to address waste stored in our communities that could safely be disposed of in the shorter-term, rather than remain orphaned on-site while the politics of developing a deep geologic HLW repository persist.

ECA Comments on the EA

In reviewing the EA, ECA members expressed the following specific comments:

- ECA appreciates that the EA illustrates how the current application of the HLW definition prohibits the disposal of the DWPF recycle wastewater – which does not contain HLW – *15-2*

[2] ECA also believes the implementation of the proposed HLW Interpretation could apply to waste currently stored at the West Valley Demonstration Project.

15-2 The comment is acknowledged.

until a geologic repository for HLW is available. Demonstrating the ineffectiveness of existing policy provides justification for DOE's proposal. 15-2 Cont'd

- ECA strongly supports disposal of the wastewater at licensed, commercial facilities. ECA believes there is an important role for private companies, such as Waste Control Specialists or EnergySolutions, in supporting DOE efforts to complete the EM cleanup mission. 15-3
- ECA applauds the Department for implementing timely stakeholder outreach related to the EA, specifically hosting two informational public hearings: one near the Savannah River Site and one via webinar, shortly after the Federal Register notice regarding the EA was published. 15-4
- ECA is concerned that DOE does not provide estimated timelines or schedules for any of the three alternatives considered. While we understand the projected amount of time and number of shipments related to each, understanding when a campaign could begin can help build transparency, support and trust. 15-5
- DOE should provide more information on transportation issues to highlight the exemplary safety record of nuclear waste shipments across the complex. DOE should begin discussions of waste movement and form (liquid or solid), emergency planning, the proven safety of shipping cannisters and provide information regarding notifications for state and local officials. This outreach should begin sooner rather than later to ensure robust public participation and to build support. Finally, any analysis regarding transportation should be included in the final Environmental Assessment. 15-6

ECA Recommendations:

As noted, ECA supports DOE's efforts, we believe this evaluation is beneficial and we encourage DOE to move forward. To that end, ECA offers the following recommendations as it continues to evaluate the proposed HLW interpretation:

1. **DOE should provide more information and complete and release an evaluation of the feasibility, costs, and cost savings of classifying covered defense nuclear waste as other than HLW** (such as outlined in Section 3139 of the National Defense Authorization Act for Fiscal Year 2018). To build support, it is crucial that impacted communities, states and decision-makers see an evaluation and analysis of how DOE's interpretation would impact 15-7

15-3 The comment is acknowledged.

15-4 The comment is acknowledged.

15-5 DOE plans to initiate the Proposed Action within the next 12 months. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. The specific schedule of shipments and duration of the analytical campaign would not affect the evaluation of potential impacts.

15-6 Section 3.7 of this Final SRS DWPF Recycle Wastewater EA includes an analysis of the potential impacts related to the transportation of the DWPF recycle wastewater from SRS to treatment and disposal facilities. DOE will comply with outreach requirements for transportation of LLW in the United States.

15-7 The referenced Report to Congress is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

cleanup. Only then can the intended and unintended consequences be understood. Information and resources must also be provided for education and outreach efforts to facilitate meaningful stakeholder engagement, validation and endorsement. *15-7 Cont'd*

2. **DOE must be transparent and meaningfully engage host communities, state regulators, Tribes and the broader public in the decision-making process.** As noted above, ECA appreciates DOE's outreach efforts related to the EA and urges continued interaction to ensure a common understanding of the timeline, challenges and impacts of DOE's waste management decisions. As DOE has already noted, any changes to how waste is currently managed will still require compliance with the state agreements and performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with all applicable state and federal regulatory requirements. *15-8*

3. **DOE should continue to work to identify pilot projects and conduct waste management policy evaluations to better understand alternative approaches and inform future policy decisions**. These projects include demonstrating feasibility of treatment and off-site disposal of Hanford low-activity tank waste and documenting the technical basis for certain treated tank wastes from Savannah River and Idaho to be designated as transuranic waste (TRU) and dispositioned at WIPP or commercial facilities. *15-9*

4. **DOE must analyze the impact at each site and communicate it to the public.** Currently every site has questions regarding the change in interpretation. DOE has not provided the data and the policy direction. Questions regarding grouting, for example, continue to be raised. DOE must immediately communicate the actual impact to each site and community based on its proposed actions at the sites. Failure to release the information will likely result in an inability to implement the change in policy successfully and will lead to mistrust and regulator lawsuits – which will continue the delays in reducing risk. *15-10*

5. **A deep HLW geologic repository is still needed and must be pursued.** DOE's proposed Interpretation of HLW does not negate the need for a permanent geologic repository. *15-11*

15-8 DOE has engaged the potentially affected states and tribes, and the public, as part of the NEPA process for the Proposed Action evaluated in this Final SRS DWPF Recycle Wastewater EA. DOE will continue to comply with the NEPA process and will utilize other public engagment opportunities, as appropriate. The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis, to ensure compliance with applicable programmatic requirements and regulatory agreements, as appropriate. DOE will also continue to manage wastes in compliance with applicable state and Federal regulatory requirements.

15-9 Pilot projects and policy evaluations are outside the scope of this Final SRS DWPF Recycle Wastewater EA.

15-10 Impacts at other sites are outside the scope of this Final SRS DWPF Recycle Wastewater EA.

15-11 The status of a deep geologic repository is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

Regardless of how DOE proceeds, there will still be federal defense HLW requiring permanent disposal in a deep geologic repository. ECA supports moving ahead with the Yucca Mountain licensing process. Even if it is determined that the site is not safe, there will be many lessons learned for DOE, for the Nuclear Regulatory Commission, for the Environmental Protection Agency, and stakeholders that can inform the siting of another high-level waste repository.

15-11 Cont'd

ECA appreciates the continued opportunities to provide input on DOE's Interpretation of High-Level Radioactive Waste, and more broadly, on advancing the cleanup mission in the safest, most-efficient and expeditious way.

Many DOE sites across the complex were never intended to store waste yet serve now as *de facto* interim storage sites. Simply leaving waste in place is neither acceptable nor the safest option. ECA looks forward to engaging on all efforts and facilitating discussion of nuclear waste management options that can provide risk-based, technically feasible, cost-effective and safe alternatives for moving waste out of our communities more expeditiously.

Please contact Kara Colton, ECA's Director of Nuclear Policy, by phone at (703) 864-3520 or email at kara.colton@energyca.org with any questions or for any additional information.

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Comment 16: Alexandra K. Smith, Program Manager, Nuclear Waste Program, State of Washington Department of Ecology

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February 10, 2020 20-NWP-032

James Joyce
Office of Environmental Management
United States Department of Energy
DWPFEA@em.doe.gov

Re: Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (*Federal Register Notice, Vol. 84, No. 237, December 10, 2019, and Federal Register Notice, Vol. 84, No. 249, December 30, 2019*)

Dear Mr. Joyce:

On behalf of the Washington Department of Ecology (Ecology), I write to provide comments and express serious concerns with the U.S. Department of Energy's Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (DWPF EA).

The DWPF EA represents DOE's first attempt to implement its new interpretation of the Nuclear Waste Policy Act term "high-level waste," which DOE issued as a new interpretive rule on June 10, 2019. *See* 84 Federal Register (FR) 26835. As set forth in a number of letters from Washington State officials,[1] DOE's new interpretation of the term "high-level waste" does not comport with federal law and has the potential to lead to major changes in the way high-level waste is managed, treated, and disposed of, contrary to established compliance orders, records of decision, and expectations. *16-1*

In the Nuclear Waste Policy Act of 1992, Congress established a national policy that recognized the highly radioactive nature of spent nuclear fuel reprocessing waste, i.e. "high-level waste," and, therefore, required it to be treated and placed for disposal in permanent isolation in a deep geologic repository. *16-2*

Congress modified this policy through Section 3116 of the National Defense Authorization Act of 2005 (NDAA Section 3116) to allow for the reclassification of some spent nuclear fuel reprocessing waste when specific criteria are met. DOE Order 435.1 similarly sets forth specific criteria for reclassifying some high-level waste.

[1] *See* January 7, 2019 letter from Washington State Governor Jay Inslee and Washington State Attorney General Bob Ferguson to DOE Environmental Management Assistant Secretary Anne Marie White, and January 4, 2019 letter from Ecology Director Maia D. Bellon to Assistant Secretary White.

16-1 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. The public's comments on the HLW interpretation, including the state of Washington's, were addressed in the Supplemental *Federal Register* notice (84 FR 26835, June 10, 2019).

In its Supplemental Notice, DOE explains its interpretation of the term HLW, as defined in the Atomic Energy Act of 1954, as amended (AEA, 42 U.S.C. 2011, et seq.), and the Nuclear Waste Policy Act of 1982, as amended (NWPA, 42 U.S.C. 10101, et seq.). DOE has the long-standing authority and responsibility under the AEA to ensure that all radioactive waste from the United States' defense program—including reprocessing waste—is managed and disposed of in a safe manner.

