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Plutonium Pit Production
Programmatic Environmental Impact Statement

VOLUME 1

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COVER SHEET

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TITLE: Draft Plutonium Pit Production Programmatic Environmental Impact Statement (DOE/EIS-0573) (Pit Production PEIS or PEIS)

LOCATION: Los Alamos, New Mexico and Aiken, South Carolina

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This document is available for viewing and downloading on the DOE NEPA website (https://www.energy.gov/nepa/doeeis-0573-plutonium-pit-production-multiple-locations).

Abstract: NNSA's Proposed Action is to produce plutonium pits at required quantities to meet national security requirements (50 U.S.C. § 2538a). This PEIS presents potential environmental impacts associated with pit production at single or multiple sites. For analytical purposes, this PEIS evaluates potential impacts of continuous pit production over the next 50 years. The Proposed Action also includes activities across the Nuclear Security Enterprise related to transportation and waste management associated with the pit production mission.

This PEIS has been prepared to satisfy the Settlement Agreement and is compliant with Section 102(2)(C) of NEPA and DOE's NEPA Implementing Procedures. **This Draft PEIS is approximately 240 pages.**

Public and Tribal Involvement: NNSA published a Notice of Intent on May 9, 2025 (90 FR 19706), announcing preparation of the Pit Production PEIS and a scoping period that ended on July 14, 2025. NNSA conducted online public scoping meetings on May 27 and 28, 2025, and accepted comments via the meetings, email, and postal mail. All comments received were systematically reviewed, organized into comment issue categories, and considered in developing the PEIS. A summary of scoping comments and NNSA's consideration of those comments is provided in Appendix B. Pursuant to the Settlement Agreement, the Draft PEIS is subject to a 90-day public comment period beginning with publication of a Notice of Availability from the U.S. Environmental Protection Agency. NNSA will hold five in-person public hearings with at least 15 days' advance notice provided through DOE NEPA webpage, local newspapers, established email distribution lists, and direct outreach to tribes and pueblos near potentially affected sites. NNSA will consider all comments received in preparing the Final PEIS, will append or otherwise publish all substantive comments or summaries thereof if comment volume is exceptionally large, will include all Draft PEIS comment documents in the Administrative Record, and intends to issue a Record of Decision concurrently with the Final PEIS in accordance with DOE NEPA Implementing Procedures (DOE 2025a).

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ABBREVIATIONS AND ACRONYMS

°F	degrees Fahrenheit
1999 LANL SWEIS	Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico
2008 LANL SWEIS	Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico
2019 SPEIS SA	2019 Complex Transformation SPEIS Supplement Analysis
2020 LANL SWEIS SA	Final Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operations of Los Alamos National Laboratory
2020 SRS Pit Production EIS	Final Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina
2026 LANL SWEIS	Final Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory
AI	artificial intelligence
ATWIR	Annual Transuranic Waste Inventory Report
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BLS	United States Bureau of Labor Statistics
BMP	best management practice
C&D	construction and demolition
CAA	Clean Air Act
CD	Critical Decision
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Complex Transformation SPEIS	Complex Transformation Supplemental Programmatic Environmental Impact Statement
CMR	Chemistry and Metallurgy Research
CRMP	Cultural Resources Management Plan
DD&D	decontamination, decommissioning, and demolition
DNFSB	Defense Nuclear Facilities Safety Board
DoD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE-EM	DOE Office of Environmental Management
DOW	Department of War
EPA	U.S. Environmental Protection Agency
EPCU	Electrical Power Capacity Upgrade
ERPG	Emergency Response Planning Guide
ETF	Effluent Treatment Facility
FEMA	Federal Emergency Management Agency
FR	Federal Register
g	gravity
GHG	greenhouse gas
GPY	gallons per year
HC	Hazard Category
HEPA	high-efficiency particulate air

HEU	highly enriched uranium
HFTOC	High-Fidelity Training and Operations Center
HLW	high-level radioactive waste
HMP	Threatened and Endangered Species Habitat Management Plan
I-25	Interstate 25
INL	Idaho National Laboratory
KCNSC	Kansas City National Security Campus
kW-hr/yr	kilowatt-hour per hour
LANL	Los Alamos National Laboratory
LANL MAP	Mitigation Action Plan for Los Alamos National Laboratory Operations
LANSCE	Los Alamos Neutron Science Center
LAPP	Los Alamos Power Pool
LCF	latent cancer fatality
LEP	life extension program
LLNL	Lawrence Livermore National Laboratory
LLW	low-level radioactive waste
LOS	level of service
LWA	Land Withdrawal Act (WIPP)
MAR	material-at-risk
MEI	maximally exposed individual
MFFF	Mixed-Oxide Fuel Fabrication Facility
MGY	million gallons per year
MLLW	mixed low-level radioactive waste
MPB	Main Process Building
mpg	miles per gallon
MVA	megavolt ampere
N_2O	nitrous oxide
NA	not applicable
NAAQS	National Ambient Air Quality Standards
NDS	National Defense Strategy
NEEWC	National Energetic and Engineering Weapons Complex
NEPA	National Environmental Policy Act
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NM-4	New Mexico State Road 4
NMED	New Mexico Environment Department
NMSW	New Mexico Special Waste
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Sites
NOx	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPR	Nuclear Posture Review
NPS	National Park Service
NPT	Nuclear Non-Proliferation Treaty
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
NSE	Nuclear Security Enterprise
NWSM	Nuclear Weapons Stockpile Memorandum
NWSP	Nuclear Weapons Stockpile Plan
OSHA	Occupational Safety and Health Administration

Pantex	Pantex Plant
pCi/L	picocurie per liter
PF-4	Plutonium Facility building 4
PGA	peak ground acceleration
Pit Production PEIS	Plutonium Pit Production Programmatic Environmental Impact Statement
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
ppy	pits per year
PRP	Production-Based Resilience Program
PSHA	Probabilistic Seismic Hazard Analysis
Pu	plutonium
PuEq	plutonium-239 equivalent
R&D	research and development
RCRA	Resources Conservation and Recovery Act
RFP	request for proposal
RIMS II	Regional Input-Output Modeling System
RLUOB	Radiological Laboratory/Utility/Office Building
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
ROI	region of influence
SCDES	South Carolina Department of Environmental Services
SCDHEC	South Carolina Department of Health and Environmental Control
SNL/NM	Sandia National Laboratories/New Mexico
SPDP EIS	Surplus Plutonium Disposition Program Final Environmental Impact Statement
SRPPF	Savannah River Plutonium Processing Facility
SRS	Savannah River Site
SSM PEIS	Stockpile Stewardship and Management Programmatic Environmental Impact Statement
SSM Plan	Stockpile Stewardship Management Plan
SSMP	Stockpile Stewardship and Management Program
SC 125	South Carolina State Highway 125
SWEIS	site-wide environmental impact statement
SWWS	Sanitary Wastewater System
TA	technical area
TFF	Tritium Finishing Facility
TLW	TRU Liquid Waste (Treatment Facility)
TRU	transuranic
TSD	treatment, storage, and disposal
U.S.	United States
U.S.C.	United States Code
US 84	U.S. Highway 84
USDOT	United States Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
VRM	Visual Resource Management
VTR	Versatile Test Reactor
WCS	Waste Control Specialists
WIPP	Waste Isolation Pilot Plant
Y-12	Y-12 National Security Complex

1.0 INTRODUCTION AND PURPOSE AND NEED FOR AGENCY ACTION

1.1 Introduction

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States (U.S.) Department of Energy (DOE), is responsible for meeting the national security requirements established by the President and Congress to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test (per Title 50 *United States Code* [U.S.C.] § 2538a et seq.). Plutonium pits are critical components of every nuclear weapon; nearly all current stockpile pits were produced from 1978 to 1989 (DoD 2018). The Nation's capability to produce plutonium pits is limited and does not meet federal requirements.

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

Since 2014, 50 U.S.C. § 2538a has mandated that NNSA shall manufacture not less than 80 war-reserve plutonium pits per year (ppy). This number is driven by the stockpile's size, the need to replace existing pits as they age, and the requirement for the U.S. to have a flexible and resilient manufacturing capability with the capacity to produce a variety of pits to meet current and planned military stockpile requirements and ensure the safety, security, and effectiveness of the Nation's nuclear stockpile.

The missions of the NNSA include: (1) enhancing U.S. national security through the military application of nuclear energy; (2) maintaining and enhancing the safety, reliability, and performance of the U.S. nuclear weapons stockpile, including the ability to design, produce, and test, as necessary, in order to meet national security requirements; (3) providing the U.S. Navy with safe, militarily effective nuclear propulsion plants and to ensure the safe and reliable operation of those plants; (4) promoting international nuclear safety and nonproliferation; (5) reducing global danger from weapons of mass destruction; and (6) supporting U.S. leadership in science and technology (*see* the *National Nuclear Security Administration Act* [50 U.S.C. § 2401 et seq.]). Production of plutonium pits for the Nation's nuclear stockpile supports NNSA's mission. Pit production, which is an important element of NNSA's Stockpile Stewardship and Management Program (SSMP), is accomplished through the Nuclear Security Enterprise (NSE), which is described in more detail in Section 1.4.

> **Pit Production**
>
> Pit production is a term used to describe a complex process that involves three main areas: (1) material receipt, unpacking, and storage; (2) feed preparation; and (3) new pit manufacturing. Pit production can also include various forms of pit reuse—from minor modifications to assembled configurations, to disassembly and intact recovery of components for use in a newly manufactured pit.

NNSA has prepared this *Plutonium Pit Production Programmatic Environmental Impact Statement* (DOE/EIS-0573) (Pit Production PEIS or PEIS) in accordance with the *National Environmental Policy Act of 1969* (42 U.S.C. §§ 4321–4336(e), as amended; NEPA) and DOE's NEPA Implementing Procedures issued on June 30, 2025 (DOE 2025a) to analyze the potential programmatic environmental impacts of the reasonable alternatives for meeting the purpose and need described in Section 1.2. This PEIS also satisfies a condition of the Settlement Agreement entered into on January 16, 2025, in the matter of *Savannah River Watch et al. v. United States Department of Energy* (DOE 2025b) (*see* Section 1.6).

From 1952 to 1989, plutonium pits for the nuclear weapons stockpile were manufactured at the Rocky Flats Plant in Golden, Colorado, at a rate of 1,000 to 2,000 ppy. In December 1989, pit production at Rocky Flats ceased, and DOE later decided not to restart production at the facility. During the mid-1990s, DOE conducted a comprehensive analysis of the capability and capacity needs for the entire nuclear weapons complex in the post-Cold War era and evaluated alternatives for maintaining the Nation's nuclear stockpile, including pit production. In 1999, DOE decided to increase pit production at Los Alamos National Laboratory (LANL) in a limited capacity of no more than 20 ppy (64 FR 50797, September 20, 1999), although the actual number of pits produced to date has been less than 20 ppy. As further described in Section 1.6 below, that decision was addressed in the analysis in the *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico* (1999 LANL SWEIS; NNSA 1999), which evaluated the potential impacts of producing up to 80 ppy at LANL.

Subsequent to the 1999 decision to implement pit production at LANL, NNSA has continued to evaluate pit production needs and alternatives. The 2018 Nuclear Posture Review (2018 NPR) enhanced the pit production requirement by stating that NNSA must produce at least 80 ppy by 2030 and must sustain the capacity for future life extension programs (LEPs) and follow-on programs (DoD 2018). 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 ppy by 2030 (DoD 2018).

1.2 Purpose and Need for Agency Action

The national security policies of the U.S. require a safe, secure, and reliable nuclear weapons stockpile and the maintenance of core competencies to design, manufacture, and maintain nuclear weapons. To meet the need outlined in 50 U.S.C. § 2538a and requirements delineated by the U.S. Department of Defense (DoD),[1] NNSA must establish a workforce and infrastructure capable of producing no fewer than 80 ppy as soon as possible, while eliminating single-point failures and providing flexible capacity options. This PEIS process will ensure NEPA compliance for production of plutonium pits in support of these requirements; the plan for which is outlined in the SSMP. This PEIS evaluates the programmatic environmental impacts of producing pits at the congressionally mandated rate needed to meet near-term national security requirements using various single-site and multi-site alternatives; associated activities at other NNSA sites; and associated waste management and transportation activities. This PEIS also analyzes capacity alternatives for the long term to account for potential changes in future national security requirements for pit production. The alternatives evaluated in this PEIS are described in Chapter 2.

