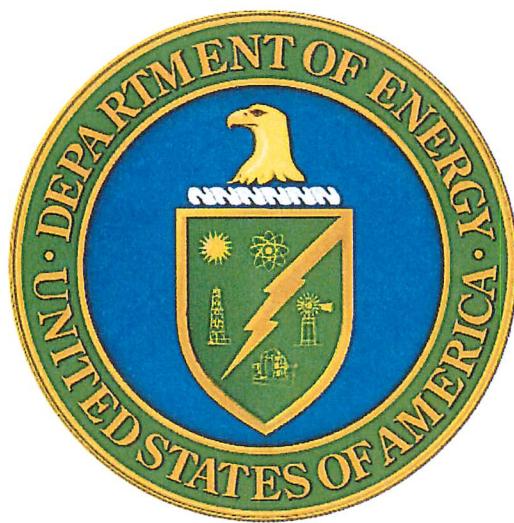


**SUPPLEMENT ANALYSIS FOR A PROPOSAL TO TRANSPORT LOW-LEVEL
RADIOACTIVE WASTE MATERIAL GENERATED
by the
CONSOLIDATED EDISON URANIUM SOLIDIFICATION PROJECT
FROM THE OAK RIDGE NATIONAL LABORATORY
to the
NEVADA NATIONAL SECURITY SITE FOR DISPOSAL**



U.S. Department of Energy

August 2014

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ACRONYMS

| | |
|-------------------------------|---|
| CEQ | Council on Environmental Quality |
| CERCLA | Comprehensive Environmental Response, Compensation, and Liability Act |
| CEUSP | Consolidated Edison Uranium Solidification Project |
| CFR | Code of Federal Regulations |
| Ci | Curies |
| DNFSB | Defense Nuclear Facilities Safety Board |
| DOE | Department of Energy |
| DOT | Department of Transportation |
| EIS | Environmental Impact Statement |
| EM | Environmental Management |
| EMWMF | Environmental Management Waste Management Facility |
| FR | Federal Register |
| LLW | low-level waste |
| LWT | legal weight truck |
| MRFA | maximum reasonably foreseeable accident |
| NCSE | Nuclear Criticality Safety Evaluation |
| NEPA | National Environmental Policy Act |
| NNSS | Nevada National Security Site |
| ORNL | Oak Ridge National Laboratory |
| OST | Office of Secure Transportation |
| PE-g | plutonium equivalent gram |
| ROD | Record of Decision |
| RWAP | Radioactive Waste Acceptance Program |
| RWMS | Radioactive Waste Management Site |
| SA | Supplement Analysis |
| TECC | Transportation Emergency Control Center |
| U ₃ O ₈ | uranium oxide |

| | |
|---------|--|
| WAC | Waste Acceptance Criteria |
| WARP | Waste Acceptance Review Panel |
| WCS | Waste Control Specialists |
| WM PEIS | Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste |

1.0 INTRODUCTION

Council on Environmental Quality (CEQ) National Environmental Policy Act (NEPA) regulations (40 Code of Federal Regulations (CFR) 1502.9(c)) require Federal agencies to prepare supplements to either draft or final environmental impact statements (EISs) if “(i) The agency makes substantial changes in the proposed action that are relevant to environmental concerns” or “(ii) There are significant new circumstances or information relevant to environmental concerns and bearing on the proposed action or its impacts.” In cases where it is unclear whether a supplemental EIS is required, the Department of Energy’s (DOE) regulations (10 CFR 1021.314(c)) require the preparation of a supplement analysis (SA) to support a determination whether there is a change in the proposed action that is “substantial,” or whether new circumstances or information are “significant,” pursuant to the CEQ regulations (40 CFR 1502.9(c)).

This SA addresses the transportation and disposal of ceramic-like monoliths containing radioisotopes of uranium from the Consolidated Edison Uranium Solidification Project (CEUSP). DOE proposes to ship this material from the Oak Ridge National Laboratory (ORNL) in Tennessee, where these monoliths are currently stored, to the Nevada National Security Site (NNSS) for disposal. This SA addresses whether existing NEPA reviews remain adequate for the proposal, or whether significant new circumstances or information exist relevant to environmental concerns and bearing on the proposed actions and their impacts that would require preparation of a new or supplemental EIS.

2.0 BACKGROUND

2.1 *Definition and Terminology*

For clarity and accuracy, this SA will use the term “CEUSP LLW material” when referring to the monoliths. Radioactive wastes are categorized under existing law as high-level radioactive waste¹, transuranic waste², spent nuclear fuel, or by-product material³. If the waste is not in any of these categories, it qualifies as low-level waste (LLW), subject to all applicable regulations and requirements. The CEUSP LLW material is neither high-level radioactive waste (since it is not waste from the re-processing of spent nuclear fuel), nor is it transuranic waste (since it does not contain isotopes with an atomic number greater than 92 in excess of 100 nCi/g). The CEUSP LLW material is also not by-product material or spent nuclear fuel.

¹ The Nuclear Waste Policy Act of 1982, Section 2(12), 42 USC 10101(12)

² The WIPP Land Withdrawal Act, Section 2(18), Public Law 102-579, (106 Stat. 4777), as amended by the WIPP Land Withdrawal Act Amendments, Public Law 104-201, (110 Stat. 28511)

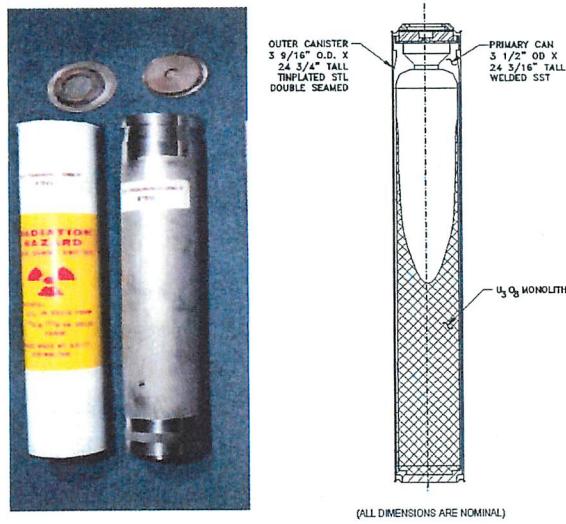
³ The Atomic Energy Act, as amended, 42 USC, defines “by-product material” as: 1) any radioactive material (except special nuclear material) yielded in or made radioactive by exposure to the radiation incident to the process of producing or utilizing special nuclear material, and 2) the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content.

However, because the CEUSP LLW material contains the fissile U-233 and U-235 radioisotopes, it is managed as special nuclear material⁴ that requires stringent management controls and procedures for both material protection (i.e., assuring protection of the material from theft or diversions) and physical security. DOE manages the CEUSP LLW material as special nuclear material at ORNL. Transportation of this waste material to the NNSS will comply with all handling and transportation requirements and protocols for special nuclear material. This waste material will be emplaced in a disposal trench at NNSS's Area 5 disposal facility as described in Section 4.0.

2.2 Brief History of the CEUSP LLW Material

The CEUSP LLW material originated from a 1960s research and development test of thorium and uranium reactor fuel. The test, sponsored by the Atomic Energy Commission, was conducted at the Consolidated Edison Indian Point-1 reactor in New York State. Following

completion of the test in late 1968, Nuclear Fuel Services at West Valley, New York, recovered the uranium (considered at the time to be a reusable nuclear material) by separating it from transuranic isotopes, fission products, and other constituents common to reactor fuel. The extracted liquid uranium (8,000 liters of uranyl nitrate) was shipped to ORNL in Tennessee for storage in anticipation of potential reuse, and the other constituents remained at West Valley for either vitrification or land disposal. Because the extracted material contained several isotopes of uranium, including U-235 and U-233—both fissile materials which can sustain a nuclear criticality reaction—cadmium and gadolinium were added to the liquid to prevent a criticality reaction. During the ensuing years, the material continued to be managed in ORNL's Building 3019 in anticipation of reuse.



