DOE/EIS-0236-S4-SA-02

June 2019

Draft Supplement Analysis of the Complex Transformation Supplemental Programmatic Environmental Impact Statement

National Nuclear Security Administration

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Executive Summary

In 2008, the National Nuclear Security Administration (NNSA) prepared the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (Complex Transformation SPEIS) which evaluated, among other things, alternatives for producing 10-200 pits per year at different site alternatives, including the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico, and the Savannah River Site (SRS) near Aiken, South Carolina. In the Complex Transformation SPEIS Records of Decision, NNSA did not make any new decisions related to pit production capacity and did not foresee an imminent need to produce more than 20 pits per year to meet national security requirements. Currently, plutonium pits are produced at LANL, although the actual number of pits produced has been less than 20 per year.

NNSA, a semi-autonomous agency within the United States Department of Energy, is responsible for meeting the national security requirements established by the President and the Congress to maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile. Since 2008, NNSA has emphasized the need to eventually produce 80 pits per year; the joint DoD-DOE white paper entitled, *National Security and Nuclear Weapons in the 21st Century,* cataloged the need and justification for pit production rates. In the decade plus since this paper was published, the drivers and the requirement for pit production have remained relatively unchanged through several administrations and changes in congressional leadership. In addition, language in National Defense Authorization Acts from 2013-2018 provided specific pit production goals. On January 27, 2017, the President directed the Department of Defense to conduct a Nuclear Posture Review (NPR) to ensure a safe, secure, and effective nuclear deterrent that protects the homeland, assures allies, and above all, deters adversaries. The 2018 NPR echoed the need for pit production by announcing that the United States will pursue initiatives to ensure the necessary capability, capacity, and responsiveness of the nuclear weapons infrastructure and the needed skill of the workforce, including providing the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030. In 2018, Congress enacted as formal policy of the United States that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120).

NNSA now foresees an imminent need to provide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030. Addressing this need can no longer be delayed without increasing the risk to the deterrent. As a result, NNSA is proposing to produce a minimum of 50 pits per year at a repurposed Mixed-Oxide Fuel Fabrication Facility (MFFF) at SRS and a minimum of 30 pits per year at LANL, with additional surge capacity at each site, if needed, 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 as identified in the 2018 NPR.

NNSA has prepared this Supplement Analysis (SA) to allow NNSA to determine whether, prior to proceeding with the effort to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030, the existing Complex Transformation SPEIS should be supplemented, a new environmental impact statement should be prepared, or no further *National Environmental Policy Act* (NEPA) analysis is required. The Draft SA preliminarily concludes that further NEPA documentation at a programmatic level is not required; however, NNSA will consider comments on this Draft SA and publish a Final SA. NNSA has committed to preparing site-specific analyses prior to initiating pit production at SRS or producing more than 20 pits per year at LANL.

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Acronyms and Abbreviations

AOA	Analysis of Alternatives
CBFO	Carlsbad Field Office
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Ci	curies
CMRR	Chemistry and Metallurgy Research Building Replacement
CMRR-NF	Chemistry and Metallurgy Research Building Replacement- Nuclear Facility
DoD	Department of Defense
DOE	Department of Energy
EIS	environmental impact statement
FPF	Fuel Processing Facility
ft^2	square feet
HC	Hazard Category
INL	Idaho National Laboratory
KCNSC	Kansas City National Security Campus
LANL	Los Alamos National Laboratory
LCF	latent cancer fatality
LLNL	Lawrence Livermore National Laboratory
LLW	low-level radioactive waste
MAR	material-at-risk
MEI	maximally exposed individual
MFFF	Mixed-Oxide Fuel Fabrication Facility
MOX	mixed-oxide
mrem	millirem
MWe	megawatts-electric
m^3	cubic meters
NAAQS	National Ambient Air Quality Standards
NAS	National Academies of Sciences, Engineering, and Medicine
NEPA	National Environmental Policy Act of 1969, as amended
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NPR	Nuclear Posture Review
NTP	National TRU Program
OST	Office of Secure Transportation
Pantex	Pantex Plant
PCB	polychlorinated biphenyl
PDCF	pit disassembly and conversion facility
PEIS	Programmatic Environmental Impact Statement
PF	Plutonium Facility
PIDAS	Perimeter Intrusion, Detection, and Assessment System
PuE	plutonium-239 equivalent
RLUOB	Radiological Laboratory/Utility/Office Building
ROD	Record of Decision
SA	supplement analysis

SEIS	Supplemental Environmental Impact Statement
SNF	spent nuclear fuel
SNL	Sandia National Laboratories
SPEIS	Supplemental Programmatic Environmental Impact Statement
SRS	Savannah River Site
SWEIS	Site-Wide Environmental Impact Statement
TA	technical area
TWF	TRU Waste Facility
TRU	transuranic
U.S.	United States
VRM	visual resource management
WIPP	Waste Isolation Pilot Plant
Y-12	Y-12 National Security Complex
yd^3	cubic yards

1.0 INTRODUCTION

This Supplement Analysis (SA) was prepared in accordance with the United States Department of Energy (DOE) procedures implementing the *National Environmental Policy Act of 1969* (NEPA; 42 U.S.C. § 4321 et seq.) that require that "[when] it is unclear whether or not an EIS supplement is required, DOE shall prepare a Supplement Analysis [that] shall discuss the circumstances that are pertinent to deciding whether to prepare a supplemental EIS pursuant to 40 CFR 1502.9(c)" (10 CFR 1021.314).

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within DOE, is responsible for meeting the national security requirements established by the President and Congress to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test (Public Law 106-65, as amended). Plutonium pits are critical components of every nuclear weapon, with nearly all current stockpiled pits having been produced from 1978-1989 (DOD 2018a p. 62). Currently, plutonium pits are produced at the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico. A production rate of up to 20 pits per year was initially decided and the environmental effects of this production level were examined by the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (PEIS) and its accompanying Record of Decision (ROD) (DOE 1996a). A production level of up to 20 pits per year was again examined as the selected No Action Alternative for the 2008 LANL Site-Wide Environmental Impact Statement (SWEIS) (DOE 2008a).

> **Pit**
>
> A pit is the central core of a nuclear weapon, principally containing plutonium or enriched uranium.

In 2008, NNSA prepared the Complex Transformation Supplemental Programmatic Environmental Impact Statement (Complex Transformation SPEIS) that evaluated, among other things, constructing a new pit production facility ("Greenfield") to produce 125 pits per year at one of five site alternatives: LANL; the Savannah River Site (SRS) near Aiken, South Carolina; the Pantex Plant (Pantex) near Amarillo, Texas; the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee; and the Nevada National Security Site (NNSS) north of Las Vegas, Nevada (DOE 2008c p. 3-20). At LANL, the SPEIS also included an analysis of two distinct upgrades to existing facilities, one to support production of 125 pits per year, and one to support production of 50-80 pits per year (DOE 2008e p. 5-3). At SRS, the SPEIS also evaluated a pit production facility that would use the Mixed-Oxide Fuel Fabrication Facility (MFFF) and Pit Disassembly and Conversion Facility (PDCF) infrastructure (DOE 2008c p. 5-236). In the SPEIS ROD, NNSA did not make any new decisions related to pit production capacity and did not foresee an imminent need to produce more than 20 pits per year to meet national security requirements (DOE 2008e).[1]

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[1] To date, NNSA has issued two RODs for the Complex Transformation SPEIS, both published December 19, 2008, including: (1) Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement – Operations Involving Plutonium, Uranium, and the Assembly and Disassembly of Nuclear Weapons (the "programmatic

Since 2008, NNSA has emphasized the need to eventually produce 80 pits per year. The joint Department of Defense (DoD)-DOE white paper, *National Security and Nuclear Weapons in the 21st Century,* cataloged the need and justification for pit production rates. In the decade plus since the DoD-DOE paper was published, the drivers and the requirement for pit production have remained relatively unchanged through several administrations and changes in congressional leadership. Language in National Defense Authorization Acts from 2013-2018 also provided specific pit production goals. The 2018 *Nuclear Posture Review* (2018 NPR) codified this pit production requirement by stating that NNSA must produce at least 80 plutonium pits per year by 2030 and must sustain the capacity for future life extension programs and follow-on programs (DOD 2018a p.62). As a result, the U.S. is pursuing an initiative to provide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030 (DOD 2018a p.62-63). Additionally, in 2018, the *Johns S. McCain National Defense Authorization Act for Fiscal Year 2019* (Public Law 115-232, Section 3120), Congress enacted as formal policy of the United States that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120). To that end, the U.S. Department of Defense (DoD) Under Secretary of Defense for Acquisition and Sustainment and the NNSA Administrator issued a Joint Statement on May 10, 2018, describing NNSA's recommended alternative to pursue a two-prong approach—with a minimum of 50 pits per year produced at SRS and a minimum of 30 pits per year produced at LANL (DOD 2018b). This approach would provide an effective, responsive, and resilient nuclear weapons infrastructure with the flexibility of adapting to shifting requirements.

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION AND THIS SUPPLEMENT ANALYSIS

NNSA's responsibility is to maintain a safe, secure, and reliable nuclear weapons stockpile and create a responsive nuclear weapons infrastructure that is cost-effective and has adequate capacity to meet reasonably foreseeable national security requirements. By congressional mandate and DOE and NNSA direction, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 (DOD 2018a). The purpose and need has not changed from that stated in the Complex Transformation SPEIS (DOE 2008c p. 2-1). The preparation and analysis in this SA will enable NNSA to decide whether or not a supplemental EIS, a new EIS, or no further NEPA documentation is required prior to making programmatic decisions regarding pit production.

1.2 PROPOSED ACTION

NNSA's proposed action (detailed in Section 2 of this SA) is to produce a minimum of 50 pits per year at a repurposed MFFF at SRS and a minimum of 30 pits per year at LANL, with

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alternatives" ROD) (DOE/NNSA EIS-0235-S4 ROD-01); and (2) Record of Decision for the Complex Transformation Supplemental Programmatic Environmental Impact Statement – Tritium Research and Development, Flight Test Operations, and Major Environmental Test Facilities (the "project-specific alternatives" ROD) (DOE/NNSA EIS-0235-S4 ROD-02). Where this SA references the ROD to the SPEIS, it is referencing the programmatic alternatives ROD.

additional surge capacity at each site, if needed, 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 proposed action also includes activities across the nuclear weapons complex (Complex) associated with transportation, waste management, and ancillary support (e.g., staging, testing, etc.) for pit production.

1.3 SCOPE AND ORGANIZATION OF THIS SUPPLEMENT ANALYSIS

In this SA, NNSA evaluates the potential environmental impacts of producing up to 80 pits per year at *both* LANL and SRS. This approach provides a conservative analysis and affords NNSA the flexibility of adapting to shifting requirements. The Complex Transformation SPEIS acknowledged that NNSA would prepare site-specific analyses, as needed, following any programmatic decisions (DOE 2008c p. 1-11). Those site-specific documents would use more detailed information to evaluate the potential environmental impacts at LANL and SRS.

This SA is organized as follows:

- Section 1 contains the introduction;
- Section 2 describes the proposed action;
- Section 3 discusses the process/methodology used, and contains the comparative environmental impact analysis;
- Section 4 presents potential cumulative impacts;
- Section 5 includes the Preliminary Determination, and
- Section 6 identifies references used.

1.4 NEPA STRATEGY AND RELEVANT NEPA DOCUMENTS AND OTHER DOCUMENTS

If, through the analysis in this SA, NNSA determines that the programmatic proposed action is adequately supported by existing NEPA documentation, NNSA could amend the Complex Transformation ROD and prepare at least two site-specific documents. These could include: (1) a site-specific SA to the 2008 LANL Site-wide Environmental Impact Statement (SWEIS) for the proposal to increase authorized production levels to produce a minimum of 30 pits per year at LANL, with additional surge capacity, if needed; and (2) a site-specific EIS for the proposal to repurpose the MFFF at SRS to produce a minimum of 50 pits per year at SRS, with additional surge capacity, if needed. NNSA is preparing a new EIS at SRS but not at LANL at this time in light of several factors, including the fact that LANL has multiple SWEISs that have analyzed pit production at levels of 80 pits per year whereas SRS does not have an EIS that has analyzed site-level pit production, and the MFFF is being repurposed for a new use not previously analyzed at a site-level. The SA to the 2008 LANL SWEIS will enable NNSA to decide whether further NEPA documentation is required at LANL prior to making final decisions for LANL at a site-level.

For preparation of this SA, NNSA uses incorporation by reference and tiers from previous DOE/NNSA NEPA and non-NEPA documents to succinctly present the analysis. Information from these documents provides a context for understanding the current status of NEPA compliance, which forms the foundation for preparing the comparative analysis in this SA. The following documents, presented in order of highest relevance within each of five sub-categories (e.g., Programmatic NEPA documents, Site-Wide NEPA documents, Waste Isolation Pilot Plant (WIPP)-Related NEPA documents, Site-Specific Plutonium-Related NEPA Documents, and Other Relevant Documents), are key references relevant to this SA proposed action:

Programmatic NEPA Documents

The Complex Transformation SPEIS (DOE 2008c) analyzed the environmental impacts of alternatives for transforming the nuclear weapons complex into a smaller, more efficient enterprise that could respond to changing national security challenges and ensure the long-term safety, security, and reliability of the nuclear weapons stockpile. With respect to pit production specifically, the Complex Transformation SPEIS evaluated: (1) constructing and operating a new Greenfield pit production facility to produce 125 pits per year at LANL, SRS, Y-12, Pantex, and NNSS; (2) two distinct upgrades to existing facilities at LANL, one to support production of 200 pits per year, and one to support production of 50-80 pits per year; and (3) constructing and operating a pit production facility that would use the MFFF and PDCF infrastructure at SRS to produce 200 pits per year (DOE 2008c p. 3-20, p. 5-3, p. 5-236). In the ROD (DOE 2008e), NNSA did not make any new decisions related to pit production capacity and did not foresee an imminent need to produce more than 20 pits per year to meet national security requirements. The ROD also stated that manufacturing, research, and development involving plutonium would remain at LANL, which was reaffirmed by the *Fiscal Year 2019 Stockpile Stewardship Management Plan* (DOE 2018a p. 2-15). The Complex Transformation SPEIS is the primary NEPA document supporting the analysis in this SA.

The Surplus Plutonium Disposition Final Environmental Impact Statement (DOE 1999b) analyzed the environmental impacts of alternatives for disposition of up to 50 metric tons of surplus plutonium using both immobilization and mixed-oxide (MOX) fuel technologies. In the ROD (DOE 2000), DOE announced its decision to construct and operate three new facilities at SRS, including the MFFF, which NNSA is now proposing to repurpose for pit production.

The Surplus Plutonium Disposition Final Supplemental Environmental Impact Statement (DOE 2015a) 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 surplus pit plutonium and 6 metric tons of surplus non-pit plutonium. In the ROD (DOE 2016a), DOE announced its decision to prepare and package the 6 metric tons using facilities at SRS to meet the WIPP waste acceptance criteria and ship the surplus plutonium to WIPP for disposal.