NNSA's current pit production capacity cannot meet the current pit production requirements; therefore, NNSA needs to establish additional pit production capability and capacity not only to meet the congressional mandate, but also to mitigate against the risk of plutonium aging.

[1] On September 5, 2025, Executive Order 14347, "Restoring the United States Department of War," ordered that the Department of Defense may be referred to as the Department of War and the Secretary of Defense may be referred to as the Secretary of War. As such, this PEIS refers to the Department of Defense when referring to documents prepared prior to September 5, 2025, and when applicable, regulations refer to Department of Defense. The PEIS refer to Department of War (DOW) when referring to future actions or responsibilities.

1.2.1 Pit Aging and Pit Lifetime

> **Pit Production Using Existing Pits as Feedstock**
>
> From 1944 to 1992, DOE produced plutonium in government-owned nuclear reactors and extracted the plutonium from irradiated uranium to produce plutonium pits. NNSA stores pits at Pantex. Because those pits would provide the feedstock for pit production activities at LANL and the Savannah River Site, there is no need for NNSA to produce any new plutonium; rather, NNSA is manufacturing new pits using plutonium from existing (but aged) pits. The process is shown in Chapter 2, Figure 2-1, of this PEIS.

Modern nuclear weapons have a primary, or trigger, that contains a central core, called the "pit." Over time, the materials that make up the pit change in ways that reduce the pit's functionality. Eventually, the reduction in functionality will, if unchecked, compromise the safety and reliability of America's nuclear stockpile. Although U.S. nuclear weapons presently are safe and reliable, they are 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. 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 requires many years of plutonium aging studies to fully understand. Building the manufacturing capacity to produce at least 80 ppy before the end of the decade is essential to maintaining a reliable nuclear deterrence. Many of the aging pits will have to be replaced with new ones in the coming years to maintain a safe and reliable nuclear stockpile and deterrence.

In 2020, NNSA provided Congress with the findings, observations, and recommendations of the JASON Defense Advisory Group Phase One report, *Pit Aging* (JASON 2019). In that report, JASON urged "that pit manufacturing be re-established as expeditiously as possible in parallel with the focused program to understand Pu [plutonium] aging, to mitigate potential risks posed by Pu aging on the stockpile. The reuse of aged pits in rebuilt primaries can address certain issues but cannot change the aged pits themselves. A significant period of time will be required to recreate the facilities and expertise needed to manufacture Pu pits. Given the number and age distribution of weapons in the stockpile, it will then include some eighty-year-old pits, even under most favorable circumstances" (JASON 2019).

In 2021, NNSA prepared a report to Congress, *Research Program Plan for Plutonium and Pit Aging* (NNSA 2021a). The classified report outlines a 10-year research program (2021–2030) to study the effects of plutonium aging on nuclear weapon performance. An unclassified summary of this report is included in Appendix A, Section A.1. The long-term goals of the aging research program should provide more information on any issues related to aging on the stockpile. 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 seek to implement a moderately sized pit manufacturing capability of not less than 80 ppy by 2030.

1.2.2 Enhanced Safety Features

Stockpile modernization activities are performed through a series of planned LEPs, modification programs, alterations, and warhead acquisition programs enabled by science, technology, engineering, and production capabilities. The priorities for these programs are established and formally authorized by the Nuclear Weapons Council.[2] The current long-term vision for the nuclear weapons stockpile is to build additional flexibility for the Nation and enable rapid response to unforeseen contingencies while incorporating features and technologies that enhance safety and security, as appropriate and practicable (NNSA 2024a).

The science-based stewardship program enables NNSA to address aging and performance issues, enhance safety features, improve security, and meet today's military and national security requirements. 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) to ensure continued safety, security, and effectiveness. The pit capacity requirements analyzed in this PEIS account for producing pits with enhanced safety features (e.g., including insensitive high explosives) to meet NNSA and DoD/DOW requirements. In some instances, these enhanced safety features could be incorporated into a pit through modifications associated with pit reuse.

1.3 National Security Requirements and Recommendations

Decisions concerning whether the U.S. should possess nuclear weapons and the type and number of those weapons are made by Congress and the President. Since 2014, Congress and the President have set explicit requirements for pit production levels. The scope of this PEIS includes an analysis of those limited aspects of implementing national policy where NNSA has discretion. However, to aid in public understanding, there are several principal national security policy overlays and related treaties that are potentially relevant to the Proposed Action of this Pit Production PEIS (*see* Section 1.5), 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.

1.3.1 National Defense Strategy

The National Defense Strategy (NDS) is a legislatively mandated, comprehensive review of U.S. defense policy, strategy, and force posture, to include nuclear deterrence. The 2026 NDS reaffirmed the continued commitment to a strong, secure, and effective nuclear deterrent with an emphasis on adapting forces to focus on deterrence and escalation management (DOE 2026). The 2026 NDS states that supercharging the U.S defense industrial base will be a strategic line of effort for the nation (DOW 2026). To achieve this, the United States will reinvest in U.S. defense production, building out capacity; empowering innovators; and adopting new advances in technology (e.g., artificial intelligence). These reinvestments include focused efforts to reestablish pit production, modernize production facilities, to include facilities integral to uranium, lithium, and non-nuclear components, and persistent utilization of advanced technologies, from additive manufacturing to strategic public-private partnerships.

[2] The Nuclear Weapons Council was established by 10 U.S.C. § 179 and is operated jointly by the DOE and DoD/DOW to, among other things: (1) prepare the annual Nuclear Weapons Stockpile Memorandum; (2) provide NNSA specific guidance regarding priorities for research on nuclear weapons and priorities among activities, including production, surveillance, research, construction; (3) review military requirements, performance requirements, and planned delivery schedules relative to production, surveillance, and research relating to nuclear weapons within NNSA; and (4) coordinate and approve DOE activities for the study, development, production, and retirement of nuclear warheads, including concept definition studies, feasibility studies, engineering development, hardware component fabrication, warhead production, and warhead retirement.

1.3.2 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. In accordance with requirements in 10 U.S.C. § 179, as part of the Nuclear Weapons Council, the secretaries of Defense (or War) and Energy jointly prepare the NWSM, which includes the NWSP as well as a long-range planning assessment. DoD/DOW prepares the NWSP based on military requirements and coordinates the development of the plan 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.

Although the NWSM and NWSP are classified documents, their effect in shaping the Proposed Action in this PEIS can be explained in an unclassified context. The NWSM specifies the number and types of weapons required to support the stockpile. The NWSP covers the current year and a five-year planning period. It 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 all NNSA stockpile support planning, and pit production requirements are derived from the NWSM and NWSP.

1.3.3 Stockpile Stewardship Management Plan

The annual Stockpile Stewardship Management Plan (SSM Plan; NNSA 2024a) describes how DOE/NNSA will sustain the stockpile across the laboratories, plants, and sites that comprise the NSE. The most recent SSM Plan was published in September 2024, and aspects of this SSM Plan related to pit production and NSE operations are summarized in Appendix A, Section A.2.

Specifically, for the manufacturing of plutonium pits, 50 U.S.C. § 2538a and national policy require that NNSA produce no fewer than 30 ppy during 2026 and implement surge efforts to exceed 30 ppy. Additionally, 50 U.S.C. § 2538a requires that the Secretary of Energy ensure that the NSE began production of qualification plutonium pits during 2021 and produced not less than 10 war-reserve plutonium pits during 2024. The 2026 pit production milestone is delayed until 2028 (NNSA 2023).

1.3.4 Nonproliferation and Treaty Compliance

NNSA missions are conducted fully consistent with current treaty obligations. The SSMP is fully consistent with and supports the U.S. commitment to the NPT[3]. Another benefit of the SSMP is it preserves credibility in the U.S. nuclear stockpile, removing incentives within non-nuclear weapon states,[4] whose security relies on the U.S. nuclear deterrent, to develop their own nuclear weapons.

Nuclear Nonproliferation Treaty. The NPT was ratified by the Senate in 1969 and officially entered into force as a Treaty of the U.S. in 1970. In Article VI of the NPT, treaty parties "undertake 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 United States takes this commitment seriously and has emphasized dedication to both the long-term goal of a world

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[3] Additional details regarding the NPT can be found at https://treaties.unoda.org/t/npt and in previous NNSA NEPA documents such as the SRS Pit Production EIS (NNSA 2020b).

[4] The NPT defines a nuclear-weapon state as a state that manufactured and exploded a nuclear weapon or other nuclear device prior to January 1, 1967. These states are China, France, Russia, the United Kingdom, and the United States. All other states are non-nuclear weapon states under the treaty.

without nuclear weapons and the requirement that the United States maintain modern, flexible, and resilient nuclear capabilities that are safe and secure. The NPT does not provide any specific date for achieving the ultimate goal of nuclear disarmament, nor does it preclude the maintenance of nuclear weapons, pending progress toward disarmament, to deter strategic attacks, assure allies and partners, and achieve objectives if deterrence fails. Continued operations of the NSE enable NNSA to maintain the safety, reliability, and performance of the U.S. nuclear weapons stockpile consistent with obligations under the NPT.

The nonproliferation and treaty compliance aspects of the SSMP were evaluated in the *Stockpile Stewardship and Management Programmatic Environmental Impact Statement* (DOE/EIS-0236) (SSM PEIS; DOE 1996) and in the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (DOE/EIS-0236-S4) (Complex Transformation SPEIS; NNSA 2008a). These documents conclude that implementation of the SSMP (including plutonium pit production) is consistent with the NPT while maintaining nuclear weapons competencies and capabilities at the weapons laboratories.

Comprehensive Nuclear-Test-Ban Treaty. The United States signed the Comprehensive Nuclear-Test-Ban Treaty, which bans all nuclear explosions for civilian or military purposes, on September 24, 1996; however, the treaty has not entered into force and the United States does not intend to pursue ratification. Nonetheless, the United States has observed a moratorium on nuclear explosives testing since 1992. The stated policy of the U.S. is to not resume underground nuclear explosives testing unless necessary to ensure the safety and effectiveness of the U.S. nuclear arsenal (NNSA 2023). The Proposed Action in this PEIS (*see* Section 1.5) would support DOE/NNSA's certification of the safety, reliability, and performance of the U.S. nuclear weapons stockpile to the President without the use of nuclear explosives testing.

1.4 NNSA's Mission Through the Nuclear Security Enterprise

The SSM Plan defines the NSE as the physical infrastructure, technology, and workforce at the national security laboratories, the nuclear weapons production sites, and the Nevada National Security Sites (NNSS) that sustain the research, development, production, and dismantlement capabilities needed to support the nuclear weapons stockpile (NNSA 2024a). A graphical depiction of the locations that support the NSE is presented in Figure 1.4-1 (NNSA 2023).[5] The facilities are labeled as headquarters (office facilities in Albuquerque, NM; Germantown, MD; and the District of Columbia), national security laboratories, nuclear weapons production sites, or the national security site. Other than the office facilities, these NSE facilities/locations are described in Table 1.4-1, which, for each site, provides the capabilities related to the stockpile and the interfaces with the pit production process or facilities. As noted in the table, the facilities and infrastructure at the Savannah River Site (SRS) and LANL are suitable for and capable of near-term implementation of pit production. Although operations at the Kansas City National Security Campus (KCNSC), Lawrence Livermore National Laboratory (LLNL), NNSS, Pantex Plant (Pantex), Sandia National Laboratories, and Y-12 National Security Complex (Y-12) are essential to the success of the NSE, these sites are not directly involved in pit production activities. Furthermore, they do not influence the determination of national security and legal requirements related to pit production, nor do they affect decisions whether production occurs at a single site or multiple sites. Consequently, this PEIS does not consider alternatives for these activities at these sites.

[5] Figure 1.4-1 identifies LANL as a National Security Laboratory, which is consistent with 50 U.S.C. § 2501, even though the Laboratory also has a production role (e.g., detonators, plutonium pits).

