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

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Executive Summary

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States Department of Energy (DOE), is responsible for meeting the national security requirements to maintain and enhance the safety, reliability, and performance of the United States (U.S.) nuclear weapons stockpile. The NNSA has a programmatic environmental impact statement covering pit production activities designed to provide NNSA the flexibility to adapt decisions as needed in response to national security requirements. As national security priorities evolved, the PEIS has been supplemented and reanalyzed several times. In 2008, the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (DOE/EIS-0236-S4) (Complex Transformation SPEIS) evaluated, among other things, alternatives for producing 10-200 pits per year at different site alternatives, including the Savannah River Site (SRS) in South Carolina and the Los Alamos National Laboratory (LANL) in New Mexico.

Since 2008, the U.S. has emphasized the need to eventually produce 80 pits per year (DoD/DOE 2008). The drivers and the requirement for pit production have remained relatively unchanged through several administrations and changes in congressional leadership. Since 2014, federal law has required the Secretary of Energy to produce no less than 30 war reserve plutonium pits by 2026 and thereafter demonstrate the capability to produce war reserve plutonium pits at a rate sufficient to produce 80 pits per year (50 U.S. Code (USC) 2538a). On January 27, 2017, the President directed the Department of Defense to conduct an updated *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 and confirmed that the U.S. 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 must implement a strategy to provide the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030. As a result, NNSA has prepared this Supplement Analysis (SA) to evaluate adopting a Modified Distributed Centers of Excellence Alternative for plutonium operations from the Complex Transformation SPEIS to enable producing a minimum of 50 pits per year at a repurposed Mixed-Oxide Fuel Fabrication Facility 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. In this SA, NNSA evaluates the potential environmental impacts of producing up to 80 pits per year at both SRS and LANL. This approach provides a conservative analysis and affords NNSA the flexibility of adapting to shifting requirements.

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Contents

List of Tables

List of Figures

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Acronyms and Abbreviations

AoA	Analysis of Alternatives
AC/MC	analytical chemistry and materials characterization
ASCE	American Society of Civil Engineers
ASER	Annual Site Environmental Report
CBFO	Carlsbad Field Office
CFR	Code of Federal Regulations
CMR	Chemistry and Metallurgy Research
CMRR	Chemistry and Metallurgy Research Replacement
CMRR-NF	Chemistry and Metallurgy Research Replacement Nuclear Facility
CPC	Consolidated Plutonium Complex
CRD	comment response document
DCE	Distributed Centers of Excellence
DoD	Department of Defense
DOE	Department of Energy
FFRDC	Federally Funded Research and Development Center
EIS	Environmental Impact Statement
GNEP	Global Nuclear Energy Partnership
HC	Hazard Category
IBC	International Building Code
ICC	International Code Council
IDA	Institute for Defense Analyses
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
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act of 1969, as amended
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NOA	Notice of Availability
NOI	Notice of Intent
NPR	Nuclear Posture Review
NPT	Nuclear Non-Proliferation Treaty
NRC	Nuclear Regulatory Commission

NTP	National TRU Program
NWSM	Nuclear Weapons Stockpile Memorandum
NWSP	Nuclear Weapons Stockpile Plan
OST	Office of Secure Transportation
ORNL	Oak Ridge National Laboratory
Pantex	Pantex Plant
PDCF	Pit Disassembly and Conversion Facility
PEIS	Programmatic Environmental Impact Statement
PF	Plutonium Facility
PGA	peak ground acceleration
PIDAS	Perimeter Intrusion, Detection, and Assessment System
PSHA	probabilistic seismic hazards assessments
ROI	region of influence
RLUOB	Radiological Laboratory/Utility/Office Building
ROD	Record of Decision
ROI	Return on Investment
SA	supplement analysis
SEIS	Supplemental Environmental Impact Statement
SNL	Sandia National Laboratories
SNM	special nuclear material
SPEIS	Supplemental Programmatic Environmental Impact Statement
SRNL	Savannah River National Laboratory
SRNS	Savannah River Nuclear Solutions
SRS	Savannah River Site
SSM PEIS	Stockpile Stewardship and Management Programmatic Environmental Impact Statement
SWEIS	Site-Wide Environmental Impact Statement
TA	technical area
TEF	Tritium Extraction Facility
TRU	transuranic
U.S.	United States
USGS	U.S. Geological Survey
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 U.S. Department of Energy (DOE) procedures implementing the *National Environmental Policy Act of 1969*, as amended (NEPA; 42 U.S. Code (USC) § 4321 *et seq.*) that require that "[when] it is unclear whether or not an Environmental Impact Statement (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 Code of Federal Regulations (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 Congress and the President and has a statutory mission to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements (50 USC 2401(b)). 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). During the Cold War, the U.S. maintained a pit production capacity of approximately 2,000 pits per year (actual production numbers are classified), but lost this large-scale production capability in the late 1980s. In 1996, the environmental effects of a production rate of up to 80 pits per year at the Savannah River Site (SRS) in South Carolina and at the Los Alamos National Laboratory (LANL) in New Mexico were analyzed in the *Stockpile Stewardship and Management Programmatic Environmental Impact Statement* (DOE/EIS-0236) (SSM PEIS) (DOE 1996a). A production level of up to 80 pits per year at a programmatic level was re-examined in subsequent analyses (DOE 1999a, DOE 2008a). Currently, plutonium pits are produced at LANL, although the actual number of pits produced has been less than 20 per year.

Pit

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

In 2008, NNSA prepared a Supplemental Programmatic Environmental Impact Statement (DOE/EIS-0236-S4) (Complex Transformation SPEIS) that evaluated, among other things, constructing a new pit production facility ("Greenfield") to produce 125 to 200 pits per year at one of five site alternatives: LANL; SRS; 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) northwest of Las Vegas, Nevada (DOE 2008b ch. 3 p. 20). At LANL, in addition to the Greenfield Alternative, the SPEIS included an analysis of two distinct upgrades to existing facilities, one to support production of 125 pits per year (Upgrade Alternative) and one to support production of 50-80 pits per year (50/80 Alternative) (DOE 2008b ch. 5 p. 3).

At SRS, in addition to the Greenfield Alternative, the SPEIS included an analysis of a pit production facility that would use the Mixed-Oxide Fuel Fabrication Facility (MFFF) and Pit Disassembly and Conversion Facility (PDCF) infrastructure (DOE 2008b ch. 5 p. 236). In the

SPEIS Record of Decision (ROD), NNSA did not make any new decisions related to pit production capacity beyond 20 pits per year at LANL (76 *Federal Register* (FR) 245).[1]

Since 2008, the U.S. 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 (DoD/DOE 2008). Since 2014, federal law has required the Secretary of Energy to produce no less than 30 war reserve plutonium pits by 2026 and thereafter demonstrate the capability to produce war reserve plutonium pits at a rate sufficient to produce 80 pits per year (50 USC 2538a). The 2018 *Nuclear Posture Review* (2018 NPR) reinforces 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, in the *John S. McCain National Defense Authorization Act for Fiscal Year 2019*, 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 these ends, the 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—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.

NNSA has prepared this SA 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 NEPA analysis is required. For preparation of this SA, NNSA uses incorporation by reference and tiers from previous NEPA and other documents (*see* Section 1.4) to succinctly present the analysis. Although pertinent regulations do not require public comment on an SA, NNSA decided, in its discretion, that public comment in this instance would be helpful. NNSA issued the Draft SA for a 45-day public review on June 28, 2019. This Final SA considers all comments received during the public comment period and documents NNSA's determination that further NEPA documentation at a programmatic level is not required at this time. NNSA has included a comment response document as Appendix A to this Final SA. Prior to implementing expanded pit production, NNSA will complete further site-specific analysis, if necessary, including at minimum an SA to the LANL Site-wide Environmental Impact Statement

[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 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.

(LANL SWEIS) and intends to develop a site-specific Environmental Impact Statement (EIS) for pit production at SRS (84 FR 26849; June 10, 2019).

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

The security policies of the United States require the maintenance of a safe, secure, and reliable nuclear weapons stockpile, and the maintenance of core competencies to design, manufacture, and maintain nuclear weapons. The purposes of NNSA's proposed actions in the Complex Transformation SPEIS include maintaining core competencies in nuclear weapons, maintaining a safe and reliable nuclear weapons stockpile, creating a responsive nuclear weapons infrastructure that is cost-effective and has adequate capacity to meet reasonably foreseeable national security requirements. Under federal law, to meet this purpose and need NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 including producing no fewer than 30 pits per year at LANL (50 USC 2538a; Public Law 115-232; DoD 2018a).

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 at two sites. Although the purpose and need has not changed from the Complex Transformation SPEIS (DOE 2008b ch. 2 p. 1), DOE has identified a modification of an alternative previously analyzed that would meet this purpose and need. This SA provides additional details related to national security considerations and the need for pit production (*see* Sections 1.1.1 and 1.1.2) and also analyzes the potential environmental impacts of this combination of alternatives.

1.1.1 National Security Considerations

Decisions on whether the U.S. should possess nuclear weapons and the type and number of those weapons are made by the Congress and the President. Since 2014, the Congress and the President have set explicit requirements for NNSA's pit production levels. The scope of the Complex Transformation SPEIS and this SA is restricted to an analysis of those limited aspects of implementing national policy where NNSA has discretion. However, to aid in public understanding, NNSA notes that there are several principal national security policy overlays and related treaties that are potentially relevant to the proposed action addressed in this SA, such as the NPR, the Nuclear Weapons Stockpile Memorandum (NWSM) and the corresponding Nuclear Weapons Stockpile Plan (NWSP), the Nuclear Non-Proliferation Treaty (NPT), and the Comprehensive Test Ban Treaty. Each of these is discussed below.

1.1.1.1 Nuclear Posture Review

The NPR is a legislatively mandated, comprehensive review of the United States nuclear deterrence policy, strategy, and force posture. NPRs have previously been prepared in 1994, 2002, and 2010. On January 27, 2017, the President directed the DoD to conduct a new NPR to ensure a safe, secure, and effective nuclear deterrent that protects the homeland, assures allies,

and above all, deters adversaries. The President also emphasized both the long-term goal of eliminating nuclear weapons and the requirement that the U.S. have modern, flexible, and resilient nuclear capabilities that are safe and secure until such a time as nuclear weapons can prudently be eliminated from the world. With respect to the proposed action in this SA (*see* Section 1.2), the 2018 NPR expressly states that the U.S. will pursue initiatives to ensure the necessary capability, capacity, and responsiveness of the nuclear weapons infrastructure and the needed skills 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 (DoD 2018a, p. 62–63).

1.1.1.2 Nuclear Weapons Stockpile Memorandum and Nuclear Weapons Stockpile Plan

The size and composition of the U.S. nuclear weapons stockpile is determined annually by the President. The secretaries of Defense and Energy jointly prepare the NWSM, which includes the NWSP as well as a long-range planning assessment. DoD prepares the NWSP based on military requirements and coordinates the development of the NWSP with NNSA concerning its ability to support the NWSP. The President approves the NWSM and NWSP, and the Congress and the President approve funding for the NNSA to carry out the requirements of the NWSP and NWSM.

Although the NWSM and NWSP are classified documents, their effect in shaping the proposed action in this SA can be explained in an unclassified context. The NWSM directly specifies the number and types of weapons required to support the stockpile. The NWSP covers the current year and a five-year planning period. The NWSP specifies the types and quantities of weapons required and sets limits on the size and nature of stockpile changes that can be made without additional approval of the President. As such, the NWSM and NWSP are the basis for NNSA stockpile support planning, and pit production requirements are derived from the NWSM and NWSP.

1.1.1.3 Nuclear Non-proliferation Treaty

The NPT was ratified by the Senate in 1969 and officially entered into force as a Treaty of the United States in 1970. Today, the U.S. continues to view the NPT as the cornerstone of the nuclear non-proliferation regime (DoD 2018a, p. 70). Article VI of the NPT obligates the parties "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." The U.S. has taken this obligation seriously and the President has emphasized both the long-term goal of eliminating nuclear weapons and the requirement that the U.S. have modern, flexible, and resilient nuclear capabilities that are safe and secure until such a time as nuclear weapons can prudently be eliminated from the world (DoD 2018a, p. V). It must be noted that the NPT does not provide any time period for achieving the ultimate goal of nuclear disarmament nor does it preclude the maintenance of nuclear weapons until their disposition. For this SA, speculation on the terms and conditions of a "zero level" U.S. stockpile goes beyond the bounds of the reasonably foreseeable

future consistent with federal law and national security policy. The proposed actions in the SSM PEIS (DOE 1996a), the Complex Transformation SPEIS, and this SA, which would enable NNSA to maintain the safety, reliability, and performance of the U.S. nuclear weapons stockpile until the ultimate goals of the NPT are attained, are consistent with the NPT.

1.1.1.4 Comprehensive Test Ban Treaty

The U.S. signed the Comprehensive Test Ban Treaty, which bans all nuclear explosions for civilian or military purposes, on September 24, 1996, but the Senate has never ratified it. Nonetheless, the U.S. has been observing a moratorium on nuclear testing since 1992, and the NPR reflects this policy. The stated policy of the United States is to not resume nuclear explosive testing unless necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal (DoD 2018a, p. 72). There is nothing in this proposed action which requires or assumes that the U.S. would resume nuclear explosive testing, therefore this SA would be consistent with the existing moratorium on testing, and the Comprehensive Test Ban Treaty.

1.1.2 Need for Pit Production

Under federal law and to meet national security requirements, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 (50 USC 2538a; Public Law 115-232; DoD 2018a, p. 62–63). The limited pit production authorization at LANL cannot meet this requirement. NNSA's proposed action would: (1) mitigate against the risk of plutonium aging (*see* Section 1.1.2.1); (2) produce pits with enhanced safety features to meet NNSA and DoD requirements (*see* Section 1.1.2.2); (3) respond to changes in deterrent requirements driven by growing threats from peer competitors (*see* Section 1.1.2.3); and (4) improve the resiliency, flexibility, and redundancy of the Nuclear Security Enterprise by not relying on a single production site (*see* Section 1.1.2.4). If implemented, the proposed action would address a critical national security issue by providing the needed long-term capability to maintain the nuclear deterrent that is a cornerstone of Untied States national security policy.

1.1.2.1 Pit Aging and Pit Lifetime

Modern nuclear weapons have a primary, or trigger, that contains a central core, called the "pit." Over time, as materials age, their fundamental properties change; these age-related changes affect a nuclear weapon's plutonium pit. The reliability of a nuclear weapon is directly dependent on the plutonium. Although U.S. nuclear weapons are presently safe and reliable, they are undoubtedly aging; most of the pits in the enduring stockpile were produced in the mid to late 1970s and 1980s.

Considerable research has been dedicated to understanding how long plutonium pits will remain effective. Results thus far show that uncertainty in the performance of older plutonium increases over time resulting in decreasing confidence over time. At at some age, the properties will change sufficiently to warrant replacement. NNSA continues to research the life expectancy of plutonium pits. This is scientifically challenging and will require many years to fully understand.

Implementing a moderate pit manufacturing capability now is a prudent approach to mitigate against age-related risk.

For the foreseeable future, NNSA will rely on a combination of newly manufactured pits and judicious reuse of existing pits to modernize the U.S. nuclear stockpile. This approach enables NNSA to implement a moderately sized pit manufacturing capability of no fewer than 80 pits per year by 2030. This capability allows for:

- Enhanced warhead safety and security to meet DoD and NNSA requirements;
- Deliberate, methodical replacement of older existing plutonium pits with newly manufactured pits as risk mitigation against plutonium aging; and
- Response to changes in deterrent requirements driven by renewed great power competition.

1.1.2.2 Enhanced Safety Features

The Stockpile Stewardship Program enables NNSA to address aging and performance issues, enhance safety features, improve security, and allow NNSA to meet today's military and national security requirements (DoD 2018a). Each different weapon type in the U.S. nuclear stockpile requires routine maintenance, periodic repair, replacement of limited life components, and surveillance (*i.e.*, a thorough examination of a weapon) in order to ensure continued safety, security, and effectiveness and other support activities as necessary. The pit capacity requirements analyzed in this SA account for producing pits with enhanced safety features to meet NNSA and DoD requirements.

1.1.2.3 Deterrent Requirements by Growing Threats

Nuclear weapons have played and will continue to play a critical role in deterring nuclear attack and in preventing large-scale conventional warfare between nuclear-armed states for the foreseeable future. U.S. nuclear weapons not only defend our allies against conventional and nuclear threats, they also help them avoid the need to develop their own nuclear arsenals. This, in turn, furthers global security (DoD 2018a, p. III). While the U.S. has continued to reduce the number and salience of nuclear weapons, others, including Russia and China, have moved in the opposite direction. They have added new types of nuclear capabilities to their arsenals, increased the salience of nuclear forces in their strategies and plans, and engaged in increasingly aggressive behavior, including in outer and cyber space. North Korea continues its illicit pursuit of nuclear weapons and missile capabilities in direct violation of United Nations Security Council resolutions (DoD 2018a, p. V).

An effective, responsive, and resilient nuclear weapons infrastructure is essential to the U.S. capacity to adapt flexibly to shifting requirements. Such an infrastructure offers tangible evidence to both allies and potential adversaries of U.S. nuclear weapons capabilities and thus contributes to deterrence, assurance, and hedging against adverse developments. It also discourages adversary interest in arms competition. Providing the enduring capability and

capacity to produce plutonium pits at a rate of no fewer than 80 pits per year by 2030 is an integral part of this strategy (DoD 2018a, p. XIV).

1.1.2.4 Two-Prong/Two-Site Approach

Using two pit production sites would improve the resiliency, flexibility, and redundancy of the Nuclear Security Enterprise by not relying on a single production site and is considered the best way to manage the cost, schedule, and risk of such a vital undertaking (DoD 2018b). According to NNSA testimony, "Even though this approach will require NNSA to fund activities at two sites, any interruption or delay to pit production in the future due to the lack of resiliency will have huge cost increases across the entire Nuclear Security Enterprise" (DOE 2019a). A two-site pit production strategy would enable NNSA to meet national security requirements if one facility became unavailable.

1.2 PROPOSED ACTION

NNSA's proposed action (detailed in Section 2.0 of this SA) is to implement a Modified Distributed Centers of Excellence (DCE) Alternative for plutonium operations, which will enable NNSA to produce a minimum of 30 pits per year at LANL and a minimum of 50 pits per year at a repurposed MFFF at SRS, 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. The proposed action also includes activities across the nuclear weapons complex (Complex) associated with transportation, waste management, and ancillary support (*e.g.*, staging and testing) for pit production. This two-site approach is a modification of the DCE Alternative previously analyzed in the Complex Transformation SPEIS. NNSA proposes no new actions with respect to uranium operations and weapons assembly/disassembly/high explosive functions across the Complex.

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 SRS and LANL. 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 2008b ch. 1 p. 11). Those site-specific documents would use more detailed information to evaluate the potential environmental impacts at SRS and LANL.

This SA is organized as follows:

- Section 1.0 contains the introduction;
- Section 2.0 describes the proposed action;
- Section 3.0 discusses the process/methodology used, and contains the comparative environmental impact analysis;
- Section 4.0 presents the cumulative impacts analysis;

- Section 5.0 includes the determination;
- Section 6.0 identifies references used; and
- Appendix A provides responses to comments on the Draft SA.

1.4 NEPA STRATEGY AND RELEVANT NEPA DOCUMENTS AND OTHER DOCUMENTS

Upon an NNSA determination 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, and to implement surge efforts to exceed 30 pits per year to meet federal law, and Nuclear Posture Review and national policy; 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, and to implement surge efforts to exceed 50 pits per year to meet federal law, and Nuclear Posture Review and national policy. NNSA is preparing a new EIS at SRS at this time because 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.. NNSA is preparing an SA to the 2008 LANL SWEIS because LANL has multiple site-wide EISs that have analyzed site-specific pit production levels of 80 pits per year. The SA to the 2008 LANL SWEIS will enable NNSA to decide whether to prepare further NEPA documentation at a site-level for LANL.