Site-Wide NEPA Documents

The Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (1999 LANL SWEIS) (DOE 1999c) considered the environmental impacts of ongoing and proposed activities at LANL. In the

September 1999 ROD (DOE 1999a), DOE decided to continue to operate LANL for the foreseeable future and to expand the scope and level of its operations. With respect to pit production specifically, DOE decided to conduct "pit production limited to a capacity that can be accommodated within the limited space currently set aside for this activity in the plutonium facility (estimated at nominally 20 pits per year)." The Expanded Operations Alternative analyzed production of up to 80 pits per year.

2008 LANL SWEIS (DOE 2008a) was issued May 16, 2008. In the September 2008 ROD (DOE 2008b), NNSA decided "to continue operation of the Laboratory with discrete elements from the Expanded Operations Alternative." With respect to pit production specifically, NNSA decided to not change pit production capacity at LANL, which was established at 20 pits per year by the 1999 LANL SWEIS ROD. The Expanded Operations Alternative analyzed production of up to 80 pits per year.

The 2018 Supplement Analysis of the 2008 LANL SWEIS (DOE 2018h) evaluated projects and impacts of activities conducted since publication of the LANL SWEIS and projects being proposed from 2018 through 2022. NNSA determined that ongoing operations, new and modified projects, and modifications in site operations at LANL do not constitute a substantial change in the actions previously analyzed in the 2008 SWEIS. The analysis supporting the 2018 SA to the LANL SWEIS was conducted before the announcement of national policy on pit production.

The Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components (Pantex SWEIS) (DOE 1996b) analyzed the potential environmental impacts of ongoing and future operations and activities at Pantex. In the ROD (DOE 1997b), DOE decided to (1) continue assembly and disassembly of nuclear weapons; (2) implement facility projects, including upgrades and construction consistent with conducting these operations; and (3) continue providing interim pit staging and increasing the staging capacity from 12,000 to 20,000 pits. Pantex supports the pit production mission by storing pits, providing feedstock to LANL for use in pit production, and performing nonintrusive pit modification (e.g., changes to the external surfaces and features of a pit).

The Four Supplement Analyses for the Pantex SWEIS (DOE 2003b, 2008d, 2012b, 2018b) evaluated changes since the issuance of the Pantex SWEIS to determine if the EIS should be supplemented or if a new Pantex EIS was needed. These analyses indicate that the identified and projected resource area impacts, including cumulative impacts, were not substantially changed from those identified in the Pantex EIS, nor did they represent significant, new circumstances or information relative to environmental concerns.

The Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (NNSS SWEIS) (DOE 2013) discussed ongoing and reasonably foreseeable future operations and activities for support of the NNSA mission. The NNSS SWEIS included an analysis of the transportation and disposal of low-level radioactive waste (LLW) from various NNSA sites, including LANL, to NNSS. The 2014 ROD (DOE 2014) enables LLW from LANL to be disposed of at NNSS.

The Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex (Y-12 SWEIS) (DOE 2011b) analyzed the potential environmental impacts of ongoing and future operations and activities at Y-12. In the ROD (DOE 2011a), NNSA decided to construct and operate a capability-sized uranium processing facility at Y-12 next to the Highly Enriched Uranium Materials Facility. Y-12 supports the pit production mission by providing any required uranium to the pit production facility.

The two Supplement Analyses for the Y-12 SWEIS (DOE 2016b, 2018e) evaluated changes since the issuance of the Y-12 SWEIS to determine if the SWEIS should be supplemented or if a new Y-12 SWEIS was needed. These analyses indicate that the identified and projected environmental impacts, including cumulative impacts, were not substantially changed from those identified in the Y-12 SWEIS, nor did they represent significant, new circumstances or information relative to environmental concerns.

WIPP-Related NEPA Documents

The Waste Isolation Pilot Plant (WIPP) Final Environmental Impact Statement (1980 WIPP EIS) (DOE 1980) analyzed the environmental impacts of initial construction and operation of WIPP. The ROD (DOE 1981) documented DOE's decision to proceed with the phased construction and operation of WIPP near Carlsbad, New Mexico. The WIPP stores transuranic (TRU) waste from pit production activities.

The Supplemental Environmental Impact Statement for the Waste Isolation Pilot Plant (WIPP SEIS-I) (DOE 1990b) evaluated the environmental impacts associated with new information and changes since the 1981 ROD. SEIS-I included an analysis of changes in the TRU waste inventory, consideration of the hazardous chemical constituents in the TRU waste, modification and refinement of the system for the transportation of TRU waste to WIPP, modification of the Test Phase, and changes in the understanding of the hydrogeological characteristics of the WIPP site. The ROD for SEIS-I (DOE 1990a), which was issued in June 1990, continued the phased development of WIPP by instituting an experimental program to further examine WIPP's suitability as a TRU waste repository.

The Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS-II) (DOE 1997a) analyzed the potential environmental impacts associated with disposing of TRU waste at WIPP and polychlorinated biphenyl (PCB)-commingled TRU waste in the DOE inventory at the time. DOE's Proposed Action was to open WIPP and dispose of up to 175,600 m^3 of TRU waste generated from defense activities. The ROD (DOE 1998) authorized the disposal of up to 175,600 m^3 of TRU waste (except PCB-commingled TRU waste) at WIPP.

The Supplement Analysis for the WIPP SEIS-II (DOE 2016c) was prepared in December 2016 to evaluate the restart of operations at WIPP following two accidents that occurred at WIPP in February 2014. Following that SA, DOE restarted WIPP operations in January 2017.

Site-Specific Plutonium-Related NEPA Documents

In 2005, the U.S. Nuclear Regulatory Commission prepared the Final EIS on the Construction and Operation of a Mixed Oxide Fuel Fabrication Facility at the Savannah River Site, South Carolina (NRC 2005) which evaluated use of the MFFF for conversion of 34 metric tons of surplus weapons-grade plutonium into MOX fuel, operating at a maximum annual throughput of 3.5 metric tons of plutonium. Feedstock transportation from other sites was included in the analysis as were two proposed facilities — the PDCF and the Waste Solidification Building — that would have been required to support operation of the proposed MOX facility.

In 2003, NNSA prepared the Chemistry and Metallurgy Research Building Replacement (CMRR) EIS (DOE 2003a), which evaluated alternatives for replacing the analytical chemistry and materials characterization capabilities provided in the CMR Building. The CMRR project was to provide the physical means for conducting mission-critical CMR capabilities, to consolidate like activities for operational efficiency, and to potentially provide extra space for future modifications. The ROD (DOE 2004) authorized the construction and operation of a two-building replacement for the CMR Building to be located in Technical Area (TA)-55. These buildings were to consist of: (1) a Radiological Laboratory/Utility/Office Building (RLUOB); and (2) a nuclear facility (CMRR-NF) housing Hazard Category (HC) 2 nuclear operations. RLUOB was constructed and is in operation; however, construction of CMRR-NF was initially delayed and subsequently cancelled (see below).

In 2011, NNSA issued the SEIS for the Nuclear Facility Portion of the CMRR Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR-NF SEIS) (DOE 2011c), which evaluated the potential environmental impacts from revised alternatives for constructing and operating the CMRR-NF and from ancillary projects that had been proposed since publication of the CMRR EIS. On October 18, 2011, in an amended ROD (DOE 2011d) NNSA selected the Modified CMRR-NF Alternative for constructing and operating the CMRR-NF portion of the CMRR project. After publication of the CMRR-NF SEIS ROD, NNSA first announced a delay in construction of the CMRR-NF (DOE 2012a) and then cancelled it in the 2016 budget request (DOE 2015b). In this same time frame, other changes occurred that affected the options available to NNSA for providing needed analytical chemistry and materials characterization capabilities.

In January 2015, NNSA issued the 2015 CMRR SA (DOE 2015c), which addressed proposed modifications to NNSA's approach for ensuring analytical chemistry and materials characterization capabilities at LANL by performing analytical chemistry and materials characterization work in RLUOB and in space to be made available at PF-4. Under these modifications, RLUOB would continue to operate as a radiological facility, but with an increased allowable quantity of actinides such as plutonium-239. NNSA determined that no additional NEPA documentation was needed to implement this modified approach.

Other Relevant Documents

Fiscal Year 2019 Stockpile Stewardship and Management Plan, a Report to Congress (DOE 2018a) describes the DOE/NNSA's plans to ensure the safety, security, and effectiveness of the U.S. nuclear weapons stockpile mission to carry out national security responsibilities by maintaining a safe, secure, and effective nuclear deterrent; preventing, countering, and responding to the threats of nuclear proliferation and terrorism worldwide; and providing naval nuclear propulsion.

2018 NPR (DOD 2018a) was issued in February 2018 by the Office of the Secretary of Defense. The 2018 NPR assessed previous nuclear policies and requirements and focused on identifying the nuclear policies, strategy, and corresponding capabilities needed to protect the Nation in the deteriorating threat environment that confronts the United States, its allies, and partners. The NPR provided guidance for the nuclear force posture and policy requirements needed now and in the future.

2018 Joint DoD/NNSA Statement on the recapitalization of plutonium pit production (DOD 2018b) was issued on May 10, 2018 by Ellen M. Lord, DoD Under Secretary of Defense for Acquisition and Sustainment, and Lisa E. Gordon-Hagerty, NNSA Administrator. This Joint Statement announced the two-prong approach to produce a minimum of 50 pits per year at SRS and a minimum of 30 pits per year at LANL.

Final Report for the Plutonium Pit Production Analysis of Alternatives (AOA Report) (DOE 2017b) was issued in October 2017. The purpose of this report was to identify and assess alternatives across DOE sites that could deliver the infrastructure to meet the sustained plutonium pit requirements of 80 pits per year by 2030. To achieve the required annual pit production rate, the AOA Report considered the construction of new facilities and the refurbishment of existing facilities. The AOA Report identified LANL and SRS as the two preferred locations to accomplish this enduring mission (DOE 2017b p. 1).

Pit Production Engineering Assessment (Parsons 2018) was issued in April 2018. The purpose of this report was to conduct an engineering assessment of a 50 pit per year capability in support of pre-Critical Decision-1 activities to support decision making and conceptual design of preferred alternatives for enduring pit production and related plutonium operations. The Pit Production Engineering Assessment Report determined the engineering feasibility of alternatives, developed schedule and cost estimate ranges, and assessed qualitative risks. Together, the Pit Production Engineering Assessment Report and AOA Report provided analyses related to cost, schedule, risk, and feasibility for the pit production alternatives.

John S. McCain National Defense Authorization Act for Fiscal Year 2019 (Public Law 115-232). In Section 3120 of this Authorization Act, Congress enacted as formal policy of the United States that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet 2018 NPR and national policy.

1.5 PUBLIC PROCESS

Although publication of a draft SA is not required (DOE 2019 p. 11), NNSA is making this draft SA available for public review and comment on the DOE NEPA web page (https://www.energy.gov/nepa/nepa-documents). NNSA recognizes that public comments on this proposed action can provide valuable input, and NNSA will consider comments received on the draft SA and provide responses to those comments in the final SA. The final SA and determination will be made available to the public on the DOE NEPA web page (https://www.energy.gov/nepa/nepa-documents).

NNSA also notes that the Complex Transformation SPEIS process provided for public input on two separate occasions: during initial public scoping and during the comments phase for the Draft SPEIS. As shown on Figure 1-1, NNSA held 20 public meetings on the Draft SPEIS.

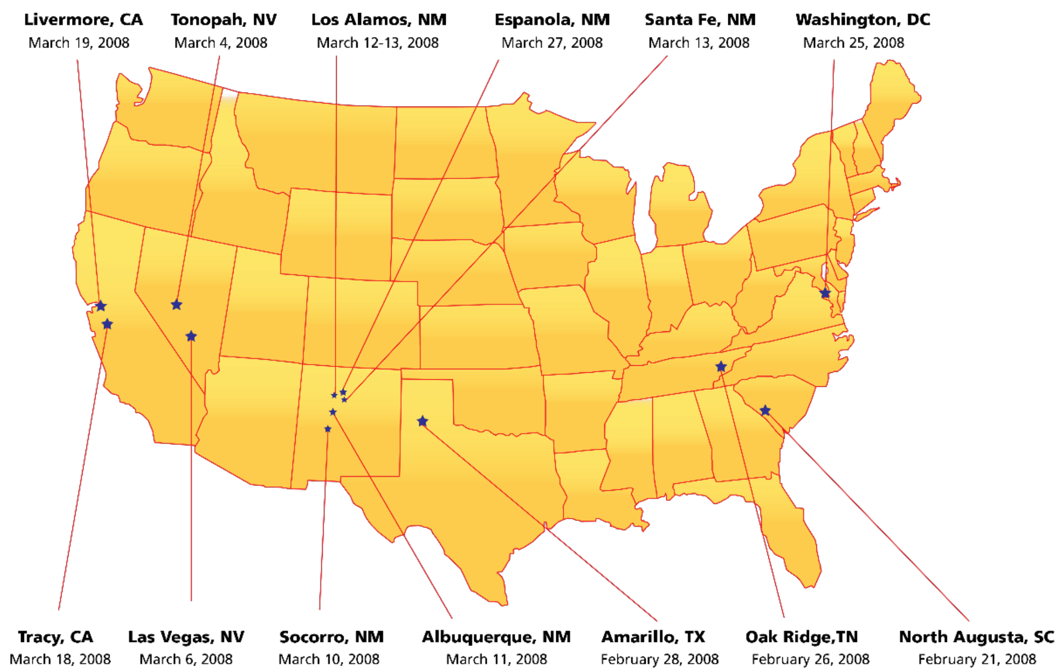


Figure 1-1. Previous Public Meetings on the Complex Transformation Draft SPEIS

2.0 PROPOSED ACTION

NNSA's proposed action is to produce a minimum of 50 pits per year at a repurposed MFFF at SRS and a minimum of 30 pits per year at LANL, with additional surge capacity at each site, if needed. This is to meet the requirement to produce pits at a rate of no fewer than 80 pits per year by 2030 for the nuclear weapons stockpile as identified in the 2018 NPR (DOD 2018a) and national policy. The proposed action also includes actions across the Complex associated with transportation, waste management, and ancillary support (e.g., staging, testing, etc.). More details regarding the proposed action at both LANL and SRS are provided in sub-sections 2.2.1 and 2.2.2, respectively.

2.1 EXISTING PLUTONIUM OPERATIONS

Sites that support the pit production mission are LANL; Pantex; Y-12; SRS; NNSS; the Lawrence Livermore National Laboratory (LLNL) in Livermore, California; Sandia National Laboratories (SNL) in Albuquerque, New Mexico and Livermore, California; the Kansas City National Security Campus (KCNSC) in Kansas City, Missouri; and WIPP (see Figure 2-1). A brief description of these sites is provided below.