**Figure 1 – (Left) Actual 24-inch steel canister.
(Right) Representation of canister interior**

In the mid-1980s, with no identification of a near-term use, and for reasons of safety and security, DOE solidified all 8,000 liters of the liquid uranyl nitrate at high temperatures into 403 individual small, ceramic-like uranium oxide (U_3O_8) monoliths, each bonded to the inside of a steel canister measuring about 3.5 inches in diameter by about 2 feet long (see Figure 1). Individual canisters contain an average of 2.6 kilograms (kg) of uranium, but no more than 3.17 kg of uranium. The canister inventory includes: 101 kg of U-233; 796 kg of U-235; and 94 grams of U-232⁵, totalling approximately 3,000 curies (Ci) and approximately 100 ft³ or 2.83 m³.

⁴ Atomic Energy Act of 1954, as amended, defines "special nuclear material" as 1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of section 51, determined to be special nuclear material, but does not include source material; or 2) any material artificially enriched by any of the foregoing, but does not include source material. 42 U.S.C. §2014 aa

⁵ Half lives: U-233 – 159 thousand years; U-235 – 703 million years; U-232 – 69 year

3.0 PURPOSE AND NEED FOR ACTION

After examining a number of reuse approaches for the CEUSP LLW material, DOE was unable to identify any programmatic need for it. In 2005, Congress⁶ provided no funds for the continued storage of the CEUSP LLW material at the ORNL. The current storage location for the CEUSP LLW material, Building 3019 at the ORNL, presents a number of serious challenges. Building 3019 was constructed in the 1940s and is the oldest continually operating nuclear facility in the DOE complex. As a result, it is difficult to maintain and to ensure adequacy of security systems. In 1997, the Defense Nuclear Facilities Safety Board (DNFSB) (Recommendation 97-1) expressed its concern regarding the continued storage of the CEUSP LLW material in Building 3019. In 2007, DOE's Office of Environmental Management (EM) determined that continued storage of U-233 in Building 3019 represented a significant safety, safeguards and security, and financial burden (DOE/EA-1574).

Thus DOE changed its management strategy for the CEUSP LLW material from one of storage for potential reuse to a search for an appropriate disposal location. In 2010, the DNFSB reiterated that "...the Board does not consider long-term storage of this material in the aging Building 3019 a desired condition."⁷ The Department shares the concerns of the DNFSB that continued storage of this waste in Building 3019 cannot be a long-term solution for the disposition of this waste. After the CEUSP LLW material and other material are removed from Building 3019, the building can be decontaminated and decommissioned.

DOE considered several locations for disposal of the CEUSP LLW material; however, the material protection and security requirements preclude these other disposal locations. Pursuant to DOE Order 435.1, "Radioactive Waste Management," before a waste is disposed of, it must be evaluated against site-specific waste acceptance criteria (WAC). As a matter of policy, DOE requires that each site consider on-site or commercial waste disposal options before considering disposal at any other DOE site. The CEUSP LLW material was evaluated for disposal at the Oak Ridge Environmental Management Waste Management Facility (EMWMF). However, the CEUSP LLW material could not meet the requirements for disposal at the EMWMF, since the facility is allowed to accommodate only those wastes resulting from a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) remedial action.⁸ This disposal facility is also not equipped from a security perspective to receive, unload, perform burial operations or provide long-term surveillance of the CEUSP LLW material. In addition, the EMWMF is categorized as a Radiological Facility, not a Category II Nuclear Facility. Such

⁶ The Conference Report accompanying the Energy and Water Development Appropriations Act, 2006, Public Law 109-103, Nov. 19, 2005, recommended (p.142) against funding any additional infrastructure construction and facility modification associated with medical isotope production at the Oak Ridge National Laboratory. The Conference Report also stated: "The Conference provide no funding for the Medical Isotope Production and Building 3019 Complex Shutdown Project. The Conference direct the Department to terminate promptly the Medical Isotope Production and Building 3019 Complex Shutdown Project. The responsibility for disposition of the U-233 is transferred to the Defense Environmental Management program per DOE's recommendation, and the conferees have provided funds in the Defense Environmental Management appropriation for disposition of the material stored in Building 3019."

⁷ October 1, 2010 letter from Peter Winokur, Chairman of the Defense Nuclear Facilities Safety Board, to John Snyder, Ph.D.

⁸ Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee, DOE/OR/01-1791&D3 (1999). "The on-site disposal cell will accept CERCLA waste that meets the facility-specific WAC from ORR sites..."

a designation would be necessary to receive shipments of CEUSP LLW material. Also, disposal of the CEUSP LLW material in the EMWMF would significantly exceed the uranium isotope concentration limits for the facility as well as the EMWMF WAC limit for total uranium concentration. The CEUSP LLW material canisters would also significantly exceed the EMWMF contact dose limit of 200 millirem per hour for the facility.

DOE also evaluated two commercial disposal facilities licensed to dispose of radioactive LLW: Energy Solutions near Clive, Utah, and Waste Control Specialists (WCS) in Andrews, Texas. For purposes of the potential disposal of the CEUSP LLW material at a commercial site, the material could be classified as Class A, B, or C LLW⁹ depending on the specific radioactivity content of a particular CEUSP canister. Under its license, Energy Solutions may only accept Class A radioactive waste, and it does not meet DOE security requirements for the acceptance of waste containing the amounts of special nuclear materials contained in the CEUSP LLW material. While WCS may accept Class A, B, and C wastes under its license, it also does not meet DOE security requirements for the acceptance of waste containing the amounts of special nuclear materials contained in the CEUSP LLW material. NNSS is the only DOE or commercial site currently authorized to accept the CEUSP LLW material for disposal. The NNSS' suitability for disposing of this waste is discussed in Section 5.0

DOE considered downblending (i.e., dissolving the CEUSP LLW material and mixing it with another waste or depleted uranium) prior to disposal. While the downblending approach would lower the U-233 and U-235 concentration, it would increase the volume of waste to be disposed of from approximately 100 ft³ (2.83 m³) to almost 30,000 ft³ (almost 850 m³). Downblending would require construction and operation of a new, heavily shielded processing facility. The downblending process would also increase worker exposure to radiological doses and require the expenditure of additional funds for structures and processes to minimize the health risks to workers associated with the increased exposures. Ultimately, in light of such considerations, DOE recognized a need to examine direct disposal of the CEUSP LLW material in its current waste form, i.e., ceramic-like monoliths bonded to the inside of relatively small steel canisters in order to maximize worker safety, to avoid the costs associated with the construction and operation of a new Category II downblending facility, to avoid the increased amount of waste that would require transportation to a disposal facility, and to minimize the time that the CEUSP LLW material would have to be stored prior to disposal in a building that is ill-suited for that purpose.

3.1 Comparison of Downblended CEUSP LLW Material to Direct Disposal of the Existing Waste Form

The most important parameter affecting potential health and environmental impacts associated with the direct disposal of the CEUSP LLW material is the make-up of its radiological features. This is the primary consideration regardless of whether the final waste form is downblended or

⁹ The Nuclear Regulatory Commission (NRC) classification system for classes A, B, and C LLW is contained in 10 CFR 61.55, and is based on the concentrations of specific short- and long-lived radionuclides (Class A LLW contains the shortest-lived radionuclides and Class C the highest). Prior to the disposal of LLW in a commercial disposal facility, the LLW must be classified in accordance with the NRC requirements in this regulation.

remains as a monolith in a steel canister. For potential environmental impacts at the disposal facility, the radiological features of the waste are more important than the volume to be disposed of, which in the current waste form is very small (100 ft³ or 2.83 m³).