1.5 Proposed Action

NNSA's Proposed Action (described in detail in Chapter 2) is to produce plutonium pits at required quantities to meet national security requirements (50 U.S.C. § 2538a). This PEIS presents potential environmental impacts associated with a range of reasonable alternatives for achieving the necessary pit production capabilities and operations at a programmatic level. For analytical purposes, this PEIS evaluates potential impacts of continuous pit production over the next 50 years—through approximately 2075. This PEIS often refers to this period as the 50-year analytical period. Production of pits includes the activities needed to fabricate new pits, modify the internal features of existing pits, and certify new pits or requalify existing pits. The Proposed Action also includes activities across the NSE related to transportation and waste management associated with the pit production mission.

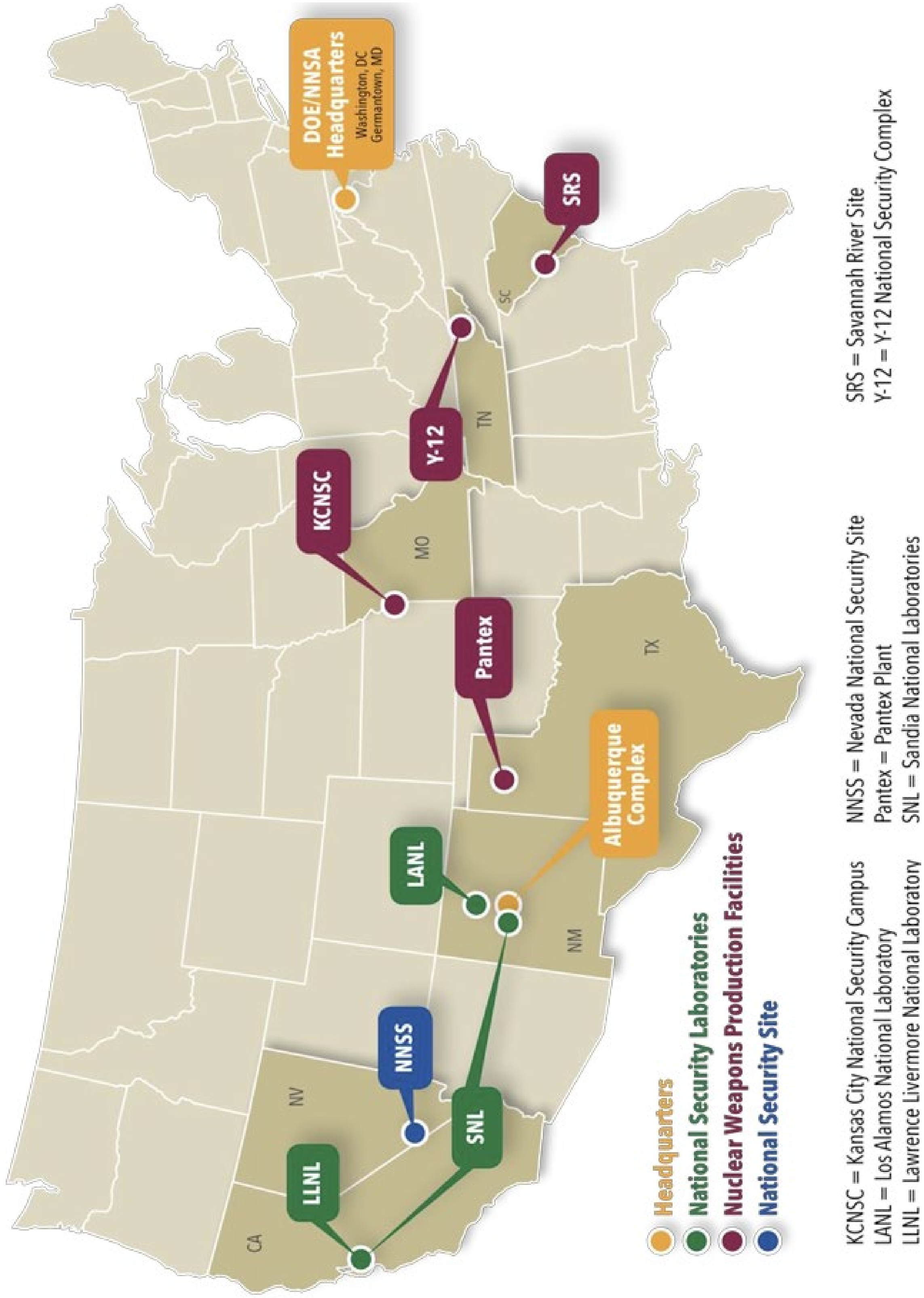

Figure 1.4-1 NNSA's Nuclear Security Enterprise

Table 1.4-1 Capabilities and Interfaces for Facilities in the Nuclear Security Enterprise

Facility/Location	Current Capabilities Related to the Stockpile	Interfaces with Other DOE/NNSA Sites Related to Pit Production
National Security Laboratories		
Los Alamos National Laboratory (NM)	• Design and certification for weapons • Weapon component production (e.g., pits, detonators) • Weapons R&D activities • High-performance computing/simulation codes and models • Weapons engineering and energetics • Hydrodynamic and subcritical experiments • Neutron science at the LANSCE • Uranium, beryllium, organics, and inorganics production and manufacturing processes • SNM accountability, storage, protection, handling, and disposition • High-energy density physics • Materials science and engineering	• Responsible for producing and surveilling pits and detonators for use in the nuclear weapons stockpile. • Sends/receives SNM (including old and new pits). to/from Pantex, SRS, NNSS, and Y-12. • Sends/receives nonnuclear components from KCNSC. • Sends LLW/MLLW to NNSS. • Sends TRU waste to WIPP. • Sends SNM to LLNL and SNL for R&D, testing, and certification activities. • Sends/receives tritium reservoirs to/from SRS.
Lawrence Livermore National Laboratory (CA)	• Design and certification for weapons • Weapons R&D activities • High explosives science and engineering • High-performance computing • High energy density physics • Additive manufacturing	• Receives Pu coupons (small metal samples) from NNSS and LANL and performs R&D, testing, and certification activities.

Facility/Location	Current Capabilities Related to the Stockpile	Interfaces with Other DOE/NNSA Sites Related to Pit Production
Sandia National Laboratories (NM and CA)	• Design and certification for weapons • Weapons R&D activities • Agile component and systems design • Radiation-hardened microelectronics design and manufacturing • Materials science and engineering • Advanced manufacturing • Environmental effects analysis, testing, and engineering sciences • High energy density physics • Advanced experimental diagnostics and sensors • High-performance computing/simulation codes and models	• Manufactures nonnuclear components (e.g., power sources, neutron generators, and microelectronics).
Nuclear Weapons Production Facilities		
Kansas City National Security Campus (KCNSC) (MO and NM)	• Nonnuclear weapon component manufacturing and assembly • Testing equipment design and fabrication • Fabrication and support of secure transportation assets (in the KCNSC facilities in Albuquerque, NM) • Weapons components surveillance and assessment • Advanced manufacturing	• Manufactures or procures and provides nonnuclear components to pit production and weapons assembly locations (e.g., radar systems; arming, fuzing, and firing systems; joint test assemblies).
Pantex Plant (TX)	• Weapons assembly and disassembly • Surveillance of pits and weapons components • High explosives (conventional and insensitive) • SNM accountability, storage, protection, handling, and disposition	• Provides interim staging and storage of pits from dismantled weapons. • Performs pit requalification, surveillance, and packaging. • Provides pits from retired weapons to the pit production facility for feedstock. • Receives new pits from the pit production facility for staging or assembly into weapons.

Facility/Location	Current Capabilities Related to the Stockpile	Interfaces with Other DOE/NNSA Sites Related to Pit Production
Savannah River Site (SC)	• Tritium recycling and recovery • Tritium extraction from irradiated tritium-producing burnable absorber rods • Replenishing tritium in gas transfer system reservoirs • Gas transfer system surveillance and tritium R&D • SNM accountability, storage, protection, handling, and disposition	• Sends/receives tritium reservoirs to/from LANL. • Proposed for the production of plutonium pits for the stockpile. If selected for pit production: – would send/receive SNM (including old and new pits and pieces/parts) to/from Pantex, NNSS, LANL, and Y-12; – would send/receive nonnuclear components from KCNSC; – would send classified LLW/MLLW to NNSS; and – would send TRU waste to WIPP.
Y-12 National Security Complex (TN)	• Uranium and canned subassembly production • Lithium operations (e.g., purification, material preparation, fabrication, storage) • Material and process R&D (primarily related to uranium and lithium operations)	• Sends/receives highly enriched uranium to/from pit production facility.
National Security Site		
Nevada National Security Sites (NV)	• Hydrodynamic and subcritical experiments at weapons-relevant scales • Weapons science experiments using high-hazard materials • Advanced experimental diagnostics and sensors • Pit and weapons components surveillance support • Glovebox and down-draft-table capabilities • Pit staging • High explosives • SNM accountability, staging, protection, handling, and disposition • LLW/MLLW disposal	• Receives LLW/MLLW from pit production facility. • Sends/receives pits and plutonium to/from the pit production facility for staging and surveillance.

CA = California; KCNSC = Kansas City National Security Campus; LANL = Los Alamos National Laboratory; LANSCE = Los Alamos Neutron Science Center; LLNL = Lawrence Livermore National Laboratory; LLW = low-level radioactive waste; MLLW = mixed low-level radioactive waste; MO = Missouri; NM = New Mexico; NNSS = Nevada National Security Sites; NV = Nevada; Pu = plutonium; R&D = research and development; SC = South Carolina; SNL = Sandia National Laboratories; SNM = special nuclear material; SRS = Savannah River Site; TN = Tennessee; TRU = transuranic; TX = Texas; WIPP = Waste Isolation Pilot Plant; Y-12 = Y-12 National Security Complex

1.6 Relationships to Other DOE/NNSA NEPA Documents

NEPA ensures that federal decision-makers consider the environmental impacts of major federal actions before decisions are made and actions taken. This Pit Production PEIS has been prepared in accordance with Section 102(2)(C) of NEPA and the Settlement Agreement in *Savannah River Watch et al. v. United States Department of Energy* (DOE 2025b), and it complies with DOE's NEPA Implementing Procedures (DOE 2025a).[6]

For preparation of this Pit Production PEIS, NNSA refers to, and incorporates by reference, information in previous NEPA documents, many of which have specifically evaluated pit production, 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 this PEIS. A list of these documents is provided in Table 1.6-1; brief descriptions of the documents follow. More detailed descriptions of the documents and how they relate to the PEIS are provided in Appendix A, Section A.3.

Table 1.6-1 Relevant NEPA Documents

Document Title
Programmatic NEPA Documents
Stockpile Stewardship and Management Programmatic Environmental Impact Statement (DOE/EIS-0236) (SSM PEIS) (DOE 1996)
Final Complex Transformation Supplemental Programmatic Environmental Impact Statement (DOE/EIS-0236-S4) (Complex Transformation SPEIS) (NNSA 2008a)
Final Supplement Analysis of the Complex Transformation Supplemental Programmatic Impact Statement (DOE/EIS-0236-S4-SA-02) (2019 SPEIS SA) (NNSA 2019)
Site-Specific NEPA Documents
Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (DOE/EIS-0238) (1999 LANL SWEIS) (DOE 1999a)
Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (DOE/EIS-0380) (2008 LANL SWEIS) (NNSA 2008b) and subsequent supplement analyses (DOE 2016a, 2016b; NNSA 2009, 2011, 2018a, 2020a)
Final Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina (DOE/EIS-0541) (2020 SRS Pit Production EIS) (NNSA 2020b)
Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (DOE/EIS-0552) (2026 LANL SWEIS) (NNSA 2026a)
Waste-Related Environmental Impact Statements
Waste Isolation Pilot Plant (WIPP) Final Environmental Impact Statement) (DOE/EIS-0026) (DOE 1980)
Supplement Environmental Impact Statement Waste Isolation Pilot Plant (DOE/EIS-0026-FS) (DOE 1990)
Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (DOE/EIS-0026-S2) (DOE 1997a)
*Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (*DOE/EIS-0200) (DOE 1997b)

[6] On February 25, 2025, the Council on Environmental Quality published an interim final rule rescinding its NEPA regulations (i.e., 40 CFR Parts 1500–1508) (90 FR 10610). The rescission went into effect on April 11, 2025. On June 30, 2025, DOE rescinded most of its NEPA implementing procedures at 10 CFR Part 1021 and published its new NEPA Implementing Procedures DOE (2025). A few of the notable changes reflected in the current DOE NEPA Implementing Procedures include: (1) DOE is not required to publish a Notice of Availability in the *Federal Register*, (2) DOE is not required to publish a Draft EIS for public review and comment, and (3) a ROD can be issued concurrently with the publication of the Final EIS.