For preparation of this SA, NNSA uses incorporation by reference and tiers from previous 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 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 Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SSM PEIS) (DOE 1996a) evaluated alternatives for maintaining the safety and reliability of the U.S. nuclear weapons stockpile and preserving competencies in nuclear weapons in the post-Cold War era. The SSM PEIS ROD (61 FR 68014) documented important decisions related to fulfilling these requirements without underground nuclear testing.

The Final Complex Transformation SPEIS (DOE 2008b) supplemented the SSM PEIS and 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. The Complex Transformation SPEIS considered how to configure facilities that hold

Category I and Category II quantities of Special Nuclear Material (SNM) across the Complex, including the three functional areas of plutonium, uranium operations, and weapons assembly/disassembly/high explosives, in various ways. These alternatives were broadly categorized into a DCE Alternative, a Consolidated Centers of Excellence Alternative, and a Capability-Based Alternative. The Complex Transformation SPEIS also analyzed a No Action Alternative.

With respect to plutonium operations and pit production specifically, under the various alternatives the Complex Transformation SPEIS evaluated: (1) constructing and operating a new Greenfield pit production facility to produce 125 pits per year at SRS, LANL, Y-12, Pantex, and NNSS; (2) constructing and operating a pit production facility that would use the MFFF and PDCF infrastructure at SRS to produce 200 pits per year; and (3) 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 (DOE 2008b ch 3. p. 20, ch. 5 pgs. 3 and 236). In the 2008 Programmatic ROD (76 FR 245), NNSA decided to implement its preferred programmatic alternative, which was a combination of the DCE Alternative and the Capability-Based Alternative and did not make any new decisions related to pit production capacity because it 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 2020 Stockpile Stewardship Management Plan* (DOE 2019b ch. 2 p. 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 fuel technologies. In the ROD (65 FR 1608), 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 Final Surplus Plutonium Disposition 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 (81 FR 19588), DOE announced its decision to prepare and package the 6 metric tons using facilities at SRS to meet the WIPP waste acceptance criteria and to ship the surplus plutonium to WIPP for disposal. DOE has not yet announced a decision for the remaining 7.1 metric tons of surplus pit plutonium.

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 1999a) considered the environmental impacts of continuing to operate LANL to support DOE's national missions. The 1999 SWEIS analyzed four alternatives including a No Action, Expanded Operations (analyzing a pit production rate of up to 80 pits per year), Reduced Operations, and

"Greener" alternative. In the September 1999 ROD (64 FR 50797), 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)."

2008 LANL SWEIS (DOE 2008a) was issued May 16, 2008. In the September 2008 ROD (73 FR 55833), NNSA decided "to continue operation of the Laboratory with discrete elements from the Expanded Operations Alternative." The 2008 LANL SWEIS Expanded Operations Alternative analyzed production of up to 80 pits per year. The 2008 LANL SWEIS also evaluated the impacts of constructing and operating a consolidated nuclear production center of excellence at LANL, which entailed consolidation of special nuclear materials storage and production of 125 pits with a potential surge capacity of 200 pits annually, and included that impact analysis in the cumulative impacts section of the 2008 LANL SWEIS.

The 2018 Supplement Analysis of the 2008 LANL SWEIS (DOE 2018d) 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. This SA was completed in April 2018, before the May 10, 2018 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 (62 FR 3880), 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, 2008c, 2012b, 2018a) evaluated changes since the issuance of the Pantex SWEIS to determine if the EIS should be supplemented or if a new Pantex SWEIS 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 SWEIS, 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 (79 FR 78421) 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 2011a) analyzed the potential environmental impacts of ongoing and future operations and activities at Y-12. 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 2016a, 2018b)[2] 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 (46 FR 9162) documented DOE's decision to proceed with the phased construction and operation of WIPP near Carlsbad, New Mexico. WIPP stores transuranic (TRU) waste from pit production activities.

The Final Supplemental Environmental Impact Statement for the Waste Isolation Pilot Plant (WIPP SEIS-I) (DOE 1990) evaluated the environmental impacts associated with new information and changes since the 1981 ROD. WIPP 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 WIPP SEIS-I (55 FR 25689), which was issued in June 1990, continued the phased development of WIPP.

The Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS-II) (DOE 1997) analyzed the potential environmental impacts associated with disposing of TRU waste at WIPP and polychlorinated biphenyl -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 cubic meters (m^3) of TRU waste generated from defense activities. In the ROD (63 FR

[2] The Y-12 2016 SA, associated 2016 Amended ROD, and 2018 SA have been subject to litigation in a case filed in United States District Court for the Eastern District of Tennessee. In September 2019, the Court issued a Memorandum Opinion and Order that rejected plaintiffs' arguments that NNSA is required to conduct a new EIS in light of changed circumstances related to plans for Y-12's uranium facility. However, the Court declared the Amended ROD and SAs "in violation of NEPA," remanding to NNSA and directing it to conduct, at minimum, a supplement analysis using "an unbounded accident analysis of earthquake consequences at the Y-12 site, performed using updated seismic hazard analyses that incorporate the 2014 USGS seismic hazard map." NNSA's evaluations of the Court's decision and Y-12 seismic issues are ongoing.

3624), DOE decided to dispose of up to 175,600 m^3 of TRU waste (except polychlorinated biphenyl -commingled TRU waste) at WIPP.

The Supplement Analysis for the WIPP SEIS-II (DOE 2016b) 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 mixed oxide (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 Final Environmental Impact Statement for the Chemistry and Metallurgy Research Replacement (CMRR) Project (DOE 2003a) which evaluated alternatives for replacing the analytical chemistry and materials characterization (AC/MC) capabilities provided in the Chemistry and Metallurgy Research (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 (69 FR 6967) 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.[3] RLUOB was constructed and is in operation; however, construction of CMRR-NF was initially delayed and subsequently cancelled.

In 2011, NNSA issued the Final Supplemental Environmental Impact Statement (SEIS) for the Nuclear Facility Portion of the CMRR Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR-NF SEIS) (DOE 2011b) 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 (69 FR 6967) 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 funding in the 2016 budget request (DOE 2015b).

[3] Title 10, Code of Federal Regulations (CFR) Part 830 assigns hazard categories to nuclear and radiological facilities in accordance with the potential consequences in the event of a radiological accident. PF-4 is a HC-2 nuclear facility. Facilities with smaller inventories of radiological material would be HC-3 or below HC-3. The nuclear facilities at LANL are either HC-2 or HC-3 (DOE 2008a, ch. 1 p. 11). The threshold for a DOE HC-3 Nuclear Facility is 38.6 grams of plutonium-239 and the threshold for a DOE HC-2 Nuclear Facility is 2,610 grams of plutonium-239 (NNSA 2014, Attachment 2, Table 1).

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 Plutonium Facility building 4 (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

Atomic Energy Defense Act (50 USC 2538a) enacted in 2014, the Secretary of Energy is charged with producing no less than 30 war reserve plutonium pits by 2026 and demonstrating, during 2027, the capability to produce war reserve plutonium pits at a rate sufficient to produce 80 pits per year, and to submit an annual certification to Congress and the Secretary of Defense that the programs and budget of the Secretary of Energy will enable the nuclear security enterprise to meet these requirements.

John 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 2018 NPR and national policy.

Fiscal Year 2020 Stockpile Stewardship and Management Plan, a Report to Congress (DOE 2019b) 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 U.S., 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 DoD Under Secretary of Defense for Acquisition and Sustainment and the 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 SRS and LANL as the two preferred locations to accomplish this enduring mission (DOE 2017b p. 1).

1.5 PUBLIC PROCESS

Although publication of a draft SA is not required, NNSA made the Draft SA available for public review and comment on the DOE NEPA web page (https://www.energy.gov/nepa/nepa-documents). A *Federal Register* Notice of Availability (NOA) (84 FR 31055; June 28, 2019) announced the availability of the Draft SA and provided a 45-day public comment period that ended on August 12, 2019. Section 1.6 of this SA provides a summary of the review process and the comments received.

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.

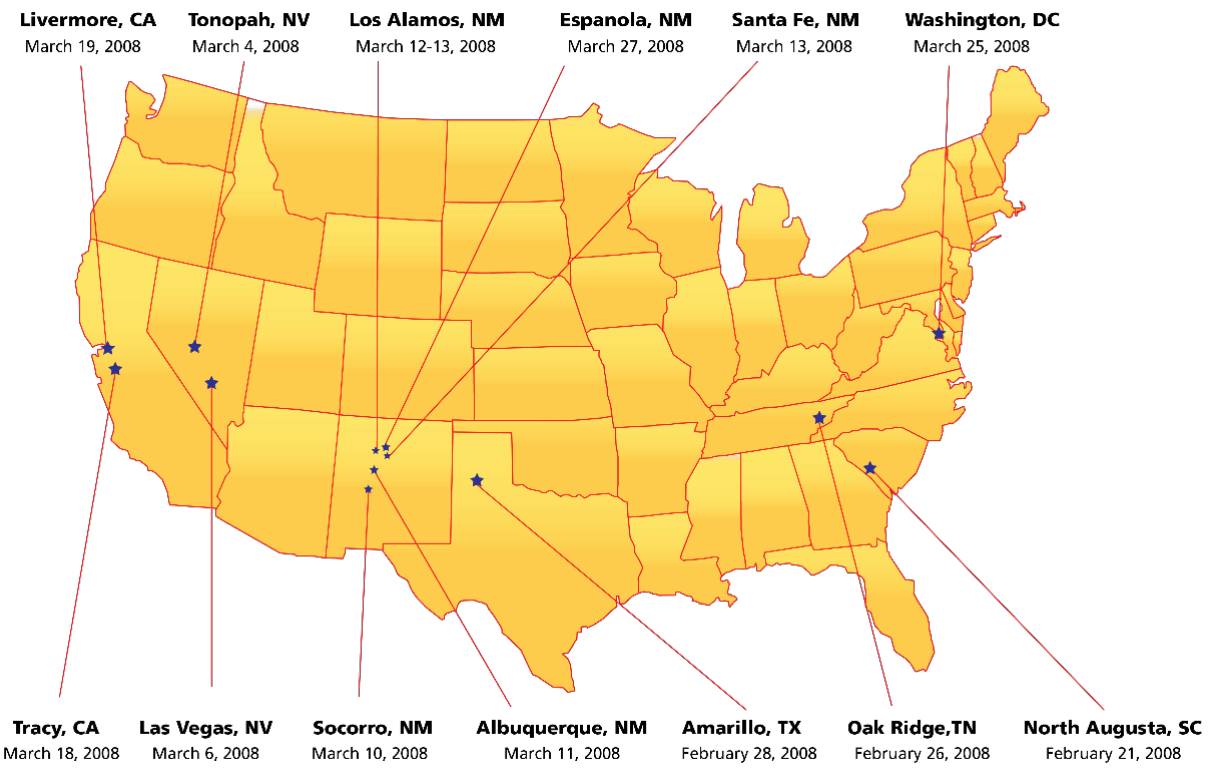

FIGURE 1-1. PREVIOUS PUBLIC MEETINGS ON THE COMPLEX TRANSFORMATION DRAFT SPEIS

1.6 PUBLIC COMMENTS ON THE DRAFT SA

As noted in Section 1.5 of this SA, NNSA made the Draft SA available for public review and comment on the DOE NEPA web page (https://www.energy.gov/nepa/nepa-documents). A NOA (84 FR 31055; June 28, 2019) announced the availability of the Draft SA and provided a 45-day public comment period that ended on August 12, 2019. Previously, on June 10, 2019, DOE issued a *Federal Register* Notice of Intent (NOI) to prepare the site-specific SRS Pit Production EIS (84 FR 26849; June 10, 2019) and announced a 45-day EIS scoping period that ended on July 25, 2019. The SRS Pit Production EIS NOI also provided information regarding DOE's overall NEPA strategy related to fulfilling national requirements for pit production. In separate email notices at SRS and LANL, NNSA notified individuals and groups on their respective mailing lists of the availability of the Draft SA for public review and comment. Comments submitted in response to the NOA were sent to the same email and physical address as comments in response to the NOI for the SRS Pit Production EIS. As a result, NNSA reviewed all comments submitted in response to either the NOA or NOI for applicability to the programmatic NEPA review.

NNSA received 205 total comment documents including the transcripts of 44 speakers at the public scoping meeting for the SRS Pit Production EIS and 161 comment document submittals. Of these, 82 had some relevance to the Draft SA, including 34 comment documents that were received after the August 12, 2019 deadline. Comments relevant to the SA, as well as NNSA's corresponding responses to those comments, are presented in Appendix A of this SA. All comment documents received in response to both notices were reviewed and considered by NNSA and are included in the Administrative Record for this SA.

The SA comments were organized into the following topic areas:

- Validity of the SA determination;
- The purpose and need for NNSA's proposal;
- Requests for an extension to the comment period;
- The two-prong (two-site) approach to pit production[4];
- New information or changed circumstances;
- Questions about the technical aspects of the impact analyses;
- General opposition to, or support for, the proposal;
- Comments about nuclear weapon policies or new weapon designs; and
- Miscellaneous comments.

NNSA considered all comments, including late comments, during the preparation of this Final SA and determination. In response to questions related to the programmatic need for pits and non-proliferation, NNSA has modified Section 1.0, Introduction; Section 1.1, Purpose and Need;

[4] A minimum of 50 pits per year produced at SRS and a minimum of 30 pits per year produced at LANL (DoD 2018b).

and made other revisions throughout the SA. NNSA has made other modifications in response to public comments as appropriate. The Final SA and determination are available to the public on the NNSA NEPA Reading Room website (https://www.energy.gov/nnsa/nnsa-nepa-reading-room).

2.0 PROPOSED ACTION

NNSA's proposed action is to implement a Modified DCE Alternative for plutonium operations from the Complex Transformation SPEIS, which will enable NNSA 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. The Proposed Action in the Complex Transformation SPEIS is the transformation of the nuclear weapons complex, and by selecting this modified alternative, NNSA continues actions discussed and analyzed in the Complex Transformation SPEIS. NNSA is making no proposals and no decisions about uranium operations and weapons assembly/disassembly/high explosives capabilities.

The original DCE Alternative considered one larger consolidated pit production facility within the Complex, but national security policy requires a more resilient configuration. Therefore, in this SA, NNSA is analyzing the impacts of a modified DCE Alternative to include two smaller capacity pit production facilities rather than a single facility. This configuration would give NNSA the resiliency 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. In addition to analyzing a Modified DCE Alternative for plutonium operations, NNSA also includes an analysis of actions across the Complex associated with transportation, waste management, and ancillary support (*e.g.*, staging, testing, etc.). More details regarding actions at both SRS and LANL are provided in Sections 2.2.1 and 2.2.2, respectively.

2.1 EXISTING PLUTONIUM OPERATIONS

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

2.1.1 Los Alamos National Laboratory

LANL, a nuclear weapons design and physics laboratory, serves as the Plutonium Science and Production Center of Excellence for the U.S. and provides current pit production capabilities for the weapons complex (Public Law 115-232, Section 3120). Plutonium pit production is conducted at the Plutonium Facility Complex in TA-55, which consists of six key buildings and several support, storage, security, and training structures (DOE 2017a Appendix E p. 15-17). The most important building, PF-4, is categorized as a HC-2 nuclear facility (DOE 2008a ch. 3 p. 56).

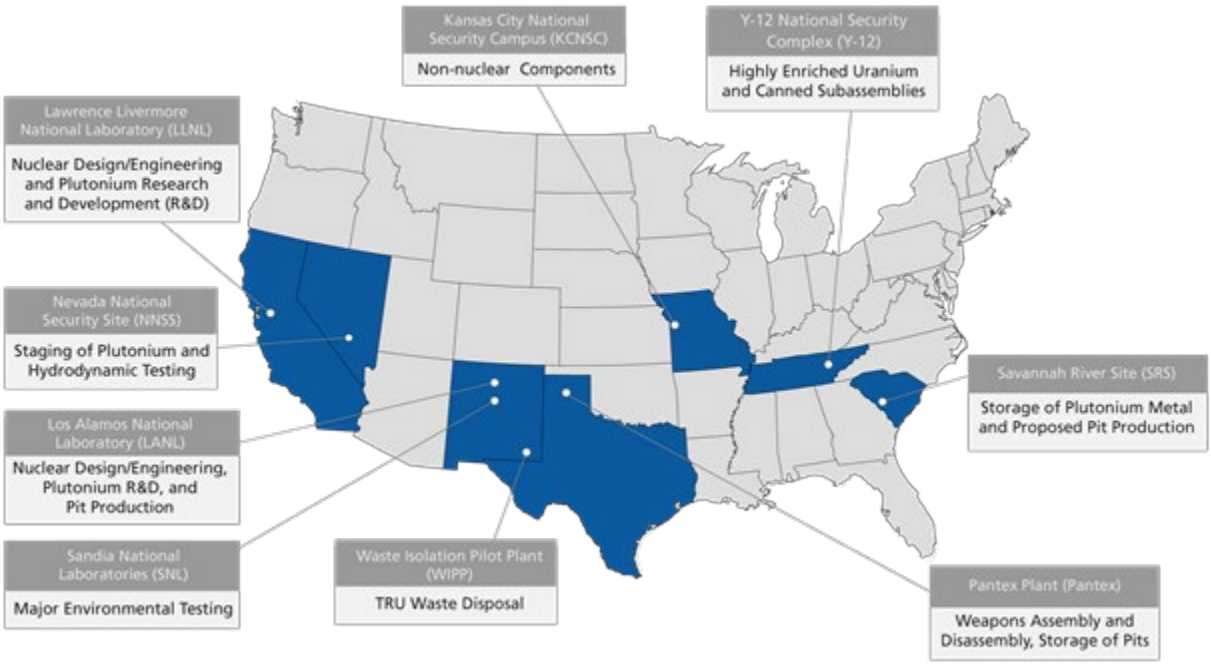

FIGURE 2-1. DOE/NNSA SITES ASSOCIATED WITH PIT PRODUCTION MISSION

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 for use in pit production, and performing nonintrusive pit modification (*e.g.*, changes to the external surfaces and features of a pit) (DOE 2008c, 2018a).

2.1.3 Y-12 National Security Complex

Y-12, located in 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 PF-4 (DOE 2011a).

2.1.4 Savannah River Site

SRS, located in South Carolina, has extensive experience in capabilities for the receipt, storage, processing, packaging, and shipping of plutonium (DOE 2008b ch. 3 p. 12-13). The MFFF is located in F-Area; near the center of the 300-square mile site (DOE 2015a Appendix B p. 11).

2.1.5 Nevada National Security Site

NNSS, located in 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 SNM to support

various missions (DOE 2017a Appendix E p. 74-76). NNSS also accepts LLW from other DOE sites and disposes of LLW onsite (DOE 2013 ch. 3 p. 21-22).

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 Appendix E p. 5-8).

2.1.7 Sandia National Laboratories

SNL, with locations in New Mexico and California, conducts environmental effects analyses, testing, and engineering sciences to evaluate the effects of operational and abnormal environments on nuclear weapons systems and components. SNL 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 Appendix E p. 25-29).

2.1.8 Kansas City National Security Campus

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

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 DOE and NNSA sites is sent to WIPP for permanent disposal (DOE 1997).

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 2018c 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 primarily at TA-55 (Figure 2-2). In order to produce a minimum of 30 pits per year, and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy. NNSA would continue to 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 (*e.g.*, 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). From a programmatic perspective, these upgrades and modifications are less than those NNSA previously identified as necessary for a larger pit production capability (of 125 to 200 pits per year) at LANL or even what was previously considered as potentially required for production levels of 80 pits per year. From an environmental impact perspective, as discussed below, the environmental impacts are also less than previously identified in the Complex Transformation SPEIS. The site-specific SA for LANL would analyze any specific upgrades to these facilities to support pit production.