16-2 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. The public's comments on the HLW interpretation, including the state of Washington's, were addressed in the Supplemental *Federal Register* notice (84 FR 26835, June 10, 2019).

As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the HLW interpretation does not impact DOE's obligation to comply with Section 3116 of the *Ronald W. Reagan National Defense Authorization Act* for Fiscal Year 2005. In addition, Section 3116 does not limit DOE's long-standing authority under the AEA to interpret the definition of HLW or to apply that interpretation to reprocessing wastes that are not covered by Section 3116. Section 3116 sets forth a process for determining that specified DOE reprocessing waste is not HLW.

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Among others, an important prerequisite for reclassification in both NDAA Section 3116 and DOE Order 435.1 is the requirement that key radionuclides be removed from high-level waste to the maximum extent practical. A second safeguard in NDAA Section 3116 and DOE Order 435.1 is Nuclear Regulatory Commission (NRC) review of the waste proposed for reclassification and the site where the reclassified waste will be disposed.

16-2 Cont'd

Despite these clear legislative and policy directives, the DWPF EA is based on an entirely new DOE interpretation of the term "high-level waste" that does away with all of the objective criteria required by NDAA Section 3116 and Order 435.1, including the requirement to remove key radionuclides from the waste to the maximum extent practical. Indeed, the DWPF EA fails to even mention the removal of key radionuclides, such as long-lived, mobile radionuclides like technetium-99 and iodine-129 and actinides like plutonium from the DWPF recycle wastewater prior to reclassification.

The DWFP EA is also devoid of the safeguard of an independent regulatory assessment of the reclassification by NRC, which NDAA Section 3116 and DOE Order 435.1 both provide.

Even if DOE could lawfully determine that the DWFP recycle wastewater is not high-level waste based on its new interpretive rule, the EA suffers from additional technical flaws, including:

16-3

- The EA fails to demonstrate how the performance objectives of 10 C.F.R. Part 61 will be met for disposal of this waste. Stating that the waste will not exceed NRC's low-level waste Class C limits alone does not demonstrate compliance with performance objectives. DOE should present a waste and disposal facility specific evaluation to demonstrate how the waste will meet the performance objectives of the specific disposal facility alternatives.

16-4

- The EA fails to address the disposal of the full 380,000 gallons of potential DWFP recycle wastewater. Analyzing only 10,000 gallons of the potential 380,000 gallons that could be disposed of could result in improper segmentation.

Finally, the National Defense Authorization Act of 2020, Section 3121, states:

> LIMITATION RELATING TO RECLASSIFICATION OF HIGH-LEVEL WASTE
>
> None of the funds authorized to be appropriated by this Act or otherwise made available for fiscal year 2020 for the Department of Energy may be obligated or expended by the Secretary of Energy to apply the interpretation of high-level radioactive waste described in the notice published by the Secretary titled Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste (84 Fed. Reg. 26835), or successor notice, with respect to such waste located in the State of Washington.

16-2 (cont'd) This Section 3116 process is similar to the process in DOE Order 435.1, "Radioactive Waste Management," the accompanying DOE Manual 435.1–1, "Radioactive Waste Management Manual," and the accompanying DOE Guide 435.1–1, "Implementation Guide," for use with DOE M 435.1–1 for determining whether certain reprocessing wastes are "wastes incidental to reprocessing." See Public Law 108–375, 2004, Section 3116(a). Section 3116 applies to two "covered States"—South Carolina and Idaho. However, Section 3116 does not apply to reprocessing wastes that are transported out of South Carolina or Idaho and disposed of in a different state. Section 3116 also specifies that "nothing in this section establishes any precedent or is binding" outside of South Carolina and Idaho. In short, in enacting Section 3116, Congress did not limit DOE's long-standing authority under the AEA to interpret the term HLW or to apply this interpretation to reprocessing wastes that are disposed of in states other than Idaho and South Carolina.

16-3 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA, prepared to satisfy the regulations established by the CEQ (40 CFR Parts 1500–1508) and the DOE NEPA implementing procedures (10 CFR Part 1021).

As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW.The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation. As part of this process, DOE would verify with the licensee of the disposal facility that the stabilized waste meets the facility's WAC including additional confirmatory characterization, and all other requirements of the disposal facility, including any applicable regulatory requirements (e.g.,RCRA) for stabilization of the waste and applicable U.S. Department of Transportation (USDOT) requirements for packaging and transportation from SRS to the commercial facility.

Comment side of this page intentionally left blank.

16-3 (Cont'd) The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis as appropriate, to ensure compliance with applicable programmatic requirements and regulatory agreements. Prior to a disposal decision, DOE would characterize the DWPF recycle wastewater to determine it meets DOE's HLW interpretation and to validate with the licensee of the commercial LLW disposal facility that the waste would meet the facility's WAC. The WAC are the technical and administrative requirements a waste must meet to be accepted at a disposal facility (e.g., waste characterization, waste form acceptability, quality assurance) and validation that the waste meets the WAC is not required as part of the NEPA analysis and documentation.

16-4 The Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. The intent of this Final SRS DWPF Recycle Wastewater EA is not to dispose of the full 380,000 gallons of potential DWPF recycle wastewater. As stated in this Final SRS DWPF Recycle Wastewater EA, any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal. In its review of reasonably foreseeable future actions, DOE acknowledges that there is a possibility of using this same approach for the anticipated inventory of approximately 380,000 gallons within the next 14 years. The potential impacts of processing the 380,000 gallons of DWPF recycle wastewater were evaluated in Chapter 4 of this Final SRS DWPF Recycle Wastewater EA, and potential impacts were shown to be relatively minor with low risks to human health and the environment.

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To the extent that DOE has obligated or expended any funds appropriated by the NDAA of 2020 or otherwise made available for fiscal year 2020 to prepare this EA, which includes shipping DWFP recycle wastewater for processing in a facility in Richland, Washington, DOE is in direct conflict with this provision. *16-5*

Because the DWFP EA is based on what Ecology believes is an unlawful new interpretative rule on reclassification of high-level waste, we believe the EA is similarly flawed and therefore cannot stand. *16-6*

Ecology believes DOE should analyze the treatment and disposal of DWPF recycle wastewater using existing federal law and policy, adhere to NDAA of 2020, Section 3121, and issue a new EA that aligns with those statutory and regulatory requirements.

Sincerely,

Stephanie Schleif for

Alexandra K. Smith
Program Manager
Nuclear Waste Program

cc: electronic:
Dave Einan, EPA Hanford Project Office
EPA Region 10 Correspondence Control
ERWM Staff, YN
Jeff Burright, ODOE
Ken Niles, ODOE
Andy Fitz, AGO
Koa Kaulukukui-Barbee, AGO
Suzanne Dahl, Ecology
Jay Decker, Ecology

cc:
Mason Murphy, CTUIR
Jack Bell, NPT
Rex Buck, Jr., Wanapum
Laurene Contreras , YN
Susan Leckband, HAB
NWP Central File

16-5 As clarified Sections 2.1.4.2, 2.1.5, and 3.3.4, DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS. This is a bounding analytical construct only and clearly demonstrates that the potential impacts of Alternative 3 would be minor for transportation scenarios that result in shorter shipment distances.

16-6 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. The public's comments on the HLW interpretation, including the state of Washington's, were addressed in the Supplemental *Federal Register* notice (84 FR 26835, June 10, 2019).

In its Supplemental Notice, DOE explains its interpretation of the term HLW, as defined in the AEA and NWPA. DOE has the long-standing authority and responsibility under the AEA to ensure that all radioactive waste from the United States' defense program—including reprocessing waste—is managed and disposed of in a safe manner.

DOE will not take any action in Washington that would be in conflict with NDAA of 2020, Section 3121.

Comment 17: Toby Baker, Executive Director, Texas Commission on Environmental Quality

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 10, 2020

James Joyce, U.S. Department of Energy
1000 Independence Avenue SW
Washington, DC 20585.

Re: U.S. Department of Energy (DOE) Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (DOE/EA-2115)

Dear Mr. Joyce:

The Texas Commission on Environmental Quality (TCEQ) appreciates the opportunity to comment on the U.S. Department of Energy (DOE) Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site.

Enclosed please find the TCEQ's detailed comments relating to the DOE's draft environmental assessment referenced above.

If you have any questions concerning the enclosed comments, please contact Mr. Brad Broussard of the Radioactive Materials Division, at (512) 239-6380, or at brad.broussard@tceq.texas.gov.