DOE/NNSA has evaluated alternatives for pit production in several NEPA documents over the past 30 years. During the mid-1990s, DOE prepared the **SSM PEIS (DOE 1996)**, which evaluated alternatives for maintaining the safety and reliability of the nuclear weapons stockpile and preserving competencies in nuclear weapons in the post-Cold War era. The SSM PEIS analyzed a production level of 80 ppy at both LANL and SRS and associated impacts across the NSE.

In 1999, DOE prepared the **1999 LANL SWEIS (DOE 1999a)**, which considered the environmental impacts of ongoing and proposed activities at LANL. With respect to pit production, the 1999 LANL SWEIS analyzed a production level of 80 ppy.

In 2008, NNSA prepared the **Complex Transformation SPEIS (NNSA 2008a)**, which is a supplement to the SSM PEIS. The SPEIS evaluated, among other things, constructing a new pit production facility ("Greenfield") to produce 125 to 200 ppy at one of five site alternatives: NNSS, LANL, Pantex, SRS, and Y-12. At SRS, the SPEIS also evaluated a pit production facility that would use the Mixed-Oxide Fuel Fabrication Facility (MFFF) and Pit Disassembly and Conversion Facility infrastructure (NNSA 2008a).

Also in 2008, NNSA prepared the **2008 LANL SWEIS (NNSA 2008b)**, which evaluated alternatives for the continued operation of the Laboratory and production of 80 ppy.

In 2019, NNSA prepared the **2019 SPEIS SA (NNSA 2019)**, which analyzed NNSA's dual-site pit production approach at a programmatic level. Based on the 2019 SPEIS SA, NNSA determined that the proposed approach for pit production did not constitute a substantial change from actions analyzed previously and there were no significant new circumstances or information relevant to environmental concerns. As identified in that SA, NNSA committed to preparing two site-specific documents: (1) the site-specific SRS Pit Production EIS for the proposal to repurpose the MFFF at SRS to produce a minimum of 50 ppy and to develop the ability to implement a short-term surge capacity to meet the requirements of producing pits at a rate of no fewer than 80 ppy beginning during 2030, and (2) a site-specific SA for the proposal to produce a minimum of 30 ppy at LANL and to develop the ability to implement a short-term surge capacity to meet mission needs if necessary.

In 2020, NNSA published the **2020 SRS Pit Production EIS (NNSA 2020b)**, which evaluated the potential environmental impacts of repurposing the MFFF to produce between 50 and 125 ppy at SRS. NNSA published the Record of Decision (ROD) (85 FR 70601, November 5, 2020) to announce its decision to move forward with the SRS Pit Production EIS proposed action.

Also in 2020, NNSA published an amended ROD on the 2008 LANL SWEIS (85 FR 54544, September 2, 2020) to announce its decision to implement elements of the 2008 LANL SWEIS Expanded Operations Alternative needed to produce a minimum of 30 ppy and to implement surge efforts to exceed 30 ppy to meet NPR and national policy. This amended ROD was based on analysis in the ***Final Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operations of Los Alamos National Laboratory*** **(2020 LANL SWEIS SA; NNSA 2020a).**

Most recently, NNSA published the **2026 LANL SWEIS (NNSA 2026a)**, which evaluated the production of 30 ppy with a surge capacity of 80 ppy at LANL and the implementation of a number of specific projects related to infrastructure necessary for this level of pit production. Such infrastructure includes nonradiological and radiological support facilities. Examples of nonradiological facilities include office buildings, security facilities, cafeterias, and parking structures. Examples of radiological facilities include construction of a transuranic (TRU) liquid waste treatment facility and an estimated 240,000 square feet of TRU waste staging areas. In the ROD based on the 2026 LANL SWEIS, NNSA decided to implement the Expanded Operations Alternative (NNSA 2026b).

Following publication of the 2020 SRS Pit Production EIS ROD, NNSA was sued, with the plaintiffs alleging, among other things, that NNSA should prepare a PEIS for the dual-site approach. In early 2025, the plaintiffs and DOE entered into a Settlement Agreement, which subsequently was filed by the Court on January 16, 2025 (DOE 2025b).

The Settlement Agreement has specific requirements for the NEPA process that are in addition to those requirements in DOE's NEPA Implementing Procedures (10 CFR Part 1021; DOE 2025a). These include:

- Prepare this Pit Production PEIS and any subsequent ROD within 2.5 years of the signed Settlement Agreement (by July 2027).
- Allow 45 days of scoping after the last scoping meeting (the last scoping meeting for this PEIS was held on May 28, 2025; thus, the scoping period ended on July 14, 2025).
- Provide for a longer comment period on the Draft PEIS than that previously required by 10 CFR 1021.313 (90 days).
- Hold five public hearings in specific locations (Aiken, South Carolina; Kansas City, Missouri; Santa Fe, New Mexico; Livermore, California; and the District of Columbia) and any other location(s) that NNSA deems relevant to the PEIS.

Additionally, until a ROD is issued on this PEIS, NNSA has agreed not to:

- Introduce or process any nuclear material in the Main Process Building (MPB) of the Savannah River Plutonium Processing Facility (SRPPF) at SRS;
- Install any classified equipment in the MPB of the SRPPF; and
- Begin field construction of certain waste storage/inspection stations or the waste characterization laboratory at SRS.

1.7 Public and Tribal Involvement

The NEPA process for this PEIS includes two opportunities during which NNSA specifically requests public involvement: the scoping process and the public comment period for the Draft PEIS. Scoping is a process in which the public and stakeholders provide comments directly to the federal agency on the scope of the analysis. This process began with the publication of a Notice of Intent (NOI) in the *Federal Register*. On May 9, 2025, NNSA published an NOI to prepare this Pit Production PEIS (90 FR 19706) and announced a PEIS scoping period that ended on July 14, 2025.

Because the Proposed Action has the potential to affect multiple states and regions across the southern U.S., NNSA elected to hold online public scoping meetings to reach a broader audience. NNSA held online public scoping meetings on May 27 and 28, 2025, to discuss the PEIS and to receive comments on the potential scope. In addition to the online scoping meetings, NNSA provided other methods (i.e., email or postal mail) for submitting comments on the PEIS scope.

NNSA developed a transcript of the comments provided orally at the online scoping meetings. Thirty-nine people spoke at the first scoping meeting and 37 people spoke at the second meeting.

In addition to the spoken comments received at the scoping meetings, NNSA received 365 written comment documents, some containing multiple discrete comments. NNSA considered all comments received during the scoping process for this PEIS, including comments received after the close of the comment period. Comments were systematically reviewed by NNSA. Where possible, comments on similar or related topics were grouped under comment issue categories as a means of considering and addressing the comments. The comment issue categories were used to identify specific issues. The summary of the comments, including an indication of how NNSA considered the comments, along with a more detailed discussion of the public scoping process, is provided in Appendix B of this PEIS. The transcripts from the scoping meetings and copies of all comment documents received are included in the Administrative Record for this PEIS.

Pursuant to the Settlement Agreement, this Draft PEIS is subject to public review and a 90-day comment period, which will begin with the U.S. Environmental Protection Agency (EPA) publication of the Notice of Availability for this Draft PEIS in the *Federal Register*. During the public comment period, NNSA will hold five, in-person public hearings (as stipulated in the Settlement Agreement), which will be announced at least 15 days in advance on the DOE NEPA web page for this PEIS (https://www.energy.gov/nepa/doeeis-0573-plutonium-pit-production-multiple-locations), in local newspapers, in notices sent to established email distribution lists, and in direct outreach with tribes and pueblos near any of the potentially affected sites. NNSA will consider all comments received during the public comment period in preparing the Final PEIS and will append or otherwise publish all substantive comments received on the Draft PEIS, or summaries thereof if the number of comments is exceptionally voluminous. All comment documents received on the Draft PEIS will be included in the PEIS Administrative Record. In accordance with DOE's NEPA Implementing Procedures, NNSA intends to issue a ROD concurrently with the Final PEIS (DOE 2025a).

1.8 Content of this Programmatic Environmental Impact Statement

Volume 1 of this Draft Pit Production PEIS contains 7 chapters and 9 appendices, as presented in Table 1.8-1. The material in Volume 1 focuses on current and future actions that NNSA will use to form the basis of its ROD. Supplemental, supporting information that provides additional background related to the NEPA process, the affected environment, and potential environmental impacts is contained in Volume 2.

Table 1.8-1 Content of Volumes 1 and 2 of this PEIS

Volume 1 – Chapters
Chapter 1, Introduction and Purpose and Need for Agency Action – Contains background information and provides reasons for NNSA action and purposes to be achieved. The chapter also includes a list of relevant NEPA documents and describes the public involvement process required by the Settlement Agreement.
Chapter 2, Proposed Action and Alternatives – Describes how NNSA proposes to meet the specified need and achieve its objectives. This chapter describes alternatives analyzed and those considered but eliminated from detailed analysis, includes a summary comparison of the potential environmental impacts of the PEIS alternatives, and identifies any preferred alternative.
Chapter 3, Affected Environment – Summarizes the current condition of the existing environment that might be affected by the alternatives. The chapter provides separate discussions for LANL and SRS and is supported by Appendix C.
Chapter 4, Environmental Consequences – Presents analyses of the potential impacts on the environment that would result from the various alternatives. Impacts are compared to the impacts of the No-Action Alternative.
Chapter 5, Cumulative Impacts – Provides analyses of the potential cumulative impacts on the environment from the alternatives when combined with other past, present, and reasonably foreseeable future actions within the region of influence for each resource area.
Chapter 6, Statutory Requirements and Environmental Standards − Identifies and briefly describes the statutory requirements and environmental standards that are applicable to the activities included in the alternatives addressed in this PEIS.
Chapter 7, References – Provides complete citations for references used in this PEIS. Hyperlinks are provided for references that are available online.
Volume 2 – Appendices
Appendix A, Supplemental Supporting Information – Presents additional information to support the descriptions presented in Volume 1.
Appendix B, Scoping Process Summary – Provides a summary of the scoping process that NNSA undertook after publication of the NOI, a summary of the scoping comments received, and NNSA's responses.
Appendix C, Affected Environment Supplemental Information – Provides additional background information related to LANL and SRS resource areas to supplement information in Chapter 3.
Appendix D, Accidents and Intentional Destructive Acts – Provides supporting technical information about the potential consequences to workers and members of the public from accident scenarios and intentional destructive acts. The appendix also includes a discussion of emergency management at LANL and SRS. These analyses support the analysis in Chapter 4.
Appendix E, Transportation – Includes supporting technical information about the analysis of potential impacts to traffic and human health from transportation of radiological and nonradiological materials to support the analysis in Chapter 4.
Appendix F, Public Notices – Presents copies of notices related to this PEIS.
Appendix G, Glossary – Provides definitions of terms to aid the reader and decision-maker in understanding the content of this PEIS.
Appendix H, List of Preparers – Presents an accounting of the federal and contractor personnel primarily responsible for the development and review of this PEIS.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 Introduction

Chapter 2 describes the alternatives evaluated in this Pit Production PEIS. The chapter begins with an overview of plutonium pit production (Section 2.2), a description of the planning assumptions, and the process NNSA used to develop the reasonable alternatives for this PEIS (Section 2.3). Sections 2.4−2.6 describe the three programmatic alternatives NNSA is evaluating in this PEIS: (1) No-Action Alternative (Section 2.4); (2) Multi-Site Alternative at LANL and SRS (Section 2.5); and (3) Single-Site Alternative (Section 2.6). Section 2.7 describes project enhancements that NNSA is considering to improve the pit production mission at LANL or SRS. Section 2.8 discusses alternatives that were considered and subsequently eliminated from detailed analysis. The chapter concludes with a tabular comparison of the environmental impacts of the alternatives (Section 2.9) and identifies NNSA's preferred alternative (Section 2.10).