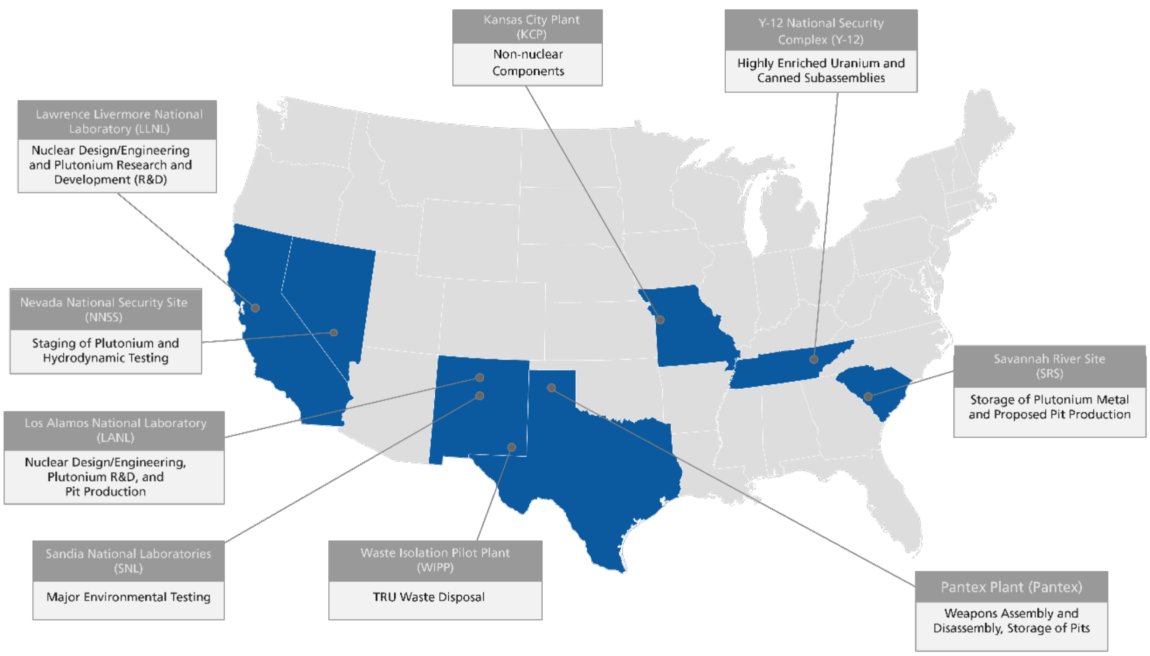


Figure 2-1. DOE/NNSA Sites Associated with Pit Production Mission

2.1.1 Los Alamos National Laboratory

LANL, a nuclear weapons design and physics laboratory, serves as NNSA's Plutonium Science and Production Center of Excellence and provides current pit production capabilities for the weapons complex (Public Law 115-232). Plutonium pit production is conducted at the Plutonium Facility Complex in Technical Area (TA)-55, which consists of six key buildings and several support, storage, security, and training structures (DOE 2017a p. E-15 through -17). The most important building, Plutonium Facility (PF)-4, is categorized as a HC 2 nuclear facility (DOE 2008a p. 3-56).

2.1.2 Pantex Plant

The Pantex Plant located in Texas is the only NNSA site authorized to assemble or disassemble nuclear weapons. Pantex supports the pit production mission by storing pits, providing feedstock to LANL for use in pit production, and performing nonintrusive pit modification (e.g., changes to the external surfaces and features of a pit) (DOE 2008d, 2018b).

2.1.3 Y-12 National Security Complex

Y-12, near Oak Ridge, Tennessee, is NNSA's Uranium Center of Excellence and is the nation's only source for enriched uranium components for nuclear weapons. Y-12 supports the pit production mission by providing any required uranium to the Pit Production Facility (DOE 2011b).

2.1.4 Savannah River Site

SRS, near Aiken, South Carolina, has extensive experience in capabilities for the receipt, storage, processing, packaging, and shipping of plutonium (DOE 2008c p. 3-12 through 13). The MFFF is located in the center of F-Area (DOE 2015a p. B-11). Storage of plutonium at SRS takes place in the K-Area Complex (DOE 2015a p. B-16 through 17).

2.1.5 Nevada National Security Site

NNSS, located Nevada, is the primary location within the NNSA complex where high-hazard experiments with radiological and other high-hazard materials are conducted. The Device Assembly Facility supports nuclear stockpile experimental capabilities and is one of the facilities in the nuclear security enterprise that permits staging of large quantities of special nuclear material to support various missions (DOE 2017a p. E-74 through 76). NNSS also accepts LLW from other DOE sites and disposes of LLW onsite (DOE 2013 p. 3-21 through 22).

2.1.6 Lawrence Livermore National Laboratory

LLNL, in California, is an NNSA Center of Excellence for Nuclear Design and Engineering, and is integral to the design and performance assessment of the nuclear explosive package. LLNL supports the capability to certify the stockpile without nuclear testing. A key facility for this capability is the Superblock Facility (DOE 2017a p. E-5 through 8).

2.1.7 Sandia National Laboratories

The SNL site in New Mexico conducts environmental effects analyses, testing, and engineering sciences to evaluate the effects of operational and abnormal environments on nuclear weapons systems and components. The site uses an array of engineering science test equipment, tools, and techniques. A key facility is the Annular Core Research Reactor, which is used in radiation effects research and testing to support certification (DOE 2017a p. E-25 through 29).

2.1.8 Kansas City National Security Campus

KCNSC manufactures and procures non-nuclear components for the nuclear stockpile, including electronic, mechanical, and engineered materials. The site in Missouri does not conduct operations with nuclear materials (DOE 2017a p. E-37 through 40).

2.1.9 Waste Isolation Pilot Plant

Located in southern New Mexico, WIPP is the nation's only repository for the disposal of TRU waste. Waste from other NNSA sites is sent to WIPP for permanent disposal (DOE 1997a).

2.1.10 Office of Secure Transportation

The Office of Secure Transportation (OST) is responsible for the Secure Transportation Asset Program. The Program complies with DOE Order 461.1C, *Packaging and Transportation for Offsite Materials of National Security Interest*, which requires that packaging and transportation of all nuclear material must be conducted in accordance with Department of Transportation and Nuclear Regulatory Commission regulations, except where an alternative course of action is identified in the DOE Order. This program provides safe, secure transport of the Nation's nuclear weapons, weapon components, and nuclear material between sites in the complex (DOE 2018f p. 16).

2.2 Specific Actions Related to the Proposed Action

2.2.1 Los Alamos National Laboratory

LANL's pit production mission is conducted at TA-55 (Figure 2-2). In order to produce a minimum of 30 pits per year, and up to 80 pits per year, assuming that the technical capacity is in place, NNSA would upgrade existing plutonium facilities, upgrade/construct new support facilities, construct administrative offices and parking, and hire and train staff required for the mission. Upgrades to PF-4 (Figure 2-3) would consist of internal modifications and the installation of additional process equipment. LANL has existing support facilities (such as warehouses, waste storage and staging, radiography capabilities, and maintenance support offices) within the Perimeter Intrusion, Detection, and Assessment System (PIDAS) and outside the PIDAS (DOE 2017b p. 19-21). The site-specific SA for LANL would address any specific upgrades to these facilities to support pit production.

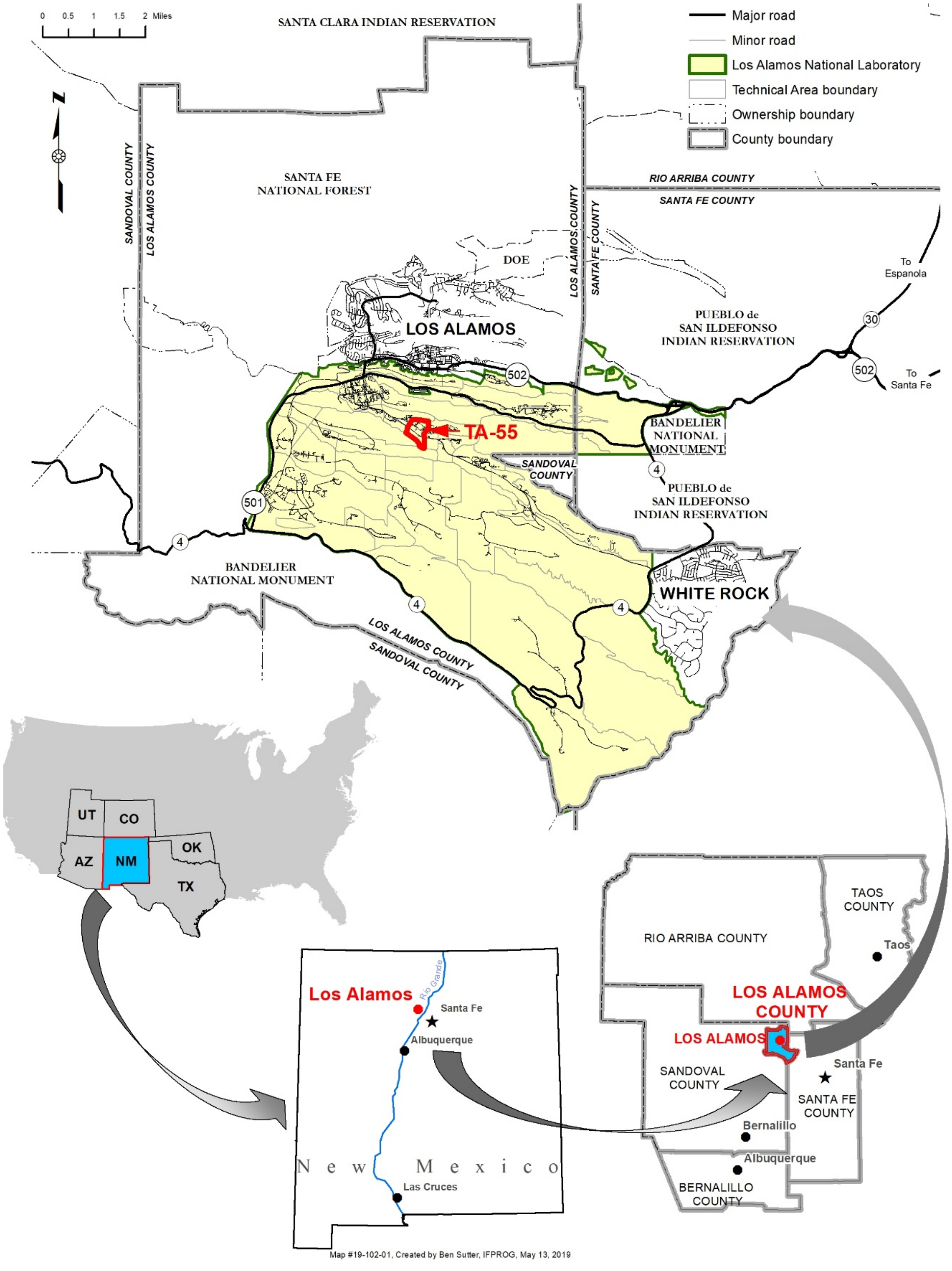


Figure 2-2. Location of Los Alamos National Laboratory

Figure 2-3. PF-4 at TA-55

In addition to these support facilities, because of additional workforce requirements associated with any increased pit production scenarios, LANL is proposing to construct several administrative offices and parking facilities along the Pajarito corridor (TA-46, -48, -50, -52, -55 and -63). Table 2-1 presents construction estimates, as analyzed in the Complex Transformation SPEIS, for upgrading/constructing new facilities at LANL for increasing pit production. The estimates in Table 2-1 are provided for all three alternatives presented in the Complex Transformation SPEIS: 50/80 Alternative, Upgrade Alternative, and the Greenfield Alternative. Any construction at LANL associated with the proposed action in this SA would be bounded by estimates presented in Table 2-1.

TABLE 2-1. PREVIOUS CONSTRUCTION ESTIMATES AT LANL

Parameter	50/80 Alternative (80 pits/year)	Upgrade Alternative (200 pits/year)	Greenfield Alternative (200 pits/year)
Land Disturbance (acres)	6.5	13.5	140
Construction Duration (years)	4	3.6	6
Peak Construction Workforce (persons)	190	300	770
Peak Electricity (megawatts-electric [MWe])	1.0	2.0	3.0
Peak Water (gallons/year)	550,000	2,111,800	5,600,000
Nonhazardous Solid Waste (tons)	Not estimated	578	9,800

Source: (DOE 2008c) Tables 3.4.1-1, 3.4.1-2, 3.4.1-7, 3.4.1-8.

Producing at least 30-80 pits per year at LANL would be achieved with multiple shift operations. Table 2-2 presents operational estimates, as analyzed in the Complex Transformation SPEIS, for increasing pit production at LANL. The estimates in Table 2-2 are provided for all three alternatives presented in the SPEIS. Note that operational estimates for the Upgrade Alternative and the Greenfield Alternative are the same because those alternatives were designed to produce the same number of pits, and thus, would have similar operational estimates. Any operations at LANL associated with the proposed action in this SA would be bounded by estimates presented in Table 2-2.

TABLE 2-2. PREVIOUS OPERATIONAL ESTIMATES AT LANL

Parameter	50/80 Alternative (80 pits/year)	Upgrade Alternative (200 pits/year)	Greenfield Alternative (200 pits/year)
Additional Workers (persons)	680	1,170	1,170
Additional Radiation Workers (persons)	458	675	675
Peak Electrical (MWe)	10	11	11
Domestic Water (gallons/year)	43,000,000	80,000,000	80,000,000
Wastes			
LLW Solid (cubic yards [yd^3]/year)	1,850	3,500	3,500
TRU Solid (including Mixed TRU) (yd^3/year)	575	850	850
TRU Liquid (yd^3/year)	6.5	16.2[1]	16.2[1]

[1] Liquid TRU wastes were not estimated for the Upgrade Alternative and Greenfield Alternative. The estimate of 16.2 yd^3 is based on scaling the estimate of 6.5 yd^3 the 50/80 Alternative based on producing 2.5 times more pits.
Source: (DOE 2008c) Tables 3.4.1-3, 3.4.1-4, 3.4.1-9, 3.4.1-10.

2.2.2 Savannah River Site

SRS's potential pit production mission would be located in F-Area where the MFFF is located (Figure 2-4). In order to produce a minimum of 50 pits per year, and up to 80 pits per year, NNSA would repurpose the MFFF (Figure 2-5) and the administrative and support facilities. Repurposing the MFFF, which has been partially constructed in F-Area, would include internal modifications and installation of manufacturing and support equipment directly associated with the pit production mission. This manufacturing and support equipment would include equipment for disassembly/metal preparation, pit assembly, machining, aqueous processing, foundry operations, material characterization and analytical chemistry operations and support operations for manufacturing pits. Additional requirements for the mission include: removal/relocation of unneeded structures; construction of new support and training structures, administrative offices and additional parking facilities; and hiring and training staff. Any new facilities would be constructed on land previously disturbed by the MFFF construction.