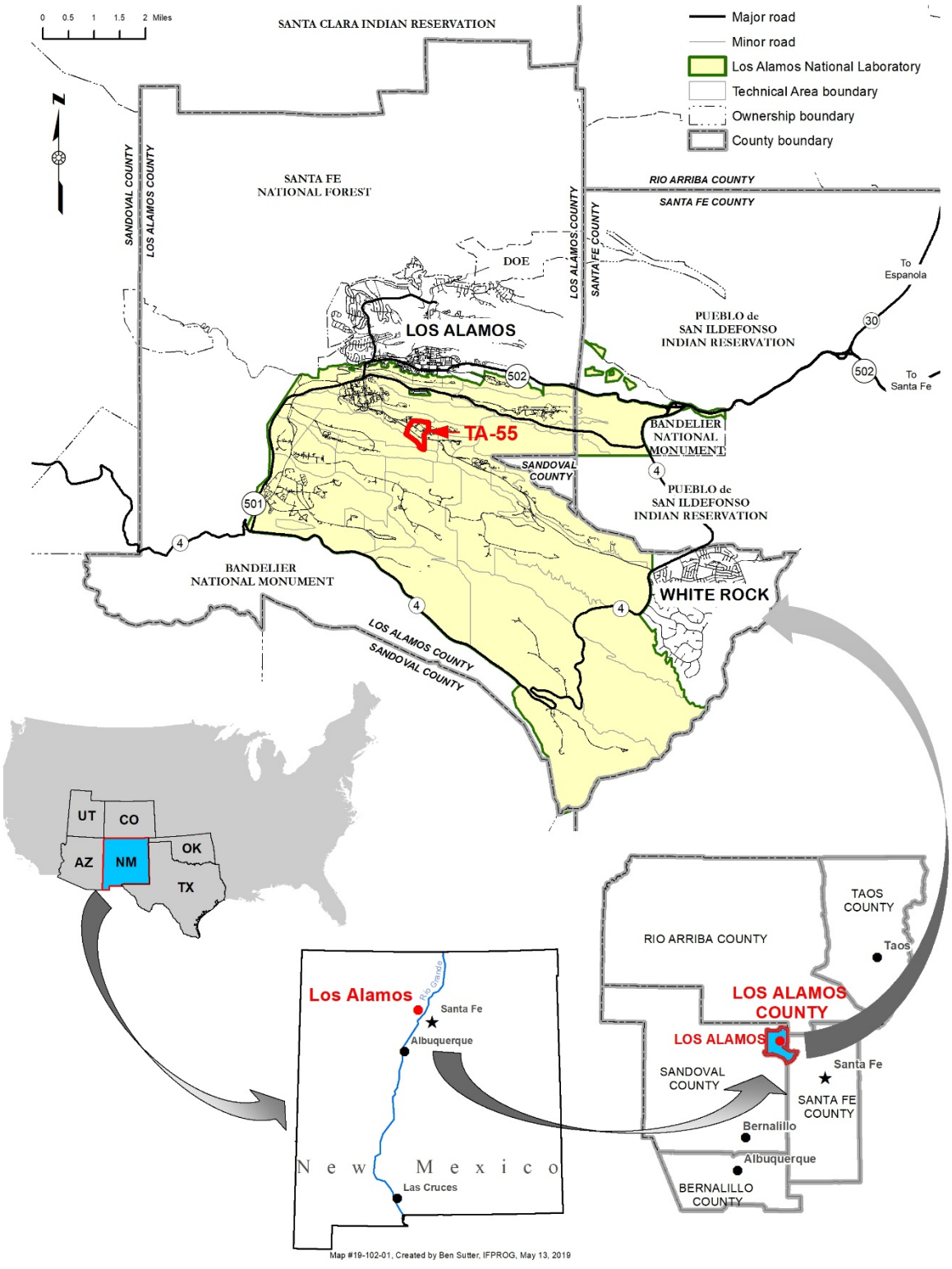

FIGURE 2-2. LOCATION OF LOS ALAMOS NATIONAL LABORATORY

FIGURE 2-3. PF-4 AT TA-55

In addition to these support facilities, because of additional workforce requirements associated with increased pit production, LANL is proposing to construct several administrative offices and parking facilities. Table 2-1 presents construction estimates, as analyzed in the Complex Transformation SPEIS and in the proposed action analyzed in this SA, 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, as well as the proposed action. As shown in Table 2-1, construction estimates associated with the proposed action would be less than estimates in the Complex Transformation SPEIS. This SA evaluates whether the construction impacts associated with the proposed action constitute a substantial change from actions analyzed previously and whether there are any significant new circumstances or information relevant to environmental concerns.

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)	Proposed Action (30-80 Pits Per Year)
Land Disturbance (acres)	6.5	13.5	140	21
Construction Duration (years)	4	3.6	6	5
Peak Construction Workforce (persons)	190	300	770	200
Peak Electricity (megawatts-	1.0	2.0	3.0	1.0

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)	Proposed Action (30-80 Pits Per Year)
electric [MWe])				
Peak Water (gallons/year)	550,000	2,111,800	5,600,000	2,000,000
Nonhazardous Solid Waste (tons)	Not estimated	578	9,800	3,500

Source: (DOE 2008b) Tables 3.4.1-1, 3.4.1-2, 3.4.1-7, 3.4.1-8. LANL proposed action values from Triad (2019).

Producing pits at LANL could be achieved with multiple shift operations. Table 2-2 presents operational estimates, as analyzed in the Complex Transformation SPEIS and as proposed in this SA, for increasing pit production at LANL. The estimates in Table 2-2 are provided for all three alternatives presented in the SPEIS as well as the proposed action. 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. As shown in Table 2-2, operational estimates associated with the proposed action would be less than or equal to estimates in the Complex Transformation SPEIS. This SA evaluates whether the operational impacts associated with the proposed action constitute a substantial change from actions analyzed previously and whether there are any significant new circumstances or information relevant to environmental concerns

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)	Proposed Action (30-80 Pits Per Year)
Workforce (persons)	680	1,170	1,170	400
Radiation Workers (persons)	458	675	675	250
Peak Electrical (MWe)	10	11	11	10
Domestic Water (gallons/year)	43,000,000	80,000,000	80,000,000	43,000,000
Wastes				
LLW Solid (cubic yards [yd^3]/year)	1,850	3,500	3,500	1,100-2,930
TRU Solid (including Mixed TRU) (yd^3/year)	575	850	850	140 - 400
TRU Liquid (yd^3/year)	6.5	16.2[1]	16.2[1]	5

[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 2008b) Tables 3.4.1-3, 3.4.1-4, 3.4.1-9, 3.4.1-10. LANL proposed action values from Triad (2019).

2.2.2 Savannah River Site

SRS's 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 to implement surge efforts to exceed 50 pits per year to meet Nuclear Posture Review and national policy, 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 and modification of support and training structures, administrative offices and additional parking facilities; and hiring and training staff. 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 sufficient to meet the pit production requirements (DOE 2017b p. 79-80). The MFFF does not currently have a PIDAS (DOE 2017b Appendix A p. 29). If a decision is made to repurpose the MFFF to produce pits, a PIDAS would be constructed around the facility (DOE 2017b Appendix A p. 26).

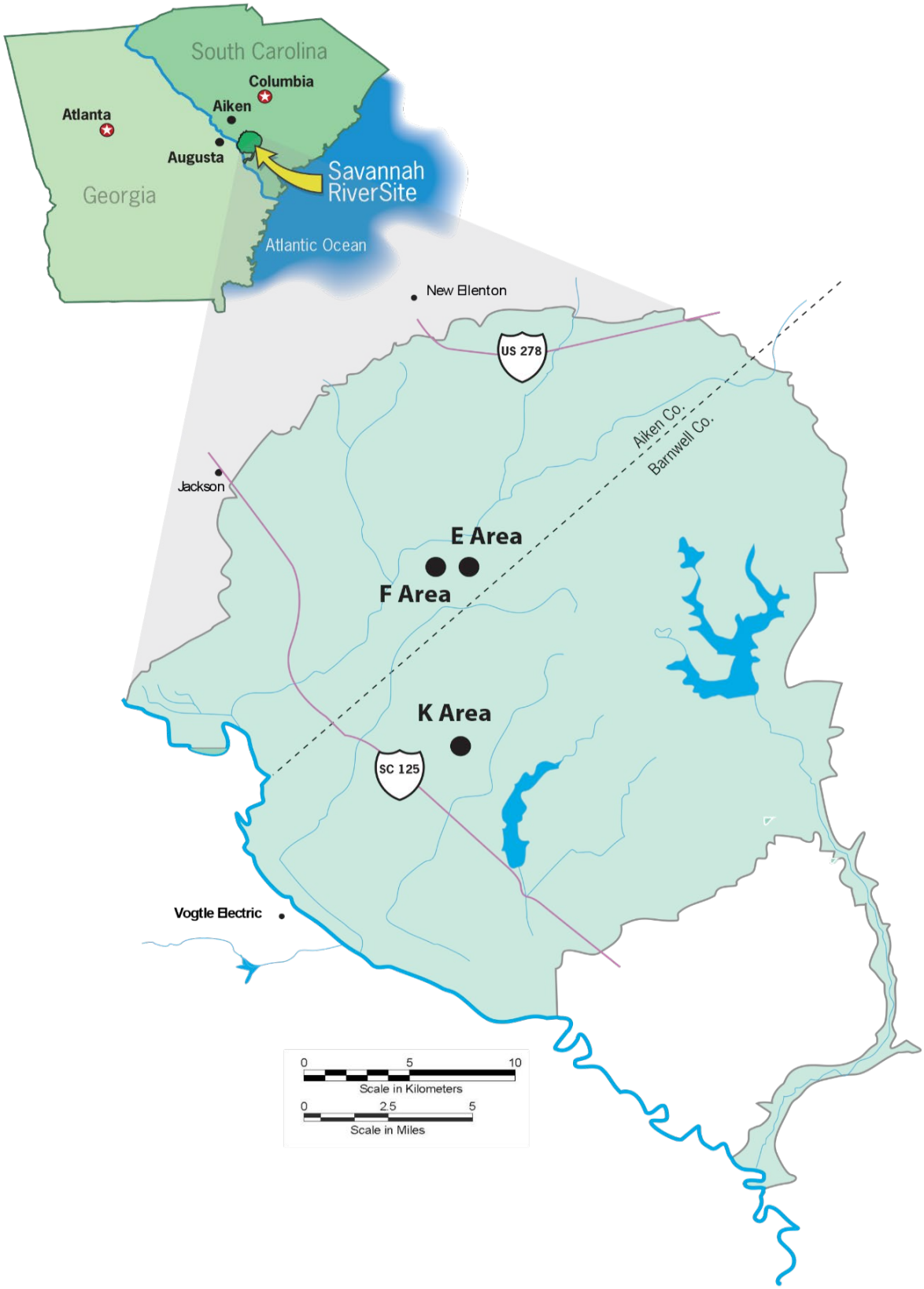

FIGURE 2-4. LOCATION OF SAVANNAH RIVER SITE

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 were 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; and
- Installing fire water supply equipment and the emergency diesel generators in separate structures adjacent to the MFFF.

Table 2-3 presents construction estimates, as analyzed in the Complex Transformation SPEIS and in the proposed action analyzed in this SA, 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, as well as a Greenfield Alternative (DOE 2008b, ch. 5 p. 236). As shown in Table 2-3, construction estimates associated with the proposed action would be less than estimates in the Complex Transformation SPEIS, with the exception of peak electricity demand, water requirements, and the peak construction workforce. This SA evaluates whether the construction impacts associated with the proposed action constitute a substantial change from actions analyzed previously and whether there are any significant new circumstances or information relevant to environmental concerns. Regarding increased peak electricity demand

and water requirements, as discussed in Table 3-2, the infrastructure at SRS has adequate supply to meet demand. For example, the SRS electricity grid can support a peak demand of 500 megawatts, so a demand of 18.2 megawatts would represent an increase of less than four percent. The construction water requirement would represent about five percent of the groundwater used per day by SRS. The peak construction employment is estimated to represent less than one percent of the projected region of influence (ROI) labor force and would not affect community resources.

TABLE 2-3. PREVIOUS CONSTRUCTION ESTIMATES AT SRS

Parameter	Alternative using MOX and PDCF Infrastructure[a] (200 Pits Per Year)	Greenfield Alternative[a] (200 Pits Per Year)	Proposed Action[b] (50-80 Pits Per Year)
Land Disturbance (acres)	126	140	48[c]
Construction Duration (years)	6	6	6
Peak Construction Workforce (persons)	770	850	1,800
Peak Electricity (megawatts-electric [MWe])	3.0	3.3	18.2
Peak Water (gallons/year)	5,200,000	5,700,000	16,600,000
Nonhazardous Solid Waste (tons)	9,800	10,900	3,400

[a] Source: (DOE 2008b, Tables 3.4.1-1, 3.4.1-2)
[b] Source: (SRNS 2019a)
[c] Land disturbance would occur on previously disturbed land. No land disturbance on previously undisturbed land is expected.

Table 2-4 presents operational estimates, as analyzed in the Complex Transformation SPEIS and as proposed in this SA, for producing pits at SRS. The Complex Transformation SPEIS evaluated a production facility that would use the MFFF and other infrastructure, as well as a Greenfield Alternative (DOE 2008b ch. 5 p. 236). As shown in Table 2-4, operational estimates associated with the proposed action would be less than or equal to estimates in the Complex Transformation SPEIS, with the exception of LLW and TRU waste generation. This SA evaluates whether the operational impacts associated with the proposed action constitute a substantial change from actions analyzed previously and whether there are any significant new circumstances or information relevant to environmental concerns. Regarding potential increases in LLW, as discussed in Table 3-2, LLW disposal onsite at SRS (E Area) would be adequate to support pit production. Regarding TRU waste generation, the available capacity at WIPP would be adequate to support pit production TRU wastes. As discussed in Section 4.3.3, the combined TRU waste from pit production at LANL and SRS generated over 50-years would account for 53 percent of the projected available capacity at WIPP.

TABLE 2-4. PREVIOUS OPERATIONAL ESTIMATES AT SRS

Parameter	Alternative using MOX and PDCF Infrastructure or Greenfield Alternative[a] (200 pits/year)	Proposed Action[b] (50-80 Pits Per Year)
Workforce (persons)	1,780	1,110-1,220
Radiation Workers (persons)	1,150	680-750
Peak Electrical (MWe)	11	11
Domestic Water (gallons)	88,500,000[c]	10,800,000
Wastes		
LLW Solid (yd^3)	3,900	7,800-13,100
TRU Solid (including Mixed TRU) (yd^3)	950	1,365-2,185

[a] Operation of an alternative using MOX and PDCF Infrastructure or Greenfield Alternative would be the same. Source: (DOE 2008b, Tables 3.4.1-3, 3.4.1-4, 3.4.1-10)
[b] Source: (SRNS 2019a)
[c] Domestic water value reflects the sum of estimates for domestic water and cooling tower makeup

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 3.0 of this SA, NNSA analyzes whether the differences in impacts at SRS and LANL 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 SRS and LANL are also involved in pit production operations, and 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 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.

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 2008b); Pantex SWEIS (DOE 1996b); 2018 SA (DOE 2018a)	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 SRS and LANL would be bounded by existing analyses. (*see* "OST" for Complex-wide transportation impacts).
Y-12	Provides uranium	Complex Transformation SPEIS (DOE 2008b); Y-12 SWEIS (DOE 2011a); 2016 SA (DOE 2016a)	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 SRS and LANL 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 2008b); 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 2008b)	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 2008b)	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 2008b); Kansas City Plant EA (DOE 2008d)	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

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?
			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 2008b); WIPP SEIS-II (DOE 1997)	Yes. Increased pit production would increase TRU waste disposal at WIPP. Available capacity has decreased since the time the Complex Transformation SPEIS was prepared, however, as reported in Section 4.3.3, the method of calculating the Volume of Record and available capacity has changed, increasing the capacity to offset the decrease. 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 2008b)	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.

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 across the Complex, focusing on SRS and LANL to determine whether or not the baseline natural environment at either site has changed significantly since the Complex Transformation SPEIS was prepared. 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. 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 SRS and LANL, as appropriate.

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

2.3.1.1 LANL

NNSA evaluated the environmental conditions at LANL in the 2018 *Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory* (DOE 2018d). The 2018 SA to the 2008 LANL SWEIS considered potential changes to the environmental conditions analyzed in the 2008 LANL SWEIS (DOE 2008a). Considerations for potential changes include: (1) the Las Conchas fire in 2011, (2) flooding as a result of the Las Conchas Fire in 2013, (3) listing of the Jemez Mountains Salamander as a federally listed endangered species, (4) ongoing land conveyance and transfer, (5) effects of global and regional climate change, (6) the 2009 Defense Nuclear Facilities Safety Board Recommendation addressing seismic concerns, and (7) the revised supplemental guidance to DOE Technical Standard 1027 for changing allowable inventory limits for radionuclides. The 2018 SA for LANL also evaluated potential impacts from projects implemented and proposed to be implemented since the 2008 LANL SWEIS, excluding projects related to increased pit production. NNSA determined that based on the results of the 2018 SA for LANL, the potential changes to the environment and projected impacts from actions evaluated did not constitute a significance difference from the analysis in the 2008 LANL SWEIS.

2.3.1.2 SRS

Environmental conditions at SRS have not changed notably since the Complex Transformation SPEIS was prepared. Environmental conditions are documented in Annual Site Environmental Reports (ASERs) (*see* https://www.srs.gov/general/pubs/ERsum/index.html for all SRS ASERs published since 2001). The ASERs are the primary documents DOE uses to inform the public of environmental performance and conditions at each of its sites. The ASERs document DOE's

compliance with applicable environmental regulations and laws and provide detailed information on monitoring programs, environmental management systems, and site environmental conditions. The information from the ASERs supports NNSA's conclusion that the environmental conditions at SRS have not changed notably since the Complex Transformation SPEIS was prepared and are incorporated by reference in this SA. The most notable programmatic change involves the cancellation of the MFFF for surplus plutonium disposition. The potential environmental impacts of operating the MFFF for surplus plutonium disposition, which are documented in the *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (DOE 2015a), will no longer occur. NNSA acknowledges that the proposed action evaluated in this SA would result in similar types of environmental impacts as the MFFF at SRS, as documented in Section 3.0 of this SA.

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 (63 FR 3624) 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.[5] 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 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 and CMRR-NF at LANL

Operations at PF-4 at LANL began in 1978. When the Complex Transformation SPEIS ROD (76 FR 245) was announced on December 19, 2008, PF-4 was 30 years old. Although PF-4 will reach its initial assumed 50 year design life in 2028, there are 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.

In the Complex Transformation SPEIS and the 2008 Programmatic ROD, NNSA identified CMRR-NF as a facility that would be required at LANL to support pit production. However, in

[5] 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 4.0 for more details).

the ensuing years, alternatives for AC/MC capabilities were identified that have separate and sufficient NEPA analysis and NNSA was able to withdraw funding requests for construction of CMRR-NF. The CMRR-NF does not now anchor LANL pit production capabilities.

2.3.5 NNSA NEPA Process and Pit Production Operations

There have been no significant changes in NNSA's approach to NEPA documents since publication of the Complex Transformation 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.

Pit production operations have remained well-defined over the past several decades. There have been no significant changes to pit production operations that would affect the analysis in this SA.

2.3.6 DOE Seismic Risk Assessment and Seismic Hazard Analysis

In evaluating the risks posed by existing or planned buildings which will hold nuclear materials, DOE considers the risk that impacts from seismic events may affect facilities and cause a release of nuclear material into the environment. In order to do this, DOE must consider a number of variables, each one of which may influence the results of the risk analysis. These include such things as the design of the facility, the material-at-risk (MAR), which is the amount and character of nuclear materials present, the likelihood and severity of a seismic event (seismic hazard) and the impact of the event on the structure.