Sincerely,

Toby Baker
Executive Director

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Texas Commission on Environmental Quality (TCEQ) Comments on the U.S. Department of Energy (DOE) Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (DOE/EA-2115)

Background: On December 10, 2019, the U.S. Department of Energy (DOE) published in the *Federal Register* Notice of a Draft Environmental Assessment (EA) for the disposal of Defense Waste Processing Facility (DWPF) recycle wastewater from the Savannah River Site. The EA evaluates the potential impacts from a proposed action to retrieve, stabilize, and dispose of up to 10,000 gallons of DWPF recycle wastewater at a commercial low-level radioactive waste (LLRW) disposal facility located outside of South Carolina, licensed by either the Nuclear Regulatory Commission (NRC) or an Agreement State under NRC's regulations regarding licensing requirements for land disposal of radioactive waste.

<u>The TCEQ offers the following comments:</u>

1. **Section 1.2, page 1-3, #1 criteria of 1st paragraph of the section, section 2.1.1, page 2-4, 2nd paragraph, section 3.6.1.1, page 3-18, 1st paragraph, Section 3.6.2, page 3-21, 1st paragraph** *17-1*

   <u>Comment:</u> The Draft EA states that classification of the low-level radioactive waste stream will be defined according to Title 10 Code of Federal Regulations (CFR) §61.55. One of the options considered in the Draft EA is disposal in Texas, which would be in accordance with Title 30 of the Texas Administrative Code (TAC) Chapter 336. Texas includes radium-226 (Ra-226) as one of the Table 1 radionuclides for determining LLRW classification (30 TAC §336.362), which is not included in 10 CFR §61.55. The TCEQ requests that this information be considered in the Final EA. Any analysis of the expected LLRW classification in the Final EA should also include an analysis of how the Ra-226 concentration values would affect this calculation if this waste stream is disposed in Texas at the Waste Control Specialists (WCS) facility.

2. **Footnote 7 page 2-4, Section 2.1.2, section 3.6.1.2, page 3-20, 1st paragraph** *17-2*

   <u>Comment:</u> The TCEQ respectfully requests the correction of the WCS license number to R04100. CN600616890/RN101702439 represent the Customer Number and the Regulated Entity Number which are distinct from the license number and used for a different regulatory purpose.

3. **Section 3.5.2.1 page 3-14, 1st paragraph** *17-3*

   <u>Comment:</u> The Draft EA states, "These consequences are approximately 1,000 times below the DOE exposure guidelines of 25 rem for a member of the public at the nearest site boundary." The TCEQ respectfully requests correcting "25 rem" to "25 mrem."

Page 1

17-1 Section 2.1 and Appendix A of the Final SRS DWPF Recycle Wastewater EA have been revised to acknowledge that radium-226 would be evaluated as part of the waste classification process.

17-2 Sections 2.1 and 3.6.1.2 in the Final SRS DWPF Recycle Wastewater EA have been revised to include the requested information.

17-3 The value of 25 rem is correct. This is actually referred to as the evaluation guideline (EG) in DOE-STD-3009-2014, which is the *DOE Standard for Preparation of Nonreactor Nuclear Facility Documented Safety Analysis* (available at <u>https://www.nrc.gov/docs/ML1801/ML18019A922.pdf; see Section A-10, Evaluation Guideline</u>). Section 3.5.2.1 of this Final SRS DWPF Recycle Wastewater EA has been revised to reflect the term. The concept of an EG was developed to help DOE determine the rigor of controls (including defense-in-depth) needed to avoid the potential dose from an accident, the level of planning necessary to respond to given accidents, or the training needed for individuals that may be placed in situations where such doses might occur.

The EG is established for the purpose of identifying and evaluating the effectiveness of needed safety class structures, systems, and components. The 25 rem EG is not a safety standard because it does not define an acceptable or unacceptable dose from an accident. The 25 rem EG is a criterion used by DOE to help identify and define what measures and controls are necessary. It has been used for many years in a number of ways in emergency response and nuclear safety areas. Although the value exceeds the operational annual safety dose limits for protection of the workers and the public, it is deemed appropriate for use as a planning and evaluation tool for accident prevention and mitigation assessment. The value is a fraction of the dose necessary to cause a prompt radiation-induced fatality. A prompt fatality would not occur if the whole body absorbed dose (received over a few hours) is less than 100 rads; therefore, the selection of the 25 rem value from a 50-year dose commitment provides protection from acute radiation risk.

Comment 18: Geoffrey H. Fettus, Senior Attorney, Natural Resources Defense Council; Caroline Reiser, Nuclear Energy Legal Fellow, Natural Resources Defenses Council; Tom Carpenter, Executive Director, Hanford Challenge; Simone Anter, Legal Director, Columbia Riverkeeper; Don Hancock, Director, Nuclear Waste Program, Southwest Research and Information Center; Tom Clements, Savannah River Site Watch

NRDC HANFORD CHALLENGE COLUMBIA RIVERKEEPER®

SRS WATCH Savannah River Site Watch SOUTHWEST RESEARCH AND INFORMATION CENTER

February 10, 2020

Via Electronic Mail

Mr. James Joyce
U.S. Department of Energy
Office of Environmental Management
Office of Waste and Materials Management (EM–4.2)
1000 Independence Avenue SW
Washington, D.C. 20585
Email: DWPFEA@em.doe.gov

RE: NRDC et al. Comments on Energy Department's Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater From the Savannah River Site

Dear Mr. Joyce:

The Natural Resources Defense Council ("NRDC"), Hanford Challenge, Columbia Riverkeeper, Southwest Research & Information Center, and Savannah River Site Watch ("SRS Watch") write today to comment on the Department of Energy's ("DOE" or "the Department") *Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site (DOE/EA–2115)*. 84 Fed. Reg. 67438, Dec. 10, 2019 (hereinafter "Draft SRS DWPF Recycle Wastewater EA" or "Draft EA") (comment deadline extended to this date, 84 Fed. Reg. 71909, Dec. 30, 2019).

I. Summary Comments

The Draft EA targets the seemingly smallest of "major federal actions" possible in this instance – the characterization, treatment, and ultimate disposal of a 10,000 gallon "representative sample" of liquid high level waste ("HLW") – and describes a "purpose and need" for the action that *18-1*

18-1 The Proposed Action is the disposal of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial LLW disposal facility located outside of South Carolina and licensed by either the NRC or an Agreement State under 10 CFR Part 61. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in the 2031–2034 timeframe. Additional NEPA reviews would be performed when that proposal was better defined, informed by the results of this NEPA analysis. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

As stated in this Final SRS DWPF Recycle Wastewater EA, any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal. DOE acknowledges in their review of reasonably foreseeable future actions that there is a possibility of using this same approach for the anticipated inventory of approximately 380,000 gallons within the next 14 years. The potential impacts of processing the 380,000 gallons of DWPF recycle wastewater were evaluated in Chapter 4 of this Final SRS DWPF Recycle Wastewater EA, and potential impacts were shown to be relatively minor with low risks to human health and the environment.

Implementation of the HLW interpretation beyond the up to 10,000 gallons of DWPF recycle has not been decided and is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

18-1 Cont'd

makes no sense in light of the larger challenge of addressing the massive legacy of HLW at the Savannah River Site ("SRS"), Hanford, Idaho, and New York, much less the smaller subtask of finding an ultimate disposition path for the estimated 380,000 gallons of Defense Waste Processing Facility ("DWPF") recycle wastewater at some point years in the future.

Indeed, the genuine reason for DOE to perform this seemingly pointless exercise of treating and providing a "new" disposition pathway for 10,000 gallons of waste, at some indeterminant point in the future, is to provide a pretext to use the HLW Reinterpretation Rule (84 Fed. Reg. 26835, June 10, 2019) in such a manner as to attempt to inoculate it from the legal challenge that will inevitably occur when DOE attempts to "reclassify" large amounts of HLW in the tanks. Without question, the seemingly less-than-urgent need to analyze the potential set of treatment options for 10,000 gallons of wastewater seems insignificant compared to the decades-long and multi-billion-dollar history of the tank waste cleanup. And to make matters worse, DOE has written the Draft EA so that no single entity or person – not a court that might be so unfortunate as to have to review this action; not the public; and not the relevant states can precisely and meaningfully articulate what the Department is trying to accomplish here.

In short, the Draft EA is a muddle that should be withdrawn and approached differently so as not to run afoul of the law. Such an approach may take a larger, longer and holistic update of the existing National Environmental Policy Act ("NEPA") documents to address areas currently lacking clarity on particular waste streams associated with the massive, multi-billion dollar cleanup of the HLW tanks. We leave it to the Department to analyze whether site specific supplements and updates to the existing environmental impact statements ("EISs") such as those done for Hanford, SRS, and Idaho National Lab is the appropriate course, or if a multi-site programmatic EIS would be the wiser approach. At this early juncture, we'd suggest the latter course. But in either case the Department should withdraw this Draft EA that improperly segments a small sliver of an enormous cleanup challenge that has a host of associated actions, waste streams, and disposal endpoints.