2.2 Overview of Plutonium Pit Production

NNSA has described the pit production process in previous NEPA documents, including the 2019 SPEIS SA (NNSA 2019), 2020 LANL SWEIS SA (NNSA 2020a), 2020 SRS Pit Production EIS (NNSA 2020b), and 2026 LANL SWEIS (NNSA 2026a). A summary of the typical pit production process is provided below. Any production processes specific to LANL are described in the 2020 LANL SWEIS SA and/or the 2026 LANL SWEIS. The 2026 LANL SWEIS also provides details of ongoing activities associated with implementing the amended ROD (85 FR 54544) to produce up to 30 ppy at LANL and implement surge efforts to exceed 30 ppy up to the analyzed limit (80 ppy) as necessary. The 2026 LANL SWEIS also discusses and analyzes the addition of TRU waste staging areas at four onsite locations. All projects supporting pit production at LANL were included in the recent ROD based on the 2026 LANL SWEIS (NNSA 2026b). These LANL pit production activities will continue regardless of any decisions in this PEIS and are included in the No-Action Alternative in this PEIS.

Any production processes specific to SRS are described in the 2020 SRS Pit Production EIS (NNSA 2020b). On November 5, 2020, NNSA published a ROD to repurpose the MFFF at SRS to produce a minimum of 50 ppy and to develop the ability to implement a short-term surge capacity to enable NNSA to meet the requirements of producing pits at a rate of not less than 80 ppy up to the analyzed limit (125 ppy) as necessary beginning during 2030 (85 FR 70601). Since that ROD, NNSA has been conducting activities to implement that decision. Those activities will continue during the preparation of this PEIS.[7] Therefore, the No-Action Alternative in this PEIS includes the ongoing construction activities previously approved in the 2020 SRS ROD. This includes the activities that have occurred at SRS since publication of the SRS Pit Production ROD, as well as activities that are expected to continue during preparation of this PEIS, but not operations of the SRPPF. The Multi-Site Alternative (Section 2.5) and the Single-Site Alternative (Section 2.6) include the operational impacts of producing plutonium pits at SRS. NNSA will comply with requirements in the Settlement Agreement (DOE 2025b), which are identified in detail in Section 1.6 and discussed in Section 2.3 as they relate to implementing pit production at SRS.

[7] Per the Settlement Agreement discussed in Section 1.6 of this PEIS, until a ROD is published, NNSA will not: (1) introduce or process any nuclear material in the SRPPF at SRS; (2) install any classified equipment in the SRPPF MPB; and (3) begin field construction of certain waste storage/inspection stations or the waste characterization laboratory at SRS (*see* Section 2.3).

Figure 2.2-1 depicts a simplified illustration of the plutonium pit production process. As shown on that figure, and described below, plutonium pit production involves the following major processes: (1) material receipt and storage; (2) pit disassembly; (3) plutonium purification; (4) melting and casting; (5) machining; (6) assembly; (7) quality assurance; and (8) inspection and transport. Production alternatives incorporate reuse where needed within the broader national security mission, with reuse utilizing a subset of the process descriptions below.

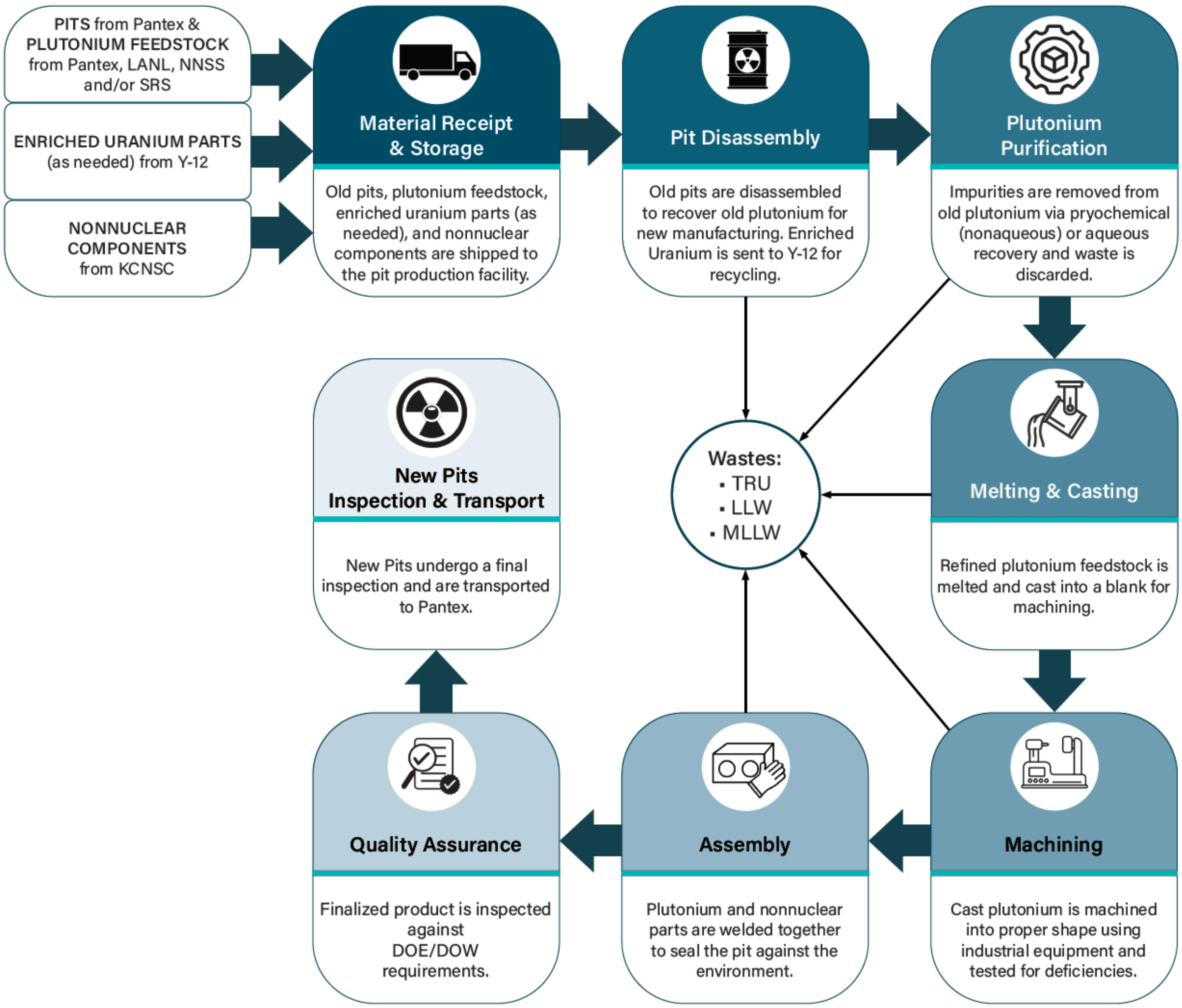

Figure 2.2-1 Simplified Plutonium Pit Production Process

2.2.1 Material Receipt and Storage

Existing pits and plutonium feedstock will be delivered from Pantex, near Amarillo, Texas, in DOE/U.S. Department of Transportation (USDOT)-approved shipping containers via NNSA's safe, secure transport system. The bulk of the feedstock material will be in the form of pits from retired weapons, although some plutonium from other locations, such as LANL, Pantex, NNSS, and SRS, also could be used. The shipping containers will be securely unloaded from the truck and will be unpacked within the pit production facility. Each shipment will be measured to confirm the plutonium content, entered into the facility's material control and accountability database, and placed into temporary storage in vaults or safes until needed in the pit production process (NNSA 2020b).

2.2.2 Pit Disassembly

Once pits and/or plutonium feedstock arrive at their destination, the material will be transferred through a secure transfer corridor to a feed preparation area to process the existing plutonium metal to meet metal specifications of new pits. Activities involving pits will be conducted in gloveboxes or enclosures interconnected by a contained conveyor system to move materials from one process step to the next (the following discussion about glovebox safety is applicable to all pit-related activities, not just disassembly). Gloveboxes remain completely sealed and operate independently, except during material transfer operations. Built-in safety features limit the temperature and pressure inside the gloveboxes and ensure that operations are conducted safely. Safety systems maintain an inert atmosphere inside the gloveboxes/enclosures and continuously monitor the processing room environment for radioactive contamination. The atmosphere in the gloveboxes is kept at a lower pressure than that of the surrounding areas so that any leaks of gaseous or suspended particulate matter are contained and filtered appropriately. The ventilation system includes high-efficiency particulate air (HEPA) filters and is designed to maintain confinement, thus precluding the spread of airborne radioactive particulates or hazardous chemicals within the processing room, facility, or to the outside environment. Both intake and exhaust air are filtered, and exhaust gases are monitored for radioactivity (NNSA 2020b). At the SRPPF at SRS, a sand filter will be used for exhausts to the environment (NNSA 2020b, Section 2.1.5.2.2).

Plutonium recovery requires mechanical disassembly. For pits whose components do not separate easily, thermal or chemical means could also be used. As necessary, highly enriched uranium (HEU) parts are disassembled from the pit assemblies, converted to an acceptable form, and shipped to another NNSA site (currently Y-12) for recycling. All other disassembled components that could not be reused are decontaminated to the maximum extent possible and disposed of as radioactive waste (NNSA 2020b).

Beryllium may be a component in both pit disassembly and assembly operations. Because inhalation of beryllium dust and particles can cause adverse health effects, beryllium is of special interest. The disassembly operations are expected to generate only larger, non-respirable turnings and pieces of metal, and all work will be performed in enclosures. No operations are expected to cause beryllium to become airborne. The beryllium in solid form will be disposed of as radioactive waste and is included in the waste estimates presented in this PEIS.

2.2.3 Plutonium Purification

In general, the pit-derived plutonium is not suitable for new manufacturing—it contains plutonium radioactive decay products (uranium, americium-241, and neptunium-237) and other undesirable characteristics. Therefore, the plutonium will be purified using pyrochemical (nonaqueous) recovery techniques, which generate plutonium-bearing residues that must be either recovered using aqueous techniques or disposed of as TRU waste.[8] Similar purification techniques have been used at other DOE/NNSA sites (NNSA 2020b).

Nonaqueous plutonium metal purification operations could include a combination of the following primary processes: (1) direct oxide reduction, which generally uses calcium metal to reduce plutonium oxide to plutonium metal; (2) molten salt extraction, which uses chloride salts to remove

[8] Because TRU waste and mixed TRU waste (containing hazardous materials) are managed and disposed of similarly, this PEIS does not differentiate between TRU and mixed TRU waste. Both are referred to as TRU waste.

americium-241 from the plutonium; and (3) electrorefining, which uses chloride salts to remove other key impurities from the plutonium metal (NNSA 2020b).

In aqueous recovery, plutonium-bearing residues are recovered using techniques in which nitric acid and hydrochloric acid support the dissolution of feed material. Use of the aqueous process to recover plutonium reduces the overall quantities of TRU waste. Pit production could continue without aqueous recovery; however, TRU waste generation would increase.[9]

The solid waste generated throughout the feed preparation and purification process consists of TRU waste, low-level radioactive waste (LLW),[10] and uncontaminated waste (e.g., waste that can be assayed and certified for disposal as commercial waste). At SRS, liquids will be neutralized and solidified for disposal as LLW or TRU waste depending on their radiological characteristics (NNSA 2020b). At LANL, liquid waste is generated in the Plutonium Facility Building 4 (PF-4) in Technical Area (TA-55) and transferred to the Radioactive Liquid Waste Treatment Facility (RLWTF) in TA-50 through an underground pipeline. Liquid LLW is treated at the RLWTF in sequential steps to remove and reduce the radioactive components of the liquid waste stream. Neutralization, precipitation, filtration, ion exchange, and reverse osmosis are among the treatment steps that can be used, depending on individual waste-stream characteristics. The treated water from the RLWTF is either evaporated or released at National Pollutant Discharge Elimination System (NPDES)-permitted Outfall 051. Resultant LLW sludges are packaged and sent off site for disposal (NNSA 2026a). Similarly, liquid TRU waste will be managed at the RLWTF in the newly constructed TRU Liquid Waste facility (TLW). Resultant solidified TRU waste is managed on site and shipped to the Waste Isolation Pilot Plant (WIPP) facility for disposal.