The potential for seismic events at a site is often defined in terms of probabilistic ground motion. Ground motion means the motion of the ground that is caused by an earthquake. The United States Geological Survey (USGS) provides periodic updates to estimates of probabilistic ground motion. These USGS updates to probabilistic ground motion are used by model building codes, such as the International Building Code (IBC). DOE uses IBC standards for non-nuclear facilities. However, DOE requires a more detailed, multi-parameter site-specific Probabilistic Seismic Hazard Analysis (PSHA) as part of a seismic risk assessment for sites that house nuclear facilities. These PSHAs are re-evaluated on a time-defined basis outlined in DOE-STD-1020-2016 (DOE 2016c) to account for new information and when new information suggests a change in the hazard from the previous investigation, an updated PSHA is performed.

As explained further below, a full PSHA considers a range of site-specific information and data to develop the design response spectra for all frequencies of ground motion. However, in evaluating the degree to which updated USGS data may affect an existing PSHA, it is useful to pick a data point, such as Peak Ground Acceleration (PGA) in order to conduct an "apples-to-apples" comparison; even though such data are only part of the suite of data which will be utilized. This allows an assessment as to whether the predicted ground motion is more or less

severe than that previously predicted, and if it is more severe, whether there is sufficient margin in the design to cover the predicted increase. One public source of information that allows this type of comparison using the PGA is the USGS online maps and calculation tools.

2.3.6.1 USGS Seismic Hazard Analysis Tools

In 2014, the USGS issued a report, *Documentation for the 2014 Update of the United States National Seismic Hazards Maps* (USGS 2014 Report; Petersen, et. al. 2014). The USGS 2014 Report provides generalized seismic hazard maps by geographic area for the entire country. The USGS provides an on-line tool where specific geographic coordinates (latitude/longitude) can be entered to obtain various parameters that help identify potential seismic hazards in a geographic area. However, this tool does not have observational data from every specific location in the nation which is why focused site-specific studies can supersede the USGS tool. A similar tool is provided by the American Society of Civil Engineers (ASCE) that incorporates USGS data to help compute ground motion parameters.

The online tool provided by the USGS allows for the evaluation of seismic hazard maps to estimate earthquake vibratory ground motion parameters at a particular site. The frequency and duration of strong ground shaking is used by structural engineers in facility design. PGA is frequently used for discussion and comparison because it is provided in most PSHAs.[6] PGA also provides a relatively easy comparison of seismic hazard at different sites.

The USGS seismic hazard maps and earthquake ground motion parameters are updated approximately every five years to account for new data and incorporate recently published findings on earthquake ground shaking, faults, seismicity, and geodesy. The USGS 2014 Report is the successor to the USGS 2008 Report. The USGS 2014 Report provides comparative maps that depict the change in seismic hazards since the publication of the USGS 2008 Report (*see* Figure 2-6).

To determine if the earthquake hazard based on PGA, as depicted in the USGS 2014 Report, has changed since the issuance of the USGS 2008 Report, NNSA used the USGS on-line tool to compute the PGA at firm rock and the modified PGA at the surface for specific locations at LANL and SRS.[7] The modified PGA at the surface is calculated to account for local site

[6] For any given site on the map, the computer calculates earthquake ground motion (peak acceleration) for all the earthquake locations and magnitudes believed possible in the vicinity of the site. Each of these magnitude-location pairs is believed to happen at some average probability per year. Small ground motions are relatively likely, large ground motions are very unlikely. Beginning with the largest ground motions and proceeding to smaller, probabilities are added for the total probability (P) in a particular period of time (T). The corresponding ground motion (peak acceleration) is said to have a probability of exceedance (PE) in time (T) (years). The map contours represent the ground motions corresponding to this probability at all the sites in a grid covering the U.S. Thus, the maps are not actually probability maps, but rather ground motion hazard maps at a given level of probability.

[7] Access to the USGS design ground motion values for a particular latitude, longitude, risk category, and site class, may be obtained at https://earthquake.usgs.gov/ws/designmaps/ (Accessed here on November 5, 2019). The ground motion values for the 2008 National Hazards Maps may be obtained either by using the 2009 NEHRP Standard, or 2010 ASCE 7 Standard. The values for the 2014 National Hazards Maps may be obtained using either the 2015 NEHRP Standard, or the 2016 ASCE 7 Standard.

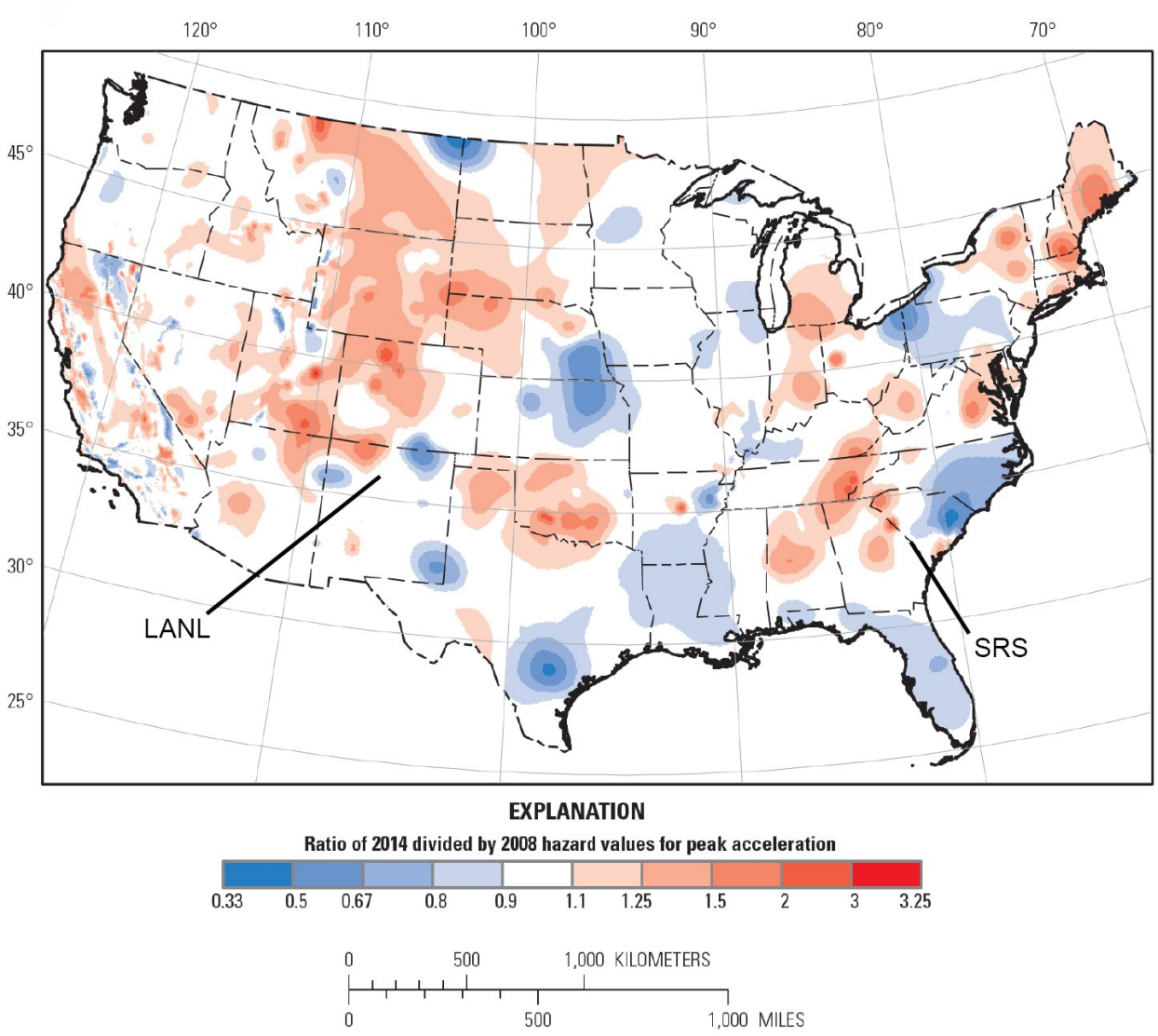

FIGURE 2-6. MAP COMPARING CHANGE IN PEAK GROUND ACCELERATION.

amplification. To compute the modified PGAs for both LANL and SRS, NNSA assumed a site class D and a risk category III structure. A site class D is an area with stiff soil and is more susceptible to elevated ground motion (Kelly 2006). A risk category III structure is a critical facility most commonly associated with utilities that are required to protect the health and safety of a community (ASCE-7 Table 1604.5).

At LANL, the coordinates of PF-4 (35.8637 N, 106.3029 W) were entered into the USGS online tool to calculate an estimate of the PGA at firm rock with 2-percent probability of exceedance in 50 years for both the USGS 2008 Report and the USGS 2014 Report. Based on the calculation, the PGA at LANL changed from approximately 0.224g in 2008 to approximately 0.225g in 2014, which represents an increase in predicted ground motion of less than 0.5 percent. NNSA also evaluated the PGA at rock values on contour maps provided by USGS in order to check the

values obtained using the online calculator. The mapped values for LANL are well within the online calculator values.

The USGS online tool calculated that the modified PGA at the surface, corrected for site class D, with 2 percent probability of exceedance in 50 years, changed from approximately 0.303g in 2008 to approximately 0.31g in 2014. The change represents an increase in predicted ground motion of about 2 percent.

At SRS, the coordinates of the MFFF (33.2931 N, 81.6772 W) were entered into the USGS online tool to calculate an estimate of the PGA at firm rock with 2 percent probability of exceedance in 50 years for both the USGS 2008 Report and USGS 2014 Report. Based on the calculation, the PGA at SRS changed from approximately 0.17g in 2008 to approximately 0.156g in 2014, which represents a decrease in predicted ground motion of approximately 8 percent. NNSA also evaluated the PGA at rock values on contour maps provided by USGS in order to check the values obtained using the online calculator. The mapped values for SRS are well within the online calculator values.

The USGS online tool calculated that the modified PGA at the surface, corrected for site class D, with 2 percent probability of exceedance in 50 years, changed from approximately 0.249g in 2008 to approximately 0.232g in 2014. The change represents a decrease in predicted ground motion of about 7 percent.

The seismic hazard maps provided by the USGS are adapted into the National Earthquake Hazards Reduction Program (NEHRP). The NEHRP is tasked with reducing the risks to life and property from earthquakes through the development and implementation of hazard reduction measures. One of these measures is the publication of the "Recommended Seismic Provisions for New Buildings and Other Structures" (NEHRP 2015). The publication provides recommendations for standards in the structural designs to withstand seismic hazards. These recommendations, along with the ASCE standards and IBC, are adopted by many states and local building departments into law (ASCE 2016; ICC 2014).

2.3.6.2 DOE Seismic Hazard Analysis

Seismic hazard analysis is an analysis of the impacts of possible future earthquakes based on study and understanding of the geology in a region. A full scale PSHA could involve extensive field work including geologic mapping, fault excavation, geophysics, geologic age dating, evaluation of seismic (vibratory ground motion) wave propagation through rock and soil layers, expert elicitation/judgement, and peer reviews etc. Many parameters for a specific site or facility location are evaluated including PGA, peak ground velocity, and peak ground displacement to define the potential hazard. Development of these values is achieved by developing seismic source models and ground motion models. These parameters and the models based on them are affected by local variables such as bedrock type, depth to bedrock, and local soil thickness and properties.

DOE uses the IBC and hence the USGS ground motion values in the seismic design of low-risk facilities. However, DOE requires a site-specific PSHA to define the seismic ground motion for

the design of critical facilities, including high-risk structures. The site-specific PSHA requires the incorporation of geologic and geophysical studies to improve characterization and reduce uncertainties in assessment of local seismic sources and established facility site conditions affecting ground motion or geological investigations in the site vicinity that can define the proximity and rate of deformation of local fault sources. The incorporation of site-specific geophysical or geologic studies in a focused PSHA can increase or decrease design ground motions as compared to the USGS National Seismic Hazards Maps and provides greater detail and understanding of the site.

Each site-specific PSHA study follows a similar basic framework in producing probabilistic seismic hazard analyses. However, LANL site-specific PSHA studies incorporate detailed, site-specific geologic, geophysical, and geotechnical information that is significantly more detailed than the USGS studies.

LANL completed its most recent site-specific PSHAs in 2007 and 2009. The PGA value at the surface used in the LANL PSHAs, corrected for site amplification for a 2 percent probability of exceedance in 50 years at PF-4, is approximately 0.47g. This site-specific value is above those estimated by the USGS (0.303g in 2008 and 0.31g in 2014) and is used for design and analysis of critical facilities at LANL.

At SRS, the MFFF was designed and built using Nuclear Regulatory Commission (NRC) guidelines, while a repurposed facility would be qualified under DOE standards. Savannah River Nuclear Solutions (SRNS) geotechnical and structural engineers evaluated the geotechnical and seismic design criteria that would be applied under the proposal to refurbish the MFFF to produce plutonium pits (SRNS 2019b). The MFFF was evaluated against plausible seismic events, which showed the expected seismic spectra are adequately considered by the previous NRC requirements used to design the MFFF.

Based on the information collected from the USGS online tool and subsequent calculations, NNSA concludes that the USGS 2014 Report and subsequent data are fully accounted for in NNSA's seismic hazard evaluations and there is no significant change in earthquake hazards at either LANL or SRS.

2.3.7 Other Site Alternatives

In considering new circumstances or information relevant to environmental concerns, NNSA considered whether any new sites should be considered for the pit production mission. For example, the AoA Report (*see* Section 1.4 of this SA) identified the Idaho National Laboratory as a potential site for the pit production mission. Regarding non-NNSA sites, the Complex Transformation SPEIS stated that, "NNSA eliminated sites that do not conduct major NNSA program activities, as these sites would further expand the NNSA Complex." At the present time, expansion of the NNSA Complex is not contemplated and would raise a host of practical issues which need not be dealt with when there are suitable sites within the Complex.

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 adopting a Modified DCE Alternative for plutonium operations exceed those impacts previously analyzed 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 or a new EIS. 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. 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, NNSA believes that 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. 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* SRS or LANL, which represents a bounding estimate of pit production at each site.

Table 3-3 addresses the combined impacts from pit production at *both* SRS and LANL, and Table 3-4 addresses Complex-wide transportation impacts. The information provides an analysis of producing up to 80 pits per year at *both* SRS and LANL, which represents a conservative estimate of the combined impacts for the proposed action. This information is provided only for analytical perspective; DOE is not proposing to produce 80 pits per year at *both* sites.

As discussed in Table 3-3, there are few differences in the potential environmental impacts on a programmatic basis associated with producing pits at two smaller capacity sites compared to producing the same number of pits at a single site, which possesses a larger pit production capacity. The primary difference is that smaller impacts would occur at two sites versus larger impacts at a single site. Regarding construction, many impacts are a function of the amount of new land disturbed. At LANL, new land disturbance associated with expanding pit production

would be less than Complex Transformation SPEIS estimates, while at SRS, no new land disturbance is expected because of the proposal to use an existing facility within a large area of previously disturbed land that is suited for plutonium operations. Consequently, the combined new land disturbances at LANL and SRS would be less than estimates in the Complex Transformation SPEIS.

Regarding operations, many impacts are primarily a function of the number of pits produced, regardless of where the pits are produced or whether the production is split between two sites or occurs at a single site. For example, the overall radiological air emissions from producing 30 pits per year at LANL plus 50 pits per year at SRS would be the same as producing 80 pits per year at either LANL or SRS. While the "split production approach" would result in smaller impacts to human health at each site compared to producing 80 pits at a single site, the combined human health impacts would be essentially the same (note: minor differences in impacts would be primarily due to population differences around each site, as well as differing meteorological conditions).

The potentially largest difference between the split-production approach and single site production is related to socioeconomics. While the split production approach would not be as efficient as single site production, NNSA notes that socioeconomic effects are primarily beneficial. In addition, while these socioeconomic impacts could be larger than estimates in the Complex Transformation SPEIS, the impacts would not be significantly different. For example, at either LANL or SRS the workforce associated with pit production would represent a small percentage of the local region's labor force and socioeconomic impacts would be small (the site-specific documents that NNSA would prepare following the amended ROD would quantify these increases). Table 3-3 provides more details on each of the resources analyzed in this SA.

NNSA also notes that the Complex Transformation SPEIS evaluated the cumulative impacts of producing up to 200 pits per year at LANL (and SRS) while simultaneously conducting plutonium disposition activities at the MFFF at SRS. Because of the many similarities in the potential environmental impacts associated with plutonium disposition activities and pit production activities, the Complex Transformation SPEIS accounted for combined impacts that would be similar to the impacts associated with the split production approach analyzed in this SA.

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 2008b, Table 3.16-1)	Land disturbance would be approximately 21 acres, which is less than estimate for the Greenfield Facility Alternative. 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 2008b, 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 2008b, 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.	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 2018d, p. 85-86). 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	No

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?
	Source: (DOE 2008b, Table 3.16-1)	Alternative. Construction activities would temporarily 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 for the Greenfield Facility Alternative.	
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 2008b, Table 3.16-1)	Water consumption at LANL has decreased since 2008, from approximately 371 million gallons per year to 262 million gallons per year in 2017 (DOE 2018d, Figure 3-11). Two million gallons per year is estimated for use during construction. Construction activities and operational impacts would be less than those for the Greenfield Facility Alternative. Use of water for operations is expected to be less than the Greenfield Facility and Upgrade Alternative.	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 2008b, Table 3.16-1)	USGS estimate of the PGA with a 2-percent probability of exceedance in 50 years at LANL changed from about 0.224g in 2008 to about 0.225g in 2014, which represents an increase in ground motion of less than 0.5 percent. The 2008 LANL SWEIS evaluated seismic risks using data from URS 2007 which provided a more conservative analysis of seismic hazard than USGS. Construction activities and operational impacts would be less than or equal to those for the Greenfield Facility Alternative.	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 2008b, Table 3.16-1)	Construction impacts could impact both core and buffer habitat of the Mexican Spotted Owl. NNSA determined that construction may affect, but is unlikely to adversely affect, the Mexican Spotted Owl due to removal of a	No

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?
		small portion of potential habitat (DOE 2011c p. 49-52). TA-55 is mostly developed land so minor impacts to vegetation and no impacts to wetlands. Potential impacts would be similar to the analyses in the Complex Transformation SPEIS analysis and the 2008 LANL SWEIS.	
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 2008b, Table 3.16-1)	Land disturbance would be approximately 21 acres, which 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 2008b, Table 3.16-1)	Construction and operation workforces would be less than estimates in the Complex Transformation SPEIS. The 2018 SA to the 2008 LANL SWEIS evaluated increases in staffing for current operations and the economic impacts on the socioeconomic region of influence that includes Los Alamos, Rio Arriba, Sandoval, and Santa Fe counties (DOE 2018d). These impacts were not considered to be significantly different than those analyzed in the 2008 LANL SWEIS.	No
Environmental Justice	Construction or operation activities would not result in any disproportionately high and adverse effects on minority or low-income populations. The Complex Transformation SPEIS references the special	The 2018 SA to the 2008 LANL SWEIS reaffirmed that the radiological dose from emissions associated with normal operations would be slightly lower for members of Hispanic, Native American, total minority,	No

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?
	pathways receptor analysis (DOE 2008a, Appx. C.1.4) from the final 2008 LANL SWEIS. Source: (DOE 2008b, Table 3.16-1)	and low-income populations than for members of the population that are not in these groups (DOE 2018d 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.	
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 2008b, Table 3.16-1)	Utility requirements at LANL are consistent with prior analyses in the 2008 SWEIS and remain below system capacities (DOE 2018d 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 2008b, Table 3.16-1)	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 Alternative. Those doses were as follows: Greenfield Facility and Upgrade Alternative: Collective dose to population during operations: 6.0×10^{-4} person-rem; 4×10^{-7} LCFs. MEI dose: 1.5×10^{-4} mrem; 9×10^{-11} LCFs annually. Worker dose: 333 person-rem; 0.20 LCFs annually.	No