Rather than proceed down a path toward more acrimonious and wholly unnecessary disputes over the massive and multi-billion dollar cleanup of the nuclear weapons complex, DOE should promptly withdraw the Draft SRS DWPF Recycle Wastewater EA and start negotiating with the public, the state of South Carolina, the other states that host HLW, and those states consistently targeted as potential recipients of the Department's legacy nuclear waste.

II. Statements of Interest

NRDC is a national non-profit membership environmental organization with offices in Washington, D.C., New York City, San Francisco, Chicago, Los Angeles, and Beijing. NRDC has a nationwide membership of over one million combined members and activists. NRDC's activities include maintaining and enhancing environmental quality and monitoring federal agency actions to ensure that federal statutes enacted to protect human health and the environment are fully and properly implemented. Since its inception in 1970, NRDC has sought to improve the environmental, health, and safety conditions at the nuclear facilities operated by the Department and its predecessor agencies, and we will continue to do so.

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Hanford Challenge is a non-profit, public interest, environmental, and worker advocacy organization located at 2719 East Madison Street, Suite 304, Seattle, WA 98112. Hanford Challenge is an independent 501(c)(3) membership organization incorporated in the State of Washington and dedicated to creating a future for Hanford that secures human health and safety, advances accountability, and promotes a sustainable environmental legacy. Hanford Challenge has members who work at the Hanford Site and within the Tank Farms who are at risk of imminent and substantial endangerment due to DOE's handling, storage, treatment, transportation, and disposal of Hanford's solid and hazardous waste. Other members of Hanford Challenge work and/or recreate near Hanford, where they may also be affected by hazardous materials emitted into the environment by Hanford. All members have a strong interest in ensuring the safe and effective cleanup of the nation's most toxic nuclear site for themselves and for current and future generations.

Columbia Riverkeeper is a 501(c)(3) nonprofit organization with a mission to protect and restore the Columbia River, from its headwaters to the Pacific Ocean. Since 1989, Riverkeeper and its predecessor organizations have played an active role in educating the public about Hanford, increasing public participation in cleanup decisions, and monitoring and improving cleanup activities at Hanford. Columbia Riverkeeper and its 16,000 members in Oregon and Washington have a strong interest in protecting the Columbia River, people, fish, and wildlife from contamination at Hanford, including pollution originating in Hanford's tank farms.

Southwest Research and Information Center is a 501(c)(3) nonprofit organization with a mission to promote the health of people and communities, protect natural resources, ensure citizen participation, and secure environmental and social justice now and for future generations. Founded in 1971, for more than forty years Southwest Research and Information Center's board, staff, and supporters have worked to protect worker and public health and safety of WIPP, as well as technically sound, publicly accepted cleanup of DOE nuclear weapons sites.

SRS Watch is a research and advocacy 501(c)(3) nonprofit organization that primarily focuses on the environmental and health impact of management of nuclear materials and of nuclear waste, including HLW in aging tanks, at DOE's SRS in South Carolina. SRS Watch endorses sound nuclear non-proliferation policies that preclude unnecessary import of highly radioactive foreign and domestic spent fuel and plutonium to SRS and that facilitate closure of the DOE's last remaining reprocessing plant, the 63-year-old H-Canyon.

III. Specific Comments on the Draft SRS DWPF Recycle Wastewater EA

Cleanup of HLW at SRS has been the subject of several NEPA reviews over the decades of the ongoing cleanup. DOE helpfully provides a short review of the SRS related NEPA documents and their evolution over time. Draft EA at 1-5 to 1-6. There is also a long history of disputes related to the "reclassification of HLW." There is no need to repeat all these arguments here.

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Rather, we incorporate by reference our comments before the Department[1] and move directly to address the specific flaws in the Draft SRS DWPF Recycle Wastewater EA. *18-2*

A number of problems with the Draft EA creates a muddle for the reader. Indeed, examining the proposed action, its strangely configured purpose and need, and its premature analysis of an issue that may take place sometime 10 years in the future, as we noted above, seems quite simply to be a transparent attempt to use the highly controversial HLW Reinterpretation Rule on as small and insignificant a factual predicate as possible. But before we turn to the HLW reinterpretation controversy, we start with a substantial need for clarification on several key issues. We then finish with additional environmental concerns implicated by the Draft EA.

A. What is DOE attempting to analyze?

As the Draft EA is a muddle of information, here we summarize our understanding of the document. There are key areas where we request clarification of DOE's intent and purpose.

DOE describes the major (or in this instance, seemingly comparatively minor) federal action for the Draft SRS DWPF Recycle Wastewater EA as follows:

> To analyze capabilities of a potential alternative treatment and disposal method at the end of the liquid waste mission life, DOE is proposing to dispose of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from the SRS H-Area Tank Farm at a commercial low-level radioactive waste (LLW) facility outside of South Carolina, licensed by either the U.S. Nuclear Regulatory Commission (NRC) or an Agreement State under Title 10 of the Code of Federal Regulations (10 CFR) Part 61. If implemented, this proposal would provide alternative treatment and disposal options for certain reprocessing waste—namely, DWPF recycle wastewater—through the use of existing, licensed, off-site commercial treatment and disposal facilities.

Draft EA at 1-1, 1-2 (notes omitted). Essentially, DOE proposes to dispose of approximately 10,000 gallons of a particular kind of radioactively contaminated wastewater outside of the state of South Carolina.

The current practice for the disposal of this wastewater – though DOE does not describe how much it has already disposed of and over what time frame[2] – is by reuse in the ongoing DWPF cleanup efforts. DOE describes this practice on 1-6, where it briefly discusses the 2001 *Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement*, Aiken, South Carolina (DOE/EIS-0082-S2):

[1] See Attachment A – *Comments of NRDC, Hanford Challenge, Columbia Riverkeeper, SRIC, Snake River Alliance, SRS Watch, and Nuclear Information & Resource Service on the Department of Energy's Request for Public Comment on the U.S. Department of Energy Interpretation of High-Level Radioactive Waste*. January 9, 2019.

[2] Tens of thousands of gallons? Hundreds of thousands of gallons? Over 5 years? Over 20 years?

18-2 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. The public's comments on the HLW interpretation, including NRDC's, were addressed in the Supplemental *Federal Register* notice (84 FR 26835, June 10, 2019).

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> This SEIS also analyzed the current practice of returning the DWPF recycle wastewater to the tank farm for reduction by evaporation or reuse in saltcake dissolution or sludge washing. That process constitutes the No-Action Alternative evaluated in this SRS DWPF Recycle Wastewater EA. As described in Section 2.1.1, the Proposed Action in this EA would change that process for up to 10,000 gallons of DWPF recycle wastewater.

Id. at 1-6.

DOE attempts to explain in its Purpose & Need section precisely *why* it needs to make the change from its current practice and purportedly undertake such an analysis:

> When DOE prepared the 1994 DWPF SEIS (DOE 1994), the Savannah River Site Salt Processing Alternatives Final Supplemental Environmental Impact Statement (SRS Salt Processing Alternatives SEIS; DOE 2001), and the High-Level Waste Tank Closure Final Environmental Impact Statement (SRS HLW Tank Closure EIS; DOE 2002), *DOE did not analyze the potential environmental impacts associated with potential commercial treatment and disposal options* for DWPF recycle wastewater. DOE now proposes to use commercial LLW disposal facilities for up to 10,000 gallons of DWPF recycle wastewater to inform planning activities on treatment and disposal options for completion of the tank closure program. The *10,000-gallon amount is reasonable to enable a representative volume of DWPF recycle wastewater* to be collected and stabilized to evaluate commercial disposal capabilities for this waste stream. Any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review. *Treatment or disposal of this waste at a commercial LLW facility would help to inform planning activities for the three years between the completion of the Salt Waste Processing Facility (SWPF) mission (estimated 2031) and DWPF mission completion* (estimated 2034) (SRR 2019). During this period, DOE will not have the option of returning DWPF recycle wastewater to SWPF for processing because SWPF will have completed its mission of treating salt waste from the tank farms and will undergo closure.

Draft EA at 1-4 (citations omitted, emphasis added). So basically, previous SRS NEPA documents have not analyzed the potential commercial treatment and disposal options for a particular type of wastewater. More than a decade from now there will be approximately three years – the three years between the completion of the Salt Waste Processing Facility ("SWPF") mission (estimated 2031) and DWPF mission completion (estimated 2034) – where there could theoretically be a gap of disposal options. Therefore DOE now, more than ten years before that disposal gap, is analyzing potential commercial treatment and disposal options by considering a less than 3% "representative volume" of the wastewater. *Id.* *18-3*

18-3 The Proposed Action is described in Response 18-1. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in the 2031–2034 timeframe. Additional NEPA reviews would be performed when that proposal was better defined, informed by the results of this NEPA analysis. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

As stated in this Final SRS DWPF Recycle Wastewater EA, any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal. DOE acknowledges in their review of reasonably foreseeable future actions that there is a possibility of using this same approach for the anticipated inventory of approximately 380,000 gallons within the next 14 years. The potential impacts of processing the 380,000 gallons of DWPF recycle wastewater were evaluated in Chapter 4 of this Final SRS DWPF Recycle Wastewater EA, and potential impacts were shown to be relatively minor with low risks to human health and the environment.