2.2.4 Melting and Casting, Machining, and Assembly

The plutonium metal resulting from the purification process will be transferred to the manufacturing area, where it will be melted and cast in a foundry operation. Some plutonium metal from other sources may be used to supplement the plutonium recovered from the purification operations, including internal process metal recycling. These castings will then be machined to proper dimensions, combined with other non-plutonium parts, which could include beryllium and HEU components, and assembled into pits. Analytical chemistry capabilities in the pit production facility will be utilized to test plutonium-bearing samples from all aspects of the pit production process to ensure that they are within specified limits (NNSA 2020b).

2.2.5 Quality Assurance and Inspection of New Pits

Analytical chemistry requires rigorous quality controls, including National Institute of Standards and Technology traceability for key analytes. Materials characterization operations analyze plutonium metal and pit-derived samples for physical properties, validate results from key manufacturing steps, and support process troubleshooting. A materials certification laboratory performs analyses to ensure that commercial materials used in process operations meet specifications and do not adversely affect product performance or quality. Throughout the manufacturing operations, certification and

[9] This PEIS assumes that aqueous recovery would be used at both LANL and SRS, as that is the baseline normal operating process. Based on historical data at LANL, when the aqueous recovery line was not available (e.g., for maintenance), the projected volume of TRU waste generated from pit production would increase by about 65 percent for the period of unavailability.

[10] For these process descriptions, this PEIS acknowledges that LLW could include some hazardous constituents and be managed as mixed LLW. LLW and mixed LLW are discussed separately when describing the baseline and potential impacts of waste management.

inspection will be conducted to ensure that components meet specifications. New pits will be inspected and prepared for storage and eventual shipment.

2.2.6 Transportation Activities Associated with Pit Production

Plutonium pit production requires transportation activities. Plutonium pit assemblies, which are used as material feedstock, are shipped primarily from Pantex to the pit production facility. Enriched uranium parts are disassembled from the pit assemblies, converted to oxide, and shipped to Y-12 in Oak Ridge, Tennessee. Y-12 provides new HEU parts to the pit production facility, as required. During startup of SRS, and potentially at other infrequent times at either LANL or SRS, additional plutonium metal could be used in the pit production process. This additional plutonium could be shipped to the pit production facility from other locations, such as SRS, LANL, NNSS, or Pantex.

The pit production facility will generate radioactive wastes. TRU waste will be disposed of at the WIPP facility near Carlsbad, New Mexico. SRS has existing LLW disposal facilities (as discussed in Section 3.2.12 of this PEIS). LLW from pit production activities at LANL is managed on site and transferred for disposal to either NNSS northwest of Las Vegas, Nevada, or a commercial facility (e.g., Waste Control Specialists LLC [WCS] near Andrews, Texas, or Energy*Solutions* near Clive, Utah). Mixed LLW (MLLW), which is LLW that contains hazardous waste, could be disposed of at either NNSS or one of the aforementioned commercial facilities.

Table 2.2-1 provides information on the transportation activities (i.e., shipment types, origins, and destinations) associated with pit production. In the impacts analysis of transporting pits, plutonium, and HEU in Chapter 4 of this PEIS, shipments of these materials are combined and referred to as "secure shipments."

Table 2.2-1 Transportation Activities Associated with Pit Production

Shipment Type	Origin ⇒ Destination
Existing pits	Pantex, NNSS ⇒ Pit production site(s)
Plutonium	LANL, SRS, NNSS, Pantex ⇒ Pit production site(s)
HEU	Y-12 ⇒ Pit production site(s) Pit production site (s) ⇒ Y-12
Beryllium	LANL or commercial manufacturer ⇒ Pit production site(s)
Nonnuclear parts	KCNSC or commercial vendors ⇒ pit production site(s) Pit production site(s) ⇒ KCNSC
New or recertified pits	Pit production site(s) ⇒ Pantex
TRU waste	Pit production site(s) ⇒ WIPP
LLW	Onsite disposal at SRS Pit production site(s) ⇒ NNSS (classified LLW) or commercial facility
MLLW	Pit production site(s) ⇒ NNSS (classified MLLW) or commercial facility
Hazardous and nonhazardous wastes	Pit production site(s) ⇒ commercial waste disposal facilities

HEU = highly enriched uranium; KCNSC = Kansas City National Security Campus; LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; MLLW = mixed LLW; NNSS = Nevada National Security Sites; SRS = Savannah River Site; TRU = transuranic; WIPP = Waste Isolation Pilot Plant; Y-12 = Y-12 National Security Complex

2.2.7 Potential Project Enhancements

In 2025, NNSA established matrixed execution teams to evaluate aspects of the pit production process at SRS, LANL, and other support facilities within the NSE and DOE Complex to identify potential enhancements that could be implemented to improve the overall pit production mission. There were 13 task teams that focused on discrete topics (e.g., optimizing security controls, optimizing storage/staging footprint, streamlining waste management, throughput modeling, and alternate site capabilities). In the fall of 2025, these task teams provided their reports to NNSA management for further consideration. As an outcome of these task team reports and other NNSA considerations, there are opportunities for enhancements that NNSA is considering for further conceptual design and potential future implementation at one or both sites. Those enhancements that are the most mature, have the highest potential for eventual implementation, and could potentially affect environmental impacts, are identified and described in Section 2.7.

2.3 Planning Assumptions and Basis for Analysis

The following are some of the more specific assumptions and considerations that form the basis of the analyses and impact assessments in this PEIS.

The exact size and composition of the enduring nuclear weapons stockpile is determined on an annual basis, as explained in Section 1.3 of this PEIS. Based on federal law, current national policy, and long-range planning consistent with the 2026 NDS, NNSA must implement a strategy to provide the enduring capability and capacity to produce not less than 80 ppy beginning during 2030 (50 U.S.C. § 2538a). In addition, because national policy and pit production requirements could change over the 50-year analytical period evaluated in this PEIS, NNSA analyzes a broader range of pit production quantities for the action alternatives.

This PEIS analyzes a No-Action Alternative (Section 2.4) based on the amended LANL ROD that NNSA issued on September 2, 2020 (85 FR 54544) and the SRS ROD NNSA issued on November 5, 2020 (85 FR 70601). As noted in Section 1.6, NNSA re-affirmed the LANL decision in the 2026 ROD based on the LANL SWEIS (NNSA 2026b). As noted in Section 2.4, the activities at SRS based on the SRS ROD are limited to construction activities for the SRPPF complex that were evaluated in the SRS Pit Production EIS (NNSA 2020b).

NNSA considers LANL and SRS to be the only reasonable site alternatives for pit production. These are the only sites with available facilities and existing infrastructure that could be used to produce pits to meet the mandated schedule and current pit production requirements. These are also the only sites identified in the *Fiscal Year 2026 National Defense Authorization Act*, enacted on December 18, 2025, which specifies production of plutonium pits at LANL and SRS (Public Law 119-60). NNSA does not consider construction of a new facility (greenfield) reasonable because it would not meet the federally mandated pit production rate in the near term and would be cost prohibitive relative to the use of available facilities and existing infrastructure at LANL and SRS. Section 2.8 discusses why sites other than LANL and SRS, as well as a greenfield facility, were eliminated from detailed evaluation.

This PEIS analyzes multi-site and single-site pit production alternatives across a range of reasonable production capacities. As identified in Section 2.10, NNSA's preferred alternative is the Multi-Site Alternative (Section 2.5), which would produce pits concurrently at LANL and SRS. Such an alternative would eliminate single-point failures and provide maximum flexibility. Three production capacities are analyzed under the Multi-Site Alternative:

- **Maximum Production Capacity:** production of up to 80 ppy at LANL[11] and up to 125 ppy at SRS.[12] Based on concurrent operations at these sites, up to 205 ppy could be produced, which is the maximum annual pit production capacity analyzed in this PEIS.
- **Steady-State Near-Term Production Capacity:** production of 30 ppy at LANL and 50 ppy at SRS. This corresponds to the overall pit production level (80 ppy in total) that would satisfy current national policy and congressionally mandated requirements (50 U.S.C. § 2538a).
- **Capability-Based Production Capacity[13]:** production of 10 ppy at LANL and 50 ppy at SRS. This is the minimum annual pit production capacity analyzed under the Multi-Site Alternative in this PEIS. NNSA has included this production capacity in the PEIS analysis in the event future pit production requirements are significantly reduced. NNSA has selected these capacities for the purpose of analysis in this PEIS to provide a reasonable lower bound. NNSA acknowledges that, in practice, there may be periods (e.g., months to years) when no pits are produced at one or both sites; however, an analytical scenario that includes zero pit production at either site would be counter to multi-site operations and would not enable NNSA to maintain production competencies at both sites; thus, it is not analyzed within this alternative.

This PEIS analyzes a Single-Site Alternative (*see* Section 2.6) in the event multi-site pit production is no longer needed/desired in the future. For example, funding constraints might force NNSA to produce pits at a single site. Because a Single-Site Alternative at LANL would be the same as the No-Action Alternative, no additional analysis is needed or presented in this PEIS for that scenario. Under a Single-Site Alternative at SRS, NNSA would produce 50 to 125 ppy only at SRS, with minimal pit production at LANL.[14]

Any pit production facility in the U.S. would be capable of manufacturing plutonium components and assembling pit types that support the enduring nuclear weapons stockpile, as well as any future newly designed pits. Manufacturing a pit is defined as the suite of operations needed to receive and purify plutonium metal, form plutonium components, assemble them into a certifiable pit, inspect the pit, and transport it for assembly (or staging for future assembly) into a nuclear weapon. Plutonium pit reuse would involve modifying an existing pit and consists of a subset of the processes required for manufacturing a new pit and could be an important component of the overall pit

[11] Producing pits at LANL is consistent with the amended ROD that NNSA issued on September 2, 2020 (85 FR 54544). Producing 80 ppy at LANL is considered a surge capability that could not be sustained over the long term. Sustained production of 80 ppy at LANL would require construction of another facility, which NNSA does not currently deem as a reasonable alternative (*see* Section 2.8).

[12] Producing pits at SRS is consistent with the ROD that NNSA issued on November 5, 2020 (85 FR 70601). Producing 125 ppy is consistent with the value used in the Complex Transformation SPEIS (NNSA 2008a) and SRS Pit Production EIS (NNSA 2020b) and provides long-term flexibility to account for potential changes in national security requirements for pits.

[13] A "Capability-Based Production Capacity," as described in Section 2.6.2 of the Complex Transformation SPEIS (NNSA 2008a), is based on the concept that the layout of the process equipment needed to produce just one pit is inherently capable of producing more pits if operated throughout the year. Because the physical size and layout of PF-4 at LANL is different than the SRPPF at SRS, the inherent pit production capacity is judged to be 10 ppy at LANL and 50 ppy at SRS.

[14] With pit production only at SRS, NNSA would not be required to produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby. In this mode, NNSA would produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. In addition, plutonium research and development, surveillance, testing, and other plutonium missions would continue at LANL, as these activities are independent of pit production. The environmental impacts at LANL would be the same as the Capability-Based Production Capacity analyzed under the Multi-Site Alternative of this PEIS.

production mission; however, as explained in Section 2.8, it cannot be relied upon as the only pit production process.

Both construction and operational impacts are considered for all environmental resource areas. Construction impacts are generally short term (i.e., most are occurring over the next 8 years), while operational impacts are expected to be long-term (i.e., would occur annually over the 50-year analytical period). As noted earlier, the operational impacts for pit production at SRS are included in the Multi-Site and Single-Site alternatives, not the No-Action Alternative.

Generated wastes would be managed in accordance with applicable federal, state, and local laws, regulations, and requirements, as well as DOE/NNSA's waste management orders and pollution prevention and waste minimization policy and procedures. Any TRU waste generated by the plutonium pit production facilities would be processed and packaged in accordance with the WIPP waste acceptance criteria and transported to the WIPP facility for disposal. All other wastes would be managed in accordance with applicable site procedures and DOE waste management decisions.