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?
		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 2008b, Table 3.16-1). 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.	
Health and Safety – Facility Accidents	Accident with the highest consequences to the offsite population is 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 one 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 one in 1,000. For the population, the LCF risk would be 0.19, or approximately one in five. Source: (DOE 2008b, 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; the consequences of these accidents are based on MAR. 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.*, MAR). Potential accident scenarios based on MAR limits at PF-4 are analyzed in the 2008 LANL SWEIS (DOE 2008a) and were reevaluated for current operations in the 2018 SA to the 2008 LANL SWEIS (DOE 2018d). Consequently, the potential impacts from these relevant types of accidents with regard	No

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?
		to increased pit production would be expected to be consistent with the impacts analyzed in the SPEIS and the 2008 LANL SWEIS.	
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 2008b, Section 3.16.6).	In preparing this SA, NNSA reviewed the classified Appendix that was prepared for the Complex Transformation SPEIS to address intentional destructive acts. As a result of that review, NNSA concluded that the classified Appendix analysis is reasonable and adequate to represent the proposed action in this SA and does not need to be revised (DOE 2019c).	No
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 2008b, 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 LANL SWEIS projections (DOE 2018d 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 Alternative in the Complex Transformation SPEIS. 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 adequate to support the pit production mission. The available capacity at WIPP would be adequate to support pit production TRU wastes (*see* Section 4.0 for the cumulative impact analysis which considers pit production TRU waste and other reasonably foreseeable TRU waste).	No

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?
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 2008b, Table 3.16-1)	NNSA acknowledges that there have been changes in impacts regarding transportation and traffic since issuance of the 2008 LANL SWEIS (DOE 2008a). The 2018 SA to the 2008 LANL SWEIS evaluated impacts from increased traffic and transportation activities at LANL. These impacts were not considered to be significantly different than those analyzed in the 2008 LANL SWEIS. This SA concluded that producing up to 80 pits per year at LANL would result in small radiological transportation impacts (*see* Table 3-4 of this SA).	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 2008b, Table 3.16-1)	Land disturbance within previously disturbed areas around the MFFF would be 48 acres, which is 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 2008b, 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 2008b, 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 2008b, 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

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?
Water Resources	For construction and operation, annual water use would increase by approximately two percent compared to existing use. Source: (DOE 2008b, Table 3.16-1)	Peak year of construction activities could require more water than analyzed in the Complex Transformation SPEIS (16,600,000 gallons versus 5,700,000 gallons). The construction water requirement would represent about five percent of the groundwater used per day by SRS. The operational impacts would be less than or equal to estimates in the Complex Transformation SPEIS. Groundwater is used at SRS for domestic and facility requirements. The SRS water capacity is approximately 3 billion gallons per year and current usage is approximately 325 million gallons per year. Source: (DOE 2015a, Section 3.1.3.2.)	No
Geology and Soils	Impacts would be minor. Appropriate mitigation measures would minimize soil erosion and impacts. Source: (DOE 2008b, Table 3.16-1)	The USGS estimate of the PGA with a 2-percent probability of exceedance in 50 years at the MFFF at SRS, changed from about 0.17g in 2008 to about 0.156g in 2014, which represents a decrease in ground motion of about nine percent. 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 2008b, 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

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?
Cultural Resources	The reference location is located in an Archaeological Zone 2 (area with moderate archaeological potential) and close to a Zone 1 (area with high archaeological potential). 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 2008b, 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 2008b, Table 3.16-1)	1,800 workers during the peak year of construction. Once operational, there would be 1,110-1,220 workers. The peak construction workforce would be greater than estimates in the Complex Transformation SPEIS. However, the peak construction employment is estimated to represent less than one percent of the projected region of influence (ROI) labor force and would not affect community resources. The operational workforce would be less than estimates in the Complex Transformation SPEIS. Overall, potential impacts to socioeconomic characteristics would be positive but would not significantly impact community resources.	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 2008b, 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 ch. 4 p. 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

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?
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 2008b, Table 3.16-1)	Estimates for water use and electricity requirements during construction would be more than estimates in the Complex Transformation SPEIS. The construction water requirement would represent about five percent of the groundwater used per day by SRS. The SRS electricity grid can support a peak demand of 500 megawatts, so a demand of 18.2 megawatts would represent an increase of less than four percent. Existing infrastructure capacity is more than adequate to meet current and future requirements at SRS (DOE 2015a, Table 3-19).	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 2008b, 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 greater than Complex Transformation SPEIS estimates due to greater construction worker-years for the proposed action. Over the full construction period, 38 days of lost work from illness/injury and less than one fatality would be expected. 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

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?
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 one 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 2008b, 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 approximately 75 percent 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 2008b, Section 3.16.6).	In preparing this SA, NNSA reviewed the classified Appendix that was prepared for the Complex Transformation SPEIS to address intentional destructive acts. As a result of that review, NNSA concluded that the classified Appendix analysis is reasonable and adequate to represent the proposed action in this SA and does not need to be revised (DOE 2019c).	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?
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 2008b, Table 3.16-1)	Although the types of wastes generated would be the same as presented in the SPEIS, LLW and TRU waste quantities would be greater than estimates in the Complex Transformation SPEIS. Wastes would continue to be managed in accordance with all applicable regulations and waste management facilities would be available to manage wastes. LLW disposal onsite at SRS (E Area) would be adequate to support pit production. The available capacity at WIPP would be adequate to support pit production TRU wastes (*see* Section 4.0 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 2008b, Table 3.16-1)	Collectively, the overall number of construction and operational jobs, and transportation requirements, would be similar to estimates in the Complex Transformation SPEIS. Potential impacts to transportation and traffic would also be similar. Given that the level of service on area roads was not adversely affected during MFFF construction, no adverse impacts would be expected for the pit production mission, which is expected to require less workers.	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 (21 acres) would be less than estimates in the Complex Transformation SPEIS, which estimated that up to140 acres of land could be disturbed at LANL or SRS for the pit production mission. At SRS, no disturbance would occur on previously undisturbed land. Combined impacts to undisturbed land from the proposed action in this SA (21 acres) would be less than estimates in the SPEIS at both LANL and SRS.
Visual Resources	Short-term, temporary visual impacts from construction at SRS and LANL 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 SRS and LANL, 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 SRS and LANL, noise impacts would not be additive.
Air Quality	Based on overall smaller construction and operational requirements for the proposed action evaluated in this SA, air emissions associated with construction and operational activities would be less than those presented in the Complex Transformation SPEIS. There would be no violations of any NAAQS at either site. Because of the distance between SRS and LANL, combining air quality impacts is not applicable. Greenhouse gas emissions would be negligible at each site and collectively.
Water Resources	The combined water consumption at SRS and LANL for the proposed action evaluated in this SA would be less than estimates in the Complex Transformation SPEIS for each site, with the exception of peak construction activities at SRS, which could require more water than analyzed in the Complex Transformation SPEIS (16,600,000 gallons versus 5,700,000 gallons). That construction water requirement would represent about five percent of the groundwater used per day by SRS. Each site has existing water availability to support the pit production mission. Because of the distance between SRS and LANL, water consumption impacts would not be additive.

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

Resource Area	Combined Impacts for the SA Proposed Action
Geology and Soils	The USGS estimate of the PGA with 2-percent probability of exceedance in 50 years at LANL changed from about 0.224g in 2008 to about 0.225g in 2014, which represents an increase in ground motion of less than 0.5 percent. At the MFFF at SRS, the PGA with 2-percent probability of exceedance in 50 years changed from about 0.17g in 2008 to about 0.156g in 2014, which represents a decrease in ground motion of about eight percent. 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 SRS and LANL, impacts to geology and soils would not be additive.
Ecological Resources	At both SRS and LANL, potential impacts to ecological resources would be less than estimates in the Complex Transformation SPEIS. Because of the distance between SRS and LANL, 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 SRS and LANL, cultural impacts would not be additive.
Socioeconomics	The combined construction workforce of 2,000 (consisting of 200 workers at LANL and 1,800 workers at SRS) would exceed Complex Transformation SPEIS combined estimates of 1,620 workers. The increase, which would be due to a larger construction workforce at SRS, would represent less than one percent of the projected ROI labor force at SRS and would not affect community resources. The combined operational workforce of 1,620 (consisting of 400 workers at LANL and 1,220 workers at SRS) would be less than Complex Transformation SPEIS combined estimates of 2,950 workers. Overall, the potential impacts to socioeconomic characteristics would be positive, but could be greater than estimates in the SPEIS for construction at SRS.
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 SRS and LANL. 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 SRS and LANL, environmental justice impacts would not be additive.

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

Resource Area	Combined Impacts for the SA Proposed Action
Infrastructure	The combined utility requirements and impacts at both SRS and LANL would be less than estimates presented in the Complex Transformation SPEIS, and each site has adequate infrastructure capacity to meet demand requirements. Because of the distance between SRS and LANL, 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. Because health and safety impacts during construction are generally small (according to Bureau of Labor Statistics, one construction fatality could be expected for every 7,900 worker-years [BLS 2019]), no fatalities during construction would be expected for the combined construction. 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 SRS and LANL would be less than impacts presented in the SPEIS (for 200 pits per year surge capacity). Regarding workers, the combined number of radiation workers during operations would be 1,000 (consisting of 250 radiation workers at LANL and up to 750 radiation workers at SRS). At either LANL or SRS, the Complex Transformation SPEIS estimated 1,150 radiation workers and a total worker dose of 333 person-rem/year, which correlates to 0.20 LCFs annually. Consequently, the total worker dose associated with pit production at LANL and SRS would be less than the impacts presented in the Complex Transformation SPEIS for either site.
Health and Safety – Facility Accidents	Potential impacts from accidents would be independent 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 SRS and 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.

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

Resource Area	Combined Impacts for the SA Proposed Action
Intentional Destructive Acts	In preparing this SA, NNSA reviewed the classified Appendix that was prepared for the Complex Transformation SPEIS to address intentional destructive acts. As a result of that review, NNSA concluded that the classified Appendix analysis is reasonable and adequate to represent the proposed action in this SA and does not need to be revised (DOE 2019c). Potential impacts from intentional destructive acts would be independent at each site.
Waste Management	Wastes from producing up to 80 pits per year at SRS and LANL would be less than previously analyzed for the Greenfield Facility in the Complex Transformation SPEIS for producing up to 200 pits per year, with the exception of LLW and TRU waste generation at SRS. LLW disposal at offsite locations such as NNSS would be adequate to support the pit production mission at LANL and LLW disposal onsite at SRS (E Area) would be adequate to support the pit production mission at SRS. Wastes would continue to be managed in accordance with all applicable regulations and waste management facilities would be available to manage wastes. The available capacity at WIPP would be adequate to support pit production TRU wastes (*see* Section 4.0 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 SRS and LANL would be similar to estimates in the Complex Transformation SPEIS. Because of the distance between SRS and LANL, non-radiological transportation impacts would not be additive. Radiological transportation impacts from combined operations at SRS and LANL 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>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>
<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>
</table>
Source: (DOE 2008b, 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 SRS or LANL would result in insignificant transportation impacts (even assuming an eight percent increase in impacts due to population increases [see Section 2.3.2]) and would be bounded by the impacts presented in the Complex Transformation SPEIS. Even if 80 pits were produced annually at both SRS and LANL, 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>SRS</td><td>7.2×10^{-6}</td><td>3.7×10^{-3}</td><td>3.7×10^{-3}</td></tr>
<tr><td>LANL</td><td>1.3×10^{-7}</td><td>6.6×10^{-4}</td><td>6.6×10^{-4}</td></tr>
</table>
Source: (DOE 2008b, Table 5.10-24) Impacts based on producing 200 pits per year and transporting TRU waste from Pit Production Site to WIPP.
</td><td>Producing up to 80 pits per year at LANL would generate less TRU waste compared to estimates in the Complex Transformation SPEIS (see Table 2-2). As shown in the Table below, the impacts associated with transporting the LANL TRU waste would be small (even assuming an eight percent increase in impacts due to population increases [see Section 2.3.2]). At SRS, producing up to 80 pits per year could generate approximately three times as much TRU waste compared to estimates in the Complex Transformation SPEIS (see Table 2-4). As shown in the table below, the impacts associated with transporting the SRS TRU waste would be small (even assuming an eight percent increase in impacts due to population increases [see Section 2.3.2]). Even if 80 pits were produced annually at both SRS and LANL, the TRU waste transportation impacts would be small as shown in the table below.
<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>SRS (80 pits per year)</td><td>2.3×10^{-5}</td><td>1.2×10^{-2}</td><td>1.2×10^{-2}</td></tr>
<tr><td>LANL (80 pits per year)</td><td>7.0×10^{-8}</td><td>3.6×10^{-4}</td><td>3.6×10^{-4}</td></tr>
<tr><td>SRS and LANL (80 pits per year at both sites)</td><td>2.3×10^{-5}</td><td>1.2×10^{-2}</td><td>1.2×10^{-2}</td></tr>
</table>
</td></tr>
</table>

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>LLW Transportation</td><td>
<table>
<tr><th></th><th colspan="3">Annual Waste Generation (yd^3)</th></tr>
<tr><th></th><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 2008b, 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 could generate up to approximately 2,930 yd^3 of LLW (see Table 2-2) and would result in small LLW transportation impacts. Even assuming an eight percent increase in impacts due to population increases (see Section 2.3.2), 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>

4.0 CUMULATIVE IMPACTS

This section contains analysis of potential cumulative impacts resulting from NNSA selecting a Modified DCE Alternative for plutonium operations. 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. This SA also considers whether there are any cumulative impacts to a Modified DCE Alternative, where pit production would occur at two smaller facilities rather than one larger facility as considered in the Complex Transformation 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. This section 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. 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 those presented in the Complex Transformation 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 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 (66 FR 7877). Relative to this SA, those decisions identified the use of TA-55 at LANL to purify and encapsulate Pu-238.

4.2.3 Yucca Mountain Repository

The Complex Transformation SPEIS addressed the proposed action to transport and emplace 70,000 metric tons of spent nuclear fuel and high-level radioactive waste from across the country to Yucca Mountain, Nevada. Since publication of the Complex Transformation SPEIS further development, licensing, and construction of the Yucca Mountain repository has not occurred. 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 could be reduced from that presented in the Complex Transformation SPEIS.

As a potential result of the delay or elimination of Yucca Mountain licensing, construction, and operations, two private entities have applied to the Nuclear Regulatory Commission for licenses to provide consolidated interim storage for commercial spent nuclear fuel. One application is for a site in Andrews County, Texas and the other is for a site in southeastern New Mexico. Depending on whether the Nuclear Regulatory Commission licenses these facilities, their construction and operations could increase the potential transportation of spent nuclear fuel on the nation's highways and rail lines. This could have a cumulative national transportation impact similar to that postulated for Yucca Mountain in the Complex Transformation SPEIS, except that it would be focused in southwest Texas and southeast New Mexico, instead of Nevada. However, these projects are not yet licensed and impacts from either project are speculative.

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 the Expanded Operations Alternative from the LANL SWEIS (DOE 2008a), LANL would process up to 460 pounds of plutonium oxide annually, 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.

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 prepare and package 6 metric tons of surplus, non-pit plutonium at SRS using H-Canyon/HB-Line and/or K-Area facilities to meet the WIPP waste acceptance criteria and all other applicable regulatory requirements for disposal 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 have been announced.

The other significant change that has occurred regarding plutonium disposition is the cancellation of the construction of the MFFF at SRS. The Complex Transformation SPEIS analyzed using the infrastructure of the planned MFFF and PDCF for pit production before its construction commenced as part of the DCE Alternative. Now, with some of the construction of the MFFF complete, as discussed in Section 1.1 of this SA, NNSA is again evaluating repurposing the MFFF for pit production (DoD 2018b).

Since cancelling the MFFF for surplus plutonium disposition, DOE has not announced any decisions regarding how the surplus plutonium planned for the MFFF would eventually be dispositioned. 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 could 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 could require new, modified, or existing capabilities at Pantex, SRS, LANL, and WIPP. If there were new programmatic decisions regarding surplus plutonium disposition, potential cumulative impacts at all involved sites would be analyzed prior to NNSA making a decision for that program.

4.3 SITE-SPECIFIC CUMULATIVE ACTIONS

This section updates the potential cumulative actions at the primary sites affected by the increased pit production under the Modified DCE Alternative.

4.3.1 Los Alamos National Laboratory

The Complex Transformation SPEIS evaluated potential cumulative impacts at LANL but focused analysis on transfer of Pu-238 operations from LANL under some alternatives. As identified in Section 1.4 of this SA, the 2008 LANL SWEIS evaluated the cumulative impacts associated with consolidation of special nuclear materials storage and production of 125 pits with a potential surge capacity of 200 pits annually as proposed in the Complex Transformation SPEIS.

In 2018, NNSA prepared a *Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory* (DOE 2018d) 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 SA to the 2008 LANL SWEIS it was acknowledged that the Fiscal Year 2020 *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 2018d, ch. 2 p. 23). The 2018 SA to the 2008 LANL SWEIS noted that DOE evaluated the production of 80 pits per year in the Expanded Operations Alternative of the 2008 LANL SWEIS and may issue a new ROD in the future for an increase in pit production. With respect to cumulative impacts, that 2018 SA concluded that the potential impacts associated with the continued operation of LANL were bounded by the 2008 LANL SWEIS analysis. NNSA would further analyze any site-level cumulative impacts of increased pit production in the planned LANL SA.

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 (81 FR 19588) 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 LANL NEPA analysis, which NNSA expects to prepare, would contain an 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 potential cumulative impacts at SRS. 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 would repurpose the facility under the Modified DCE Alternative. Therefore, cumulative impacts for these activities would be less than analyzed in the Complex Transformation SPEIS.

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 (81 FR 19588) 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 SRS EIS, which NNSA is preparing, 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 in H Area and/or K Area. The non-pit plutonium containers would be opened in an existing glovebox or newly-constructed glovebox capability in H Area and/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 to ensure they meet the WIPP waste acceptance criteria and then shipped to WIPP. The SPD SEIS ROD concluded that the operations at SRS would result in negligible incremental impacts to both workers and the public (81 FR 19588). Given this negligible impact, notable cumulative impacts would be unlikely. The site-specific EIS for pit production at SRS, which NNSA is preparing, will 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.

NNSA is currently in the early stages of considering whether tritium extraction activities at SRS would need to increase in the foreseeable future to support future stockpile requirements. Tritium extraction occurs at the Tritium Extraction Facility (TEF) in H Area, which was evaluated in the *Final Environmental Impact Statement for the Construction and Operation of a Tritium Extraction Facility at the Savannah River Site* (TEF EIS) (DOE/EIS-0271, March 1999; DOE 1999c). NNSA notes that any potential cumulative impacts would likely be related to radiological doses to workers and the public, and increased radiological LLW generation. Based

on the analysis in the TEF EIS, NNSA has previously determined that: (1) annual radiological doses to the public would be approximately 0.02 millirem/year to the MEI, and 0.77 person-rem to the 50 mile population surrounding SRS; (2) annual radiological doses to workers would be 0.66 person-rem; and (3) LLW generation would be approximately 235 cubic meters per year (DOE 1999c, Sections 4.1.1.4 and 4.1.1.5). Any increase in tritium production beyond what was analyzed in the TEF EIS would be evaluated in an appropriate NEPA review.

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 2016b) 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 1997) and other relevant WIPP NEPA documentation. The 2016 SA (DOE 2016b) 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 (63 FR 3624) 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 (*see* text box below).

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 seven disposal panels. Clarifying the 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 under the existing *WIPP Land Withdrawal Act* limit. The change in methodology was approved in 2018 and implemented in 2019.