B. What is DWPF Recycle Wastewater?

18-4

There is a distinct lack of information in the Draft EA on the waste of which DOE proposes to dispose. The Department provides a radiation estimate from only one sample of the wastewater (see Draft EA Appendix A), even while also noting that "there are several DWPF processes that generate secondary aqueous radioactive waste as contributors to DWPF recycle wastewater." Draft EA at 2-2. Do the several processes that contribute to the waste then always produce the same radiation mix? And is there always the same proportion of waste coming from the several processes? The Draft EA does not say. It then provides "expected concentrations" for once the waste is stabilized but doesn't explain how it arrived at such data and conclusions for its analysis.[3]

The closest DOE comes to clarifying what the DWPF recycle wastewater is, is by loosely naming the 10,000 gallons of "DWPF recycle wastewater" as "reprocessing waste." Draft EA at 1-2. By definition, reprocessing waste is HLW and must therefore be disposed of in a geologic repository.[4] DOE, however, states in the document that "the sample profile of the DWPF recycle wastewater in Tank 22 would not exceed Class C limits, in accordance to NRC waste classification tables (10 CFR 61.55)." Draft EA at 2-4. DOE's descriptions prompt questions that the text of the Draft EA does not answer. What exactly is the current definition applied by DOE to the 10,000 gallons of wastewater? At what point in the process is HLW treated and/or mixed with liquid to become the DWPF recycle wastewater? The Draft EA provides a diagram of the current process flow in Figure 2-1 but fails to clarify where DWPF recycle wastewater or the proposed action fit into that process flow. Please clarify.

To further complicate this point, the Draft EA states that "DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed assessments of its characteristics

[3] The Federal Register Notice also provides little clarity on specifics, stating that "DWPF operations generate recycle wastewater. The DWPF recycle wastewater is a combination of several dilute liquid waste streams consisting primarily of condensates from the vitrification processes. Other components of the DWPF recycle wastewater include process samples, sample line flushes, sump flushes, and cleaning solutions from the decontamination and filter dissolution processes. Currently, the DWPF recycle wastewater is returned to the tank farm for volume reduction by evaporation or is beneficially reused in salt dissolution or sludge washing." 84 Fed. Reg. 67439.

[4] DOE, via almost 50 years of nuclear fuel reprocessing, generated approximately 100 million gallons of HLW, most of it associated with the production of plutonium and tritium for nuclear weapons. This waste is so radioactive and so dangerous to manage that it merited passage of its own law outlining the requirements of final disposal. Nuclear Waste Policy Act, ("NWPA"), 42 U.S.C. § 10101 *et seq*. Passed by Congress over two decades ago after years of inquiry and debate, the NWPA requires deep, geologic isolation for all HLW, as far from the human biosphere as possible. *See* H.R. Rep. No 97-491, 97th Cong., 2nd Sess. at 26-30 (1982). In passing the NWPA, Congress limited its consideration of long-term disposal of HLW to a deep geologic repository. The reasoning is self-evident in the legislative history of the NWPA: "the Committee strongly recommends that the focus of the Federal waste management program remain, as it is today, on the development of facilities for disposal of high-level nuclear waste *which do not rely on human monitoring and maintenance to keep the waste from entering the biosphere. As has been emphasized and reiterated over the lifetime of the federal nuclear program, high level wastes should not be a burden on future generations.*" *Id.* at 29 (emphasis added).

18-4 The radionuclide contributions of recycle waste streams may vary in concentration depending on the contributing process but all result from the same waste feed materials in the facility. The six contributors are consolidated (blended) in the same tank—first the Recycle Collection Tank which then transfers the consolidated recycle wastewater to Tank 22 at the SRS H Tank Farm (1.3 million gallon capacity) on a batch basis. It is from Tank 22 that the up to 10,000 gallons of DWPF recycle wastewater would be retrieved, stabilized, and disposed of as non-HLW at a licensed commercial facility. Although, the aggregate concentration in Tank 22 has been relatively constant for most radionuclides, there has been variation in the content of other radionuclides, such as cesium. Appendix C provides a sensitivity analysis on radionuclide concentration variations. DOE would appropriately characterize the up to 10,000 gallons of DWPF recycle wastewater.

Further description has been added to Section 2 of this Final SRS DWPF Recycle Wastewater EA regarding recycle stream contributors. Decontamination solutions are acidic solutions used to reduce radiation rates on equipment prior to work in a maintenance cell and rinse water which can be pumped from a sump, if necessary. Any collected solutions are neutralized to a pH greater than 7, sampled to confirm pH, and the sampler is flushed, prior to transfer of the liquids to the Recycle Collection Tank. While concentrations may vary, depending on the source of the solutions within the facility, such as laboratory discharges and remote equipment decontamination, all radioactivity results from the same waste stream feed materials and therefore have similar radionuclide distributions.

As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

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and an evaluation of potential disposal pathways." Draft EA at 1-3. This statement is unclear and must be withdrawn and amended. Waste – by definition – is either HLW or it is not HLW. The language "managing all its reprocessing wastes as if they were HLW" has essentially been a dodge in this long fight over the specific criteria for cleanup. DOE needs to make a definitive statement as to the current definition of *this* waste. Simply, if DOE does not define the waste water as HLW and it is Class C waste, then, after volume reduction in Tank 22, why isn't the pathway for the waste onsite disposal? *18-4 Cont'd*

C. Problems with Timing, Sequencing & Segmentation

18-5

Another failing of the Draft EA is attempting to describe a process that is not fully explained or examined, and that violates NEPA.

First, the Department fails to provide a reason why the Draft EA needs to be conducted now. The Draft EA is for a proposed action that may occur at a minimum ten years in the future. It therefore can be based on only half-planned projections. DOE stresses that this Draft EA is for a specific three-year window in the 2030s and seems to posit this three-year window based on projections of when certain facilities will be in operation. Yet according to this analysis, the facility (the SWPF) that will have gone out of service, and therefore require an alternative disposal method for the wastewater, has not even currently commenced its service. Draft EA at 4-3. We note that DOE does not have a strong track record of predicting the operational status of its cleanup facilities and associated obligations.[5] How reasonable, then, is it to rely on this approximation of a projected three-year window of time more than ten years from now?

The Draft EA presents nothing that would suggest urgency, reason, or need to vary from the status quo. No reasons have been given as to why the "no action" option can't continue to be utilized or why the volume of the wastewater can't be reduced via "volume reduction by evaporation." No reasons have been given why, after evaporation (and subsequent disposal of concentrates) or other volume reduction techniques that are not discussed – the liquid waste streams can't be vitrified in DWPF, even if SWPF is out of operation. Is it a cost issue to avoid making more vitrified canisters and to avoid geologic disposal?

[5] GAO-19-28, *Program-Wide Strategy and Better Reporting Needed to Address Growing Environmental Cleanup Liability*, January 2019 ("... EM's environmental liability increased by nearly $130 billion from fiscal year 2014 to 2018 at the Hanford Site in Washington State, in part because of contract and project management problems with waste cleanup. GAO found that EM's liability will likely continue to grow, in part because the costs of some future work are not yet included in the estimated liability. For example, EM's liability does not include more than $2.3 billion in costs associated with 45 contaminated facilities that will likely be transferred to EM from other DOE programs in the future.") Additionally, DOE's 1981 Record of Decision for the Waste Isolation Pilot Plant ("WIPP") stated: "By approximately 1990 all existing waste stored at INEL will have been removed to WIPP, and the WIPP facility would be in a position to receive and dispose of TRU waste from other defense waste generating facilities." 46 Fed. Reg. 9162 (Jan. 28, 1981). In fact, WIPP did not begin accepting waste until March 26, 1999. As of this date – 30 years after all INL waste was supposed to be at WIPP – not all of that waste is at WIPP.

18-4 (Cont'd) As part of this process, DOE would verify with the licensee of the disposal facility that the stabilized waste meets the facility's WAC including additional confirmatory characterization, and all other requirements of the disposal facility, including any applicable regulatory requirements (e.g.,RCRA) for stabilization of the waste and applicable U.S. Department of Transportation (USDOT) requirements for packaging and transportation from SRS to the commercial facility.

As stated in Section 1.2 of this Final SRS DWPF Recycle Wastewater EA and the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW, unless and until a specific waste is determined to be another category of waste based on detailed technical assessments of its characteristics and an evaluation of potential disposal pathways. Therefore, the DWPF recycle wastewater will continue to be treated as if it is HLW until a formal determination is made that the waste meets the criteria stipulated in DOE's Supplemental Notice on HLW interpretation.