The major difference between the downblended waste form and the current ceramic-like monolith would be in the area of potential transportation impacts. For example, estimated potential impacts with respect to dose rates at the container surface of downblended waste would be lower compared to the smaller volumes for the ceramic-like waste form. On the other hand, potential impacts due to the number of shipments would be much lower in the current ceramic-like waste form.

The most important considerations relative to the disposal of the CEUSP LLW material at the NNSS are the potential long-term impacts to groundwater and potential short-term impacts to workers during unloading and emplacement of the CEUSP LLW material at the Radioactive Waste Management Area 5 disposal facility. Regardless of the final waste form, DOE and other Federal safety regulations require that any individual worker's time in proximity to the waste be monitored and limited to comply with exposure safety restrictions. Thus, in practice, the risk to workers from either waste form would be similar, as would potential impacts to groundwater (See Section 7.2 for a discussion of potential impacts to groundwater).

4.0 DESCRIPTION OF THE PROPOSAL

DOE proposes to transport the CEUSP LLW material in its existing ceramic-like form, encased in stainless steel canisters and Type B shipping casks, loaded into cargo containers, from ORNL to Radioactive Waste Management Area 5 at the NNSS for direct disposal (see Figure 2). Because the CEUSP LLW material contains fissile isotopes, DOE would minimize the potential dose to members of the general public and workers using applicable procedures. DOE would ensure appropriate safety and security protection by keeping the waste shielded, maintaining proximity restrictions around the LLW, and by limiting the time individuals are near the containers.

To limit exposures to CEUSP LLW material, DOE would:

- Use established procedures at ORNL to ensure that the retrieval and packaging of the CEUSP LLW material canisters from secure storage at ORNL would be accomplished using remote retrieval equipment. At ORNL, trained workers would survey each canister for removable contamination, and each canister would be inspected and weighed. Following inspection, up to seven canisters would be placed in a disposal sleeve inside a Type B shipping cask to ensure stability during transport.

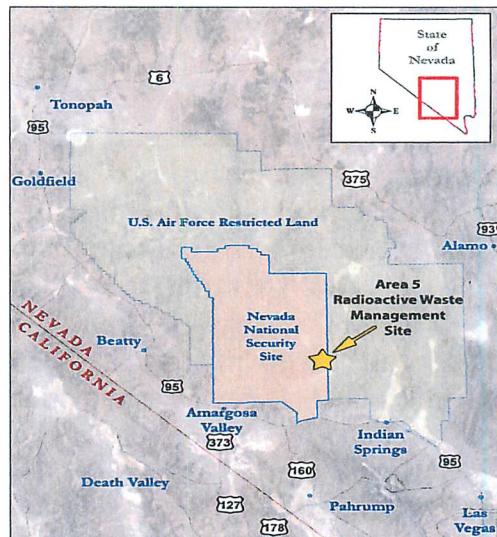


Figure 2 – Area 5 Radioactive Waste Management Site.

- DOE would use only certified Type B shipping casks that comply with the Department of Transportation (DOT) regulations for all shipments of the CEUSP LLW material (see Figure 3). An independent organization within DOE certifies the Type B shipping cask based on Nuclear Regulatory Commission (NRC) standards.
- The Type B shipping cask is designed to provide the highest levels of protection of workers and the public from radioactivity (5.75 inches of lead and 2.19 inches of steel shielding). A Type B cask is required to meet specific safety performance standards including Federal standards for radiation dose. A Type B shipping cask is required to survive a drop from 30 feet onto an unyielding surface, a drop from three feet onto a 6-inch diameter steel rod, exposure to a fire of 1,475 degrees Fahrenheit for at least 30 minutes, and immersion into at least 50 feet of water. Each of these tests must be completed sequentially. Compliance with the requirements has been demonstrated with both modeling as well as physical testing of Type B shipping casks.
- The Type B shipping cask lid would be prepared for closure by installing two types of leak gaskets prior to securing the lid on the cask. The lid would be bolted to the cask and leak tested according to the cask certification requirements. Upon a successful leak test, the cask would be moved from Building 3019 and placed into a steel cargo container, which would maintain distance between the Type B cask and the driver and members of the public who may be nearby in traffic, along the roadway, or at rest stops or service stations.
- The loaded cargo container would be secured on a flatbed truck for transport. This configuration would result in one certified Type B shipping cask per truck. (See Figure 4.)



Figure 3 – During training, onsite workers remove a Type B shipping cask from the cargo container.



Figure 4 – Cargo container on a typical transport vehicle

- At the NNSS, trained workers would remove the Type B cask from the cargo container and remove the disposal sleeve containing the CEUSP LLW material canisters from the cask using remote handling equipment to increase distance from the waste to reduce personnel

radiation exposure. The amount of time site workers take to unload the Type B shipping cask would be carefully monitored to assure the lowest possible dose and conformance with all Federal and DOE worker safety regulations and protocols.

- The CEUSP LLW material would be placed into a trench approximately 40 feet below grade and covered with a layer of soil to provide shielding to protect workers and the environment. Additional LLW would be placed on top of the CEUSP LLW material trench as a security feature. Finally, an eight-foot soil cap would be placed on the waste cell. With the soil covering the disposal trench, the dose rate would be indistinguishable from background radiation.¹⁰ This disposal configuration would make it extremely resource intensive, requiring the extraordinary dedication of significant time, funding, and heavy equipment to retrieve and process the waste for an unauthorized purpose.

Collectively, the approach of time, distance, and shielding would ensure that members of the public as well as DOE site and transportation workers would be protected during all phases of CEUSP LLW material loading, transportation, and emplacement in the disposal facility.

4.1 Specific Security Measures

DOE has conducted extensive safety analyses to ensure safe transport of the CEUSP LLW material. As a ceramic-like solid, the CEUSP LLW material is a highly stable waste form, and as stated above, the disposal sleeve is designed to ensure canister stability during transport. At the request of the State of Nevada, DOE has agreed to have armed security personnel from the DOE Office of Secure Transportation (OST) accompany CEUSP LLW material shipments from Oak Ridge to the NNSS. Because these shipments would be escorted by OST, there would be no disclosure on the timing and routing of shipments. The OST CEUSP LLW material convoy commander would choose a shipping route based on route conditions (e.g., road, traffic, and weather) and security information. For the purposes of route planning, DOE has requested, and the State of Nevada has provided, information about possible routes and their condition between the shipment origin and destination.

The OST's Transportation Emergency Control Center (TECC), located in Albuquerque, N.M., would track the CEUSP LLW material shipments. The TECC would monitor weather and road conditions for all shipping routes 24-hours a day, 7-days a week. To ensure safety and security, OST convoy commanders would do extensive planning prior to shipments.

In the unlikely event of an incident during CEUSP LLW material transportation, the OST TECC would contact the Department of Energy Operations Center, the State of Nevada's (or other states') designated operations center, and the local law enforcement dispatch, if necessary. The TECC would provide location and contact information to emergency responders in State and local jurisdictions along the route between ORNL and the NNSS where ever appropriate. In

¹⁰ Almost all human exposure to radiation comes from either natural sources (e.g., cosmic radiation) or man-made sources (e.g., medical procedures such as x-rays). In 2012 the background radiation exposure measured at 10 locations at NNSS averaged approximately 120 mrem/year. (NNSS 2012 Site Environmental Report: DOE/NV/25946).

addition, the CEUSP LLW material convoy commander would provide the State's designated Public Affairs representative pertinent information for any public safety and security concerns.