Approximately 108,048 m^3 of capacity would be available at WIPP for TRU waste. Based on the Complex Transformation SPEIS estimates, producing 200 pits per year at both LANL and SRS

was estimated to generate a maximum of 1,375 m^3 of TRU waste annually (consisting of 650 m^3 at LANL and 725 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of this SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in this paragraph). Based on current estimates, producing up to 80 pits per year at both LANL and SRS could generate a maximum of 1,978 m^3 of TRU waste annually (consisting of 306 m^3 at LANL and 1,672 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of this SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in this paragraph). The combined TRU waste (1,978 m^3) generated over 50 years would be 98,900 m^3, which would account for 92 percent of the projected available capacity at WIPP. However, the analysis above conservatively assumes that both LANL and SRS would produce 80 pits per year. Under the most likely scenario, LANL would produce approximately 30 pits per year and SRS would produce approximately 50 pits per year (actual production numbers are classified). Based on current estimates, producing 30 pits per year at LANL and 50 pits per year at SRS could generate a maximum of 1,151 m^3 of TRU waste annually (consisting of 107 m^3 at LANL and 1,044 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of this SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in this paragraph). The combined TRU waste (1,151 m^3) generated over 50 years would be 57,550 m^3, which would account for 53 percent of the projected available capacity at WIPP. In addition, use of WIPP capacity for national security missions such as pit production would be given priority in the allocation process.

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. In 2022, WIPP expects approximately 750 shipments a year arriving at WIPP, based on complex-wide shipping needs (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.

At LANL, the TRU Waste Facility (TWF), which became operational in 2017, provides continuing capability to process TRU waste and was analyzed in the 2008 LANL SWEIS (DOE 2008a). 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.

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. This would provide many years of

storage capacity and allow flexibility in coping with potential fluctuations in shipments to WIPP. 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, Tables 4-48, 4-49) and are shown in Table 4-1 below:

TABLE 4-1. POTENTIAL CUMULATIVE IMPACTS FROM TRANSPORT OF NUCLEAR MATERIAL AND WASTE IN THE U.S. 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 not be significant.

5.0 CONCLUSION AND DETERMINATION

NNSA's proposed action is adopting a Modified DCE Alternative for plutonium operations. The Modified DCE Alternative would allow NNSA 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 complex-wide impacts of adopting the Modified DCE Alternative and of producing up to 80 pits per year at both SRS and LANL 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 3.0.

Based on the results of this SA, NNSA has 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 NEPA implementing procedures (10 CFR 1021.314(c)), I have 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, and implement surge efforts to exceed 30 pits per year to meet and Nuclear Posture Review and national policy; and (2) a site-specific SA for the proposal to produce a minimum of 30 pits per year at LANL, and implement surge efforts to exceed 30 pits per year to meet federal law, and Nuclear Posture Review and national policy. If implemented, these actions would allow NNSA to meet the requirements of producing pits at a rate of no fewer than 80 pits per year by 2030.

DOE/NNSA Headquarters Concurrence:

Jane Summerson
NEPA Compliance Officer, DOE/NNSA

12/5/2019
Date

Bruce Diamond
General Counsel, DOE/NNSA

12/10/2019
Date

Approving Agent:

Charles P. Verdon
Deputy Administrator for Defense Programs, DOE/NNSA

12/10/2019
Date

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APPENDIX A

COMMENT REPONSE DOCUMENT

A-1.0 Introduction

A-1.1 Draft Supplement Analysis Public Comment Period

This appendix consists of responses to comments received on the Draft SA. Although pertinent regulations do not require public comment on an SA, NNSA decided, in its discretion, that public comment in this instance would be helpful. Section A-1.1 describes the public-comment process. NNSA made the Draft SA available for public review and comment on the DOE NEPA web page (https://www.energy.gov/nepa/nepa-documents). An NOA (84 FR 31055; June 28, 2019) announced the availability of the Draft SA and provided a 45-day public comment period that ended on August 12, 2019.

Prior to the publication of the NOA, on June 10, 2019, DOE issued an NOI announcing its intent to prepare a site-specific SRS Pit Production EIS (84 FR 26849; June 10, 2019) and announced a 45-day EIS scoping period that ended on July 25, 2019. The NOI also provided information regarding DOE's overall NEPA strategy related to fulfilling national requirements for pit production. NNSA held a public scoping meeting in North Augusta, South Carolina on June 27, 2019, to discuss the SRS Pit Production EIS and to receive comments on the potential scope. Because some of those comments had programmatic implications, this comment response document (CRD) includes a list of speakers from that scoping meeting in Table A-1. Comments submitted in response to the NOI were sent to the same address as comments in response to the NOA for the SA. As a result, NNSA reviewed all comments submitted in response to either process for applicability to the programmatic analysis.

In addition to the *Federal Register* notices, NNSA at SRS published an Environmental Bulletin and NNSA at LANL issued a notice to their standard mailing lists for persons who have requested notification of activities related to SRS or LANL, respectively, to provide notice of the availability of the Draft SA for review.

NNSA received 205 comment documents (consisting of transcripts from 44 speakers at the EIS scoping meeting and 161 separately submitted comment documents), including 34 comments that were received after the August 12, 2019, deadline. NNSA considered all comments received, including late comments. Of the comment documents submitted, 82 had some relevance or comment related to the Draft SA. Table A-2 provides a list of the commenters who submitted one or more comment documents on either the EIS scoping or SA process. A summary of the comments relevant to the Draft SA, as well as NNSA's corresponding responses to those summary comments, are provided in Section A-1.2. All comment documents received in response to both *Federal Register* notices are included in the Administrative Record for the SA.

TABLE A-1. INDEX OF SPEAKERS AS SIGNED IN AT THE SRS PIT PRODUCTION EIS SCOPING MEETING

Name	Affiliation (if provided)	Name	Affiliation (if provided)
Bunker, Gary	Aiken County Board	Shepherd, Tammy	
Carroll, Glenn	WAND	Smith, Chuck	Aiken County Council
Clements, Tom	SRS Watch	Stephens, Annie Laurie	GA WAND
Cohen, Sarah	SC Chamber of Commerce	Taylor, Bill	SC State Representative
Cwalina, Andy, Dr.	SRS Retirees Assn.	Thigpen, Brinsley	
David	Matos	Timmons, Darren	USC Aiken
Furgiuele, Camille	Aiken County Council	Todd, Moses	United Auto Workers
Fralix, Cassandra		Traina, Denice	Social Justice Committee Unitarian Universalist Church of Augusta
Guild, Bob		Utley, Charles	BREDL
Hall, Chris	Sierra Club	Veldman, John P, Dr.	
Haskell, Sandy	Aiken County Council	Wahl, Phil	
Hayes, Rose O, Dr.		Wall, John	South Carolina Manufacturers Alliance
Jameson, David J.	Aiken Chamber of Commerce	White, Don	North Augusta Chamber of Commerce
Josey, Andrew		Williams, Joanne	
LaBerge, Peter			
Lance, Laura			
Little, Jim	SC Nuclear Advisory Council		
Marra, Jim	Columbia Chamber of Commerce		
McGhee, David	North Augusta Council		
Munns, Charles L.			
McLeod, Rick	SRS Community Reuse Organization		
Osbon, Rick	Aiken Mayor		
Parr, Sue	Augusta Metro Chamber of Commerce		
Powell, Rina	United Way		
Rafter, Becky	GA WAND		
Rhodes, Suzanne	SC League of Women Voters		
Rivard, Betsy			
Rodgers, Sharon	United Way of Aiken		
Salters, Will	Augusta Building Trades		
Scott, Janie			
Shepherd, Tammy			
Smith, Chuck	Aiken County Council		
Stephens, Annie Laurie	GA WAND		

TABLE A-2. INDEX OF COMMENTERS

Name	Affiliation (if provided)	Name	Affiliation (if provided)
Allen, Rick		Green, D.	
Anderson, Carl		Greenlaw, Pamela	
Arends, Joni	Co-Founder and Executive Director, Concerned Citizens for Nuclear Safety	Gregg, Nona Lee	
Azevedo, Elaine		Grey, Nina	
Beaudelaire, Suzanne		Guild, Robert	South Carolina Chapter of the Sierra Club
Bonitatibus, Tonya	Executive Director, Savannah Riverkeeper	Guyette, Tristan	
Booher, Sam	Co-chair, Savannah River Group of the Sierra Club	Hancock, Don	Southwest Research and Information Center
Brown, David		Hayes, Rose	
Brutsche, Russell		Huston, Catherine	
Burger, Scott		Hutchison, Ralph	Oak Ridge Environmental Peace Alliance
Bush, Tamera		ikkyun32@gmail.com	
Caine, Maria		Jackson, Jeri	
Carter, Patricia		Jailer, Todd	
Chavarria, J. Michael	Governor, Santa Clara Pueblo	Johnson, Elizabeth	
Clements, Tom	Director, Savannah River Site Watch	Jonathan, Terry	
Cochnauer, Tiajuana		Jones, Virginia	
Colley, Vina		Kay, Sasha	
Dean, John		Kelley, Marylia	Tri-Valley CAREs
Detwiler, Winifred		Kinsey, Robert	
Durston, Robin		Knicks, S.	
Eichinger, John		Kotowski, Serit deLopaz	
Ericson, Stephanie		LaBerge, Pete	
Ferrell, Shim		Larsen-Beville, Sherry	
Fettus, Geoffrey H.	Natural Resources Defense Council	Lovegren, Sven	
Firestone, Susan		Lundeen, Kelly	
Gilchrist, Pamela		McLeod, Rick	President/CEO SRSCRO
Gilmore, Wayne		McWalsh	
Giviens, Terri		Mello, Greg	Los Alamos Study Group
Gordon, Susan		Minsjsul2@gmail.com	
Green, D.		Missall, Marsha	
Moore, Patricia		Nolan, Nancy	
Morey, Sandra		O'Connor, Tim	
Nelson, Nancy		Olivari, Kathy	
Nelson, Renee		O'Neil, Terri	
Osborn, Rick	Mayor, City of Aiken	Sorgen, Phoebe	

Name	Affiliation (if provided)	Name	Affiliation (if provided)
Parr, Susan	President/CEO, Augusta Metro Chamber of Commerce	Treichel, Judy	
Phillips, Tom		Tutashinda, Rashidah	New Georgia Project
Regan, Danny		Warren, Barbara	Citizen's Environmental Coalition
Rhodes, Suzanne	League of Women Voters of South Carolina	Weeks, Vicki	
Richard, Pamela		White, Jessica	South Carolina Chapter of the Sierra Club
Rotherberg, Keith		Williams, Haakon	
Salters, Will	President of the Augusta Building Trades	Williams, Patricia	
Saltzen, JoAn		Williams, Will	President/CEO Economic Development Partnership
Shelby, Gail		Wing, Stephen	
Snyder, Susi		Young, Stephen	Union of Concerned Scientists
Soller, Raenell		Zeller, Louis	Blue Ridge Environmental Defense League

A-1.2 Summary Comments and Responses

NNSA reviewed every comment document received, determined if a comment document contained comments either directly related to the Draft SA or indirectly addressing a programmatic issue, summarized those comments, and prepared responses to address those comments. The comment summaries and NNSA's corresponding responses are shown below. Where applicable, the comment response indicates the section(s) of the Draft SA that were modified. For the benefit of the public and NNSA, this CRD is organized to group comment summaries by similar topic. The topics include:

- Validity of the SA determination;
- Purpose and need;
- NEPA process;
- The two-prong (two-site) approach to pit production[8];
- New information/changed circumstances;
- Impact analyses;
- General opposition or support;
- Nuclear weapon policies/new weapon designs; and
- Miscellaneous comments.

In addition to the summarized comments and responses, NNSA responded directly to any comments made by government agencies and federally recognized Indian tribes that directly related to the Draft SA or indirectly addressed a programmatic issue. Only one such comment document, from the Santa Clara Pueblo, was submitted.

Validity of the SA Determination

1. *Commenters state that a new programmatic EIS is needed for many reasons, including:*

- *NNSA's new plan for simultaneous pit production at two sites, separated by over 1,300 miles, is a programmatic alternative that the Complex Transformation SPEIS never considered.*
- *Locating pit production capacity at a new site that has never hosted this activity before.*
- *Transportation risks associated with plutonium and plutonium-contaminated wastes between NNSA sites.*
- *Occupational and public health risks of safety infractions at LANL and the need for a more effective nuclear criticality regimen regarding any future pit production at SRS.*
- *A 1998 court order that requires DOE to prepare a supplemental programmatic EIS in the event NNSA's proposed plans for future plutonium pit production extend beyond fabrication at LANL of 50 pits per year under "routine conditions," or 80 pits per year under "multiple shift operations."*

[8] A two-prong approach references NNSA's decision to select two separate pit production facilities with lower production levels rather than a larger production facility at a single site, where by a minimum of 50 pits per year would be produced at SRS and a minimum of 30 pits per year would be produced at LANL (DoD 2018b).

Response: NNSA prepared the SA to allow NNSA to determine whether the existing Complex Transformation SPEIS should be supplemented, a new environmental impact statement should be prepared, or no further NEPA analysis is required prior to proceeding with its proposed action. The SA considers relevant new information since publication of the Complex Transformation SPEIS. The Complex Transformation SPEIS considered how to configure facilities that hold Category I and Category II quantities of SNM across the Complex, including the three functional areas of plutonium, uranium operations, and weapons assembly/disassembly/high explosives in various ways. These alternatives were broadly categorized into a Distributed Centers of Excellence Alternative, a Consolidated Centers of Excellence Alternative, and a Capability-Based Alternative. The Complex Transformation SPEIS also analyzed a No Action Alternative.

With respect to plutonium operations and pit production specifically, the Complex Transformation SPEIS evaluated an option for constructing a new pit production facility ("Greenfield") to produce 125 pits per year at one of five site alternatives: LANL; SRS; Pantex; Y-12; and the NNSS. 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. At SRS, the SPEIS also evaluated a pit production facility that would use the MFFF and PDCF infrastructure. Consequently, the Complex Transformation SPEIS analyzed the environmental impacts of pit production at both SRS and LANL, consistent with, and even significantly beyond, the current proposed action addressed in the Draft SA.

While NNSA did not specifically identify "simultaneous pit production at two sites" as a stated alternative in the Complex Transformation SPEIS, the environmental analysis in the SPEIS adequately considered the potential environmental impacts of such simultaneous production. The Complex Transformation SPEIS analyzed the same kinds of activities (i.e., pit production), with the same kinds of environmental consequences, at the same two sites that are being considered in the SA, including the transportation of materials between sites. In addition, for all alternatives analyzed in the Complex Transformation SPEIS, if LANL was not the selected site for consolidated plutonium operations, there would have been many years of overlapping production at two sites until a plutonium phase out at LANL could be achieved. The SA is specifically designed to comply with DOE NEPA implementing procedures at 10 CFR 1021.314(c) by evaluating a change to the DCE Alternative from the SPEIS to reflect two smaller pit production operations in recognition of the fact that the original DCE Alternative considered a much larger single-site pit production operation. Section 3.0 confirms that the impacts of a Modified DCE Alternative are less than those previously analyzed or are not significantly greater than those previously analyzed (*see* specifically Table 3-3 of the SA).

For all resource areas, the analyses verify that the potential programmatic environmental impacts would not be different, or would not be significantly different, than impacts in existing NEPA analyses. Based on the results of the Draft SA, NNSA has 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. Transportation risks associated with plutonium and plutonium-contaminated wastes between NNSA sites are addressed in Table 3-4 of the SA. Occupational and public health risks are addressed in Table 3-1 and Table 3-2 of the SA. With regard to the 1998 court order, NNSA supplemented the SSM PEIS consistent with that court order. See also comment response numbers 12, 13, and 16.

2. *Commenters state that the expansion of pit production at LANL and the repurposing of the MOX Facility at SRS are "systematic and connected agency decisions" that are clearly "connected," "cumulative," and "similar" actions, and therefore "their environmental effects must be considered in a single impact statement."*

Response: NNSA agrees that expanding pit production at LANL and repurposing the MFFF are connected actions. However, that, in and of itself, does not mean that a new EIS is required. The Complex Transformation SPEIS addressed the potential environmental impacts of expanding pit production at LANL and repurposing the MFFF. The issue addressed in the SA is whether the existing Complex Transformation SPEIS should be supplemented, a new EIS should be prepared, or no further NEPA analysis is required prior to proceeding with its proposed action. In preparing the Draft SA, NNSA considered and addressed the potential environmental effects of the connected actions at LANL and SRS. Together, Table 3-1 and Table 3-2 provide the analyses of the potential programmatic environmental impacts for these connected actions. Table 3-3 and Table 3-4 provide further analyses of the potential combined impacts of the proposed action. The analysis in the SA supports the determination that the conclusion 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. Thus, a new EIS is not required.

3. *Commenters state that NNSA erroneously claims that the drivers and requirements for expanded plutonium pit production have remained the same. Commenters' state that, to the contrary, these drivers and requirements have substantially changed. Commenters' state that the prior "Reliable Replacement" and "Interoperable" warhead programs have been cancelled and that NNSA's rationale for the Draft SA is the W87-1 warhead. Commenters state that NNSA fails "to offer a concrete, consistent rationale for an expensive and substantially expanded plutonium pit production."*

Response: NNSA's reasons for the need for expanded plutonium pit production in the U.S. have remained fundamentally unchanged and are driven by national policy and legal requirements. Specific elements of expanded pit production or operations do change with time, but the underlying programmatic need and programmatic approach remains consistent to maintain a safe, secure, and reliable nuclear weapons stockpile. In response to public comments on the Draft SA, NNSA has expanded the purpose and need section of the SA (Section 1.1) to provide a more comprehensive discussion of the need for the proposed action and the purposes to be achieved. NNSA has clarified that the decision on whether to expand pit production is not an agency decision; NNSA is only able to evaluate how best to implement federal law and national security policy. The discussion in revised Section 1.1 now addresses issues such as pit aging and pit lifetime, enhanced safety features, deterrent requirements by growing threats, and dual pit production sites. The stated purpose and need discussion provides adequate rationale for the proposed action.

4. *Commenters state that a programmatic review of Pantex is needed because of the potential to utilize extensive pit reuse as an alternative to new pit production.*

Response: As related to pit production, the role of Pantex has not changed since the Complex Transformation SPEIS was prepared and the 2008 Programmatic ROD was announced. As stated

in Table 2-5 of the SA, Pantex stores pits, provides feedstock, conducts non-intrusive pit modification, and receives newly certified pits. Like the pits in the active stockpile, the pits stored at Pantex are aging and would not mitigate plutonium aging risks or enable NNSA to implement enhanced safety features to pits to meet national security requirements. Furthermore, failure to increase pit production would render NNSA in violation of federal law that mandates specific pit production levels in the near future. While NNSA will continue to reuse existing pits to the extent practicable, pit reuse is not a reasonable alternative to new pit production.

Purpose and Need

5. *Commenters state that there is no need for new pits and that NNSA must explain the "purpose and need" for expanded pit production of 80 or more pits per year when pit reuse can be used in many circumstances.*

Response: As discussed in Section 1.0 of the SA, NNSA's statutory mission is to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test, in order to meet national security requirements (50 USC 2401(b)). 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). As discussed in Section 1.1 of the SA, under both federal law and national security policy NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 (50 USC 2538a; Public Law 115-232; DoD 2018a p. XV). The proposed action supports NNSA's responsibility 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 and fulfills its requirements under federal law. This is the same purpose and need as NNSA stated in the Complex Transformation SPEIS (DOE 2008b ch. 2 p. 1). Section 1.1 of the SA has been modified to include more detail regarding the purpose and need.