Regarding the question of disposing waste onsite, the Proposed Action is described in Response 18-1.

18-5 The Proposed Action is described in Response 18-1. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in the 2031–2034 timeframe. Additional NEPA reviews would be performed when that proposal was better defined, informed by the results of this NEPA analysis. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

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18-5 (Cont'd) As stated in this Final SRS DWPF Recycle Wastewater EA, any proposal to dispose of more than 10,000 gallons of DWPF recycle wastewater would be evaluated in a separate NEPA review, at which time DOE would determine the need to consider DOE on-site and off-site disposal. DOE acknowledges in their review of reasonably foreseeable future actions that there is a possibility of using this same approach for the anticipated inventory of approximately 380,000 gallons within the next 14 years. The potential impacts of processing the 380,000 gallons of DWPF recycle wastewater were evaluated in Chapter 4 of this Final SRS DWPF Recycle Wastewater EA and potential impacts were shown to be relatively minor with low risks to human health and the environment.

Information obtained from implementation of the Proposed Action would potentially inform DOE's future implementation of waste management activities across the DOE complex; however, implementation of the HLW interpretation beyond the up to 10,000 gallons of DWPF recycle has not been decided and is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

The No-Action Alternative (which would include volume reduction of the up to 10,000 gallons of DWPF recycle wastewater at the SRS 2H Evaporator) would not meet the purpose and need for agency action as specified in Section 1.3 of this Final SRS DWPF Recycle Wastewater EA.

Cost does not have a bearing on the potential impacts of the Proposed Action and is outside the scope of this Final SRS DWPF Recycle Wastewater EA, but would be considered by DOE in the decision-making process.

18-6

Next, DOE bluntly admits that its plans include disposing of the full 380,000 gallons[6] of wastewater in a similar manner as for the 10,000 gallons proposed in the Draft EA. DOE explicitly states that processing the larger amount of waste is the goal: "it is reasonably foreseeable that, depending on the outcome of this proposal, DOE could elect to implement commercial treatment and disposal of a larger volume of DWPF recycle wastewater in the future." Draft EA at 4-4. Given the acknowledgement that approximately 380,000 gallons of similar liquid are likely to exist, it is unclear how the 10,000 gallons, which the Draft EA calls a "representative volume," proposed for initial treatment can be isolated or considered to be separate from the larger volume. It is also unclear at what point in time the 10,000 gallons in questions was created or when will it be created.

Further, analyzing only 10,000 gallons of a full 380,000 is a clear illustration of the kind of segmenting review that is barred by NEPA. DOE provides no meaningful explanation why it limits the analysis except to state that it will be the subject of further NEPA review. Draft EA at 1-4. But segmenting a project into multiple otherwise connected actions and only suggesting future NEPA review for some of them directly contradicts NEPA. "NEPA procedures must insure that environmental information is available to public officials and citizens *before decisions are made and before actions are taken*." 40 C.F.R. § 1500.1 (emphasis added).[7] NEPA regulations also require consideration of "connected actions," including "interdependent parts of a larger action [that] depend on the larger action for their justification." 40 CFR § 1508.25.[8] DOE cannot segment the action of treating and disposing of wastewater from a single tank in hopes of sliding the proposed action through without having to disclose to the public and decisionmakers the full extent of the potential impacts before committing to that action.

[6] In one section, the Draft EA explains "The potential volume that DOE considers reasonably foreseeable [to implement commercial treatment and disposal of] would be the total volume of DWPF recycle wastewater that is estimated to be produced after the SWPF mission is complete, but before the DWPF mission is complete (2031–2034). According to the System Plan (SRR 2019, p. 41), this value is approximately 380,000 gallons." Draft EA at 4-4. Yet in another section the Draft EA determines that "The volume of DWPF recycle wastewater is expected to increase from approximately 1.5 million gallons per year to as high as 3.2 million gallons per year." Draft EA at 2-4. What subset of DWPF recycle wastewater then is this 380,000 gallons? What does the Department propose for the remaining wastewater?

[7] *See also Oglala Sioux Tribe v. U.S. Nuclear Regulatory Comm'n*, 896 F.3d 520, 532 (D.C. Cir. 2018) (citing *Marsh v. Or. Nat. Res. Council*, 490 U.S. 360 (1989) ("NEPA ensures that the agency will not act on incomplete information, only to regret its decision after it is too late to correct."); *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 349 (1989) (explaining that NEPA "focus[es] the agency's attention on the environmental consequences of a proposed project" (emphasis added)); *Sierra Club v. U.S. Army Corps of Eng'rs*, 803 F.3d 31, 37 (D.C. Cir. 2015) (explaining that NEPA requires agencies to take a "hard look" at environmental consequences of proposed actions "in advance of deciding whether and how to proceed").

[8] *See also Delaware Riverkeeper Network v. FERC*, 753 F.3d 1304, 1313 (D.C. Cir. 2014) ("An agency impermissibly 'segments' NEPA review when it divides connected, cumulative, or similar federal actions into separate projects and thereby fails to address the true scope and impact of the activities that should be under consideration.") ("The justification for the rule against segmentation is obvious: It prevents agencies from dividing one project into multiple individual actions each of which individually has an insignificant environmental impact, but which collectively have a substantial impact.").

18-6 See response to Comment 18-5.

DOE has analyzed the potential treatment and disposal of the larger volume as a reasonably foreseeable action in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA. Should DOE propose to use a similar approach for more than 10,000 gallons, DOE will conduct additional NEPA analysis, as appropriate. This review of a new proposal would be planned to minimize impacts on operational schedules. This approach to DOE's NEPA evaluation is appropriate since the only proposal currently under consideration for decision making is the analysis of 10,000 gallons. As discussed in Section 4.2.6 of this Final SRS DWPF Recycle Wastewater EA, the potential impacts of processing the approximately 380,000 gallons of DWPF recycle wastewater were also shown to be minor with low risks to human health and the environment. Any future actions at other DOE sites are beyond the scope of this Final SRS DWPF Recycle Wastewater EA.

Thus, through all this muddle, DOE fails to answer the fundamental questions – why this analysis is happening right now, in 2020, and why it has segmented the NEPA analysis. As we discuss next, it appears to us that DOE may be slapping the "HLW Reinterpretation Rule" on as small an increment of the cleanup as possible. *18-6 Cont'd*

D. HLW Reinterpretation Rule

18-7

Our primary concern with the Draft EA is that the document is so muddled because DOE has handpicked the smallest incremental cleanup action onto which it will apply the "HLW Reinterpretation Rule" in an attempt to inoculate the rule from later legal challenge when the rule is applied to a huge amount of dangerous, toxic waste.

As we noted to the Department last year, DOE's assertion of authority to reinterpret *what is* and *what is not* HLW is no small bureaucratic exercise with minor, semantic impacts on obscure DOE operations.[9] Rather, DOE proposes to fundamentally alter more than 50 years of national consensus on how the most toxic, radioactive, and dangerous waste in the world is managed and ultimately disposed of in geologic repositories. DOE's assertion of this authority, if implemented, would seriously endanger millions of Americans and countless future generations. Because HLW contains highly radioactive fission products and radionuclides that pose long-term dangers to human health and the environment, Congress has enacted laws defining HLW and defined DOE responsibilities to safely manage the waste at its sites and to dispose of that waste in geologic repositories. It has not given DOE authority to change the definition of HLW.

Thus DOE's claimed authority to "reclassify" HLW in the waste cleanup process has been fraught with controversy for decades, fought out both in Courts and before Congress. The fundamental fight, more than any other single thing, has been over "reclassifying" HLW *in the tanks*. This fight over the most complicated and long-lasting toxic waste has been bitterly contested because the public and many states have rightly feared that DOE would use claimed authority to (1) "reclassify" HLW so as to call it another name; and (2) once that waste was no longer subject to the Nuclear Waste Policy Act, the Department could (and would) abandon the HLW *in the tanks*, left forever to eventually leak out and profoundly harm future generations with some of the most dangerous waste in the world.[10] The subordinate fight – *i.e.*, over the potential use of "reclassification" authority on waste removed from the tanks – was deeply important, but the undersigned are well aware that there has always been intention at some point to divide the HLW removed from the tanks into low-activity and high-activity fractions. Thus, to the extent there have been disputes over what has been removed from the tanks and potential

[9] *See* Attachment A.

[10] It is not the goal of NRDC and the other petitioners to prevent tank waste from being removed from the tanks. The goal of the original lawsuit (2001-2004) was to prevent DOE from awarding itself unfettered authority to abandon any amount of HLW (and potentially millions of curies of radioactivity) it deemed "incidental" in corroding, aging steel tanks. In fact, NRDC is resolutely in favor of removing waste from the tanks as safely and expeditiously as possible. Additionally, the SRS's DWPF continued to remove and treat HLW from the tanks unabated throughout and subsequent to the HLW litigation without objection from any party.