5.0 NNSS SUITABILITY FOR DISPOSAL OF THE CEUSP LLW MATERIAL

The CEUSP LLW material was evaluated against the NNESS waste acceptance criteria (WAC). The WAC is a DOE document that identifies all minimum site-specific requirements and references other regulations and protocols that must be complied with before a waste is approved for disposal at the NNESS. The WAC accounts for aspects of safety to workers, the public, and the environment. The WAC, first published in the early 1980s, is revised periodically¹¹ to ensure the most current information, requirements, and protocols for waste disposal at the NNESS are in place.

The WAC identifies criteria for the NNESS to accept the following: DOE hazardous waste and non-hazardous radioactive waste; DOE mixed hazardous and radioactive waste; and Department of Defense and DOE classified waste. Both the DOE Order 435.1, *Radioactive Waste Management*, and the NNESS WAC processes require utilization of a performance assessment to assure that wastes are suitable for disposal at the NNESS, including the shallow land disposal of LLW. In addition, the WAC identifies the following requirements:

- No high-level waste, spent nuclear fuel, or transuranic waste will be accepted;
- Hazardous waste and waste containing polychlorinated biphenyls and/or asbestos are accepted under certain conditions (e.g., hazardous waste must meet Federal land disposal restriction requirements);
- All waste containers must meet Department of Transportation (DOT) requirements for shipment;
- No liquid waste will be accepted;
- No explosives, pyrophoric materials or compressed gases will be accepted;
- Accurate waste characterization information (e.g., waste analysis or waste process knowledge) must be provided; and
- Accurate waste documentation (e.g., manifests, bills of lading, etc.) must be provided.

The WAC also has additional specific requirements for evaluations that apply to the CEUSP LLW material:

Appendix E, Section E.7 sets requirements for Fissile Material Limits. In 2012 DOE prepared a criticality evaluation for disposal of the CEUSP LLW material. In addition to that evaluation, criticality-control chemicals were added to the CEUSP LLW material in the 1980s and the CEUSP LLW material would be subjected to spacing requirements in the disposal trench in order to further preclude any potential for a criticality reaction. (See Section 7.0 of this SA for further discussion of potential impacts from a criticality incident.)

¹¹ Most recent revision: Nevada National Security Site Waste Acceptance Criteria DOE/NV-325, Revision 10, June 2013.

Section 3.1.2 sets radionuclide concentration action levels which, if exceeded, require a performance assessment to assure suitability of the site for disposition of the waste. The performance assessment examines the ability of the site to safely contain a waste as compared to a performance objective at 1,000 years. A performance assessment conducted on the CEUSP LLW material in November 2012 determined that it met criteria for shallow land disposal. At the request of the State of Nevada, an additional performance assessment was conducted in January 2013 to analyze CEUSP LLW material disposal for a longer period (i.e., out to 60,000 years) and to also consider disposal container and climate change factors. This assessment took a conservative approach, and for purposes of analysis, assumed the welded steel canister and the disposal sleeve provided no protection—as if the CEUSP LLW material were placed directly into the ground. It also considered variable conditions for climate change including substantially more precipitation. Even with these additional factors, this assessment predicted that the site was still suitable for CEUSP LLW material disposal with the maximum dose from disposal of 0.3 mrem/year at 1,000 years, well below the 25 mrem/year performance objective for protection of the public and the environment. These multiple performances assessments accompanied by the extensive field investigation of the NNSS Radioactive Waste Management Site support the conclusion that the shallow land burial trenches at the NNSS would provide for the safe isolation of the waste for a long time period, from 1,000 years to more than 60,000 years. Collectively, these analyses determined that the NNSS disposal facility would be both safe and protective of the environment for disposal of the CEUSP LLW.

Section 3.2.2 sets activity limits for each waste container or package. Because most LLW, including the CEUSP LLW material, contains multiple radioisotopes (e.g., U-232, U-233, and U-235), a conversion factor for each isotope is utilized. Following conversion, all radioisotopes are expressed as plutonium equivalent grams (PE-g). Once converted into PE-g, the waste is compared against safety limits (also expressed in PE-g) whose purpose is to bound accident analyses and set controls to ensure worker protection during waste offload and emplacement for disposal. If the PE-g for a waste container is below the limit, the safety has already been analyzed to ensure worker protection during offload. If the waste exceeds the PE-g limit, then it cannot be disposed of until further safety analysis is performed.

For the CEUSP LLW material, the calculated maximum PE-g within a disposal sleeve was approximately 2000 PE-g, which is less than the maximum quantity per disposal sleeve (12,000 PE--g) as defined in the Area 5 safety basis analysis. However, the PE-g limit as set in the WAC was lower (300 PE-g). Thus, since the WAC had not yet undergone its periodic update, DOE followed an administrative process of deviation in compliance with the WAC (Section 3.4). The deviation was approved based upon the prior analysis underlying the safety basis documentation.

Similar to all LLW waste considered for disposal at the NNSS, a detailed waste profile was prepared for the CEUSP LLW material and examined against the WAC by the Waste Acceptance Review Panel (WARP). The WARP is a group of subject matter experts that reviews all waste streams proposed for disposal at the NNSS. The WARP includes technical specialists from DOE, DOE contractors, and the State of Nevada. Waste is not approved for disposal at the NNSS unless comments by all WARP members, including the State of Nevada,

are fully addressed. After a thorough evaluation of the CEUSP LLW material profile against the NNSS waste acceptance criteria, the CEUSP LLW material profile was approved by the WARP on December 5, 2012.

6.0 EXISTING NEPA REVIEWS

There are several NEPA analyses that relate to the disposal of the CEUSP LLW material, including the Waste Management Programmatic EIS (WM PEIS) and two NNSS site-wide EISs discussed in this section. The first site-wide EIS was the *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada (DOE/EIS 0243, 1996)* (1996 NTS/EIS).

The 1996 NTS/EIS examined existing and potential impacts to the environment that have resulted from, or could result from, current or future DOE activities at the NNSS (formerly known as the Nevada Test Site, NTS). The major activities considered in the 1996 NTS/EIS were associated with defense, waste management, environmental restoration, non-defense research and development, and work for others programs. The 1996 NTS/EIS examined four alternatives: 1) Continue current operations; 2) Discontinue Operations; 3) Expanded Use; and 4) Alternative Use of Withdrawn Lands. For each alternative, the evaluations included the ongoing disposal of LLW, cumulative disposal volume, offsite transportation into the Site and potential impacts of disposal at the Area 5 Radioactive Waste Management Facility over a ten-year period, including potential impacts on human health and the affected environment.

Section 2.5.6 of this NTS/EIS discusses a performance assessment of the Area 5 disposal facility. The performance assessment is a systematic analysis of potential risks to the public and the environment and a comparison of those risks to established performance objectives. A performance assessment for the Area 5 disposal facility was developed in 1995 and has been revised periodically since that time. Through this assessment, the potential long term impacts of disposal operations were analyzed and compared to LLW performance objectives (e.g., no more than 25 mrem/year exposures via all pathways). In section 2.5.6.1, the performance assessment total dose to the general public was predicted to be approximately 0.6 mrem/year.

In the December 13, 1996, Record of Decision (ROD) (61 FR 65551) DOE selected Alternative 3, the Expanded Use Alternative for most activities and noted that the potential impacts from implementation of any of the alternatives were low. The ROD also stipulated that all wastes accepted for disposal would have to meet the NNSS waste acceptance criteria and that preliminary performance assessment results for the Area 5 Radioactive Waste Management Site did not identify any significant impacts. In this ROD, DOE decided to continue managing LLW and mixed LLW at levels under the No Action alternative, deferring a decision on increasing those activities until the completion of the *Final Waste Management Programmatic Environmental Impact Statement*.

Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (WM PEIS) (DOE/EIS-0200, 1997)

In the 1997 WM PEIS, DOE analyzed the potential environmental impacts of nationwide alternatives for managing radioactive and hazardous waste from nuclear defense and research activities at DOE sites. This EIS included analysis of the potential environmental impacts of managing 1,500,000 m³ of LLW from past, present, and reasonably foreseeable future DOE activities. DOE examined in an integrated fashion both the potential impacts of complex-wide waste management alternatives for each waste type and the specific cumulative impacts from all the waste facilities at a given site. Seventeen major sites were analyzed in the WM PEIS for waste management activities, including the NNSS. Section 4.4.8 of this PEIS described the environmental conditions at the NNSS for the disposal of LLW.

The LLW analyses presented in Chapter 7 included remote-handled waste as a distinct category, recognizing the potential for LLW radiological inventories to include some high activity isotopes, such as those found in the CEUSP LLW material. The analyses addressed, among other things, the potential human health impacts associated with transportation of LLW to regional and centralized disposal sites, including the NNSS (Regionalized Alternative 7 and Centralized Alternatives 2 and 4). Under Regionalized Alternative 7, the WM PEIS analyzed 270,000 m³ of LLW and 7,900,000 Ci for transportation to and disposal at NNSS. Centralized Alternatives 2 and 4 analyzed 1,500,000 m³ and 810,000 m³ respectively at NNSS, with 42,700,000 Ci. (Differences in volumes in the Centralized alternatives reflect differing assumptions about the degree of treatment such as volume reduction.) Estimates of potential health effects to transportation workers, site workers, and members of the general public were small for these alternatives under incident-free conditions. The WM PEIS also considered the potential impacts of a single, Maximum Reasonably Foreseeable Accident (MRFA) scenario that involved a shipment of high-activity LLW containing nearly 7,000 Ci of Co-60 (a notably larger total radionuclide inventory than that envisioned for CEUSP LLW material direct disposal shipments). This scenario used the unlikely assumption that the shipping container was breached (loss of shielding) during an accident in an urban area, resulting in between 4.2 (under neutral atmospheric conditions) and 34 (under stable atmospheric conditions) latent cancer fatalities to the public.

In a February 25, 2000, ROD (65 FR 10061), DOE decided to perform minimal treatment of LLW at all sites and to continue, to the maximum extent practicable, onsite disposal of LLW at several sites. DOE also decided in this ROD that regional disposal sites supporting the DOE complex would be established at Hanford and at the NNSS. This meant that in addition to disposing of their own LLW, the Hanford¹² Site and NNSS would dispose of LLW generated at other DOE sites which did not have the appropriate facilities or capability to dispose of waste, provided the wastes met the NNSS and Hanford Site waste acceptance criteria. The WM PEIS ROD also amended the 1996 NTS/EIS ROD, selecting the Expanded Use Alternative for waste

¹²DOE has a commitment to the State of Washington that it will not import offsite waste from other DOE sites to Hanford for disposal until the Waste Treatment and Immobilization Plant under construction at Hanford is operational.

management operations at NNSS that had been identified in the 1996 NTS/EIS. Collectively, the WM PEIS, the 1996 NTS/EIS, and the WM PEIS ROD provide the NEPA analyses and decisional basis for current and projected waste transportation and disposal of LLW, including the CEUSP LLW material, at the NNSS.

***Final Environmental Assessment for U-233 Downblending and Disposition Project
(DOE/EA-1651, 2010)***

During its consideration of disposition of the CEUSP LLW material, DOE prepared this Environmental Assessment (EA) of downblending for disposal at NNSS. The primary purpose of this approach would be to reduce the concentration of fissile material to a level that would eliminate nuclear safeguard requirements for control and security. The EA evaluated a scenario that would result in approximately 3,700 55-gallon drums of waste and require an estimated 367 truck shipments. The potential impacts from incident-free shipments were found to be small. No accident scenarios with a likely occurrence greater than 1×10^{-7} (DOE's normal criteria for inclusion) were identified that would result in a breach of transportation shielding (i.e., the Type B shipping cask). Based on the conclusions of the EA, DOE issued a finding of no significant impacts or FONSI. In 2011, DOE reviewed the number of shipments that would be required for direct disposal of the CEUSP LLW material and concluded that less than 100 shipments would be required as compared to the 367 shipments estimated in EA 1651.

***2013 Final NNSS Site-Wide Environmental Impact Statement
(DOE/EIS-0426, February 2013)***

As part of its ongoing program for NEPA evaluations at the NNSS, DOE prepared an SA of the 1996 NTS/EIS in 2007-2008. Based on public comments on the draft SA and other considerations such as potential changes to the NNSS program work scope, DOE decided to prepare a new site-wide EIS. In the *2013 Final Site-wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and the Off-Site Locations in the State of Nevada* (DOE/EIS-0426, hereafter referred to as the 2013 NNSS SWEIS), DOE analyzed three alternatives: 1) No Action, 2) Expanded Operations, and 3) Reduced Operations. The No Action Alternative reflects the use of existing facilities and maintaining operations at levels consistent with those experienced since the 1996 NTS/EIS. Management of high activity/remote handled wastes was considered under all three alternatives.

The volume of LLW planned for disposal at the NNSS under both the No Action and Reduced Operations alternatives would total approximately $424,752 \text{ m}^3$ (15,000,000 ft³), and increase to approximately $48,000,000 \text{ ft}^3$ ($1,359,209 \text{ m}^3$) under the Expanded Operations alternative. Radionuclide concentrations for the remote-handled LLW were determined using NNSS receipt data from fiscal year 2009 and earlier. Many different radioactive waste streams, each with a unique radionuclide inventory, would be transported from other DOE sites to the NNSS for disposal. To simplify the analysis and provide conservatism, the largest concentration of each radionuclide across all waste streams was assumed for a shipment. The radionuclide concentration for each radioisotope was proportionally adjusted for each type of container based on container volume. In all alternatives, the waste inventories included some high-activity

remote-handled waste forms which encompassed the radionuclides in the CEUSP LLW material from ORNL.

7.0 POTENTIAL IMPACTS OF THE PROPOSAL COMPARED TO EXISTING NEPA REVIEW

The total disposal volume for the CEUSP LLW material of approximately 100 ft³ or 2.83 m³, and the approximately 3,000 Ci are well within the quantities and potential environmental impacts analyzed in the WM PEIS for disposal at the NNSS (up to 1,500,000 m³ and 42,700,000 Ci). For perspective, it may be noted that the volume of CEUSP LLW material is approximately 0.01 percent of the total volume of LLW received on an annual basis at the NNSS.

7.1 *Human Health Risks*

The CEUSP LLW material contains radioactive isotopes—primarily U-233 and U-235—that decay over time. Based on the nature of the decay, a radioactive material emits particles or energy. The U-235 and U-233 isotopes emit alpha particles, which are easily shielded. The CEUSP LLW material also contains U-232, which radioactively decays to Tl-208, emitting high-energy gamma radiation. However, with the approaches routinely used for limiting exposure, the doses to individuals loading the transportation containers, transporting the waste, and unloading and emplacing the containers into the trenches are estimated to be less than 5 mrem/hour. This is comparable to the values reported and/or assumed in the WM PEIS and 2013 Site-wide EIS.