DOE began construction of MFFF in August 2007 and construction ceased on October 10, 2018, when DOE cancelled the contract for the facility. The MFFF was built to current safety and security standards (including seismic performance category 3+ to meet Nuclear Regulatory Commission requirements), with walls of 12-inch reinforced concrete (DOE 2017b p. A-29). MFFF contains three floors and more than 400,000 square feet of available HC 2 space, which would be more than sufficient to meet the pit production requirements (DOE 2017b p. 79-80). Although it is a HC 2 building, the MFFF does not have a PIDAS (DOE 2017b p. A-29). If the MFFF is brought into operation to produce pits, a PIDAS would need to be constructed around the facility (DOE 2017b p. A-26).

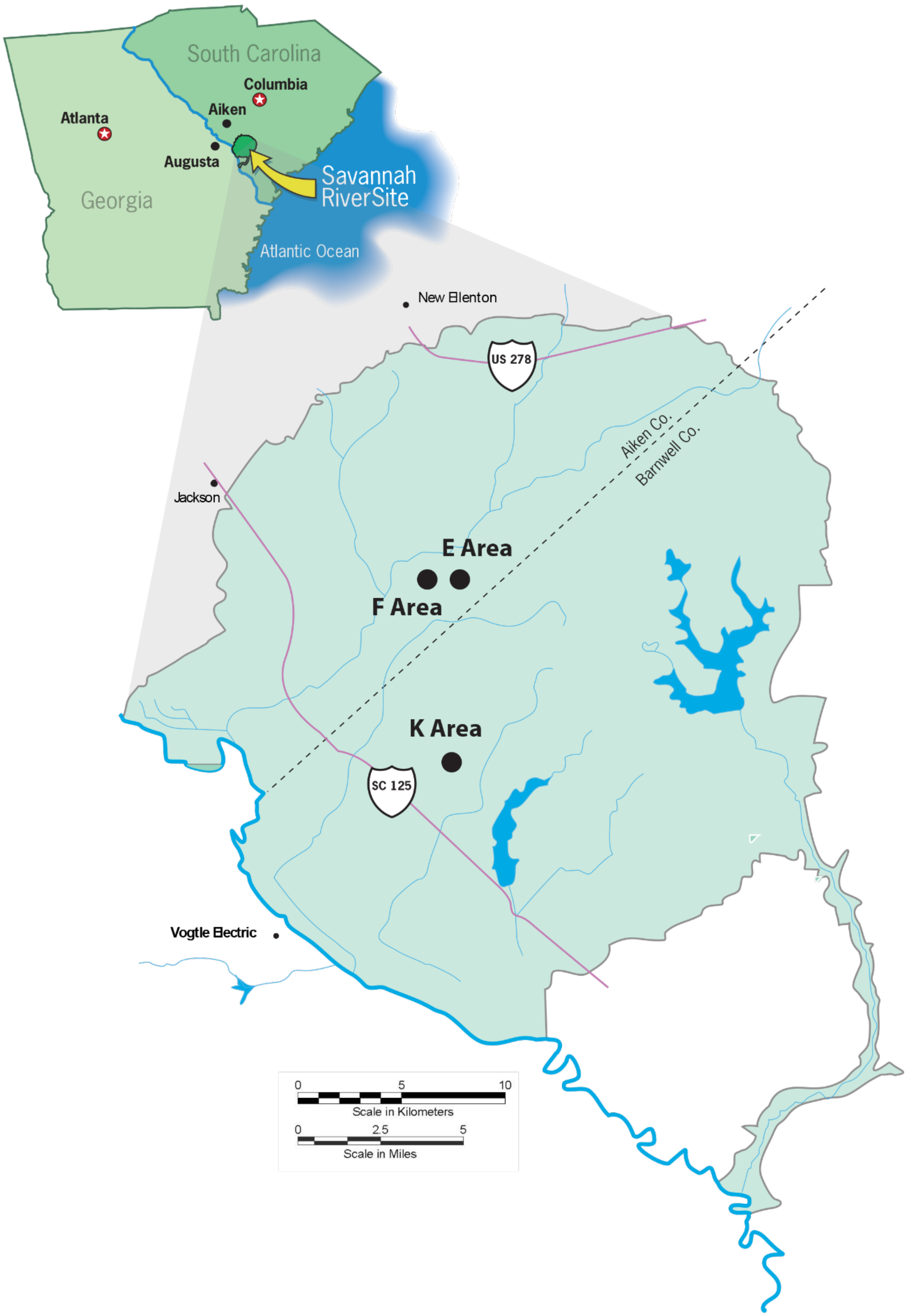


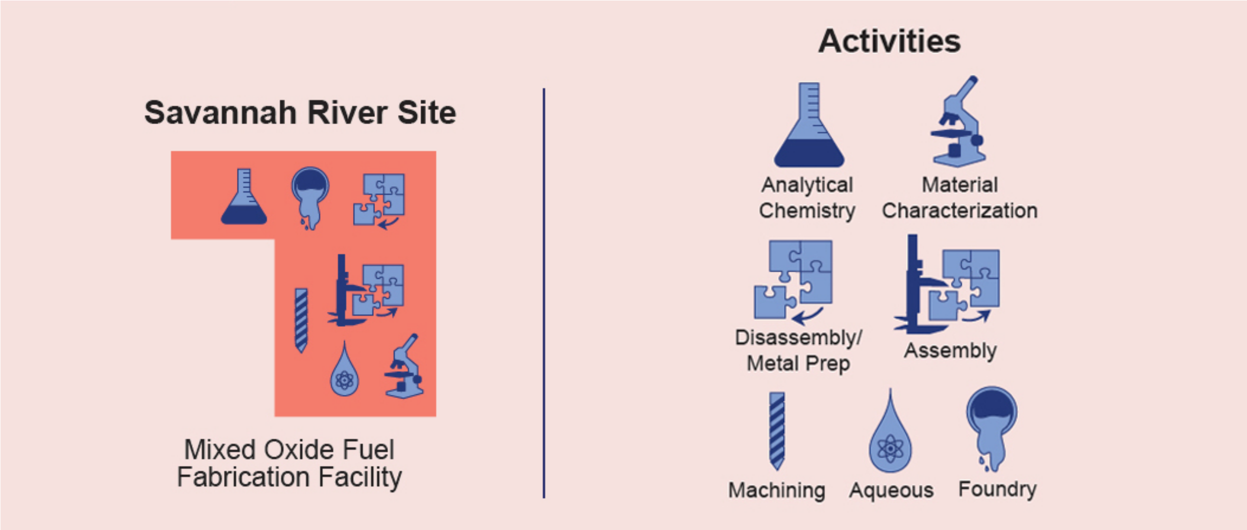
Figure 2-4. Location of Savannah River Site

Figure 2-5. The Mixed-Oxide Fuel Fabrication Facility

Internal modifications to the MFFF required for pit production could include:

- Removing equipment and utility commodities intended for fuel fabrication that had been previously installed in the existing MFFF building, followed by installation of pit production and process support equipment and utilities;
- Modifying existing support facilities as required to provide the personnel support functions for the new pit production mission;
- Installing an analytical chemistry laboratory in the MFFF;
- Installing fire water supply equipment and the emergency diesel generators in separate structures adjacent to the MFFF;
- Installing analytical laboratory capabilities (Parsons 2018 p. xiii).

Figure 2-6 depicts the activities that would be contained with the MFFF for the pit production mission at SRS.



Source: (DOE 2018g)

Figure 2-6. Pit Production Activities within the MFFF

Table 2-3 presents construction estimates, as analyzed in the Complex Transformation SPEIS, for upgrading/constructing new facilities at SRS for increasing pit production. The SPEIS evaluated a pit production facility that would use the MFFF and other infrastructure (DOE 2008c, p. 5-236). Any construction at SRS associated with the proposed action in this SA would be bounded by estimates presented in Table 2-3.

TABLE 2-3. PREVIOUS CONSTRUCTION ESTIMATES AT SRS

Parameter	200 Pits Per Year
Land Disturbance (acres)	140
Construction Duration (years)	6
Peak Construction Workforce (persons)	770
Peak Electricity (megawatts-electric [MWe])	3.0
Peak Water (gallons/year)	5,600,000
Nonhazardous Solid Waste (tons)	9,800

Source: (DOE 2008c) Tables 3.4.1-1, 3.4.1-2.

Table 2-4 presents operational estimates, as analyzed in the Complex Transformation SPEIS, for producing pits at SRS. The Complex Transformation SPEIS evaluated a Pit Production Facility that would use the MFFF and other infrastructure (DOE 2008c p. 5-236). Any operations at SRS associated with the proposed action in this SA would be bounded by estimates presented in Table 2-4.

TABLE 2-4. PREVIOUS OPERATIONAL ESTIMATES AT SRS

Parameter	Pit Production Facility at SRS (200 pits/year)
Additional Workers (persons)	1,780
Additional Radiation Workers (persons)	1,150
Peak Electrical (MWe)	11
Domestic Water (gallons)	88,500,000
Wastes	
LLW Solid (yd^3)	3,900
TRU Solid (including Mixed TRU) (yd^3)	950
TRU Liquid (yd^3)	16.2[1]

[1] Liquid TRU wastes were not estimated for SRS. The estimate of 16.2 yd^3 is based on scaling the estimate of 6.5 yd^3 for the LANL 50/80 Alternative based on producing 2.5 times more pits.
Source: (DOE 2008c) Tables 3.4.1-3, 3.4.1-4, 3.4.1-10.

SRS has most of the secondary infrastructure needed to support pit production (DOE 2017b p. 80). SRS has constructed a Waste Solidification Building intended to handle wastes from the MFFF. Any LLW and TRU waste generated by the proposed pit production operations would be managed by existing facilities at SRS.

2.2.3 Existing NEPA Analyses

NNSA has prepared many NEPA analyses related to plutonium operations for the Complex and the specific sites that may be affected by the proposed action. In Section 3 of this SA, NNSA analyzes whether the differences in impacts at LANL and SRS as a result of the proposed action would be significant compared to those existing NEPA analyses. As discussed in Section 2.1, sites other than LANL and SRS are also involved in pit production operations, for purposes of this SA, those sites are referred to as “supporting sites.” In general, the supporting sites send materials to the existing pit production site and/or receive materials from the existing pit production site (e.g., Pantex provides feedstock and receives newly certified pits). While the proposed action would not change the types of operations at the supporting sites, it could increase transportation requirements and impacts. This SA considers whether those impacts would be covered under the existing NEPA analyses. Table 2-5 presents an overview of the plutonium-related operations at the supporting sites and indicates whether additional analyses are necessary for the supporting sites.

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TABLE 2-5. OVERVIEW OF PLUTONIUM-RELATED OPERATIONS AT SUPPORTING SITES

Supporting Site	Plutonium-Related Operations	Relevant Existing NEPA Documents	Additional Analysis for Supporting Site Required?
Pantex	Stores pits, provides feedstock, conducts non-intrusive pit modification, receives newly certified pits	Complex Transformation SPEIS (DOE 2008c); Pantex SWEIS (DOE 1996b); 2018 SA (DOE 2018b)	No. The Complex Transformation SPEIS addressed Pantex operations that would support the production of 125 pits per year (and up to 200 pits per year in surge capacity). The potential impacts at Pantex from increasing pit production at LANL and SRS would be bounded by existing analyses. (See "OST" for Complex-wide transportation impacts).
Y-12	Provides uranium	Complex Transformation SPEIS (DOE 2008c); Y-12 SWEIS (DOE 2011b); 2016 SA (DOE 2016b)	No. The Complex Transformation SPEIS addressed Y-12 operations that would support production of 125 pits per year (and up to 200 pits per year in surge capacity). The potential impacts at Y-12 from increasing pit production at LANL and SRS would be bounded by existing analyses. (See "OST" for Complex-wide transportation impacts).
NNSS	Conducts dynamic plutonium experiments in support of stockpile stewardship; provides LLW disposal for LANL pit production activities; stages material for programmatic use	Complex Transformation SPEIS (DOE 2008c); NNSS SWEIS (DOE 2013)	No. Increased pit production would not significantly change ongoing stockpile stewardship activities at NNSS. Although increased LLW disposal at NNSS would result from increased pit production at LANL, the Complex Transformation SPEIS and NNSS SWEIS addressed LLW disposal impacts for 125 pits per year (and up to 200 pits per year in surge capacity). The potential impacts of increased LLW disposal from additional pit production at LANL would be bounded by existing analyses.
LLNL	Provides technical support related to pit production	Complex Transformation SPEIS (DOE 2008c)	No. Increased pit production would not significantly change ongoing technical support operations at LLNL.
SNL	Conducts major environmental testing and provides stockpile stewardship support for non-nuclear components	Complex Transformation SPEIS (DOE 2008c)	No. Increased pit production would not significantly change major environmental testing or the ongoing stockpile stewardship activities at SNL.
KCNSC	Provides non-nuclear parts to pit production site	Complex Transformation SPEIS (DOE 2008c); Kansas City Plant EA (DOE 2008f)	No. Increased pit production would increase the number of non-nuclear parts currently provided by KCNSC, however, this increase would be within the analytical envelope provided by the Complex Transformation SPEIS and the Kansas City Plant EA. Routine non-nuclear transportation activities are generally categorically excluded.
WIPP	Provides for TRU disposal from pit production activities	Complex Transformation SPEIS (DOE 2008c); WIPP SEIS-II (DOE 1997a)	Yes. Increased pit production would increase TRU waste disposal at WIPP as available capacity has decreased since the time the Complex Transformation SPEIS was prepared. This SA analyzes the impacts of increased pit production on TRU disposal at WIPP and concludes they are not significant. See Section 4.3.3.
OST[1]	Supports Complex-wide transportation	Complex Transformation SPEIS (DOE 2008c)	Yes. The Complex Transformation SPEIS addressed Complex-wide transportation impacts for production of 125 pits per year (and up to 200 pits per year in surge capacity). This SA analyzes whether the transportation impacts associated with pit production at two sites would be significantly different than existing NEPA analyses and concludes they are not significant. See Table 3-4.

[1] OST is not a site, but rather an activity.

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2.3 CHANGES IN ENVIRONMENTAL CONDITIONS, OPERATIONS, AND NEPA PROCESS

This section discusses changes that have occurred since publication of the Complex Transformation SPEIS, which may be relevant to the analysis in this SA.

2.3.1 Environmental Changes

In preparing this SA, NNSA reviewed environmental conditions at LANL and SRS to determine whether or not the baseline natural environment at either site has changed significantly since the Complex Transformation SPEIS was prepared. NNSA reviewed information in the *Los Alamos National Laboratory Annual Site Environmental Report 2017* (ASER)[2] (LANL 2018), the *Savannah River Site Annual Site Environmental Report 2017* (SRNS 2018), relevant NEPA documents, and other publicly available information. While there are differences in the natural environment at both sites since the Complex Transformation SPEIS was prepared, the differences are not significant in terms of analyzing changes in environmental impacts at a programmatic level. The analysis supporting the 2018 SA to the LANL SWEIS was conducted before the announcement of national policy on pit production. If NNSA decides to implement the proposed action, site-specific documents would be prepared and would provide a detailed analysis of any changes in the environmental conditions at LANL and SRS, as appropriate.