The operation of the pit production facilities would require transporting existing pits from Pantex to the pit production facilities and transporting pits from the pit production facilities to Pantex, where the pits eventually would be assembled into weapons. In addition, plutonium from other locations, such as SRS, LANL, and NNSS, also could be used. All transportation of pits and plutonium would occur via NNSA's safe, secure transport system over federal and state highways to the extent practicable.

A modern nuclear weapon consists of many components, most of which are nonnuclear. In general, any needed pit-related components not produced at the pit production facilities would be produced and shipped to the pit production facilities for assembly into the pit. Additionally, much of the specialty tooling and equipment required for the pit production facilities would be produced and shipped to the pit production facilities for use. The environmental impacts associated with producing these components and/or supplying this tooling/equipment were addressed in previous NEPA documents (*see* specifically the *Environmental Assessment for the Modernization of Facilities and Infrastructure for the Non-Nuclear Production Activities Conducted at the Kansas City Plant* [GSA & NNSA 2008]) and/or are ongoing commercial operations.

Beryllium is a material used in the pit production process, though the quantity needed depends on the systems being manufactured. NNSA has reviewed current beryllium inventories against anticipated mission needs and found that the availability of beryllium is adequate for forecasted pit production operations at LANL and SRS. NNSA does not anticipate the need for beryllium production capabilities beyond those currently available to support the pit production facilities. Any beryllium needed for pits would not be produced but instead secured from current quantities or acquired from other locations, such as other NNSA sites and/or commercial domestic suppliers.

Pit production operations in this PEIS are analyzed for 50 years; after that, the structures would be evaluated for potential life extension or undergo decontamination, decommissioning, and demolition (DD&D). This PEIS includes a general discussion of the environmental impacts from future DD&D, including a discussion of the DD&D process, the types of actions associated with DD&D, and the general types of impacts associated with DD&D (*see* Sections 4.1.15 [LANL] and 4.2.15 [SRS]). Any discussion of specific DD&D impacts is more appropriate for later NEPA documents because the extent of contamination, the degree of decontamination, and the environmental impacts associated with performing DD&D cannot be known without performing a detailed study of the facilities at LANL and SRS at the appropriate time.

2.4 No-Action Alternative

Under the No-Action Alternative, NNSA will continue to implement previously approved decisions regarding pit production at LANL and SRS. Section 2.4.1 addresses the No-Action Alternative activities at LANL, and Section 2.4.2 addresses the No-Action Alternative activities at SRS.

2.4.1 No-Action Alternative – Los Alamos National Laboratory

At LANL, NNSA will continue to implement the decision announced in the amended LANL ROD (85 FR 54544, September 2, 2020), to produce 30 ppy at LANL with surge capability to produce up to 80 ppy. This decision was reaffirmed in the ROD based on the 2026 Final LANL SWEIS (NNSA 2026b). The activities associated with implementing the No-Action Alternative at LANL have been assessed in prior NEPA documents, such as the 2008 LANL SWEIS (NNSA 2008b), the 2020 LANL SWEIS SA (NNSA 2020a), the *Final Environmental Assessment of Proposed Changes for Analytical Chemistry and Materials Characterization at the Radiological Laboratory/Utility/Office Building* (NNSA 2018b), and/or the 2026 LANL SWEIS (NNSA 2026a).

Since issuance of the amended LANL ROD, NNSA has continued space reconfiguration in PF-4 related to improving capacity and ability to support the pit production mission requirements. The reconfiguration includes removal of legacy gloveboxes and equipment and installation of new gloveboxes and equipment, both of which support improved capacity and reliability. This reconfiguration effort is expected to take several more years. Concurrently, NNSA has worked to improve the associated infrastructure, such as office building, entry/egress capability, security, waste management, and parking. These infrastructure-related efforts are expected to continue for several more years. Specific activities associated with implementing the amended LANL ROD are summarized below.

Upgrade, Modernize, and Extend the Life of PF-4. This project provides the critical equipment procurement, installation, and infrastructure upgrades necessary to enable the manufacturing of 30 ppy within PF-4 (Figure 2.4-1 below). It adds processing equipment (such as new lathes and mills), a new training center, and another secure entry point for worker access to TA-55. The project repurposes spaces within PF-4, including removing existing equipment and support systems as necessary to accommodate the new pit production equipment. Construction is expected to be completed by 2028.

Expand the Radiological Laboratory/Utility/Office Building's (RLUOB's) Capability. This project reconfigures and maximizes space for more intensive plutonium analysis capabilities within the RLUOB facility. Construction of the facility was completed in 2010, and it was outfitted with equipment as part of previous projects. The project maximizes the use of RLUOB by reconfiguring existing laboratory space, equipping the remaining empty laboratories with plutonium analysis capabilities, and enabling the facility to be re-categorized to a higher NNSA nuclear hazard category (HC). Upgrading RLUOB from a radiological facility to a HC-3 nuclear facility allows for the building to hold 400 grams of plutonium-239 equivalent (PuEq),[15] up from a prior limit of 38.6 grams. These plutonium analysis capabilities and the expanded material limit support various NNSA plutonium missions beyond pit production (NNSA 2018b). To date, all but two of the RLUOB

[15] The concept of PuEq activity (i.e., curies) is intended to eliminate the dependency of radiological analyses on specific knowledge of the radionuclide composition of a given radiological release. By normalizing all radionuclides to a common radiotoxic hazard index, radiological analyses can be conducted that are essentially independent of radionuclide composition variations. Plutonium was selected as the radionuclide to which the radiotoxic hazard of other radionuclides could be indexed.

laboratory spaces have been outfitted and the facility has been successfully elevated from a radiological facility to a material-at-risk (MAR)-limited, HC-3 nuclear facility (LANL 2026). As discussed in Section 2.7, NNSA is considering an option to further increase the MAR limit of RLUOB.

Figure 2.4-1 PF-4 in TA-55 (Looking Southeast)

Construct New Support Facilities/Infrastructure and Upgrade Existing Facilities. NNSA will upgrade the infrastructure and construct new office and support buildings (such as training facilities, security facilities, and warehouses) in and around TA-55 over the next five years to support pit production and provide capacity for new personnel. Approximately 30 facilities are directly related or provide significant support to the pit production mission. These facilities have a footprint of about 13.5 acres. In total, there are approximately 70 acres of facilities, roads, parking, sidewalks, areas for retaining walls, and other general buffer areas around the facilities. There are also 29 acres of institutional laydown areas to support construction. All of these site-specific proposals were evaluated in the 2026 LANL SWEIS under the No-Action Alternative. Details are provided as follows (NNSA 2026a):

- To date, NNSA has constructed four warehouses in TA-51, totaling approximately 80,000 square feet.
- The modifications to the East Vehicle Access and East Entry Control are underway. The construction of the West Entry Control Facility and Sigma Warehouse have been initiated.
- Over the next approximately eight years, NNSA plans to construct approximately 10 office buildings (four in TA-48, two in TA-50, and four in TA-63), totaling approximately 109,000 square feet. The office buildings range in size from 20,000 to 42,000 square feet.
- By approximately 2026, NNSA plans to modify the Sigma Building to install new equipment and systems to continue to support pit production.

- By approximately 2028, NNSA plans to construct a 6,000-square-foot Weapons Archiving and Records Facility for records management.
- By approximately 2030, NNSA plans to construct a 14,000-square-foot Cold Test Facility, which will consolidate laboratory space for design, engineering, and technology groups, creating a streamlined flow of process equipment destined for use at TA-55.
- By approximately 2030, NNSA plans to construct a new 20,000-square-foot fire station facility.
- Before 2030, NNSA plans to construct five new security facilities in TA-46 and TA-55, totaling approximately 38,000 square feet, to provide space for the LANL protective force and support the plutonium infrastructure to facilitate personnel and vehicle access control at LANL.
- Before 2030, NNSA plans to construct three new cafeterias in TA-48, TA-50, and TA-52, totaling approximately 31,000 square feet, to support the LANL workforce. Of these, two cafeterias are associated with pit production and would total approximately 21,000 square feet.
- By approximately 2030, NNSA plans to construct a 130,000-square-foot Training and Development Center for operator training to support plutonium operations in PF-4.
- An empty drum storage facility, considered one of the planned warehouses, will be constructed in TA-36.

Upgrade the TRU Liquid Waste (TLW) Treatment Facility. Pit production and related activities will increase the amount of TRU waste produced at LANL. NNSA is constructing a 15,000-square-foot facility in TA-50 to replace the existing RLWTF, which is more than 50 years old and is nearing the end of its functional and operational life. The existing RLWTF is experiencing a need for equipment improvements to maintain its capability to support critical missions and is no longer a feasible long-term facility. The replacement of the existing RLWTF has been designed and constructed as two separate projects to meet all applicable nuclear and safety requirements (LLW and TRU).

The TLW Treatment Facility consists of an HC-3 facility to treat liquid TRU wastewater generated mostly in TA-55 (e.g., PF-4, RLUOB). The facility will house processing equipment capable of treating up to 7,660 gallons of TRU liquid waste each year (LANL 2024a). This project is expected to be completed in approximately 2027. The RLWTF upgrade was evaluated in the 2008 SWEIS and included in both the 2008 and 2009 SWEIS RODs. It was also included in the 2026 LANL SWEIS No-Action Alternative. Facility construction is substantially complete, with commissioning forecasted for completion in fiscal year 2026. Turnover to operations and readiness activities will be completed in 2026−2027 (LANL 2025).

Provide Additional TRU Waste Staging. NNSA is planning to expand capabilities for TRU waste staging at LANL. The Proposed Action in this PEIS includes construction and operation of up to four additional staging locations for TRU waste generated from PF-4, primarily associated with pit production operations. The staging facilities would be constructed to minimize the effects that a lengthy interruption of WIPP TRU waste receipt could have on pit production activities at LANL. Specific locations for the staging areas have not yet been finalized; however, the likely locations include developed areas in TA-16 (near the Weapons Engineering Tritium Facility), TA-54, TA-55 (adjacent to RLUOB), and TA-60. Conceptually, the design and layout of these facilities are expected to be similar, but larger, than the current Transuranic Waste Facility in TA-63. The total estimated footprint of the TRU waste staging areas is assumed to be about 240,000 square feet. For the analysis in this PEIS, a 60,000-square-foot staging area would be located at each of the aforementioned TAs. The project would provide the additional capacity to stage the equivalent of approximately 6,700 TRU waste drums. This project was evaluated in the 2026 LANL SWEIS under the Expanded Operations Alternative and is included in the 2026 LANL SWEIS ROD (NNSA 2026b).

Implement Phase III of the TA-55 Reinvestment Project. This project was evaluated in the 2026 LANL SWEIS No-Action Alternative and replaces, modifies, and upgrades the existing fire alarm system in TA-55. More specifically, it replaces the existing supervisory panel, adds area-wide fire detection throughout PF-4, installs components designed to be compliant with current fire protection standards, and separates the fire alarm functions of the nuclear and nonnuclear facilities with dedicated fire alarm panels for each. The project is expected to be completed by 2027.

Upgrade Transportation and Parking Infrastructure. As described and analyzed in the 2026 LANL SWEIS No-Action Alternative, NNSA implements shuttle service from an offsite parking location to the Pajarito Corridor. The initial effort provided commuter parking in an existing lot within a quarter mile of U.S. Highway (US) 285 in Pojoaque and commuter bus service from that location to TA-55 and TA-60 (two trips to each location). The Laboratory plans to expand the park-and-ride service to other areas within the region. The Laboratory could lease existing properties within a 50-mile radius of LANL that are adjacent to main highways to provide additional shuttle service options and parking for an estimated 3,000 vehicles. Additionally, a parking garage is planned in TA-48. When fully implemented, projects included in the 2026 LANL SWEIS No-Action Alternative will add approximately 26 acres of roads and 18 acres of parking on the LANL site.

Table 2.4-1 provides key construction parameters for the projects associated with implementing pit production at LANL.