To produce pits with enhanced safety features to meet national security requirements, mitigate against the risk of plutonium aging, and respond to changes in deterrent requirements driven by growing threats from peer competitors, the U.S. must produce no fewer than 80 plutonium pits per year by 2030, and to sustain the capacity for future (Life Extension Programs and follow-on) programs. These requirements are contained in federal law and national policy. NNSA's pit production mission was emphasized as a national security imperative by the 2018 Nuclear Posture Review, issued in February 2018 by the Office of the Secretary of Defense and subsequent congressional statements of the policy of the United States. Contentions that there is no need for new pits are not consistent with federal law, the 2018 NPR, and national policy.

6. *Commenters state that the "purpose and need" analysis must fully analyze a scenario under which no new warhead designs are created that would require new-design pits.*

Response: The size and composition of the U.S. nuclear weapons stockpile is determined annually by the President. The secretaries of Defense and Energy jointly prepare the NWSM, which includes the NWSP as well as a long-range planning assessment. DoD prepares the NWSP based on military requirements and coordinates the development of the NWSP with NNSA

concerning its ability to support this plan. The President approves the NWSM and NWSP, and the Congress and the President approve funding for the NNSA to carry out the requirements of the NWSP and NWSM.

As discussed in Section 1.0 of the SA, NNSA is responsible for meeting the national security requirements established by the Congress and the President to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test (50 USC 2401(b)). Plutonium pits are critical components of every nuclear weapon, with nearly all current stockpiled pits having been produced from 1978-1989. As discussed in Section 1.1 of the SA, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030. NNSA is responsible for producing the pit quantities and pit types specified in the NWSM and NWSP and lacks discretion to consider alternatives outside of national policy. Section 1.1 of the SA has been modified to include more detail regarding the purpose and need.

7. *Commenters state that pits have credible lifetimes of at least 100 years and possibly as long as 150 years, so there is no near-term need for more pits.*

Response: Under federal law and national policy, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 (50 USC 2538a; Public Law 115-232; DoD 2018a, p. 62–63). The limited pit production capacity at LANL (20 pits per year) cannot meet this requirement. Pit lifetime is not the only factor driving the need for pit production. Pit production is required to (1) mitigate against the risk of plutonium aging; (2) produce pits with enhanced safety features to meet NNSA and DoD requirements; (3) respond to changes in deterrent requirements driven by growing threats from peer competitors; and (4) improve the resiliency, flexibility, and redundancy of the Nuclear Security Enterprise by not relying on a single production site. The two-prong approach for pit production would address a critical national security issue by providing the needed long-term capability to maintain the nuclear deterrent that is a cornerstone of United States national security policy. The deliberate, methodical replacement of older existing plutonium pits with newly manufactured pits provides a risk mitigation against plutonium aging. Section 1.1 of the SA has been modified to include more detail regarding the purpose and need.

8. *Commenters provide the following comments and questions related to pit capacity: NNSA has said it needs the capacity to produce 80 "or more" pits per year or "no fewer" than 80 pits per year. This has also been called a "surge capacity" by NNSA. What does this mean? How many actual pits does NNSA intend to produce per year or what actual capacity does NNSA intend to establish? What type of pits would be made by the new pit-production capacity?*

Response: Specific pit production requirements are classified and beyond the scope of the SA. NNSA is responsible for producing the pit quantities and pit types specified by federal law and in the NWSM and NWSP. Under federal law and national policy, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030. The exact number of pits that would be produced by either SRS or LANL is classified. As discussed in Section 1.3, in the SA, NNSA evaluates the potential environmental impacts of producing up to 80 pits per year at *both* SRS and LANL. This approach provides a conservative analysis and affords NNSA the flexibility of adapting to shifting requirements. If a higher level

of pit production were identified in a future requirement, NNSA would conduct appropriate additional analysis.

9. *Commenters state that a report on pit production by the Institute for Defense Analyses (IDA) noted that, "No available option can be expected to provide 80 ppy by 2030" and that DoD should evaluate how to best respond to this requirement shortfall. Commenters state that the full IDA report should be released into this EIS record.*

Response: The Fiscal Year 2019 National Defense Authorization Act required the Secretary of Defense, in consultation with the NNSA Administrator, to contract a federally funded research and development center (FFRDC) to conduct an assessment of NNSA's two-prong approach to achieve DoD's requirement for producing no fewer than 80 plutonium pits per year by 2030. That study was prepared by IDA and delivered to Congress on April 16, 2019, by DoD. The IDA study found that all of the options considered by NNSA had cost and schedule risks. The study concluded that NNSA's two-site plan is potentially achievable, noting that sufficient time, resources, and management focus will be necessary. IDA also examined costs and found the current approach to be comparable in costs to the other three one-site options it considered. The full IDA report is classified. The introduction of the IDA report is https://www.energy.gov/sites/prod/files/2019/06/f63/NNSA-IDA-study-introduction.pdf.

Whether NNSA can achieve completion of the proposed action within the requested schedule is outside the scope of the NEPA evaluation. The purpose of the SA is to determine whether additional NEPA analysis at a programmatic level is required.

10. *Commenters question what all the pits would be used for?*

Response: Plutonium pits are critical components of every nuclear weapon. The nuclear deterrent remains an essential element of our Nation's defense to protect our interests and those of our allies.

NEPA Process

11. *Commenters request that the public comment period be extended.*

Response: Although pertinent regulations do not require public comment on an SA, NNSA decided, in its discretion, that public comment in this instance would be helpful and issued the Draft SA for public review and comment for a 45-day period. The NNSA appreciates the public interest in NNSA's proposal to produce plutonium pits at SRS and LANL. NNSA considered requests to extend the public comment period on the Draft SA beyond August 12, 2019 but declined to grant an extension of time. NNSA considered late comments to the extent practicable.

12. *Commenters state that the SRS Pit Production EIS and any other plutonium pit decisions must be put on hold until such time as the ROD is amended in order to avoid prejudicing the SA and the issuance of a new or amended ROD.*

Response: The SRS EIS is in an early stage of development and that there is no prohibition on beginning initial preparation of a tiered NEPA document in advance of a ROD (or Amended ROD) for the document from which that NEPA document tiers.

Two-Prong Approach

13. *Commenters state that NNSA must prepare a new programmatic EIS and justify its statement of need and its plans for production at two sites and conduct thorough site-specific EISs at each of the two sites.*

Response: As discussed in Section 1.1 of the SA, preparing the SA enabled NNSA to decide whether or not a supplemental EIS, a new EIS, or no further NEPA documentation was required prior to making programmatic decisions regarding pit production. The proposed action evaluated in the SA—to implement the Modified DCE Alternative 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—would provide an effective, responsive, and resilient nuclear weapons infrastructure with the flexibility of adapting to shifting requirements. Section 1.1 of the SA has been modified to include more detail regarding the purpose and need.

The Complex Transformation SPEIS considered how to configure facilities that hold SNM across the Complex, including the three functional areas of plutonium, uranium operations, and weapons assembly/disassembly/high explosives in various ways. These alternatives were broadly categorized into a Distributed Centers of Excellence Alternative, a Consolidated Centers of Excellence Alternative, and a Capability-Based Alternative. The Complex Transformation SPEIS also analyzed a No Action Alternative. With respect to plutonium operations and pit production specifically, the Complex Transformation SPEIS programmatically 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.

The proposed action in this SA is consistent with actions analyzed in the Complex Transformation SPEIS (i.e., pit production and transportation of nuclear materials between sites) and would have the same kinds of environmental impacts, albeit with a smaller pit production capacity at two sites versus a larger pit production capacity at a single site. As discussed in Section 3.2, the SA evaluates the potential impacts from producing up to 80 pits per year at both SRS and LANL 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 the Complex Transformation SPEIS (*see* specifically Table 3-3, which provides an analysis of the potential impacts of pit production at two sites).

On June 10, 2019, DOE announced the overall NEPA strategy related to fulfilling national requirements for pit production (84 FR 26849). DOE announced that it would prepare at least three documents including the SA, a site-specific EIS for the proposal to produce pits at SRS (also announced in that notice), and site-specific documentation evaluating expanding pit production beyond 20 pits per year at LANL.

14. *Commenters state that a new programmatic EIS should be completed to account for connected actions and cumulative impacts of the proposed action of producing pits at both SRS and LANL. Commenters also state that such a document would further the purposes of NEPA.*

Response: The Complex Transformation SPEIS contains comprehensive programmatic environmental impact analysis for a wide range of alternatives. The SA addresses the potential impacts of producing pits at both SRS and LANL and re-evaluates the sufficiency of prior analyses. Impacts of production at both sites are specifically addressed in Section 3.0 of the SA. Table 3-3 addresses the combined impacts from pit production at both SRS and LANL, 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* SRS and LANL, which represents a conservative estimate of the combined impacts for the proposed action. With regard to the potential cumulative impacts of pit production and other reasonably foreseeable actions, Section 4.0 of the SA discusses the cumulative analysis.

As discussed in Section 5.0 of the SA, based on the analysis of the SA, NNSA has 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, NNSA determined that no further NEPA documentation is required at a programmatic level, and NNSA intends to amend the existing Complex Transformation SPEIS ROD to adopt a Modified DCE Alternative. It does not further the purposes of NEPA to expend additional federal resources unnecessarily re-analyzing known environmental impacts at a programmatic level, especially when NNSA's discretion in implementing pit production is highly constrained by federal law.

In order to implement the proposed action, and in furtherance of the purposes of NEPA and NNSA's statutory mission, NNSA is preparing site-specific NEPA analyses, 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 to the 2008 LANL SWEIS to analyze producing 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.

New Information/Changed Circumstances

15. *Commenters state that the proposed facilities for pit production have changed significantly since 2008, which warrants the need for a new programmatic analysis. For example, all pit production alternatives at LANL depend heavily on completion of the Chemistry and Metallurgy Research Replacement Nuclear Facility (CMRR-NF), a project that*

was cancelled in 2014. Without CMRR-NF anchoring pit production at LANL, whether at 30 pits per year or 80 pits per year, NNSA's alternatives for fulfilling its LANL mission needs, are fundamentally different than before. In addition, the RLUOB mission was expanded at LANL, the MFFF at SRS was cancelled, and the PDCF at SRS was not constructed.

Response: The 2003 CMRR EIS states that AC/MC support capabilities are required for pit production (DOE 2003a, ch. 1 p. 20). The CMMR-NF was proposed to house AC/MC capabilities after relocation from the CMR facility. The 2011 CMRR Supplemental EIS states that pit production does not take place at the CMR building and would not take place in any replacement facility such as the CMRR-NF (DOE 2011c, ch. 1 p. 7). After the CMRR-NF project was cancelled in 2014, NNSA issued a SA to the 2003 CMRR EIS that analyzed relocating AC/MC support capabilities to PF-4 and RLUOB instead of the CMRR-NF (DOE 2015c). Since an alternative for AC/MC capabilities was identified and has sufficient NEPA analysis, the CMRR-NF does not specifically anchor the LANL pit production capability.

In the 2018 *Final Environmental Assessment of Proposed Changes for Analytical Chemistry and Materials Characterization at the Radiological Laboratory/Utility/Office Building* (DOE/EA-2052), NNSA analyzed the proposal to modify RLUOB and enable its operation as a MAR-limited, HC-3 Nuclear Facility to perform more AC/MC operations than previously analyzed. The proposed action in the EA was to provide adequate physical means for accommodating AC/MC capabilities in RLUOB in a safe, secure, and environmentally sound manner. The 2018 RLUOB EA states that the proposal to provide more efficient AC/MC capabilities at RLUOB are required to support NNSA-established LANL mission requirements and are not tied specifically to LANL's pit production capability or for any pit production level.

The analysis in the SA considers and addresses the changes in facilities at SRS and LANL identified by the commenters (*see*, for example, Section 1.4 and Section 4.3.2 of the SA). The fact that there have been facility changes and that NNSA has implemented efficiencies and innovative operations in using existing facilities does not mean the SA proposed action constitutes a substantial change to the proposal from actions analyzed previously and/or there are significant new circumstances or information relevant to environmental concerns at a programmatic level (10 CFR 1021.314(a)). The SA evaluates the proposed action in light of these changes in accordance with 10 CFR 1021.314(a). Based on the analysis in the SA, NNSA concluded that no further NEPA documentation is required at a programmatic level, as the changes either have less environmental impact than previously analyzed or if there is an increased impact that impact is not significant and NNSA may amend the Complex Transformation SPEIS ROD. Site-specific NEPA evaluations at SRS and LANL are ongoing and will address specific changed circumstances on a site-level.

16. *Since the Complex Transformation SPEIS, commenters state that there has been new information regarding seismic risks at LANL PF-4 that NNSA must consider in a new supplemental programmatic EIS.*

Response: The SA considered accidents, such as the beyond evaluation basis earthquake and fire (the bounding accident), which are dependent on the quantity of plutonium in a facility that could be released in an accident (*e.g.*, the MAR). Under the Modified DCE Alternative, increasing pit production would require less MAR in LANL facilities than analyzed in the Complex

Transformation SPEIS. The potential consequences from these types of accidents would be expected to be less than the consequences analyzed in the Complex Transformation SPEIS. A detailed discussion of potential changes in seismic data has been added to the Final SA in Section 2.3.6.

LANL's ongoing Seismic Analysis of Facilities and Evaluation of Risk project is conducting a detailed, multi-year analysis of the seismic design loads on existing facilities within the Plutonium Complex. This comprehensive seismic hazard analysis provides a better understanding of the stresses on PF-4 and how it might react during a seismic event. This information will be used as a basis for future modification of facilities. LANL has undertaken upgrades to mitigate consequences from a seismically-induced accident at the facility and tangible progress has been achieved. Ongoing efforts include completion of the following: installation of the generators and transfer equipment for the electric firewater pumps; designs to remedy seismic interaction issues with the fire suppression system; and continued development of fire hazard evaluations and seismic analyses for gloveboxes. While there have been many infrastructure improvements, efforts will continue for several years. These improvements are all planned and needed even if LANL remained at a 20 pit per year level. However, because seismic risks will be mitigated appropriately, accident scenarios previously analyzed do not necessarily change as a result of changes in seismic evaluations. On January 3, 2017, the DNFSB recognized that numerous upgrades have been completed and further improvements will continue to be implemented as identified (DNFSB 2017). As further information is developed, that information will be used as a basis for further upgrades. Upgrades are ongoing and scheduled through the mid-2020's.

This issue will also be further analyzed in the LANL site-specific SA. While NNSA does not agree with commenters that these operational issues trigger a requirement for a new SPEIS, NNSA continues to monitor operational issues for all of its facilities, including current and potential pit production facilities. Issuance of a NEPA ROD related to pit production at either SRS or LANL will not modify NNSA's monitoring and continued evaluation of operations.

17. *Since the Complex Transformation SPEIS, commenters state that there has been new information regarding safety risks at LANL PF-4 (and specifically criticality risks) that NNSA must consider in a new supplemental programmatic EIS.*

Response: The SA considered accidents, such as criticality events, which are dependent on the quantity of plutonium in a facility that could be released in an accident (*e.g.*, the MAR). Increasing production at LANL would have the same MAR in LANL facilities for a criticality event as was analyzed in the Complex Transformation SPEIS. The potential consequences from these types of accidents would be expected to be the same as the consequences analyzed in the Complex Transformation SPEIS. Criticality events are not the bounding accident scenario for pit production.

In 2013, LANL paused work on all fissile material operations in PF-4. The pause stemmed from self-reported procedural issues and resulted in management evaluation of work, identifying potential deficiencies in work processes and procedures and mechanisms for continuous improvement. DOE/NNSA has taken actions to address the criticality safety concerns. Corrective actions include revising the Nuclear Criticality Safety Program. In addition, a causal analysis of criticality safety infractions that occurred in 2013 was conducted, and a plan was submitted to

DOE for reopening PF-4 for operations. Finally, corrective actions from prior assessments were incorporated into the *2014 Nuclear Criticality Safety Program Upgrades Project Management Plan*. Full operations, including pit manufacturing, resumed at PF-4 in 2016.

This issue will be further addressed in the 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. While NNSA does not agree with commenters that these operational issues trigger a requirement for a new programmatic EIS or supplement to the SPEIS, NNSA continues to monitor operational issues for all of its facilities, including current and potential pit production facilities. Issuance of a NEPA ROD for pit production at either SRS or LANL will not modify NNSA's monitoring and continued evaluation of operations.

18. *Since the Complex Transformation SPEIS, commenters state that there has been new information regarding environmental justice impacts at SRS and LANL that NNSA must consider in a new supplemental programmatic EIS. Commenters state that NNSA special pathways analysis in the Complex Transformation SPEIS was flawed. Commenters' also state that there is a need for a more robust Environmental Justice analysis with support from Environmental Justice experts, especially cumulative impacts to Environmental Justice in a new programmatic EIS.*

Response: Section 3.0 of the SA addresses environmental justice as analyzed in the Complex Transformation SPEIS. As discussed in that section, at LANL, the 2018 SA to the 2008 LANL SWEIS determined that there were no disproportionally high and adverse impacts on minority or low-income populations residing near LANL. The radiological dose from emissions associated with normal operations would, in fact, 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 2018d p.125). With regard to the proposed two-prong approach for 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. With regard to special pathway analyses, in the Complex Transformation SPEIS, NNSA analyzed the potential risk due to radiological exposure through the consumption patterns of special pathways receptors, including subsistence consumption of fish, native vegetation, surface waters, sediments, and local produce; absorption of contaminants in sediments through the skin; and inhalation of plant materials. NNSA's analysis is reasonable and sound.

The issue of environmental justice impacts at LANL has also been considered by NNSA in prior LANL-specific NEPA documents (DOE 2018d), which are incorporated by reference in the SA (*see* Section 1.4 of the SA). At SRS, as discussed in Table 3-2 of the SA, 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. There are no special circumstances that would result in any greater impact on minority or low-income populations than the population as a whole.

In March 2016, the EPA published "*Promising Practices for EJ Methodologies in NEPA Reviews*" (EPA 2016). The information in that document is "nonbinding, informal, and summary in nature," and "does not constitute rules or regulations." Nonetheless, consistent with the spirit of that document, NNSA is committed to implementing recommendations in that document, as appropriate, in order to produce more effective, efficient, and consistent consideration of environmental justice during NEPA reviews.

This issue will be further addressed in the LANL site-specific SA. While NNSA does not agree with commenters that these environmental justice issues trigger a requirement for a new programmatic EIS or supplement to the SPEIS, NNSA continues to monitor for potential greater impacts on minority or low-income populations as a whole. Issuance of a NEPA ROD related to pit production at either SRS or LANL will not modify NNSA's monitoring and continued evaluation.

19. *Commenters state that there have been significant environmental and operational changes at LANL since the Complex Transformational SPEIS including the 2011 Las Conchas wildfire that came within close proximity to LANL. Commenters state that as climate change and global warming increase, the rate of wildfires increases and ask whether the potential impact of a fire or other natural disaster impacting the facility have been studied and considered?*

Response: Wildfires, impacts from wildfires, and climate change have been considered by NNSA in prior LANL-specific NEPA documents (DOE 2008a and DOE 2018d), which are incorporated by reference in the SA (*see* Section 1.4 of the SA). This issue will be further addressed in the 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. In addition, as discussed in Section 3.0 of the SA, a spectrum of accidents related to pit production 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, and NNSA has evaluated and considered this.

20. *Commenters state that some NNSA site-wide EISs are more than ten years old. Commenters specifically state that at LANL there has been a [1] a major fire;[2] a chromium/perchlorate plume that is moving to Los Alamos County drinking wells; threats to downstream and downwind water supplies; documented nuclear safety issues;[3] workers dying from cancer.*

Response: NNSA is in compliance with its NEPA obligations for addressing the age of NEPA documents as described in DOE NEPA implementing procedures (10 CFR 1021). Per 10 CFR 1021.330, DOE shall evaluate site-wide EIS documents every five years. Per 10 CFR 1021.314, when it is unclear whether or not a supplemental to an EIS is required, DOE prepares a SA to determine if additional NEPA documentation is required. DOE has complied with these requirements for the 2008 LANL SWEIS through annual publications of the Laboratory's environmental impacts (LANL Yearbooks) and the 2018 SA to the 2008 LANL SWEIS (DOE 2018d).