A high-level summary of the most recent environmental conditions at LANL and SRS is provided below.

2.3.1.1 LANL

Environmental conditions at LANL, as documented in the 2018 ASER, are summarized as follows: (1) operations were fully in compliance with its *Clean Air Act* operating permit emission limits; (2) none of the samples of liquid effluents collected from permitted outfalls exceeded the effluent quality limits in the outfall permit; (3) there were no unplanned air releases during 2017 and no unplanned releases of radioactive liquids; (4) most radionuclide and most chemical concentrations in soil, plants, and wildlife from onsite and perimeter locations were not detected, were similar to background, or were below screening levels protective of biota; (5) LANL contains habitat for three federally listed species: the southwestern willow flycatcher, the Jemez Mountains salamander, and the Mexican spotted owl. In 2017, two Mexican spotted owl nesting locations were observed on Laboratory property, and at least one owlet fledged; (6) radiological doses to the public from Laboratory operations were well below regulatory limits and health risks were indistinguishable from zero; and (7) LANL continues to manage radiological, hazardous, and nonhazardous solid waste in accordance with all applicable requirements (LANL 2018).

In early September 2013, heavy rainfall caused extreme flooding over much of the LANL site. More than 7 inches (18 centimeters) of rain fell in a 5-day period in areas affected by the Las

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[2] The ASERs for both LANL and SRS are generally referred by their publishing year. The data in the ASERs are collected during the previous year.

Conchas fire in 2011. The Laboratory did not close during this event. Although Laboratory facilities on mesa tops suffered relatively little damage, canyons on and around Laboratory property were subject to damaging floods. Flooding affected canyons, trails, monitoring stations, and a variety of other mission activities and resources (DOE 2018h).

2.3.1.2 SRS

Environmental conditions at SRS, as documented in the 2018 SRS ASER, are summarized as follows: (1) with regard to Clean Air Act compliance, there were three exceedances for air monitoring and asbestos noncompliance; (2) with regard to liquid effluents, SRS achieved a 99.9 percent compliance rate with permit requirements, although in October 2017, there was a permit exceedance at one outfall; (3) there were no unplanned air releases during 2017 and no unplanned releases of radioactive liquids; (4) most radionuclide and most chemical concentrations in soil, plants, and wildlife from onsite and perimeter locations were not detected, were similar to background, or were below screening levels protective of biota; (5) several federally listed animal species exist at SRS, including the wood stork, the red-cockaded woodpecker, the shortnose sturgeon, and the Atlantic sturgeon; as well as plant species, including the pondberry and the smooth coneflower; (6) tritium emissions of 15,200 curies (Ci) in 2017 were the lowest in 10 years and significantly below the 10-year average. Compared to the tritium released in 2016, SRS tritium releases decreased about 30 percent in 2017. Radiological doses to the public from operations were well below regulatory limits and health risks were indistinguishable from zero; and (7) SRS continues to manage radiological, hazardous, and nonhazardous solid waste in accordance with all applicable requirements (SRNS 2018).

2.3.2 Complex-wide Transportation Population Changes

The population along the transportation routes has changed since the Complex Transformation SPEIS was prepared. Given that the potential transportation routes extend across much of the length of the country, the analysis in this SA assumes that the population along the transportation routes has changed in a manner consistent with the overall U.S. population change. Since approximately 2008, the U.S. population has increased by approximately 8 percent; from 304 million people to approximately 328 million people (Census 2019). The Complex-wide transportation analysis in this SA factors in this increase.

2.3.3 WIPP Capacity

The ROD (DOE 1998) for the WIPP SEIS-II authorized the disposal of up to 175,600 m^3 of TRU waste at WIPP. Currently, DOE has disposed of approximately 67,552 m^3 of TRU waste at WIPP.[3] Therefore, approximately 108,048 m^3 of TRU waste capacity is available at WIPP before the 175,600 m^3 limit is reached. This SA to the Complex Transformation SPEIS

[3] The 67,552 m^3 volume is based on a 2018 decision to change the calculation method to determine volume by the interior container rather than overpacks, which are known to only contain air and no waste outside the interior containers (see Section 4 for more details).

evaluates the contribution of TRU waste from increased pit production to ensure it is bounded by the WIPP NEPA analysis.

2.3.4 PF-4 at LANL

Operations at PF-4 at LANL began in 1978. When the Complex Transformation SPEIS ROD (DOE 2008e) was announced on December 19, 2008, PF-4 was 30 years old. Although PF-4 will reach its assumed 50-year design life in 2028, there is no known life-limiting mechanisms/issues that would preclude PF-4 from operating beyond its original design lifetime. Upgrades have modernized and extended the life of PF-4, and NNSA is confident that PF-4 can continue to safely and securely conduct plutonium operations into the foreseeable future.

2.3.5 NNSA NEPA Process

There have been no significant changes in NNSA's approach to NEPA documents since publication of the 2008 SPEIS. Although the current version of the DOE NEPA implementing procedures (10 CFR Part 1021) became effective November 14, 2011, which was after the Complex Transformation SPEIS and ROD were published, the most significant changes in those regulations involved updates and changes in relation to DOE Categorical Exclusions. Those changes do not affect this SA. On April 14, 2018, NNSA announced new policies and procedures for NEPA compliance (NAP-451.1). These changes do not affect the analysis in this SA.

3.0 POTENTIAL IMPACTS OF THE PROPOSED ACTION

3.1 INTRODUCTION

The purpose of this analysis is to determine, at a programmatic level: (1) if the potential impacts of the proposed action exceed those in the Complex Transformation SPEIS; and (2) if so, if the impacts would be considered significant in the context of NEPA (40 CFR 1508.27), which would require preparation of a supplement to the Complex Transformation SPEIS. NNSA conducted an initial screening review to determine if there were new circumstances or information relevant to environmental concerns or impacts that would warrant additional analysis. As a result of that initial screening, NNSA performed an analysis of all resource areas analyzed in the Complex Transformation SPEIS for the new proposed action. Per DOE guidance in *Recommendations for the Supplement Analysis Process, Second Edition* (DOE 2019), this SA: (1) identifies changes in the proposed action and/or new circumstances or information; and (2) compares the new proposed action and/or new circumstances or information to pertinent alternatives analyzed in the Complex Transformation SPEIS, including a comparison of their potential impacts. In considering the environmental impacts of the proposed change or new information, a finding that the associated environmental impacts would be less than those of any of the relevant alternatives analyzed in the existing Complex Transformation SPEIS is a strong indicator that a supplement to the Complex Transformation SPEIS is not required (DOE 2019 p. 7). Section 3.2 contains the results of the analysis.

3.2 POTENTIAL ENVIRONMENTAL IMPACTS

This section is organized in a comparative impact analysis for each resource area. Table 3-1 addresses the proposed action at LANL and Table 3-2 addresses the proposed action at SRS. Table 3-1 and Table 3-2 present a summary of the environmental impacts from the Complex Transformation SPEIS (second column) and an estimate of impacts for the proposed action in this SA (third column). For each resource area, a conclusion is provided as to whether there are significant differences in impacts (fourth column). The information in Table 3-1 and Table 3-2 provide an analysis of producing up to 80 pits per year at *either* LANL or SRS, which represents a bounding estimate of pit production at each site.

Table 3-3 addresses the combined impacts from pit production at both LANL and SRS, and Table 3-4 addresses Complex-wide transportation impacts. The information in Table 3-3 and Table 3-4 provides an analysis of producing up to 80 pits per year at *both* LANL and SRS, which represents a conservative estimate of the combined impacts for the proposed action.

TABLE 3-1. COMPARATIVE ANALYSIS OF ENVIRONMENTAL IMPACTS AT LANL

Resource Area	Impacts at LANL in Complex Transformation SPEIS	Impacts at LANL for the SA Proposed Action	Significant Differences in Impacts?
Land Resources	Greenfield Facility: Potential disturbance of 140 acres for construction and 110 acres for operation. Upgrade: Potential disturbance of 13.5 acres for construction and 6.5 acres for operation. 50/80: Potential disturbance of 6.5 acres for construction and 2.5 acres for operation. Land uses would remain compatible with surrounding areas and with land use plans. Land required would be less than one percent of LANL total land area. Source: (DOE 2008c) Table 3.16-1.	Land disturbance would be less than estimates in the Complex Transformation SPEIS. Land uses would remain compatible with surrounding areas and with land use plans. Land required would be less than one percent of LANL total land area.	No
Visual Resources	Short-term, temporary visual impacts from construction. New facilities would be visible from higher elevations beyond LANL boundary; however, change would be consistent with currently developed areas. No change to visual resource management (VRM) Classification. Source: (DOE 2008c) Table 3.16-1.	Short-term, temporary visual impacts from construction of administrative offices and parking facilities along the Pajarito Corridor. New facilities would be visible from higher elevations beyond LANL boundary; however, change would be consistent with currently developed areas. No change to VRM Classification.	No
Noise	Construction activities and additional traffic would generate temporary increases in noise but would not extend far beyond the boundaries of the construction site. Noise from operations would be similar to existing operations. Source: (DOE 2008c) Table 3.16-1.	Construction activities and additional traffic would generate temporary increases in noise but would not extend far beyond the boundaries of the construction site. Noise from operations would be similar to existing operations.	No
Air Quality	Construction activities would create temporary increase in air quality impacts but would not result in violations of the National Ambient Air Quality Standards (NAAQS). Operations would result in incremental increases less than five percent of baseline for most pollutants. The greatest increase would occur for total suspended particulates, which could increase by approximately 28 percent. Source: (DOE 2008c) Table 3.16-1.	Total emissions of criteria pollutants, hazardous air pollutants, and volatile organic compounds for 2008 through 2016 were well below the facility-wide Title V Operating Permit limits at LANL (DOE 2018a p. 86). Construction activities for the proposed action would be less than or equal to estimates in the SPEIS based on smaller construction requirements than the Greenfield Facility and Upgrade. Construction activities would create temporary increase in air quality impacts but would not be expected to result in violations of any NAAQS. Operational air emissions would be less than estimates in the SPEIS.	No

Resource Area	Impacts at LANL in Complex Transformation SPEIS	Impacts at LANL for the SA Proposed Action	Significant Differences in Impacts?
Water Resources	For construction and operation of the Greenfield Facility, annual groundwater use would increase by approximately 21 percent. LANL water use would remain within water rights. Water use for the Upgrade and 50/80 Alternatives would be less than the Greenfield Facility. Source: (DOE 2008c) Table 3.16-1.	Water consumption at LANL has decreased notably since 2008, from approximately 371 million gallons per year to 262 million gallons per year in 2017 (DOE 2018h) (Figure 3-11). Construction activities and operational impacts would be less than or equal to those for the Greenfield Facility and Upgrade.	No
Geology and Soils	Under all approaches, impacts would be minor. Appropriate mitigation measures would minimize soil erosion and impacts. All facilities would be designed and constructed in accordance with applicable regulations. Source: (DOE 2008c) Table 3.16-1.	Construction activities and operational impacts would be less than or equal to those for the Greenfield Facility and Upgrade.	No
Ecological Resources	TA-55 contains core and buffer areas of environmental interest for the Mexican spotted owl. Potential impacts would be within previously and substantially developed areas. Source: (DOE 2008c) Table 3.16-1.	Potential impacts would be within previously and substantially developed areas and potential impacts to ecological resources would be similar to Complex Transformation SPEIS analysis.	No
Cultural Resources	Under all approaches there is a potential for resources to be disturbed. The number of resources impacted would increase as the number of acres disturbed increases. Source: (DOE 2008c) Table 3.16-1.	Land disturbance would be less than estimates in the Complex Transformation SPEIS, indicating that cultural resource impacts would also be less. Any impacts would be consistent with regulatory requirements and would be reviewed in the site-specific document.	No
Socioeconomics	Greenfield Facility: 770 workers during the peak year of construction, with a total of 2,650 jobs. Once operational: 1,780 operational workers, with a total of 3,667 jobs. Upgrade: 300 workers during peak year of construction, with a total of 618 jobs. 1,780 operational workers, total of 3,667 jobs. 50/80: 190 workers during peak year of construction, with a total of 391 jobs. 680 operational workers, total of 1,401 jobs. Under all approaches there would be no appreciable changes to regional socioeconomic characteristics expected. Source: (DOE 2008c) Table 3.16-1.	The peak construction workforce and operational workforce would likely be less than estimates in the Complex Transformation SPEIS. Potential impacts to socioeconomic characteristics would be positive but less than estimates in the SPEIS.	No

Resource Area	Impacts at LANL in Complex Transformation SPEIS	Impacts at LANL for the SA Proposed Action	Significant Differences in Impacts?
Environmental Justice	Construction or operation activities would not result in any disproportionately high and adverse effects on minority or low-income populations. Source: (DOE 2008c) Table 3.16-1.	The 2018 LANL SA determined that the radiological dose from emissions associated with normal operations would be slightly lower for members of Hispanic, Native American, total minority, and low-income populations than for members of the population that are not in these groups (DOE 2018h p.125). With regard to pit production, no significant health risks to the public are expected and radiological dose would remain below estimates in the Complex Transformation SPEIS. There are no special circumstances that would result in any greater impact on minority or low-income populations than the population as a whole.	No
Infrastructure	Under all approaches, existing infrastructure would be adequate to support construction and operation requirements. Operation of a Greenfield Facility would have the potential to use approximately 17.5 percent of the peak power capacity that is available. Source: (DOE 2008c) Table 3.16-1.	Utility requirements at LANL are consistent with prior analyses in the 2008 SWEIS and remain below system capacities (DOE 2018h p. 108-109). With regard to future pit production, potential impacts would be bounded by the utility usage requirements/impacts in the Complex Transformation SPEIS.	No
Health and Safety-- Normal Operations	Greenfield Facility: Potential worker fatalities during construction: 0.6 Upgrade: 0.2 50/80: 0.1 Greenfield Facility and Upgrade: Collective dose to population during operations: 6.0×10^{-4} person-rem; 4×10^{-7} latent cancer fatalities (LCFs). Maximally exposed individual (MEI) dose: 1.5×10^{-4} millirem (mrem); 9×10^{-11} LCFs annually. Worker dose: 333 person-rem; 0.20 LCFs annually. 50/80: Collective dose to population during operations: 3.2×10-5 person-rem; 2×10^{-8} LCFs MEI dose: 7.7×10^{-6} mrem; 5×10^{-12} LCFs annually Worker dose: 154 person-rem; 0.09 LCFs annually. Source: (DOE 2008c) Table 3.16-1.	Impacts to health and safety during construction correlate directly with the number of construction workers-years. Potential fatalities during construction would be less than Complex Transformation SPEIS estimates due to reduced construction worker-years for the proposed action. During operations, potential impacts to workers (from radiological exposure) and the public (from radiological emissions) correlate directly with the number of pits produced. Potential impacts to workers and the public from producing 80 pits per year would be less than the Greenfield Facility and Upgrade. All radiation doses from normal operations would be below regulatory standards with no statistically significant impact on the health and safety of workers or public.	No