18-7 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. The *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835, June 10, 2019) provides additional explanation of DOE's HLW interpretation. The public's comments on the HLW interpretation, including NRDC's, were addressed in the Supplemental *Federal Register* notice (84 FR 26835, June 10, 2019).

In its Supplemental Notice, DOE explains its interpretation of the term HLW, as defined in the AEA and NWPA. DOE has the long-standing authority and responsibility under the AEA to ensure that all radioactive waste from the United States' defense program—including reprocessing waste—is managed and disposed of in a safe manner. DOE will continue its current practice of managing all its reprocessing wastes as if they were HLW unless and until a specific waste is determined to be another category of waste based on detailed technical assessments of its characteristics and an evaluation of potential disposal pathways.

disposal pathways, it has been over the lack of clearly defined standards and criteria that ensure protection of human health and the environment. *18-7 Cont'd*

18-8 Which in turn brings us to the Nuclear Regulatory Commission's ("NRC") role with respect to reclassifying HLW. We have repeatedly acknowledged NRC's authority to exempt solid materials derived from liquid HLW that contain sufficiently low concentrations of fission products to not require deep geologic disposal as provided by the Nuclear Waste Policy Act. The one accepted exception to the NRC's sole authority in exempting HLW from geologic disposal is the Waste Incidental to Reprocessing ("WIR") process, under Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA) (Public Law 108-375).[11] (We note that in the Draft EA's "Acronyms and Abbreviations" section that WIR is not mentioned). The provision functionally allows DOE in Idaho and South Carolina (*i.e.*, NDAA-Covered States) to "reclassify" HLW *in that state* and dispose of that reclassified waste *onsite*, with a modicum of NRC oversight, but no regulatory control.[12] Thus, through its authority under Section 3116, DOE could reclassify the wastewater at issue in the Draft EA and dispose of it at SRS.

18-9 So why is DOE writing this Draft EA and relying on the disputed HLW Reinterpretation Rule to ship the wastewater out of South Carolina rather than dispose of the waste onsite via the Section 3116 authority? The waste in question is currently being handled without significant controversy, and there is no specific technical or economic reason DOE has provided to demonstrate that it must investigate an out-of-state commercial disposal option.

Further, the Draft EA is strangely silent on whether the proposal to send 10,000 gallons to a commercial low-level waste facility is informed in any way by Section 3116. Section 3116 is mentioned only in passing, and there, DOE states cryptically that its "… HLW interpretation would not impact practices for the management of other reprocessing waste at SRS, which include stabilization and disposal of treated liquid radioactive waste at the Saltstone Production Facility and F and H farm tank closures as non-HLW under Section 3116." Draft EA at 1-4, note 5 (citation omitted). Why not? Why would DOE propose slapping this controversial label on just 10,000 gallons rather than relying on its existing in-state authority?

Likewise, no reasons have been given as to why the "no action" option can't continue to be utilized. Why isn't the volume of the 10,000 gallons to be reduced via "volume reduction by

[11] *See* NRC's description of its role at the NRC website at https://www.nrc.gov/waste/incidental-waste.html.

[12] Section 3116 provides NRC two functions when DOE decides to reclassify HLW in South Carolina. Under Section 3116(a), DOE must consult with NRC prior to making a reclassification determination on specific HLW. Under Section 3116(b), following the Energy Secretary's final determination that the waste is WIR (and thus no longer HLW), the NRC monitors DOE's disposal actions in coordination with the NDAA-Covered State. The NRC and NDAA-Covered State may assess the DOE disposal actions to determine compliance with the performance objectives set forth in Subpart C of Title 10, Part 61, of the Code of Federal Regulations, "Licensing Requirements for Land Disposal of Radioactive Waste." Also under Section 3116(b), if NRC considers disposal actions taken by DOE to not be in compliance with those performance objectives, then the NRC must, as soon as practicable after discovery of the noncompliant conditions, inform the DOE, NDAA-Covered State, and specific committees in Congress.

18-8 NRC's role, Section 3116, and WIR are out of scope of this Final SRS DWPF Recycle Wastewater EA.

As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the Department fully supports the NRC in its statutory and regulatory role with respect to regulating commercial nuclear activities (including licensing disposal facilities), as well as its historical and established consultative role to DOE on the disposal of its reprocessing wastes determined to be not HLW under DOE Order 435.1, "Radioactive Waste Management." DOE's interpretation does not change the NRC's existing authorities. DOE intends to maintain its strong relationship with the NRC and will engage with the NRC on the best way to continue that relationship when it applies its HLW interpretation in the future. Additional discussion on this topic is outside of the scope of this Final SRS DWPF Recycle Wastewater EA.

As stated in the *Supplemental Notice Concerning U.S. Department of Energy Interpretation of High-Level Radioactive Waste* (84 FR 26835), the HLW interpretation does not impact DOE's obligation to comply with Section 3116 of the *Ronald W. Reagan National Defense Authorization Act* for Fiscal Year 2005. In addition, Section 3116 does not limit DOE's long-standing authority under the AEA to interpret the definition of HLW or to apply that interpretation to reprocessing wastes that are not covered by Section 3116. Section 3116 sets forth a process for determining that specified DOE reprocessing waste is not HLW. This Section 3116 process is similar to the process in DOE's Order 435.1, the accompanying DOE Manual 435.1–1, and the accompanying DOE Guide 435.1–1 for use with DOE M 435.1–1 for determining whether certain reprocessing wastes are "wastes incidental to reprocessing." See Public Law 108–375, 2004, Section 3116(a). Section 3116 applies to two "covered States"—South Carolina and Idaho. However, Section 3116 does not apply to reprocessing wastes that are transported out of South Carolina or Idaho and disposed of in a different state.

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18-8 (Cont'd) Section 3116 also specifies that "nothing in this section establishes any precedent or is binding" outside of South Carolina and Idaho. In short, in enacting Section 3116, Congress did not limit DOE's long-standing authority under the AEA to interpret the term HLW or to apply this interpretation to reprocessing wastes that are disposed of in states other than Idaho and South Carolina.

18-9 Cont'd

evaporation?" The document articulates no technical or reasonable basis that would suggest urgency, reason, or need to vary from the status quo.

Nevertheless, DOE states that it "will dispose of up to 10,000 gallons of stabilized (grouted) DWPF recycle wastewater from SRS at a commercial LLW facility outside of South Carolina, licensed by either the NRC or an Agreement State under 10 CFR Part 61. Prior to a disposal decision, DOE would characterize the DWPF recycle wastewater to determine *whether the waste meets DOE's HLW interpretation for disposal as non-HLW*." Draft EA at 1-3 (emphasis added). For all the reasons stated above, it is unclear to us why DOE's highly controversial and sure to be contested HLW reinterpretation is necessary in this instance. The DOE proposes that it will apply its HLW Reinterpretation to this particular small waste stream, but it has made no showing of why Section 3116 or other alternatives do not suffice or whether the nature of the waste demands such a change. The Draft EA must be withdrawn and, if it is reissued, the above issues must be clarified.

E. Other Environmental Implications

In addition, a host of other implications are left entirely to the side.

- Is the proposed disposal of the 10,000 gallons of waste in an off-site commercial facility an action that could have implications for disposal of similar materials at other DOE sites, such as the Idaho National Lab or Hanford? *18-10*
- The Draft EA's alternatives and alternatives analysis are nonsensical. The primary difference between the alternatives is the facility where the waste is stabilized, and the primary impact analysis conducted is based on the distance the waste would need to be shipped. The Draft EA fails to provide a thorough explanation of why one stabilization site over another would be chosen or if each site would use a different stabilization process that might have diverse impacts. The Draft EA also fails to consider disposal impacts at all. Is the Draft EA really then just to consider the environmental impacts of transporting waste to different stabilization sites – and if that's the case, why aren't other shipping alternatives considered, such as by electric truck or train? *18-11*
- The Draft EA mentions that, for the named disposal facilities, the applicable regulations, license requirements, and Waste Acceptance Criteria will apply. Draft EA at 2-1. What would NRC's role be in monitoring on-going disposal of this waste and its long-term status? Have the potentially affected states conducted any analysis or is there any showing that the waste acceptance criteria for specific facilities have been examined? Specifically, have the facilities in question agreed to accept this waste and does it, in fact, comply with all licensee requirements, performance objectives, and regulations that apply to the facilities in question? If these criteria are not now met, at what point would the chosen disposal facility make the required analysis? What would happen if the facilities do not accept the grouted waste form? *18-12*

18-9 See Response 18-8 regarding DOE's HLW interpretation and Section 3116.