7.2 *Potential Impacts to Groundwater*

The NNSS is a government controlled enclave, restricted and guarded by a 24-hour security force. The site's status will remain restricted indefinitely. The NNSS is located in a remote area approximately 65 miles northwest of Las Vegas, NV. The NNSS is approximately 1,360 square miles of federally managed land. It is further surrounded on three sides by the Nellis Test and Training Range. Collectively, this provides for geographic isolation for NNSS activities. The LLW disposal site is located within Frenchman Flat in the southeastern section of the NNSS and consists of 740 acres. The low-level waste disposal site's natural features make it ideal for disposal of radioactive waste. The climate of the NNSS is arid with an average rainfall of approximately five inches per year. The minimal precipitation, high evaporation, coupled with root uptake by vegetation, results in conditions that strongly control and minimize water movement. Multiple results from site characterization studies indicate that precipitation does not infiltrate below the depth of the plant root zone. In fact, monitoring equipment in operation for the last 18 years has not detected any water drainage more than six feet below ground surface. There are no surface waters (springs, etc.) near the low-level waste disposal facility (the nearest is approximately 10 miles to the west). The only other surface water is runoff from precipitation events which is controlled with berms. (See Figure 5.)

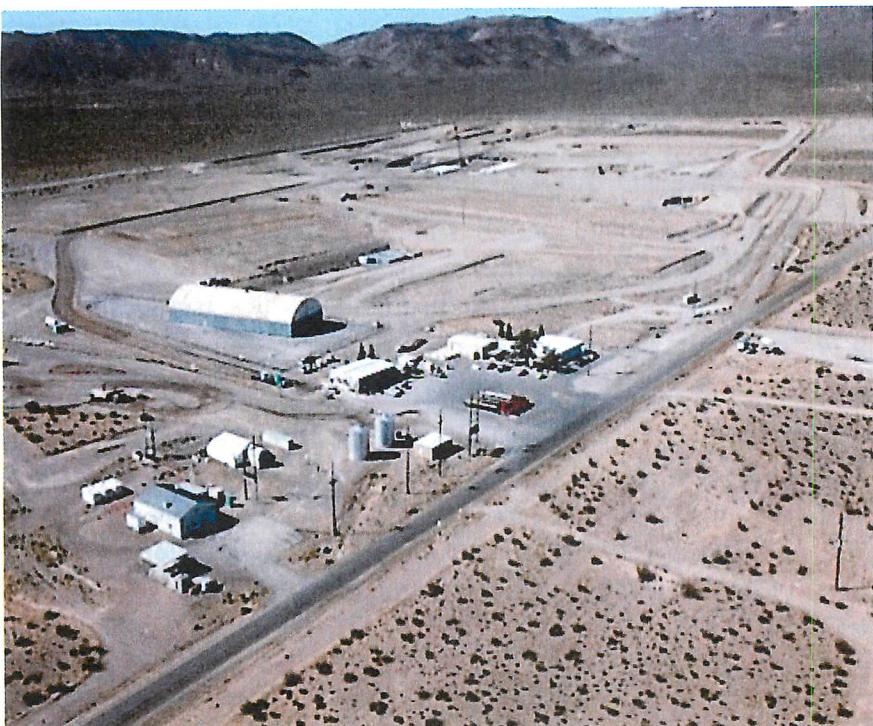


Figure 5 – Area 5 Radioactive Waste Management Site

The depth of the ground water underlying the disposal facility is approximately 770 feet below ground surface. Groundwater studies have shown essentially no vertical water flow is occurring, which suggests that there is no path to groundwater from waste disposal operations. Even though studies do not show a pathway from the waste disposal area to the groundwater below, the travel time for the

groundwater is estimated to be in feet per year. Therefore, even if there were the potential for water being contaminated by the radioactive waste, it is estimated to take tens of thousands of years to reach groundwater, and many more thousands of years for the groundwater to move across Frenchman Flat and then outside the NNSS boundaries.

The disposal area is sited in an area of alluvial deposits. There are no dominant fractures or faulting structures in or near the disposal area. Further, there is limited potential on the NNSS for volcanic activity.

Finally, the remote location and arid site environment of the NNSS are ideal for disposition of fissile uranium-containing wastes. Even though chemicals (e.g., cadmium and gadolinium) have been added to the CEUSP LLW material to preclude criticality, disposal of such wastes in this arid environment with minimal precipitation and negligible water infiltration makes it highly unlikely that potential impacts could occur beyond the site; potential adverse impacts to the environment are also highly unlikely.

7.3 Potential Impacts from Transportation

As described above, DOE's use of limitations on time and proximity to the waste and shielding of the packaging containers is expected to result in little risk of exposure under routine operating conditions. DOE's use of the OST and its protocols are expected to minimize the risk of transportation accidents. In the unlikely event that an accident may occur, OST and other DOE responders are prepared to apply all appropriate resources to reduce risks and impacts to transportation crews, the general public and to the environment.

7.4 Potential Seismic Impacts

Any potential earthquake activity is not expected to disrupt the Area 5 Radioactive Waste Management Site due to the distance (> 3 mi) from the closest active fault system. Ground motion associated with a distant earthquake event is the most likely effect of future seismic activity. The recurrence time or time between major earthquake events (i.e., > magnitude 5.0) is relatively long (10,000 to 15,000 years). Ground motion is not expected to have significant impacts on the Area 5 Radioactive Waste Management Site disposal units and closure covers, which do not use engineered components that could fail or be disrupted by seismic events.

7.5 Land Disturbance

To date, 300 acres have been utilized for waste disposal. The low-level waste disposal facility has been continuously operating since 1961, and has been the disposal site for over 25 million cubic feet (approximately 708 thousand m³) of waste. On average, the disposal facility receives approximately 1 million cubic feet (approximately 28 thousand m³) of waste per year. Thus, the disposal of the small volume of CEUSP LLW material will not cause any additional land disturbance.

7.6 Potential Impacts from Criticality Incidents in the Disposal Facility

The NNSS WAC, Appendix E, Section E.7 contains the requirements for Fissile Material Limits, which will prevent a criticality accident at the Area 5 Radioactive Waste Management Complex. On the rare occasion that a generator cannot meet the established criticality requirements, the NNSS WAC allows a generator to develop a waste specific Nuclear Criticality Safety Evaluation (NCSE) for review and consideration by the Nevada Field Office, Radioactive Waste Acceptance Program (RWAP) along with the waste profile. When RWAP receives a waste specific NCSE, per procedure RWAP-03, Waste Generator Documentation Approval Process, Section 6.3.1.3, RWAP is required to forward the NCSE to the independent nuclear criticality organization for review by a qualified Senior NCS Engineer. In accordance with CD-NOPS.001, Nuclear Criticality Safety Program, Section 4.8.1, the Senior NCS Engineer will review the waste specific NCSE for nuclear criticality compliance. The NCSE will identify necessary controls to prevent criticality events after disposal. These will include as necessary, spacing requirements and depth of burial. As necessary, the Senior NCSE Engineer will provide comments back to the RWAP staff who in turn coordinate comment resolution with the waste generator. A NCSE can be approved or rejected based upon the adequacy of comment resolution.

With regard to the CEUSP LLW material, a waste specific NCSE, *ISO-NCS-CSE-013, Nuclear Criticality Safety Evaluation CEUSP Disposal at Nevada National Security Site*, was written and reviewed via the process identified above. Using the information in the NCSE the operator of the Nevada Field Office Area 5 Radioactive Waste Management Site developed a site specific procedure, SOP-2151.237, *Off-Loading Greater Control Low-Level Waste Using the NAC-LWT Cask (SBI)* to identify and implement the controls defined by NCSE, ISO-NCS-CSE-013. Further, an Implementation Validation Review was performed to verify that the controls were effectively implemented. Additionally, a dry run using an empty disposal sleeve was performed

using the actual Type B shipping cask and necessary materials/tools/equipment per SOP-2151.237 to practice the steps required for disposal and ensure the procedure could be followed. DOE believes these procedures would ensure that the potential for a criticality incident once the CEUSP LLW material is placed in the disposal facility would render the risk negligible.