Resource Area	Impacts at LANL in Complex Transformation SPEIS	Impacts at LANL for the SA Proposed Action	Significant Differences in Impacts?
Health and Safety-- Facility Accidents	Accident with the highest consequences to the offsite population as the beyond evaluation basis earthquake and fire scenario. Approximately 26 LCFs in the offsite population could result from such an accident. Offsite MEI would receive a dose of 87.5 rem. Statistically, MEI would have 1 chance in 19 of LCF. When probabilities are taken into account, the accident with the highest risk is the explosion in a feed casting furnace. For this accident, the LCF risk to the MEI would be approximately 9×10^{-4}, or approximately 1 in 1,000. For the population, the LCF risk would be 0.19, or approximately 1 in 5. Source: (DOE 2008c) Table 3.16-1.	Although the types of potential accidents would be the same as presented in the Complex Transformation SPEIS, none of the accidents would have a higher probability of occurrence nor result in greater radiological releases or impacts. Potential impacts from some accidents, such as criticality accidents, would not change, as these accidents are not dependent on the number of pits produced. Other accidents, such as the beyond evaluation basis earthquake and fire (the bounding accident), are dependent on the quantity of plutonium in a facility that could be released in an accident (e.g., the MAR). Production of a minimum of 30 pits per year, and up to 80 pits per year, would require less MAR in LANL facilities than analyzed in the SPEIS. Consequently, the potential impacts from these types of accidents would be expected to be less than the impacts in the SPEIS.	No
Intentional Destructive Acts	NNSA prepared a classified appendix for the SPEIS which analyzed the potential impacts of intentional destructive acts (e.g., sabotage, terrorism). The conclusion in the classified appendix can be summarized as follows: “Depending on the malevolent, terrorist, or intentional destructive acts, impacts would be similar to or exceed accident impacts analyzed in the SPEIS” (DOE 2008c) Section 3.16.6.	Potential impacts of intentional destructive acts are generally a function of the MAR in a facility. To produce at least 30 pits per year, and up to 80 pits per year, the MAR in LANL facilities would be less than the MAR considered in the Complex Transformation SPEIS for the Greenfield Facility and Upgrade. Consequently, the impacts of intentional destructive acts would be bounded by the analysis in the SPEIS.	No

Resource Area	Impacts at LANL in Complex Transformation SPEIS	Impacts at LANL for the SA Proposed Action	Significant Differences in Impacts?
Waste Management	Construction (Greenfield/Upgrade/50/80 Upgrade) TRU solid (yd^3): 0/200/0 LLW solid (yd^3): 0/200/0 Hazardous liquid (gallons): 6.5/4/4 Operation (Greenfield/Upgrade/50/80 Upgrade) TRU solid (yd^3): 850/850/575 Mixed TRU (yd^3):310/310/2.6 LLW solid (yd^3): 3,500/3,500/1,850 LLW liquid (yd^3): 0/0/19.5 Non-hazardous solid (tons): 3.6/3.6/265 Non-hazardous liquid (gallons): 69,500/69,500/16,000 Source: (DOE 2008c); Table 3.16-1.	While annual waste generation trends at LANL have fluctuated between 2008 and 2017, overall waste generation has remained below the 2008 SWEIS projections (DOE 2008a p.111). Wastes from producing a minimum of 30 pits per year, and up to 80 pits per year, would be less than previously analyzed for the Greenfield Facility and Upgrade in the Complex Transformation SPEIS. Although the types of wastes would be the same as presented in the SPEIS, none of the quantities would be greater. Wastes would continue to be managed in accordance with all applicable regulations and waste management facilities have available capacity to manage wastes. LLW disposal at offsite locations such as NNSS would be bounded by the SPEIS analysis. The available capacity at WIPP would be adequate to support pit production TRU wastes (see Section 4 for the cumulative impact analysis which considers pit production TRU waste and other reasonably foreseeable TRU waste).	No
Transportation and Traffic	Under all approaches increase in traffic during construction and operation would occur. Although this traffic increase would tend to exacerbate congestion on local roads, the increase would be small compared to the average daily traffic levels. Radiological transportation impacts are discussed in Table 3-4. Source: (DOE 2008c) Table 3.16-1.	Construction and operational job changes, and transportation requirements, would be less than those presented for the Greenfield Facility and Upgrade in the Complex Transformation SPEIS. Potential impacts to transportation and traffic would also be less.	No

TABLE 3-2. COMPARATIVE ANALYSIS OF ENVIRONMENTAL IMPACTS AT SRS

Resource Area	Impacts at SRS in Complex Transformation SPEIS	Impacts at SRS for the SA Proposed Action	Significant Differences in Impacts?
Land Resources	Potential disturbance of 140 acres for construction and 110 acres for operation. Land uses would remain compatible with surrounding areas and with land use plans. Land required would be less than one percent of SRS total land area. Source: (DOE 2008c) Table 3.16-1.	No land disturbance would occur on undisturbed land. Land disturbance within previously disturbed areas around the MFFF would be less than estimates in the Complex Transformation SPEIS. Land uses would remain compatible with surrounding areas and with land use plans. Land required would be less than one percent of SRS total land area.	No
Visual Resources	Short-term, temporary visual impacts from construction. The reference location is obstructed from offsite view. Changes to visual appearance would be consistent with currently developed areas. No change to VRM Classification. Source: (DOE 2008c) Table 3.16-1.	Short-term, temporary visual impacts from construction of administrative offices and parking facilities in vicinity of MFFF. However, F-Area is in the middle of SRS and is not visible from offsite. No change to VRM Classification.	No
Noise	Construction activities and additional traffic would generate temporary increases in noise but would not extend far beyond the boundaries of the construction site. Noise from operations similar to existing operations. Source: (DOE 2008c) Table 3.16-1.	Construction activities and additional traffic would generate temporary increases in noise but would not extend beyond the boundaries of the construction site, as the MFFF is more than five miles from the nearest site boundary. Noise from operations would be similar to existing operations.	No
Air Quality	Negligible impacts to air quality for construction and operation. No NAAQS exceeded. Source: (DOE 2008c) Table 3.16-1.	None of the areas within SRS or its surrounding counties are designated as nonattainment areas with respect to the NAAQS for criteria air pollutants (DOE 2015a). Construction activities associated with the proposed action would be less than or equal to estimates in the Complex Transformation SPEIS based on smaller construction requirements. Construction activities would create temporary increase in air quality impacts but would not be expected to result in violations of the NAAQS.	No
Water Resources	For construction and operation, annual water use would increase by approximately two percent compared to existing use. Source: (DOE 2008c) Table 3.16-1.	Construction activities and operational impacts would be less than or equal to estimates in the Complex Transformation SPEIS. The Savannah River provides water for the entire site but only a fraction of the capacity is being used (DOE 2017b p. A-38).	No

Resource Area	Impacts at SRS in Complex Transformation SPEIS	Impacts at SRS for the SA Proposed Action	Significant Differences in Impacts?
Geology and Soils	Impacts would be minor. Appropriate mitigation measures would minimize soil erosion and impacts. Source: (DOE 2008c) Table 3.16-1.	Construction activities and operational impacts would be less than or equal to estimates in the Complex Transformation SPEIS.	No
Ecological Resources	Construction would not impact biological resources because new facilities would be sited on previously disturbed land. Operations would not impact biological resources because activities would be located in previously disturbed or heavily industrialized portions that do not contain habitat sufficient to support biologically diverse species mix. Source: (DOE 2008c) Table 3.16-1.	Potential impacts would be within previously and substantially developed areas and potential impacts to ecological resources would be less than estimates in the Complex Transformation SPEIS due to less land disturbance.	No
Cultural Resources	The reference location is located in an Archaeological Zone 2 (area with moderate archaeological potential) and close to a Zone 1 (high archaeological potential) area. Therefore, there is a high probability that resources are located within the reference location and would be impacted by construction activities. There would be no additional impacts from operation activities. Source: (DOE 2008c) Table 3.16-1.	Land disturbance would be less than estimates in the Complex Transformation SPEIS, indicating that cultural resource impacts would also be less. Any impacts would be consistent with regulatory requirements and would be reviewed in the site-specific EIS.	No
Socioeconomics	850 workers during the peak year of construction, with a total of 1,461 jobs. Once operational, there would be 1,780 workers. No appreciable changes to regional socioeconomic characteristics expected. Source: (DOE 2008c) Table 3.16-1.	The peak construction workforce and operational workforce would likely be less than estimates in the Complex Transformation SPEIS due to the fact that a Greenfield Facility was estimated in the SPEIS. Potential impacts to socioeconomic characteristics would be positive, but would be less than estimates in the SPEIS.	No
Environmental Justice	Construction or operation activities would not result in any disproportionately high and adverse effects on minority or low-income populations. Source: (DOE 2008c) Table 3.16-1.	Operations at SRS do not result in disproportionately high and adverse impacts on minority or low-income populations residing near SRS (DOE 2015a p. 4-80). With regard to pit production, no significant health risks to the public are expected and radiological dose would remain below the annual dose limit of 10 mrem. There are no special circumstances that would result in any greater impact on minority or low-income populations than the population as a whole.	No

Resource Area	Impacts at SRS in Complex Transformation SPEIS	Impacts at SRS for the SA Proposed Action	Significant Differences in Impacts?
Infrastructure	Existing infrastructure would be adequate to support construction and operation requirements. Construction and operation requirements would have a negligible impact on current site infrastructure. Source: (DOE 2008c); Table 3.16-1.	Existing infrastructure capacity is more than adequate to meet current and future requirements at SRS (DOE 2015a Table 3-19). With regard to future pit production, potential impacts would be bounded by the utility usage requirements/impacts presented in the Complex Transformation SPEIS.	No
Health and Safety – Normal Operations	Potential worker fatalities during construction: 0.7. Collective dose to population during operations: 1.5×10^{-4} person-rem; 9×10^{-7} LCFs. MEI dose(annual): 2.0×10^{-6} mrem; 1×10^{-12} LCFs Worker dose (annual): 333 person-rem; 0.20 LCFs. Source: (DOE 2008c); Table 3.16-1.	Impacts to health and safety during construction correlate directly with the number of construction workers-years. Potential fatalities during construction would be less than Complex Transformation SPEIS estimates due to reduced construction worker-years for the proposed action. During operations, potential impacts to workers (from radiological exposure) and the public (from radiological emissions) correlate directly with the number of pits produced. Potential impacts to workers and the public from producing 80 pits per year would be less than estimates in the SPEIS. Additionally, because the MFFF is located in F-Area, which is further from the site boundary than the reference location analyzed in the SPEIS, doses to the public should be reduced even further. All radiation doses from normal operations would be below regulatory standards with no statistically significant impact on the health and safety of workers or public.	No

Resource Area	Impacts at SRS in Complex Transformation SPEIS	Impacts at SRS for the SA Proposed Action	Significant Differences in Impacts?
Health and Safety – Facility Accidents	Spectrum of accidents were analyzed, including earthquake, fire, explosion, criticality, and spill. The accident with the highest consequences to the offsite population is the beyond evaluation basis earthquake and fire. Approximately 10.5 LCFs in the offsite population could result from such an accident. An offsite MEI would receive a dose of approximately 3 rem. Statistically, the MEI would have a 0.002 chance of developing a LCF, or about 1 in 500. When probabilities are taken into account, the accident with the highest risk to the MEI is the explosion in a feed casting furnace. For this accident, the LCF risk to the MEI would be 1×10^{-5}, or approximately 1 in 100,000. For the population, the LCF risk would be approximately 6×10^{-2}, meaning that an LCF would statistically occur once every 18 years in the population. Source: (DOE 2008c); Table 3.16-1.	Although the types of potential accidents would be the same as presented in the Complex Transformation SPEIS, none of the accidents would have a higher probability of occurrence nor result in greater radiological releases or impacts. Potential impacts from some accidents, such as criticality accidents, would not change, as these accidents are not dependent on the number of pits produced. Other accidents, such as the beyond evaluation basis earthquake and fire (the bounding accident), are dependent on the quantity of plutonium in a facility that could be released in an accident (e.g., the MAR). Production of a minimum of 50 pits per year, and up to 80 pits per year, would require less MAR in SRS facilities than analyzed in the SPEIS. Consequently, the potential impacts from these types of accidents would be expected to be less than the impacts in the SPEIS. Additionally, because the MFFF is located in F-Area, which is further from the site boundary than the reference location analyzed in the SPEIS, doses to the public from any potential accidents should be reduced even further.	No
Intentional Destructive Acts	NNSA prepared a classified appendix for the SPEIS which analyzed the potential impacts of intentional destructive acts (e.g., sabotage, terrorism). The conclusion in the classified appendix can be summarized as follows: "Depending on the malevolent, terrorist, or intentional destructive acts, impacts would be similar to or exceed accident impacts analyzed in the SPEIS" (DOE 2008c); Section 3.16.6.	Potential impacts of intentional destructive acts are generally a function of the MAR in a facility. To produce a minimum of 50 pits per year, and up to 80 pits per year, the MAR in the MFFF would be less than the MAR considered in the Complex Transformation SPEIS. Consequently, the impacts of intentional destructive acts would be bounded by the analysis in the SPEIS. Additionally, because the MFFF is located in F-Area, which is further from the site boundary than the reference location analyzed in the SPEIS, impacts to the public from intentional destructive acts should be reduced even further.	No

Resource Area	Impacts at SRS in Complex Transformation SPEIS	Impacts at SRS for the SA Proposed Action	Significant Differences in Impacts?
Waste Management	Construction TRU solid (yd^3): 0 LLW solid (yd^3): 0 Hazardous (tons): 7 Operation TRU solid (yd^3): 950 Mixed TRU solid (yd^3): 340 LLW solid (yd^3): 3,900 Mixed LLW solid (yd^3): 2.5 Non-hazardous solid (yd^3): 8,100 Source: (DOE 2008c) Table 3.16-1.	Wastes from producing a minimum of 50 pits per year, and up to 80 pits per year, would be less than previously analyzed in the Complex Transformation SPEIS. Although the types of wastes would be the same as presented in the SPEIS, none of the quantities would be greater. Wastes would continue to be managed in accordance with all applicable regulations and waste management facilities have available capacity to manage wastes. LLW disposal onsite at SRS would be bounded by the SPEIS analysis. The available capacity at WIPP would be adequate to support pit production TRU wastes (see Section 4 for the cumulative impact analysis which considers pit production TRU waste and other reasonably foreseeable TRU waste).	No
Transportation and Traffic	Increase in traffic during construction and operation would occur. Although this traffic increase would tend to exacerbate congestion on local roads, the increase would be small compared to the average daily traffic levels. Radiological transportation would include transport of pits from Pantex to SRS and recycle of enriched uranium parts to Y-12. Radiological transportation impacts are discussed in Table 3-4. Source: (DOE 2008c) Table 3.16-1.	Construction and operational job changes, and transportation requirements, would be less than estimates in the Complex Transformation SPEIS. Potential impacts to transportation and traffic would also be less.	No