The LANL-specific issues raised in the comment have been considered by NNSA in prior LANL-specific NEPA documents (DOE 2008a and DOE 2018d), which are incorporated by reference in the SA (*see* Section 1.4 of the SA). NNSA has considered these factors and determined that they do not necessitate a new programmatic NEPA analysis. To the extent that they may be relevant to site-level analysis, these issues will be further addressed, as appropriate, in the LANL site-specific SA.

21. *Commenters state that pit production affects NNSA's dilute and dispose program for surplus plutonium. Commenters state that the dilute and dispose program depends heavily on the industrial production of plutonium dioxide at LANL, and that industrial production has now been canceled, to make room for pit production in PF-4. Commenters also state that WIPP, Pantex, and SRS are also affected by the dilute and dispose program and state that pit production and dilute and dispose are related and should be addressed in a national, programmatic NEPA analysis.*

Response: NNSA disagrees that surplus plutonium disposition has been cancelled at PF-4 to make room for pit production. Generating plutonium oxide is ongoing at PF-4 on a small scale and floor space is available to increase plutonium oxide production as well as manufacturing of pits. The surplus plutonium disposition program is discussed in Section 4.2.4 of the SA. Except as noted in that section, NNSA has not made any decisions related to the disposition of surplus plutonium. The proposed action in the SA does not foreclose or otherwise prejudice any future proposals or decisions related to the disposition of surplus plutonium. As stated in Sections 4.3.1 and 4.3.2 of the SA, the site-specific SA to the 2008 LANL SWEIS and the SRS Pit Production EIS, which NNSA expects to prepare to implement the proposed action analyzed in the SA, would contain an analysis of potential cumulative impacts associated with pit production and any reasonably foreseeable plutonium disposition activities, as appropriate.

22. *Commenters state that the Draft SA dismisses the necessity of PF-4 replacement, even though the NNSA Administrator has implied in testimony that this might well prove necessary.*

Response: As discussed in Section 2.3.4 of the SA, although PF-4 will reach its initial assumed 50 year design life in 2028, there are 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. The site-specific LANL SA would analyze this issue in more detail if appropriate.

Impact Analyses

23. *Commenters state that NNSA needs to assess the impact of waste from new pit production.*

Response: Sections 2.2.1 and 2.2.2 of the SA describe, at a programmatic level, the proposed action at SRS and LANL, respectively. Section 3.0 of the SA provides the programmatic evaluation of the potential environmental impacts of NNSA adopting a Modified DCE Alternative, including the potential changes to waste generation and impacts as compared to the

analyses in the Complex Transformation SPEIS. The waste types evaluated include non-hazardous solid waste, hazardous, LLW, MLLW, and TRU wastes. The projected volumes of wastes generated by NNSA adopting a Modified DCE Alternative, and the impacts of managing those wastes, would be less than previously analyzed at a programmatic level in the Complex Transformation SPEIS. The SRS Pit Production EIS will evaluate, in more detail, the potential waste generation and impacts for these waste types associated with the production of at least 50 pits per year in a refurbished MFFF. Similarly, the site-specific LANL SA will analyze the potential waste generation and impacts for these waste types associated increased production.

24. *Commenters question how TRU waste streams from the pit facility will impact the volume cap of the WIPP in New Mexico. Commenters' also state that pit production would affect TRU waste disposal by competing for WIPP space.*

Response: Section 4.3.3 of the SA addresses this issue. As discussed in that section, approximately 108,048 m^3 of capacity would be available at WIPP for TRU waste. Based on the Complex Transformation SPEIS estimates, producing 200 pits per year at both LANL and SRS was estimated to generate a maximum of 1,375 m^3 of TRU waste annually (consisting of 650 m^3 at LANL and 725 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of the SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in this paragraph). Based on current estimates, producing up to 80 pits per year at both LANL and SRS could generate a maximum of 1,978 m^3 of TRU waste annually (consisting of 306 m^3 at LANL and 1,672 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of the SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in the paragraph). The combined TRU waste (1,978 m^3) generated over 50 years would be 98,900 m^3, which would account for 92 percent of the projected available capacity at WIPP. However, the analysis above conservatively assumes that both LANL and SRS would produce 80 pits per year. Under the most likely scenario, LANL would produce 30 pits per year and SRS would produce 50 pits per year. Based on current estimates, producing 30 pits per year at LANL and 50 pits per year at SRS could generate a maximum of 1,151 m^3 of TRU waste annually (consisting of 107 m^3 at LANL and 1,044 m^3 at SRS) (*see* Table 2-2 and Table 2-4 of the SA, noting that quantities shown in those Tables are expressed in cubic yards and are converted to cubic meters in this paragraph). The combined TRU waste (1,151 m^3) generated over 50 years would be 57,550 m^3, which would account for 53 percent of the projected available capacity at WIPP.

WIPP needs to complete regulatory changes and complete important capital projects which have the ability to affect short-term shipping rates. However, the National TRU Program (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. A large emphasis is placed on meeting NNSA shipping requirements to support active projects and missions related to national security and stockpile stewardship.

25. *Commenters state that as a result of the delay or elimination of the Yucca Mountain project, the SA states that the potential cumulative transportation impacts would be reduced from that presented in the Complex Transformation SPEIS. However, the SA does not consider the current application to the NRC from the Holtec Corporation for consolidated interim*

storage of past and future spent nuclear fuel. The SA needs to consider the potential cumulative impacts of storing spent nuclear fuel and high-level radioactive waste in a consolidated facility.

Response: Section 4.2.3 of the SA has been revised to acknowledge applications to the NRC for consolidated interim storage of spent nuclear fuel and addresses the potential cumulative impacts of such storage. However, no such license has been granted and no such facility is under construction or in operation.

26. *Commenters state that NNSA should address radiological impacts to vulnerable populations (such as pregnant women, fetuses, children and the elderly) instead of the "reference man."*

Response: The Complex Transformation SPEIS and the SA were prepared in accordance with applicable DOE guidance, including "*Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements, Second Edition*" (December 2004) and "*Recommendations for the Supplement Analysis Process, Second Edition*" (January 2019). DOE guidance for human health impacts states that a "sliding-scale approach" should be applied when characterizing human health effects. The guidance also states that estimates of potential health effects from chemical or radiological exposure should include "members of the general public." Consistent with that guidance, NNSA evaluates the potential human health impacts on an "average member of the general public." If the analysis shows that potential human health impacts may be significant to the average member of the general public, NNSA may decide to further analyze human health impacts on a more vulnerable segment of the population. In the case of the Complex Transformation SPEIS and the SA, the potential impacts to human health did not warrant a more detailed human health analysis. For example, the dose to the MEI (a hypothetical member of the public located at the closest site boundary) at either LANL or SRS from production of up to 200 pits per year was estimated to be less than 1.5×10^{-4} mrem. Such a dose is approximately 0.0015 percent of the regulatory dose limit and approximately 0.000042 percent as much as the dose a person would receive from natural background radiation. These doses to the MEI are so small to not warrant a more detailed analysis of other segments of the population.

27. *Commenters state that NNSA should address the health impacts of chemicals and toxic air pollutants.*

Response: The Complex Transformation SPEIS addresses the health impacts of chemicals and toxic air pollutants from both normal operations and accidents (*see*, for example, Sections 5.1.11.2.1, 5.1.11.2.2, and 5.1.12.2.2 [LANL] and Sections 5.8.11.2.1, 5.8.11.2.2, 5.8.12.2.2 [SRS]). The design of the production facilities provide layers of containment for both radiological and chemical hazards and the analyses in the SPEIS demonstrated that the health impacts of chemicals and toxic air pollutants were not significant. The proposed action evaluated in the SA involves less production than was analyzed in the Complex Transformation SPEIS and potential health impacts of chemicals and toxic air pollutants would remain insignificant.

28. *Commenters state that NNSA must evaluate the cumulative or connected actions regarding the proposed construction actions at LANL that would support pit production.*

Response: NNSA recognizes the potential for new construction that would support expanded pit production at LANL. These potential construction actions will be evaluated in the LANL site-specific analysis. The SA to the Complex Transformation SPEIS evaluates construction at a programmatic level.

29. *Commenters state that it is improper for the NNSA to rely on a bounding analysis from the Complex Transformation SPEIS that was written more than a decade ago under assumptions that are no longer valid.*

Response: The SA evaluates the potential impacts of adopting the Modified DCE Alternative for plutonium operations and of producing up to 80 pits per year at both SRS and LANL 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 1.4 of the SA. Based on the results of the SA, NNSA has 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. The fact that an impact associated with the proposed action evaluated in the SA is smaller than an impact presented in the Complex Transformation SPEIS merely corroborates that "there are no significant new circumstances or information relevant to environmental concerns." Table 3-3 of the SA addresses the combined impacts from pit production at *both* SRS and LANL, and Table 3-4 addresses Complex-wide transportation impacts. The information provides an analysis of producing up to 80 pits per year at *both* SRS and LANL, which represents a conservative estimate of the combined impacts for the proposed action. This information is provided only for analytical perspective; DOE is not proposing to produce 80 pits per year at both sites.

NNSA disagrees that it has improperly relied on a bounding analysis. The 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, NNSA believes that a finding that the associated environmental impacts would be less than (or not significantly greater 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.

Additionally, the fact that the Complex Transformation SPEIS is more than 10 years old does not mean that a new EIS needs to be prepared. The SA considers new information since publication of the Complex Transformation SPEIS (*see* Section 2.3 of the SA) as a factor in the analysis and determination. For example, the SA includes consideration of changes in environmental conditions at LANL and SRS since publication of the Complex Transformation SPEIS, evaluates

the impact of population changes, analyzes changes in seismic hazards, and discusses relevant programmatic changes.

General Opposition or Support

30. *Commenters express opposition to pit production for a variety of reasons, including health and environmental risks and accidents.*

Response: The commenters' opposition to pit production is noted.

31. *Commenters express favor of pit production for a variety of reasons, including an experienced nuclear workforce and historical support of defense mission.*

Response: The commenters' support for pit production is noted.

Nuclear Weapon Policies/New Weapon Designs

32. *Commenters question how NNSA will test the safety and reliability of a warhead or a weapon using a new plutonium pit.*

Response: This issue is beyond the scope of the SA. With respect to certifying the safety and reliability of the stockpile, NNSA's Stockpile Stewardship Program was established in 1994 to sustain the deterrent in the absence of nuclear explosive testing. That program has allowed DOE and DoD to certify the safety, security, and effectiveness of the U.S. nuclear weapons stockpile to the President without the use of nuclear explosive testing for the past 23 consecutive years. The status of the current stockpile is monitored through continuous, multi-layered assessments of the safety, security, and effectiveness of each U.S. nuclear weapon system.

33. *Commenters suggest that there is a straight-forward alternative, available right now that would lead to all the warheads on U.S. land-based missiles using insensitive explosives: that is to replace the W78s with W87 warheads currently in storage.*

Response: The issue of which warheads should be in the nuclear weapons stockpile is beyond the scope of the SA. Section 1.1 of the SA has been modified to include more detail regarding the purpose and need. As discussed in Section 3.0 of the SA, NNSA is responsible for meeting federal law and national security requirements to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test (50 USC 2538a).

The size and composition of the U.S. nuclear weapons stockpile is determined annually by the President. The secretaries of Defense and Energy jointly prepare the NWSM, which includes the NWSP as well as a long-range planning assessment. DoD prepares the NWSP based on military requirements and coordinates the development of the NWSP with NNSA concerning its ability to support this plan. The President approves the NWSM and NWSP, and the President and the Congress approve funding for the NNSA to carry out the requirements of the NWSP and

NWSM. Furthermore, Congress and the President enact laws requiring specific pit production levels (50 USC 2538a; Public Law 115-232).

34. *Commenters state that this proposal seemingly ignores decades of non-proliferation policies and question how will deployment of new weapons with new pits meet the obligations of the NPT. Commenters express concern that development of new pits could lead to nuclear escalation and a new nuclear arms race and state that pits cannot be full-scale tested or alternatively, could prompt the U.S. to return to testing, which would have serious international proliferation consequences.*

Response: NNSA is responsible for producing the pit quantities and pit types specified in the NWSM and NWSP and lacks discretion to consider alternatives outside of national policy. Section 1.1 of the SA has been modified to include more detail regarding the purpose and need. As discussed in that section, the NPT was ratified by the Senate in 1969 and officially entered into force as a Treaty of the United States in 1970. Today, the U.S. continues to view the NPT as the cornerstone of the nuclear non-proliferation regime (DoD 2018a, p. 70). Article VI of the NPT obligates the parties "to pursue negotiations in good faith on effective measures relating to cessation of the nuclear arms race at an early date and to nuclear disarmament, and on a treaty on general and complete disarmament under strict and effective international control." The U.S. has taken this obligation seriously and the President has emphasized both the long-term goal of eliminating nuclear weapons and the requirement that the U.S. have modern, flexible, and resilient nuclear capabilities that are safe and secure until such a time as nuclear weapons can prudently be eliminated from the world. The two-prong pit production approach would enable NNSA to maintain the safety, reliability, and performance of the U.S. nuclear weapons stockpile until the ultimate goals of the NPT are attained. That strategy is consistent with the NPT. NNSA is confident the Stockpile Stewardship Program will continue to enable DOE and DoD to certify the safety, security, and effectiveness of the U.S. nuclear weapons stockpile to the President without the use of nuclear explosive testing. Section 1.1 of the SA has been modified to include more detail regarding the NPT.

Miscellaneous Comments

35. *Commenters state that construction of the MFFF was "shoddy" and could preclude use of the facility for any activities involving handling of nuclear materials or toxic chemicals. Commenters' state that it is incumbent upon DOE to prove beyond a doubt that the building can be "repurposed" for a pit production use.*

Response: The MFFF was built to current safety and security standards (including seismic performance category 3+ to meet NRC requirements), with walls of 12-inch reinforced concrete. Geotechnical and structural engineers from Savannah River Nuclear Solutions have evaluated the geotechnical and seismic design criteria for the MFFF (NRC-based) against the similar DOE criteria which would be applied should the facility be repurposed for pit production. The MFFF was evaluated against plausible seismic events (*e.g.*, bedrock motions during an earthquake that move the building vertically and horizontally). The expected seismic spectra are predominately bounded by the previous NRC requirements used to design the MFFF and demonstrate that the

MFFF is suitable for repurposing for pit production. NNSA is currently preparing the Conceptual Design Report for repurposing the MFFF for use in pit production. That Conceptual Design Report will document any design and construction requirements needed to ensure the repurposed MFFF can be safely used for pit production. A detailed discussion of potential changes in seismic data has been added to the Final SA in Section 2.3.6.

36. *Commenters state concern that pit production will delay clean-up actions by diverting funds.*

Response: Congress and the President determine federal budget requirements and priorities. It is beyond the scope of the SA to address federal budget authorizations/appropriations.

Comments from the Santa Clara Pueblo

37. *The Santa Clara Pueblo states that a new programmatic EIS is needed for many reasons, including:*

- *NNSA's new plan for simultaneous pit production at two sites represents a new national policy.*
- *There have been significant new circumstances relevant to environmental concerns that must be considered, including:*
    - *Seismic hazards and impacts at LANL;*
    - *Safety impacts at LANL, particularly those related to criticality issues; and*
    - *Environmental Justice issues at LANL.*
- *A new programmatic EIS would further the purposes of NEPA.*
- *The two-site pit production proposal represents a systematic and connected agency action that is clearly connected, cumulative, and similar, and therefore must be considered in a single impact statement; potential impacts related to TRU waste disposal at WIPP and transportation of nuclear materials were specifically cited in support of this statement.*

Response: NNSA prepared the SA to allow NNSA to determine whether the existing Complex Transformation SPEIS should be supplemented, a new environmental impact statement should be prepared, or no further NEPA analysis is required prior to proceeding with its proposed action. The SA considers relevant new information since publication of the Complex Transformation SPEIS. The Complex Transformation SPEIS considered how to configure facilities that hold SNM across the Complex, including the three functional areas of plutonium, uranium operations, and weapons assembly/disassembly/high explosives , in various ways. These alternatives were broadly categorized into a Distributed Centers of Excellence Alternative, a Consolidated Centers of Excellence Alternative, and a Capability-Based Alternative. The Complex Transformation SPEIS also analyzed a No Action Alternative. With respect to plutonium operations and pit production specifically, the Complex Transformation SPEIS evaluated, among other things, constructing a new pit production facility ("Greenfield") to produce 125 pits per year at one of five site alternatives: SRS; LANL; Pantex; Y-12; and the NNSS. 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. At SRS, the SPEIS also evaluated a pit production facility that would use the MFFF and PDCF infrastructure. Consequently, the Complex Transformation SPEIS analyzed the environmental impacts of pit production at both SRS and LANL, consistent with, and even significantly beyond, the current proposed action addressed in the SA.

While NNSA did not specifically identify "simultaneous pit production at two sites" as a stated alternative in the Complex Transformation SPEIS, the environmental analysis in the SPEIS adequately considered the potential environmental impacts of simultaneous production. For all alternatives analyzed in the Complex Transformation SPEIS, if LANL was not the selected site for consolidated plutonium operations, there would have been many years of overlapping production at two sites until a plutonium phase out at LANL could be achieved. The SA is to specifically evaluate a Modified DCE Alternative that has two smaller pit production operations in recognition of the fact that the original DCE Alternative considered a much larger single-site pit production operation and in Section 3.0 confirms that the impacts of a Modified DCE Alternative are less than those previously analyzed or are not significantly greater than those previously analyzed (*see* specifically of the SA)

For all resource areas, the analyses verify that the potential programmatic environmental impacts would not be different, or would not be significantly different, than impacts in existing NEPA analyses. Based on the results of the SA, NNSA has 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.

With regard to new information regarding seismic hazards and impacts at LANL, please see comment-response #16.

With regard to new information regarding safety risks at LANL PF-4 (and specifically criticality risks), please see comment-response #17.

With regard to environmental justice impacts at LANL, please see comment-response #18.

With regard to impacts related to TRU waste disposal at WIPP, please see comment-response #24.

Transportation risks associated with plutonium and plutonium-contaminated wastes between NNSA sites are addressed in Table 3-4 of the SA.

While NNSA acknowledges that there is always heightened interest in its weapons-related missions, it does not further the purposes of NEPA to expend additional federal resources unnecessarily re-analyzing known environmental impacts at a programmatic level, especially when NNSA's discretion in implementing pit production is highly constrained by federal law. To meet the purpose and need stated in Section 1.1 of the SA, NNSA must implement a strategy to provide the enduring capability and capacity to produce no fewer than 80 pits per year by 2030 including producing no fewer than 30 pits per year at LANL (50 USC 2538a; Public Law 115-232; DoD 2018a). Preparation of a new programmatic EIS is neither justified nor required and would jeopardize NNSA's ability to meet its legal responsibilities.

38. *The Santa Clara Pueblo states that the minimum action NNSA should take is the preparation of a supplemental EIS to the 2008 LANL SWEIS.*

Response: The site-specific LANL SA will enable NNSA to decide whether further NEPA documentation is required at LANL prior to making final decisions for LANL.

39. *The Santa Clara Pueblo states that the 2006 Accord requires that DOE/NNSA consult with Santa Clara Pueblo "to assure that tribal rights, responsibilities, and concerns are addressed prior to the DOE taking action, making decisions, or implementing programs that may affect the Pueblo." The Santa Clara Pueblo therefore respectfully requests government-to-government consultation with the Pueblo on NNSA's decisions related to the Draft SA before such decisions are made. Such government-to-government consultation also is required to ensure DOE has lived up to its commitment to "protect and promote" Tribal Trust resources in order try to avoid impacts to those resources.*

Response: NNSA has committed to engaging the Santa Clara Pueblo in government-to-government consultations. NNSA will continue to engage in these consultations with the Pueblo.