7.7 Cumulative Impacts

The cumulative impacts at Area 5 of disposing of the CEUSP LLW material would be insignificant due to the small quantity of the radioisotopes in this waste as compared to the quantities already disposed of as well as reasonably foreseeable quantities. The WM PEIS and 2013 Sitewide EIS reported small cumulative impacts from disposal of much larger quantities of higher activity radioisotopes

7.8 Additional Safety and Security Considerations

DOE O 474.2, *Nuclear Material control and Accountability*, states that DOE Oversight shall “[r]equire that when disposal of a Category II or greater quantity of special nuclear material is being considered, DOE line management for both the shipping and receiving facilities must concur in a security analysis for theft or diversion of the material performed jointly by the shipping and receiving site/facility operators”.

A classified document, entitled *Risk Assessment for the Transport of CEUSP Material* (ISO-SEC-RSK-005), was generated as a result of an in-depth analysis of the planned transportation configuration and determines that the CEUSP LLW material canisters could be transported safely and with the proper protection. Topics covered or analysis performed and/or reviewed in the assessment includes the following:

- Categorization of the CEUSP LLW Material
- Removal (difficulty factor) of uranium from canisters
- CEUSP LLW material Transport System (packaging, configuration, transport vehicle, number of drivers and security clearance requirements)
- Definition of Protection Requirements (including evaluation of the credibility of roll-up of materials)
- Threat Definition (estimating the size of the adversary)
- Theft and Diversion Analysis During Transport
 - Protection Elements
 - Shipping Cask
 - Analysis of Time Required to Access Cask Contents
 - Office of Secure Transport Escort
 - Multiple Cask Shipment Analysis
 - Radiological Sabotage Analysis

The Risk Assessment concluded that using the planned security escorts combined with the use of the selected transport packaging, experienced drivers with security clearances, inability of adversaries to obtain the material and the extreme difficulty of processing/refining the material into a usable form that theft or diversion for terrorist use is not credible.

8.0 CONCLUSION

An examination of the isotopic and activity makeup of LLW waste streams, including high activity waste streams analyzed in the WM PEIS for disposal at the NNSS under either the Regionalized or Centralized Alternatives, shows that in all resource areas, the activity content in the CEUSP LLW material (approximately 3,000 Ci) is insignificant compared to the activity analyzed in the WM PEIS (up to 42,700,000 Ci) for transportation to and disposal at NNSS. Using conservative analytical assumptions for the far larger volume analyzed in the WM PEIS (up to 1,500,00 m³) as compared to the CEUSP LLW material (2.83 m³), the WM PEIS and other NEPA reviews nevertheless showed small potential impacts on human health and the environment. The radiological contribution of the CEUSP LLW material is not only well within the WM PEIS LLW inventories evaluated, the potential health and environmental impacts from disposing of the CEUSP LLW material at NNSS would be negligible. For all resource areas, the WM PEIS results indicated that, even for the large volume and high activity radionuclides analyzed, the potential impacts would be small. In other words, the comparatively negligible radioactivity and volume of the CEUSP LLW material would not change the impact results reported in the WM PEIS or other analyses discussed in this SA.

Since 1996, approximately 726,700 m³ (25,663,000 ft³) of LLW has been disposed of at the NNSS Area 5 facility. This does not approach the volume analyzed in the WM PEIS, and thus the CEUSP LLW material would not change the impact results reported in the WM PEIS. Further, the WM PEIS analyses continue to be valid due to the fact that radionuclides placed in the disposal facility, because of the absence of water in the soil, will not undergo chemical interactions or physical movement from the emplaced disposal location. By the same token, DOE's transportation protocols, including shipping casks and worker safety requirements during all aspects of the operation—loading at the site of origin to the site of destination—would ensure that routine operations and accidents are within the ranges of existing NEPA analyses.

Regarding public outreach, the NNSS has long maintained an active program to inform State and local officials about the Site's activities. DOE conducted two public outreach sessions in November 2013 to disseminate information. A number of additional sessions for specific state and local governmental agencies and Tribal representatives were conducted beginning in and since November 2013 to disseminate information to State regulators, Native American tribes, and other local officials with regard to all aspects associated with the transportation of the CEUSP LLW material and disposal of this material at NNSS. In early 2014, DOE posted a summary of questions, topics and responses from the November sessions on the NNSS web site at:

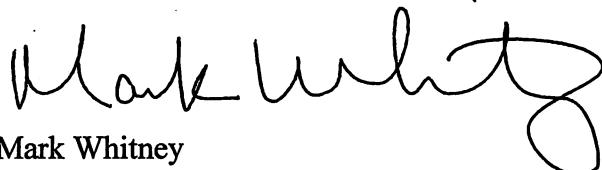
http://www.nv.energy.gov/outreach/pdfs/Summary%20of%20Qs-n-As_2-11-2014_FINAL.pdf

DOE used the valuable insights gained from the views of involved organizations and other members of the public to address, for example, concerns expressed regarding safe transportation, security, and potential environmental impacts associated with the disposal of the CEUSP waste material at NNSS. DOE has also used the information from dialogue with the public and several pertinent analyses identified in this SA to develop a careful plan for all activities, beginning with cannister loading at ORNL, transport to the NNSS, unloading at Area 5, and final emplacement in secure disposal facilities, which the Federal Government is committed to protecting from theft, diversion, or intentional destructive acts in perpetuity. The Appendix to this SA lists DOE's public involvement activities regarding the CEUSP LLW material through May 2014.

9.0 DETERMINATION

Based on the analyses in this SA, DOE has concluded that the proposal to transport the CEUSP LLW material from ORNL to the NNSS for disposal does not constitute significant new circumstances or information relevant to environmental concerns bearing on the Proposed Action(s) in the WM PEIS or the 2013 Sitewide EIS as well as other relevant NEPA reviews. Therefore, in accordance with CEQ and DOE regulations, I have determined that a supplemental EIS, new EIS, or an Environmental Assessment are unnecessary. The potential environmental impacts associated with the proposed action are within the range of analytic results of the Expanded Operations Alternative of the 1996 Sitewide EIS ROD, as amended by the 2000 WM PEIS ROD implementing the Expanded Operations Alternative for the NNSS. The potential environmental impacts associated with the proposed action are also consistent with those analyzed in the 2013 Sitewide EIS No Action Alternative.

Approved: August 7, 2014



Mark Whitney
Acting Assistant Secretary
for Environmental Management

10.0 REFERENCES

- Atomic Energy Commission (AEC). 1972. *Environmental Survey of Transportation of Radioactive Materials to and from Nuclear Power Plants*, Directorate of Regulatory Standards, WASH-1238.
- AEC. 1974. *Environmental Survey of the Uranium Fuel Cycle*. WASH-1248
- DOE. 1980a. *U.S. Spent Fuel Policy Final Environmental Impact Statement*.
- DOE. 1980b. *Management of Commercially Generated Radioactive Waste*, DOE/EIS 0046F, October.
- DOE. 1980c. *Environmental Impact Statement: Waste Isolation Pilot Plant*, DOE-EIS 0026.
- DOE. 1996. *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada*, DOE/EIS 0243.
- DOE. 1996. Record of Decision Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada, 61 FR 65551, December 13.
- DOE. 1997. *Final Waste Management Programmatic Environmental Impact Statement for Managing, Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*; DOE/EIS-0200.
- DOE. 1999. *Record of Decision for the Disposal of Oak Ridge Reservation Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Waste, Oak Ridge, Tennessee*, DOE/OR/01-1791&D3.
- DOE. 2010. *Final Environmental Assessment and Finding of No Significant Impact for U-233 Material Downblending and Disposition Project at the Oak Ridge National Laboratory, Oak Ridge, Tennessee*; DOE/EA-1651; January.
- DOE, 2011. *Supplemental National Environmental Policy Act Analysis in Support of the U-233 Disposition Project 2011*; Memorandum from Kreuger, EM-90, to Susan M. Cange, EM-90; November 7.
- DOE. nd. Classified Document: *Risk Assessment for the Transport of CEUSP Material*, ISO-SEC-RSK-005.
- DOE. 2012. *Nevada National Security Site Waste Acceptance Criteria Revision 9*, DOE/NV—325, Nevada, February 2012.