TABLE 3-3. COMBINED IMPACTS FROM PIT PRODUCTION AT BOTH LANL AND SRS

Resource Area	Combined Impacts for the SA Proposed Action
Land Resources	At LANL, land disturbance would be less than estimates in the Complex Transformation SPEIS; at SRS, no disturbance would occur on previously undisturbed land. Combined impacts to undisturbed land would be less than estimates in the SPEIS.
Visual Resources	Short-term, temporary visual impacts from construction at LANL and SRS would occur. Changes would be consistent with currently developed areas with no change to VRM Classification. Impacts would be consistent with impacts presented in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, combining visual resource impacts is not applicable.
Noise	Construction activities and additional traffic would generate temporary increases in noise but would not extend far beyond the boundaries of the construction areas. Noise from operations would be similar to existing operations and would be consistent with impacts presented in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, noise impacts would not be additive.
Air Quality	Air emissions associated with construction and operational activities would be less than those presented in the Complex Transformation SPEIS and there would be no violations of any NAAQS at either site. Because of the distance between LANL and SRS, combining air quality impacts is not applicable. Greenhouse gas emissions would be associated with transportation and would be negligible at each site and collectively.
Water Resources	Water consumption at LANL and SRS would be less than estimates in the Complex Transformation SPEIS. Each site has existing water availability to support the pit production mission. Because of the distance between LANL and SRS, water consumption would not be additive.
Geology and Soils	Potential impacts to geology and soils are generally a function of the amount of disturbance to previously undisturbed land. At LANL, the amount of disturbance to previously undisturbed land would be less than estimates in the Complex Transformation SPEIS; at SRS, no disturbance would occur on previously undisturbed land. Because of the distance between LANL and SRS, impacts to geology and soils would not be additive.
Ecological Resources	At both LANL and SRS, potential impacts to ecological resources would be less than estimates in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, impacts to ecological resources would not be additive.
Cultural Resources	Potential impacts to cultural resources are generally a function of the amount of disturbance to previously undisturbed land. At LANL, the amount of disturbance to previously undisturbed land would be less than estimates in the Complex Transformation SPEIS; at SRS, no disturbance would occur on previously undisturbed land. Because of the distance between LANL and SRS, cultural impacts would not be additive.
Socioeconomics	Positive socioeconomic impacts at both LANL and SRS would occur, with impacts likely less than estimates in the Complex Transformation SPEIS. Given the physical distance between LANL and SRS, combining socioeconomic impacts is not applicable.
Environmental Justice	No significant health risks to the public are expected and radiological dose would remain below the annual dose limit of 10 mrem at both LANL and SRS. At both sites, there are no special circumstances that would result in any greater impact on minority or low-income populations than the population as a whole. Impacts would be consistent with impacts presented in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, environmental justice impacts would not be additive.
Infrastructure	Utility requirements and impacts at both LAN and SRS would be less than estimates presented in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, infrastructure impacts would not be additive.

Health and Safety – Normal Operations	Impacts to health and safety during construction correlate directly with the number of construction workers-years. Potential fatalities during construction at either LANL or SRS would be less than estimates in the Complex Transformation SPEIS. Combined impacts would only exceed estimates in the SPEIS if the combined number of construction worker-years exceeded 3,750, which is not expected. During operations, potential impacts to the public (from radiological emissions) correlate directly with the number of pits produced. Combined impacts to the public from producing 80 pits per year at both LANL and SRS would be less than impacts presented in the SPEIS (for 200 pits per year surge capacity). Impacts to workers (from direct radiation dose) would be less than estimates in the SPEIS at both LANL and SRS. Combined doses to workers would only exceed estimates in the SPEIS for a single site if the total number of radiation workers at both sites exceeded 1,150 persons. The total worker dose for 1,150 radiation workers was estimated to be 333 person-rem/year, which correlates to 0.20 LCFs annually; consequently, even a doubling of this impact, which would be the bounding scenario, would result in less than 1 worker LCF annually.
Health and Safety – Facility Accidents	Potential impacts from accidents are independent/not additive at each site. Although the types of potential accidents would be the same as presented in the Complex Transformation SPEIS, none of the accidents would have a higher probability of occurrence nor result in greater radiological releases or impacts. Potential impacts from some accidents, such as criticality accidents, would not change, as these accidents are not dependent on the number of pits produced. Other accidents, such as the beyond evaluation basis earthquake and fire (the bounding accident), are dependent on the quantity of plutonium in a facility that could be released in an accident (e.g., the MAR). Production of up to 80 pits per year would require less MAR in LANL and SRS facilities than analyzed in the SPEIS. Consequently, the potential impacts from these types of accidents would be expected to be less than the impacts in the SPEIS.
Intentional Destructive Acts	Potential impacts of intentional destructive acts would be independent/not additive at each site. To produce up to 80 pits per year, the MAR in LANL and SRS facilities would be less than the MAR considered in the Complex Transformation SPEIS for the Greenfield Facility. Consequently, the impacts of intentional destructive acts would be bounded by the analysis in the SPEIS.
Waste Management	Wastes from producing up to 80 pits per year at LANL and SRS would be less than previously analyzed for the Greenfield Facility in the Complex Transformation SPEIS for producing up to 200 pits per year. Although the types of wastes would be the same as presented in the SPEIS, none of the quantities would be greater. Wastes would continue to be managed in accordance with all applicable regulations and waste management facilities have available capacity to manage wastes. LLW disposal at offsite locations such as NNSS would be bounded by the SPEIS analysis. The available capacity at WIPP would be adequate to support pit production TRU wastes (see Section 4 for the cumulative impact analysis which considers pit production TRU waste and other reasonably foreseeable TRU waste).
Transportation and Traffic	Non-radiological transportation impacts at both LANL and SRS would be less than estimates in the Complex Transformation SPEIS. Because of the distance between LANL and SRS, non-radiological transportation impacts would not be additive. Radiological transportation impacts from combined operations at LANL and SRS are addressed in Table 3-4.

TABLE 3-4. COMPARATIVE ANALYSIS OF COMPLEX-WIDE TRANSPORTATION IMPACTS

<table>
<tr><th>Resource Area</th><th>Impacts in Complex Transformation SPEIS</th><th>Impacts for the SA Proposed Action</th></tr>
<tr><td>Pit Transportation</td><td>
<table>
<tr><th rowspan="2">Pit Production Site</th><th rowspan="2">Transportation Assessed</th><th colspan="3">Estimated Health Impacts (LCFs)</th></tr>
<tr><th>Accident</th><th>Incident-Free</th><th>Total</th></tr>
<tr><td>LANL</td><td>200 pits/year</td><td>1.43×10^{-11}</td><td>3.58×10^{-4}</td><td>3.58×10^{-4}</td></tr>
<tr><td>SRS</td><td>200 pits/year</td><td>1.18×10^{-10}</td><td>1.99×10^{-3}</td><td>1.99×10^{-3}</td></tr>
</table>
Source: NNSA 2008a, Table 5.10-3. Impacts based on transporting 200 pits between Pantex and Pit Production Site.
</td><td>The number of shipments of pits is directly related to the number of pits produced. Producing up to 80 pits per year at either LANL or SRS would result in insignificant transportation impacts (even assuming an eight percent increase in impacts due to population increases [see Section 2.4]) and would be bounded by the impacts presented in the Complex Transformation SPEIS. Even if 80 pits were produced annually at both LANL and SRS, transportation impacts would be expected to be less than the impacts shown for a single site producing 200 pits per year.</td></tr>
<tr><td>TRU Transportation</td><td>
<table>
<tr><th rowspan="2">Pit Production Site</th><th colspan="3">Estimated Health Impacts (LCFs)</th></tr>
<tr><th>Accident</th><th>Incident-Free</th><th>Total</th></tr>
<tr><td>LANL</td><td>1.3×10^{-7}</td><td>6.6×10^{-4}</td><td>6.6×10^{-4}</td></tr>
<tr><td>SRS</td><td>7.2×10^{-6}</td><td>3.7×10^{-3}</td><td>3.7×10^{-3}</td></tr>
</table>
Source: NNSA 2008a, Table 5.10-24. Impacts based on producing 200 pits per year and transporting TRU waste from Pit Production Site to WIPP.
</td><td>The number of shipments of TRU waste is directly related to the number of pits produced. Producing up to 80 pits per year at either LANL or SRS would result in insignificant TRU waste transportation impacts (even assuming an eight percent increase in impacts due to population increases [see Section 2.4]) and would be bounded by the impacts presented in the Complex Transformation SPEIS. Even if 80 pits were produced annually at both LANL and SRS, the TRU waste transportation impacts would be expected to be less than the impacts shown for producing 200 pits per year at SRS.</td></tr>
<tr><td>LLW Transportation</td><td>
<table>
<tr><th rowspan="2"></th><th colspan="3">Annual Waste Generation (yd^3)</th></tr>
<tr><th>7,800</th><th>12,300</th><th>24,000</th></tr>
<tr><td>Incident-Free In-Transit Exposure[1]</td><td>0.0258</td><td>0.0407</td><td>0.0794</td></tr>
<tr><td>Accident Exposure[1]</td><td>1.18×10^{-8}</td><td>1.86×10^{-8}</td><td>3.63×10^{-8}</td></tr>
</table>
[1] Numbers in Table estimate health impacts (i.e., LCFs) from LLW transport. Analysis was prepared for Pantex LLW shipments to NNSS. Impacts from LANL would be similar to Pantex but bounded due to the shorter distance to NNSS.
Source: (DOE 2008c); Table 5.10-22.
</td><td>The number of shipments of LLW is directly related to the number of pits produced. Producing up to 80 pits per year at LANL would generate approximately 1,850 yd^3 of LLW (see Table 2-2 in Section 2) and would result in insignificant LLW transportation impacts. Even assuming an eight percent increase in impacts due to population increases (see Section 2.4), the impacts would be bounded by the impacts presented in the Complex Transformation SPEIS. At SRS, LLW is generally disposed of onsite and LLW transportation impacts would not be expected.</td></tr>
</table>

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4.0 CUMULATIVE IMPACTS

This chapter presents an analysis of the potential cumulative impacts resulting from the Proposed Action evaluated in this SA. Council on Environmental Quality 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." This SA evaluates changes in cumulative impacts from those evaluated in the Complex Transformation SPEIS that could have a bearing on the potential environmental impacts presented in the SPEIS.

4.1 TECHNICAL APPROACH

Table 2-5 in this SA presented an overview of the plutonium-related operations at the supporting sites and indicated that additional impact analyses were necessary for only SRS, LANL, WIPP, and national nuclear materials transportation. Each of the sites identified in Table 2-5 have existing NEPA coverage for their site-specific and potential cumulative impacts. Therefore, from a programmatic perspective, this SA evaluates the potential complex-wide changes or site-specific changes at SRS, LANL, and WIPP and national nuclear materials transportation requirements.

The Complex Transformation SPEIS presented the cumulative impacts analysis in Chapter 6, specifically identifying the past, present, and reasonably foreseeable future actions relative to that proposed action. This chapter of the SA identifies notable changes to the potential cumulative actions identified in the Complex Transformation SPEIS and any new, past, present, or reasonably foreseeable future actions at SRS, LANL, or WIPP that could have a bearing on potential cumulative impacts associated with the proposed action evaluated in this SA.

4.2 PROGRAMMATIC ACTIONS FROM THE COMPLEX TRANSFORMATION SPEIS

The Complex Transformation SPEIS described four major DOE projects that could contribute to potential cumulative impacts: (1) Global Nuclear Energy Partnership (GNEP); (2) Consolidation of Nuclear Operations Related to Production of Radioisotope Power Systems; (3), Yucca Mountain Repository; and (4) Plutonium Disposition. The status and notable changes for each of these major projects is discussed below.

4.2.1 Global Nuclear Energy Partnership

The Draft GNEP PEIS analyzed six domestic programmatic alternatives, which represent different nuclear fuel cycles including reprocessing of spent nuclear fuel (SNF). The only potential cumulative impacts resulting from the implementation of GNEP were those associated with radiological transportation. Since publication of the Final Complex Transformation SPEIS, DOE cancelled the GNEP program and did not complete the Final GNEP PEIS (74 FR 31017, June 29, 2009). Therefore, relative to the pit production mission, any potential cumulative national, nuclear transportation impacts would be reduced from that presented in the SPEIS.

4.2.2 Consolidation of Nuclear Operations Related to Production of Radioisotope Power Systems

The Draft Pu-238 Consolidation EIS was issued in 2005 and analyzed the environmental impacts of two action alternatives: Proposed Action for consolidation and a No Action Alternative in which Pu-238 operations would continue at both LANL and Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee. Since publication of the Final Complex Transformation SPEIS, DOE cancelled the EIS for consolidation and, instead decided to implement the decisions from the Nuclear Infrastructure PEIS ROD. Relative to this SA, those decisions identified the use of TA-55 at LANL to purify and encapsulate Pu-238. The potential cumulative transportation impacts would be reduced from that presented in the Complex Transformation SPEIS.

4.2.3 Yucca Mountain Repository

The Complex Transformation SPEIS addressed the proposed action to transport and emplace 70,000 metric tons of SNF and high-level radioactive waste from across the country to Yucca Mountain, Nevada. Since publication of the Complex Transformation SPEIS, the Administration has not funded further development, licensing, and construction of the Yucca Mountain repository. As identified in the Complex Transformation SPEIS, actions associated with Yucca Mountain (if implemented) have the potential to cause cumulative impacts related to the transportation of nuclear materials. At a minimum, the delay or elimination of the Yucca Mountain project would change the timing of potentially cumulative national nuclear transportation actions. The potential cumulative transportation impacts would be reduced from that presented in the Complex Transformation SPEIS.

4.2.4 Plutonium Disposition

The Complex Transformation SPEIS described the history and status (as of 2008) of the disposition plans for surplus plutonium. The SPEIS stated that the actions associated with plutonium disposition could produce: (1) local cumulative impacts at SRS, where MOX fuel fabrication activities would occur; and (2) national cumulative impacts due to the transportation of plutonium from Pantex to SRS, where the majority of U.S. surplus plutonium is stored. In 2008, the MFFF was under construction at SRS and a PDCF was scheduled to be constructed at SRS. The PDCF was originally slated to disassemble surplus pits and provide the plutonium to the MFFF. In addition, under Expanded Operations from the LANL SWEIS (DOE 2008a), LANL would produce up to 460 pounds of plutonium oxide, to be stored pending shipment to SRS for use at the MFFF. The ultimate disposition of the MOX fuel and the immobilized plutonium had been identified as the Yucca Mountain Repository, as evaluated in the Yucca Mountain SEIS. Therefore, these impacts would have been cumulative to those at NNSS.