The No Action Alternative (which would include volume reduction of the up to 10,000 gallons of DWPF recycle wastewater at the SRS 2H Evaporator) would not meet the purpose and need specified in Section 1.3 of this Final SRS DWPF Recycle Wastewater EA. DOE plans to initiate the Proposed Action within 12 months from a decision to move forward. The potential duration of the Proposed Action is uncertain, but could be implemented over a span of several years. If successful, DOE could then consider implementing the same or similar approach for the larger expected volume in 2031–2034 timeframe. Additional NEPA reviews would be performed when that proposal was better defined; informed by the results of this NEPA analysis. This Final SRS DWPF Recycle Wastewater EA has been modified for additional clarity of the proposed timing of the proposal.

As stated in Section 2 of this Final SRS DWPF Recycle Wastewater EA, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation. As part of this process, DOE would verify with the licensee of the disposal facility that the stabilized waste meets the facility's WAC including additional confirmatory characterization, and all other requirements of the disposal facility, including any applicable regulatory requirements (e.g., RCRA) for stabilization of the waste and applicable U.S. Department of Transportation (USDOT) requirements for packaging and transportation from SRS to the commercial facility.

18-10 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. At this time, DOE is not considering whether to implement the HLW interpretation at any other site or for any other waste stream.

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18-11 This Final SRS DWPF Recycle Wastewater EA adequately demonstrates that the range of alternatives considered for implementation of the Proposed Action results in minor potential environmental impacts. The Final SRS DWPF Recycle Wastewater EA analyzes potential impacts to a wide variety of environmental resource areas. Table 3-1 presents a resource screening analysis and explains why there would be little to no potential for impacts to ten resource areas. The EA presents a more detailed analysis for air quality, human health (normal operations and accidents), waste management, and transportation.

Impacts of treatment and disposal at either of the two LLW disposal facilities evaluated in this Final SRS DWPF Recycle Wastewater EA have already been considered by the state regulators of those facilities. As long as the waste to be disposed at the facility meets the WAC and performance objectives for the facility, the potential impacts would be within those expected and evaluated in the facility licensing process.

The Proposed Action described in Response 18-1 is limited to up to 10,000 gallons. DOE would not expect to use rail transportation for such a small volume.

18-12 NRC's role is outside the scope of this Final SRS DWPF Recycle Wastewater EA. See response to 18-8. Applicable regulators have oversight of WAC compliance, not affected states. DOE would not implement the Proposed Action if the final waste form would not meet the commerical disposal facility's WAC and all other requirements of the disposal facility. DOE, through coordination with the disposal facility(ies), would ensure that the WAC and other applicable requirements were met.

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18-12 (Cont'd) Both commerical disposal facilities in Texs and Utah are licensed by Agreement States. Thus the respective Agreement State regulatory oversight, inspection and enforcement actions would be implemented by the States (i.e., Texas or Utah). As such, NRC would not have an oversight role for transportation and disposal other than the role of oversight of an Agreement State and approval of certain radioactive material packages.

Any waste determination under the HLW interpretation would require approval from the authorized DOE official and be supported by technical documentation (this documentation would be in addition to, and separate from, the NEPA analysis). The Department will work closely with state and local officials, regulators, tribal governments, and stakeholders, on a site-by-site basis as appropriate, to ensure compliance with applicable programmatic requirements and regulatory agreements. As discussed in Response 18-9, DOE has evaluated representative samples of the DWPF recycle wastewater (see Appendix A of the Final SRS DWPF Recycle Wastewater EA) and prepared a technical evaluation and an official determination for up to 8 gallons that demonstrate and document, that the DWPF recycle wastewater would meet criterion 1 for non-HLW under DOE's interpretation of the NWPA definition of HLW. The technical reports can be viewed at: https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation.

- The Draft EA at 3-5 states that "nearly 80 percent of the radionuclides emitted at SRS are tritium compounds." However, the Draft EA does not mention water or air samplings done to test for tritium concentrations for the different alternatives mentioned. Tritium exposure can pose a health risk if it is ingested in drinking water or food or inhaled or absorbed by the skin or by other biological tissue. The Draft EA fails to explain in detail about the process of monitoring and control of tritium at the site. *18-13*

- If "Alternative 2: Treatment and Disposal at a Commercial LLW Facility" is chosen, what ability do the disposal sites have to manage the liquid waste and grout it? Would this be an NRC-licensed operation and not covered by the general facility license? The Draft EA only states that stabilization and disposal of the wastewater would not cause an increase in impacts beyond impacts of ongoing operations but provides no basis for this conclusion. Draft EA at 3-6, 3-11. *18-14*

- For Alternative 3, the Draft EA analyzes stabilization treatment occurring at a specific commercial treatment facility in Richland, Washington. The Draft EA at 2-10 explains that there are "several treatment facilities in the United States permitted and/or licensed to receive liquid LLW and stabilize it." Please name them and please name those that would agree to accept the waste in question. *18-15*

- The Draft EA plans to stabilize the wastewater in grout because, it argues, "grout is a proven safe and effective technology." Draft EA at 1-1 n.2. The Draft EA fails, however, to discuss the Z-Area, where grouted waste has already been placed and has contaminated groundwater. Further, DOE suggests that fly ash – which itself has serious environmental and waste concerns – may be used to grout the wastewater. Please discuss the impacts of grouted waste disposed on SRS to groundwater and any consideration of the impacts of mixing radioactive waste with fly ash. *18-16*

Conclusion

For the reasons stated above, we urge you to withdraw this Draft EA.

Sincerely,

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18-13 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA, prepared to satisfy the regulations established by CEQ (40 CFR Parts 1500–1508) and the DOE NEPA implementing procedures (10 CFR Part 1021). SRS has significant on-site and off-site air monitoring capabilites. Tritium is referenced in this Final SRS DWPF Recycle Wastewater EA in Section 3.3.1.2, which provides a description of the affected environment for radiological air emissions. As stated in Sections 3.3.2, 3.3.3, and 3.3.4, no tritium would be released as part of the Proposed Action. Therefore monitoring and control of tritium at SRS is outside the scope of this Final SRS DWPF Recycle Wastewater EA.

18-14 Both commercial LLW disposal facilities evaluated in this Final SRS DWPF Recycle Wastewater EA are licensed and permitted to perform stabilization of radioactive liquids that meet their waste acceptance criteria. As long as the waste form meets the commercial disposal facility's waste acceptance criteria, the potential impacts associated with the stabilization would have been evaluated as part of their existing license. DOE performs an intial analysis to ensure the waste meets the facility's waste acceptance criteria and further consults with the potenital commerical LLW disposal facility as part of the process to ensure the waste will be safely disposed of.

18-15 The footnote that accompanies Section 2.1.4.2 provides a DOE website link that shows the basic ordering agreements DOE has with various treatement companies: https://www.emcbc.doe.gov/About/PrimeContracts. As long as the commerical treatment facility is licensed and permitted to receive and treat the specific waste and meets the facility's waste acceptance criteria, there would not be additional environmental impacts at that facility beyond those expected and evaluated during its licensing process. As clarified Sections 2.1.4.2, 2.1.5, and 3.3.4, DOE will not ship DWPF recycle wastewater to the state of Washington for commercial treatment because there are other commercial treatment facilities in closer proximity to SRS. This is a bounding analytical construct only and clearly demonstrates that the potential impacts of Alternative 3 would be minor for transportation scenarios that result in shorter shipment distances. Referencing this location does not mean DOE is choosing this location for treatment. The selection of a treatment facility would be addressed during a future procurement process.

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18-16 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA. DOE identifies only grouting as the likely method of stabilization for Alternative 1. The grout formulation would be consistent with facility licenses and permits. The commerical treatment or disposal facility would select the specific stabilization method for Alternative 2 or 3 in accordance with their licenses and permits. These stabilization methods may also be specific to the final constituents of the liquid waste form.

Comment 19: Anonymous

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Submitter Information

Name: Anonymous Anonymous

General Comment

19-1

Dear Secretary of Energy Dan Brouillette,

Congratulations on your recent promotion. How are things going three months into the new job? You sure had big cowboy boots to fill, as your predecessor Rick "Smart Glasses" Perry not only managed to learn that DOE handles nuclear weapons but also found time to work with Rudy Giuliani on President Tiny Hands' backchannel diplomacy with Ukraine.

While it may be tempting to assist President Tiny Hands with bribing foreign leaders to "investigate" potential Democratic presidential nominees, I would advise you to tread lightly. Remember the "Three Amigos"? Well three out of three are no longer employed by the Trump kleptocracy. No, you're better off helping out in more accepted ways, e.g. promoting coal and other 17th century technologies.

#PresidentTinyHands #OrangeDumbsicle

19-1 This comment is outside the scope of this Final SRS DWPF Recycle Wastewater EA.