National Nuclear Security Administration (NNSA). 2013. *Nevada National Security Site Environmental Report Summary 2012*; Site Environmental Report: DOE/NV/25946; September.

NNSA. 2013. *Final Site-wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and the Off-Site Locations in the State of Nevada*, DOE/EIS-0426, February.

Nuclear Regulatory Commission. 1977. *Final Environmental Impact Statement on the Transportation of Radioactive Material by Air and Other Modes*, NUREG-0170, December.

U.S. Congress. 2005. *The Conference Report accompanying the Energy and Water Development Appropriations Act, 2006*, Public Law 109-103, Nov. 19.

U.S. Department of Energy (DOE). 2007. *Final Environmental Assessment U-233 Stabilization, and Building 3019 Complex Shutdown at the Oak Ridge National Laboratory Oak Ridge, Tennessee*; EA-1574.

APPENDIX

Stakeholder Interactions Regarding CEUSP LLW Material November 2013 through May 2014

November 12, 2013

- CEUSP LLW Material Key stakeholder meeting in Las Vegas for officials and tribal entities
- CEUSP LLW Material Key stakeholder meeting in Pahrump for Nye County and tribal entities
- Conducted media call

November 13, 2013

- CEUSP LLW Material Public meeting in Las Vegas
- Department of Energy, Environmental Management and Office of Secure Transportation attend Clark County Local Emergency Planning Committee Meeting

November 14, 2013

- Key stakeholder meeting in Las Vegas for Lincoln, Esmeralda and White Pine Counties and tribal entities
- Meeting with Las Vegas mayor
- CEUSP LLW Material Public meeting in Pahrump
- Posted to website (www.nv.energy.gov/llwdisposal.aspx) the Special Analysis for the Disposal of CEUSP LLW material at the Area 5 Radioactive Waste Management Site (January 2013); Environmental Monitoring Report for the Area 3 and 5 Radioactive Waste Management Sites (August 2013); Area 5 Radioactive Waste Management Site Groundwater Monitoring Program (February 2013); Performance Assessments and Composite Analyses Annual Summary for the Area 3 and Area 5 Radioactive Waste Management Sites (March 2013)

November 15, 2013

- Posted to website the posters and briefing from public meetings

November 20, 2013

- Nevada Site Specific Advisory Board meeting: provided update on CEUSP LLW material activities
- Nevada Field Office Environmental Management intergovernmental meeting (Nye, Clark, Esmeralda County) in Las Vegas

December 18, 2013

- Office of Secure Transportation Liaison Briefing to Law Enforcement and Emergency Responders

December 19, 2013

- Nevada Field Office Environmental Management meeting with Nye County to discuss Special Analysis
- Nevada Field Office Environmental Management and staff meeting with NSSAB chair and vice-chair to update on CEUSP LLW material and misc. items.

January 20–22, 2014

- Office of Secure Transportation Liaison Briefings to Nevada Emergency Responders

January 21, 2014

- Nevada Field Office Environmental Management and National Security—Provided a tour of Area 5 Radioactive Waste Management Site (and other locations on the Nevada National Security Site) to Senator Reid's Public Land Manager and Military Liaison

January 23, 2014

- Nevada National Security Site Tour for Pahrump Public Meeting Attendees

January 30 and 31, 2014

- Working Group Meeting (DOE and NV)
- Working Group with Las Vegas Mayor Goodman staff
- Working Group with Representative Titus staff
- Working Group with Nye County staff
- Working Group with Clark County staff
- Working Group with Senator Bryan

February 4, 2014

- Debriefing of Nevada Delegation by Working Group (telephone):
 - Rep. Titus staff
 - Rep. Heck staff
 - Sen. Reid staff
 - Rep. Amodei staff
 - Sen. Heller staff
 - Rep. Horsford staff
- Nevada Field Office Environmental Management meeting with NSSAB chair and vice-chair to update on CEUSP LLW material and miscellaneous items.

February 10, 2014

- Nevada National Security Site tour (including LLW facility) for Las Vegas City Council members, Fire Chief, and staff

February 12, 2014

- Posted online the summary of public meeting

February 18, 2014

- Nevada Field Office Site Manager Briefing to Nye County Commissioners

February 19, 2014

- NSSAB Meeting: provided update on CEUSP LLW material activities
- Nevada Field Office Environmental Management intergovernmental meeting (Nye, Clark, Esmeralda Counties; State of Nevada) in Beatty, NV

February 26, 2014

- Office of Secure Transportation Liaison Briefing to Nevada Highway Patrol Southern Command

March 4, 2014

- Department of Energy, Headquarters Environmental Management and Nevada Field Office Environmental Management meeting in Phoenix, AZ with State of Nevada and Clark County staff on Nevada National Security Site Waste Acceptance Criteria Revision 9 and 10

March 5, 2014

- Department of Energy Headquarters Environmental Management and Nevada Field Office Environmental Management staff met in Phoenix with State of Nevada staff to discuss:
 - Nevada National Security Site Waste Acceptance Criteria
 - Waste profile review process
 - Specific waste streams

March 8, 2014

- Nevada Field Office Environmental Management Program meeting on CEUSP LLW material with members of the Pahrump and Moapa Southern Paiute tribal members

March 12, 2014

- Nevada National Security Site Tour (including LLW facility) for Pahrump Public Meeting Attendees

March 19, 2014

- NSSAB meeting: provided update on CEUSP LLW material activities
- Nevada Field Office Environmental Management intergovernmental meeting (Nye, Clark, White Pine County, and State of Nevada) in Las Vegas, NV

March 20, 2014

- Nevada National Security Site Tour (including LLW facility) for Rep. Titus Staff

April 2, 2014

- NV observers attended the NUWAIX emergency exercise held in Grand Junction, CO

April 14, 2014

- Tabletop emergency exercise held with Office of Secure Transportation at the Nevada Field Office with participation from local emergency responders.

April 15 - 16, 2014

- Office of Secure Transportation Liaison briefing to Clark County Fire Department personnel

April 21, 2014

- Nevada National Security Site Tour (including LLW facility) for State of Nevada High Level Waste Committee and personnel.

April 23, 2014

- Nevada Field Office Environmental Management routine meeting with Clark County and Nye County on Nevada National Security Site EM program.

May 7, 2014

- Working Group Meeting (DOE and NV) in Washington, DC

May 8, 2014

- Briefing of Nevada Delegation by Working Group (Washington, DC)
 - Rep. Titus
 - Rep. Heck
 - Sen. Reid staff
 - Rep. Amodei
 - Sen. Heller
 - Rep. Horsford staff

May 21, 2014

- NSSAB meeting: provided update on CEUSP LLW material activities
- Nevada Field Office Environmental Management intergovernmental meeting (Nye, Clark Counties, and State of Nevada) in Pahrump, NV

May 29, 2014

- Nevada National Security Site Tour (including LLW facility) for Sen. Heller staff