Since publication of the Complex Transformation SPEIS, there have been numerous changes to this program. In a ROD supported by the Surplus Plutonium Disposition SEIS (81 FR 19588, dated April 5, 2016), DOE decided to dispose of 6 metric tons of surplus, non-pit plutonium at WIPP. Alternative disposition paths for the remaining 7.1 metric tons of surplus pit plutonium have been analyzed in the SPD SEIS, however, neither a preferred alternative nor a decision has been announced.

The other significant change that has occurred regarding plutonium disposition is the cancellation of the construction of the MFFF at SRS. As a result of this cancellation, and as discussed in Section 1.1 of this SA, NNSA proposes to repurpose the MFFF to produce a minimum of 50 pits per year (DOD 2018b).

Since cancelling the MFFF for surplus plutonium disposition, DOE has made no official decisions regarding how the surplus plutonium will be dispositioned but is currently evaluating the possibility of diluting the surplus plutonium and disposing of it in WIPP. In 2017, Congress requested that the National Academies of Sciences, Engineering, and Medicine (NAS) study such an approach, and in 2018, NAS issued an interim report entitled, *Disposal of Surplus Plutonium at the Waste Isolation Pilot Plant* (NAS 2018). Four DOE sites would be involved in implementing that "dilute and disposal" process: (1) Pantex, where 26.2 metric tons of surplus plutonium pits are stored; (2) LANL, where the plutonium metal would be oxidized; (3) SRS, where the oxidized plutonium would be diluted and packaged for transport and disposal; and (4) WIPP, where the diluted plutonium would be emplaced in the repository. The dilute and dispose approach would require new, modified, or existing capabilities at Pantex, LANL, SRS, and WIPP. If such an approach were implemented, cumulative impacts could occur at each of these sites.

4.3 Site-Specific Cumulative Actions

This section updates the potential cumulative actions at the primary sites affected by the increased pit production of the proposed action.

4.3.1 Los Alamos National Laboratory

As identified in Section 1.5 of this SA, NNSA prepared *the Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory* (DOE 2018h) in 2018 to evaluate projects and impacts of activities conducted since publication of the LANL SWEIS in 2008, and to also evaluate projects being proposed from 2018 through 2022. Section 2.3 of the 2018 LANL SA reported the following for potential increased pit production:

> The 2009 record of decision set production of war reserve pits to not exceed 20 pits per year. The 2017 *Stockpile Stewardship Management Plan* identifies a pit manufacturing capacity that can produce 10 war reserve pits in 2024, 20 pits in 2025, and 30 pits in 2026, followed by 50 to 80 pits per year by 2030. DOE evaluated the production of 80 pits per year in the Expanded Operations Alternative of the 2008 SWEIS and may issue a new record of decision in the future for an increase in pit production. Production of certified pits in any particular year will fluctuate and may be less than the authorized

amount due to production constraints; however, pit production would not exceed the number authorized in the record of decision.

The site-specific LANL SA that would be prepared following this SA would address the potential environmental impacts of increasing pit production at LANL.

With regard to surplus plutonium disposition, the 2008 LANL SWEIS (DOE 2008a) evaluated pit disassembly and conversion. In 2015, DOE updated its analysis for disassembly, conversion, and disposition to consider additional inventory in the SPD SEIS (DOE 2015a). That analysis considered expanding the capability for pit disassembly and subsequent plutonium oxide and/or metal conversion at LANL up to approximately 2.5 metric tons per year. The SPD SEIS ROD (DOE 2016a) announced decisions related to the disposition of 6 metric tons of surplus, weapons-usable, non-pit plutonium. Impacts from the disposition of that material would not affect LANL but would affect SRS (see Section 4.3.2) and WIPP (see Section 4.3.3). The site-specific SA, which NNSA expects to prepare to implement the proposed action analyzed in this SA, would contain a detailed analysis of any potential cumulative impacts associated with pit production and any reasonably foreseeable plutonium disposition activities, including future activities associated with dilute and disposal, as appropriate.

4.3.2 Savannah River Site

The Complex Transformation SPEIS evaluated the potential cumulative impacts at SRS in 2008. It reported that SRS could be affected by plutonium disposition activities, including the transportation of surplus plutonium, and the operation of PDCF and a MFFF. At the time, the schedule assumed that PDCF would start construction in late 2010 and begin operations in 2019. The MFFF started construction in August 2007 and was expected to begin operations in 2016. The PDCF construction was never initiated and the project has been cancelled. The MFFF was partially constructed and is now an element of the proposed action of this SA as NNSA proposes to repurpose the facility to produce a minimum of 50 plutonium pits per year.

There are two new site-specific actions that could contribute to cumulative impacts at SRS: (1) Vogtle nuclear plant construction and operation; and (2) disposition of plutonium as a result of the 2015 SPD SEIS ROD (DOE 2016a) and any future disposition decisions. Each of these are discussed below.

Units 3 and 4 at Plant Vogtle, a commercial nuclear power plant near Waynesboro, Georgia, approximately 13 miles south southwest of the MFFF on SRS, are currently under construction. Units 3 and 4 are scheduled to begin power production in 2021 and 2022, respectively. Considering that both units started construction in 2013, their peak construction coincided with ongoing construction of the MFFF. The repurposing of MFFF would not require the same level of construction requirements as was seen during the peak years of the initial construction of the facility. Additionally, since repurposing of the MFFF would not occur before the completion of Plant Vogtle's construction, no overlap of construction activities at the two sites would occur. Once operational, the potential for significant cumulative impacts would not be likely given the fact that Vogtle Units 1 and 2 have been operating at the same location since 1987 and 1989, respectively, with little to no additional cumulative impacts in any resource area. The site-specific EIS which NNSA expects to prepare would contain a detailed analysis of any potential cumulative impacts associated with pit production and the operation of four commercial reactors at Plant Vogtle.

Disposition of 6 metric tons of plutonium at SRS would use facilities at HB-Line or K-Area. The non-pit plutonium containers would be opened in an existing glovebox or newly-constructed glovebox capability in HB-Line or K-Area. Plutonium metal would be converted to oxide and the plutonium oxide would be repackaged into suitable containers, mixed/blended with inert material, and loaded into pipe overpack containers or criticality control overpacks. The pipe overpack containers or criticality control overpacks would be characterized in E-Area to ensure they meet the WIPP waste acceptance criteria and then shipped to WIPP in TRUPACT–II or HalfPACT shipping containers. The SPD SEIS ROD concluded that the operations at SRS would result in negligible incremental impacts to both workers and the public (DOE 2016a). Given this negligible impact, notable cumulative impacts would be unlikely. The site-specific EIS for pit production at SRS, which NNSA expects to prepare following this SA, would contain a detailed analysis of any potential cumulative impacts associated with pit production and any reasonably foreseeable plutonium disposition activities, including future activities associated with dilute and disposal, as appropriate.

4.3.3 Waste Isolation Pilot Plant

The Complex Transformation SPEIS evaluated the potential cumulative impacts of major nuclear facilities in New Mexico, including LANL, SNL, WIPP, and the National Enrichment Facility (the URENCO facility in Eunice, New Mexico). Since the publication of the SPEIS, the National Enrichment Facility began operations in 2010, which are consistent with the assumptions in the SPEIS cumulative impacts analyses. Changes relative to the LANL are addressed in Section 4.3.1, above.

On December 21, 2016, DOE issued the *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations* (DOE 2016c) to assess reasonably foreseeable programs, operations, and activities at WIPP, including resumption of waste emplacement. That SA evaluated whether there was any substantial changes to the Proposed Action in the WIPP SEIS-II that were relevant to environmental concerns, and any significant new circumstances or information relevant to environmental concerns and bearing on the Proposed Action or its impacts since the preparation of the WIPP SEIS-II (DOE 1997a) and other relevant WIPP NEPA documentation. The 2016 SA (DOE 2016c) evaluated any known reasonably foreseeable actions as part of a cumulative impacts analysis. That SA determined that no additional NEPA documentation was necessary.

The ROD (DOE 1998) for the WIPP SEIS-II authorized the disposal of up to 175,600 m^3 of TRU waste at WIPP. Currently, DOE has disposed of approximately 67,552 m^3 of TRU waste at WIPP. Note that this volume is based on a 2018 decision to change the calculation method to determine volume by the interior container rather than overpacks, which are known to only contain air and no waste outside the interior containers. (See text box).

Calculating the Volume of Record for WIPP

In 1999, the use of overpacks was assumed to be minimal and from 1999-2018 the inner volume of the outer most container was counted as the disposal volume of the emplaced waste. Use of overpacks has increased significantly. Using the volume of the outer container or overpack, WIPP has emplaced about 54 percent (as of 3/16/19) of the WIPP capacity limit of 175,600 m^3 in less than 7 disposal panels. Clarifying the counting methodology for overpacked containers to count the volume of the inner container(s) in an overpack improves the efficiency of WIPP TRU waste emplaced by more than 30 percent, allowing DOE to emplace additional drums (equivalent to almost 2 disposal panels) under the existing *WIPP Land Withdrawal Act* limit. The change in counting methodology was approved by the State of New Mexico in late 2018 and implemented in early 2019.

Currently, approximately 108,048 m^3 of TRU waste capacity is available at WIPP before the 175,600 m^3 limit is reached. Over the next 10 years, the National TRU Program (NTP) is planning for approximately 1,100 NNSA shipments. The source for the NNSA shipments includes facility inventory reduction for LANL, SRS, and LLNL. However, the majority of these shipments are expected to be directly related to pit production at LANL and SRS. The shipment allocation for the NNSA works off of a base assumption that the NNSA will eventually account for approximately 20 percent of the future shipments to WIPP along with initial projections for shipments from LANL which are updated at quarterly meetings between the site and NTP (CBFO 2019).

The DOE Office of Environmental Management has developed annual shipment projections from across the complex. The NTP evaluates the needs of various sites and estimates shipping allocations over the next five to ten years. The NTP also evaluates the ability of WIPP to receive and emplace waste to determine maximum shipments available. The NTP anticipates some variation in shipping numbers over the next three years; largely due to uncertainty with emplacement area conditions, capital project progress, and productivity of the WIPP waste handlers. n 2022, WIPP expects a steady climb in shipments until there will be 17 shipments a week over 44 weeks, with approximately 750 shipments a year arriving at WIPP, based on complex-wide shipping needs (CBFO 2019).

WIPP needs to complete regulatory changes and complete important capital projects which have the ability to affect short-term shipping rates, however, the NTP does not anticipate these having an impact on support for NNSA missions. If shipping rates declined or larger shipments to WIPP are needed for the NNSA, NTP would evaluate other priorities in the complex to compensate for the change. A large emphasis is placed on meeting NNSA shipping requirements to support active projects and missions related to national security and stockpile stewardship (CBFO 2019).

Both SRS and LANL provide flexibility related to TRU waste storage. For example, at SRS, the E-Area currently manages 50 cubic meters of solid TRU waste per year, equivalent to approximately 250 55-gallon drums. However, E-Area can store 2,000–2,500 55-gallon drums on each of five pads. This would provide many years of storage capacity and allow flexibility in coping with potential fluctuations in shipments to WIPP. E-area also manages and disposes of

5,000 cubic meters per year of solid LLW and could easily double that (DOE 2017b p. A 29-A 31).

At LANL, the TRU Waste Facility (TWF), which became operational in 2017, provides continuing capability to process TRU waste generated since 1999 and ship that waste to WIPP to support programs at LANL. Inside the *Resource Conservation and Recovery Act*-permitted area at TWF are six metal buildings, five designated for waste storage and one for characterization operations. The buildings are designed to withstand risks from severe weather, fire, earthquake, and a variety of other accident scenarios. The facility provides storage and characterization of newly-generated wastes from TA-55, the CMR facility, and the Radioactive Liquid Waste Treatment Facility, which improves LANL's ability to ultimately move waste to WIPP.

TWF has the design capacity of staging and storing 825 drums (or drum equivalents) under normal operations and a surge capacity of up to 1,240 drums. The facility is also equipped to certify that TRU waste containers meet WIPP acceptance criteria. Following characterization and storage at the TWF, waste containers are packaged for shipment at the Radio Assay Non-destructive Testing Facility and then transported to WIPP (LANL 2016).

4.3.4 National Nuclear Material Transportation

Cumulative impacts for transportation of nuclear material, including plutonium, and waste focuses on radiological impacts to public and worker health. The collective doses and cumulative health effects resulting from approximately 130 years (from 1943 to 2073) of nuclear material and waste transport across the U.S. were estimated in the Surplus Plutonium Disposition Final SEIS (DOE 2015a); Table 4-48 and are shown in Table 4-1 below:

TABLE 4-1. POTENTIAL CUMULATIVE IMPACTS FROM TRANSPORT OF NUCLEAR MATERIAL AND WASTE IN THE UNITED STATES OVER 130 YEARS

Action	Crew Dose (person-rem)	Risk of Latent Cancer Fatality	Population Dose	Risk of Latent Cancer Fatality
Final Surplus Plutonium Disposition SEIS (DOE 2015a)	650	0.4	580	0.3
All other action from 1943 to 2073 (DOE 2015a)	421,000	252	436,000	262
Total	421,650	252	436,580	262

Source: (DOE 2015a), Tables 4-48 and 4-49.

Per Table 3-4 in this SA, the transportation impacts of the proposed action would be minimal and would be bounded by the analysis in the Complex Transformation SPEIS. When added to the potential transportation impacts from other transportation activities shown in Table 4-1, the cumulative impacts would be insignificant.

5.0 PRELIMINARY CONCLUSIONS AND DETERMINATION

NNSA's proposed action is to produce a minimum of 50 pits per year at a repurposed MFFF at SRS and a minimum of 30 pits per year at LANL, with additional surge capacity at each site, if needed, 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. This SA evaluates the potential impacts from producing up to 80 pits per year at both LANL and SRS and considers any new circumstances or information relevant to environmental concerns. For all resource areas, the analyses verified that the potential programmatic environmental impacts would not be different, or would not be significantly different than impacts in existing NEPA analyses identified in Section 1. Based on the results of this SA, NNSA has preliminarily determined that the proposed action does not constitute a substantial change from actions analyzed previously and there are no significant new circumstances or information relevant to environmental concerns. Therefore, as Head of Defense Programs and pursuant to NNSA's Administrative Procedure and DOE's National Environmental Policy Act Implementing Procedures (10 CFR 1021.314(c)), I have preliminarily determined that no further NEPA documentation is required at a programmatic level, and NNSA may amend the existing Complex Transformation SPEIS ROD. In order to implement the proposed action, NNSA will prepare site-specific documents, including at least: (1) a site-specific EIS for the proposal to repurpose the MFFF at SRS to produce a minimum of 50 pits per year, with additional surge capacity, if needed, to meet the requirements of producing pits at a rate of no fewer than 80 pits per year by 2030; and (2) a site-specific SA for the proposal to produce a minimum of 30 pits per year at LANL, with additional surge capacity, if needed, to meet the requirements of producing pits at a rate of no fewer than 80 pits per year by 2030.

NNSA Headquarters Concurrence:

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