Table 2.4-1 Key Construction Parameters at LANL – No-Action Alternative

Parameter	30 to 80 Pits per Year
Land disturbed[a]	70 acres + 29 acres laydown (27 acres of which is currently undisturbed land)
Construction duration	9 years
Workforce[b]	300 workers (peak) 180 workers (average)
Electricity use	1 megawatt
Fuel (diesel)	1,099,000 GPY
Water use[c]	6.4 million GPY

GPY = gallons per year

a The pit production mission includes 70 total acres (13.5 acres building footprint; 43.5 acres roads – access/pull-in, retaining walls, sidewalks; 13 acres staff parking). The 29-acres of disturbance is identified separately for laydown areas, which are expected to eventually be recovered after their usefulness. Restoration is assumed to occur after 2038.

b Estimate is for external construction subcontractors. LANL maintains a site-wide craft workforce of 1,200 staff (peak) for maintenance, utilities, and internal building modifications. Craft worker numbers at TA-55 range from 100 to 200 persons providing support for PF-4 and the Radiological Laboratory Utility Office Building.

c Value based on 39 gallons per cubic yard of concrete plus 3,200 gallons per day during heavy construction period for dust control and 200 gallons per day during periods with less dust control needs.

Source: LANL 2026

Concurrent with these construction activities, NNSA is producing pits at LANL, albeit at rates less than required. Production activities are expected to ramp up to produce a minimum of 30 ppy during 2028. Most pit production operations at LANL are conducted in the PF-4 in TA-55.

Operations in PF-4 at LANL began in 1978. Although PF-4 will reach its initial assumed 50-year design life in 2028, there are no known life-limiting mechanisms or issues that would preclude PF-4 from operating beyond any preconceived planned facility lifetime. In actuality, the operational life of PF-4 is indeterminate, and NNSA expects that it is very likely to exceed at least 75 years (mid-2050s) (LANL 2026).

As a point of reference, the Chemistry and Metallurgy Research (CMR) Building was constructed in approximately 1950 (Wing 9 was added in the early 1960s) and is still nominally operational. Wings 2 through 4 have ceased operations, but Wings 5, 7, and 9 remain at least partially operational today. Furthermore, the CMR Building was constructed to 1950-era codes, is not as robust as PF-4, and has had known seismic issues since 1998. Thus, as of 2025, the CMR Building has remained operational for 75 years.

PF-4 was constructed to 1970s-era building codes and is much more structurally sound than the CMR Building. Additionally, PF-4 had a suite of upgrades completed in the 2010s, largely driven by reducing seismic risk, including drag strut installation onto the facility roof, column and column-beam strengthening, facility and key facility equipment bracing, and equipment upgrades for facility safety systems. Significant amounts of new equipment are being installed as part of the project to upgrade, modernize, and extend the life of PF-4. Because PF-4 has a wide suite of operations, select gloveboxes or internal equipment may need periodic replacement.

Overall, if the building concrete is maintained in good condition, and as long as facility infrastructure, equipment infrastructure, and programmatic equipment are maintained in good condition or replaced when needed, NNSA expects PF-4 to be useable for the foreseeable future (at least 50 years). Like any other facility, while investments are continually needed, such investments reduce the risk of needing a new facility and incurring much larger capital costs.

As the ongoing and future upgrades to modernize and extend the life of PF-4 are completed, PF-4 will continue to effectively conduct mission-related operations safely and securely into the foreseeable future (NNSA 2019). The Defense Nuclear Facilities Safety Board (DNFSB) has been engaged with NNSA on seismic safety of PF-4 since the Laboratory first identified elevated potential seismic hazards in 2009. In an August 2023 letter, DNFSB acknowledged that the Laboratory completed a probabilistic risk analysis and concluded that the seismic safety risk of PF-4 is acceptable. DNFSB found that NNSA's conclusion was technically defensible and that the accompanying peer review process was robust (DNFSB 2023). DOE/NNSA is updating the site-specific probabilistic seismic hazard analysis, which is expected to be released in early 2026. Table 2.4-2 shows the key operational parameters for producing 30 ppy and 80 ppy at LANL. Baseline data in the table are consistent with data presented in the 2026 LANL SWEIS (NNSA 2026a).

Table 2.4-2 Key Operational Parameters at LANL – No-Action Alternative

Resource	Baseline Data	No-Action Alternative (30 ppy at LANL)	No-Action Alternative (80 ppy at LANL)
Land occupied by new projects after restoration of laydown areas and other project areas	LANL is approximately 25,536 acres in size; approximately 3,286 acres (13 percent) have been developed	70 acres (13.5 acres building footprint; 43.5 acres roads – access/pull-in, retaining walls, sidewalks; 13 acres parking)	70 acres (same as 30 ppy)
Operational workforce	Total 2023 LANL workforce: 16,620 (1,745 pit production workers)	2,609 pit production workers (864 more than 2023 baseline)	3,828 pit production workers (1,219 employees above 30 ppy)
Electricity	Consumption: 440 MkW-hr/yr Peak load: 70 MW	Increase of 5.92 MkW-hr/yr Peak load: Increase of 1.9 MW	Increase of 5.94 MkW-hr/yr (0.02 MkW-hr/yr above 30 ppy) Peak load: Increase of 1.9 MW
Fuel (oil, gasoline) usage	901,000 GPY	Increase of 10,500 GPY	Increase of 10,500 GPY (no increase above 30 ppy)
Water use	271.5 MGY	Increase of 20 MGY	Increase of 30 MGY (10 MGY above 30 ppy)
Wastewater	311,689 GPD	Increase of 65,225 GPD	Increase of 95,700 GPD (30,475 GPD above 30 ppy)
Radiological air emissions	Total point source: 233 Ci/yr Total Pu: 4.0×10^{-6} Pu from TA-55: 1.6×10^{-6}	Increase of 4.5×10^{-8} Ci/yr of PuEq	Increase of 1.2×10^{-7} Ci/yr of PuEq (7.5×10^{-8} Ci/yr of PuEq above 30 ppy)
Radiological workers	4,039 (585 pit production radiological workers)	1,028 pit production radiological workers (443 more than 2023 baseline)	Increase of 2,003 radiological workers (975 more radiological workers than 30 ppy)
Average dose to radiological worker	Site-wide: 80 mrem/yr PF-4: 146 mrem/year	360 mrem/yr	Increase to 465 mrem/yr
Hazardous waste (MT/yr)	2,547 MT/yr TA-55/PF-4: 32.9 MT/yr	Increase of 169 MT/yr	Increase of 451 MT/yr (282 MT/yr above 30 ppy)
Solid sanitary waste	Site-wide: 1,633 MT/yr	Increase of 778 MT/yr	Increase of 1,141 MT/yr (363 MT/yr above 30 ppy)
LLW (solid)	Site-wide: 4,985 m^3/yr TA-55/PF-4: 302 m^3/yr	Increase of 3,029 m^3/yr	7,627 m^3/yr (4,598 m^3/yr above 30 ppy)

Resource	Baseline Data	No-Action Alternative (30 ppy at LANL)	No-Action Alternative (80 ppy at LANL)
LLW (liquid)	317,000 GPY	Increase by 660,000 GPY	Increase by 1,320,000 GPY (660,000 gallons above 30 ppy)
MLLW	Site-wide: 640 m^3/yr TA-55/PF-4: 45.4 m^3/yr	Increase of 102 m^3/yr	262 m^3/yr (160 m^3/yr above 30 ppy)
TRU wastes	Site-wide: 388 m^3/yr TA-55: 205 m^3/yr	Increase of 280 m^3/yr	634 m^3/yr (354 m^3/yr above 30 ppy)
LLW shipments	Site-wide: 342/yr	Increase of 252/yr	635 shipments/yr (383 shipments above 30 ppy)
MLLW shipments	Site-wide: 66/yr	Increase of 68/yr	175 shipments (107 shipments above 30 ppy)
TRU waste shipments to WIPP	Site-wide: 56/yr	Increase of 82/yr	186 shipments (104 shipments above 30 ppy)
Secure shipment (pits, plutonium, HEU)	17/yr	Increase to 90/yr	Increase to 173/yr (83 shipments above 30 ppy)

Ci = curie; GPD = gallons per day; GPY = gallons per year; HEU = highly enriched uranium; kW = kilowatt; LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; m^3 = cubic meters; MGY = million gallons per year; MLLW = mixed low-level radioactive waste; mrem = millirem; MT = metric ton; MW = megawatt; PF-4 = Plutonium Facility building 4; ppy = pit per year; Pu = plutonium; PuEq = plutonium-239 equivalent; TA = technical area; TRU = transuranic; WIPP = Waste Isolation Pilot Plant; yr = year
Source: LANL 2026a

2.4.2 No-Action Alternative – Savannah River Site

At SRS, NNSA will continue to implement the 2020 SRS ROD (85 FR 70601, November 5, 2020) to construct the SRPPF while also complying with the Settlement Agreement (DOE 2025b) discussed in Chapter 1, Section 1.6. The activities included in the No-Action Alternative at SRS are limited to construction activities. Operational, or pit production, activities are included in the Multi-Site and Single-Site alternatives (Sections 2.5 and 2.6, respectively).

A detailed description of constructing the SRPPF complex at SRS is provided in Section 2.1.1 of the 2020 SRS Pit Production EIS (NNSA 2020b) and summarized below.

Constructing the SRPPF complex in F Area at SRS would require internal and external modifications of the MFFF and installation of manufacturing and support equipment directly associated with the pit production mission. Modifications to the MFFF required for pit production would include:

- Removing equipment and utility commodities intended for fuel fabrication that had been previously installed in the existing MFFF building; making facility modifications to support the new mission processes; and installing pit production and process support equipment and utilities;
- Modifying existing support facilities as required to provide the personnel support functions for the pit production mission;
- Installing an analytical chemistry and materials characterization laboratory in the SRPPF; and

- Installing fire water supply equipment and the backup diesel generators in or adjacent to the SRPPF.

In addition to these modifications of the MFFF, additional requirements for establishing pit production at SRS include: (1) removal of some existing facilities; (2) construction of new facilities and modification of some existing support facilities; and (3) construction of security infrastructure (including fencing) to surround the SRPPF.[16]

A summary of the pit production-related construction activities that have occurred at SRS since 2020 through 2024 follows:

- The SRPPF project received Critical Decision (CD)-1[17] approval in June 2021. An updated project tailoring strategy was approved in 2024. The strategy includes three sub-projects:
  - **MPB Subproject:** The scope of this subproject includes changes to the existing MFFF, which includes all nuclear scope and supporting systems. This is the main SRPPF building. A preliminary design was produced in October 2024, and the final design is in progress. Multiple long-lead procurement/site preparation activities have been authorized and are progressing, including:
    - removal of legacy equipment and coatings (complete),
    - removal of legacy concrete structures and opening of new penetrations (in progress),
    - infrastructure construction (in progress),
    - procurement of process equipment/gloveboxes (in progress),
    - relocation of legacy utilities and site preparation (in progress), and excavation, shoring, and mudmat installation for the sandfilter (in progress).
  - **Administrative Building Subproject:** Design is complete for this building and supporting warehouse. Field work has not started.
  - **High-Fidelity Training and Operations Center (HFTOC) Subproject:** This will be the primary training facility supporting SRPPF operations. Design was completed in 2026, and procurement of process equipment/gloveboxes is in progress.

During the preparation of this PEIS (2025 to mid-2027), NNSA expects to accomplish the following pit production-related activities at SRS:

- **MPB Subproject:** Final design is expected to be completed in 2026. Following that, bulk construction activities will be initiated, and long-lead procurement/site preparation activities will continue. This will include construction of support buildings, installation of the fire sprinkler system and utilities, and continued construction of the sand filter.
- **Administrative Building Subproject:** Construction is scheduled to be completed by 2027.
- **HFTOC Subproject:** Final design is complete and site preparation activities are underway.
- **Various Minor Actions:** Modification, operation, and maintenance of buildings and infrastructure (e.g., support buildings and support structures, utilities and roads) that support pit production will be actions that occur in parallel with construction of the SRPPF complex. These actions would be limited in size and duration and covered by one of the categorical

[16] The security infrastructure would include a range of facilities, up to construction of a Perimeter Intrusion Detection and Assessment System around SRPPF.

[17] CD-1 approval marks the completion of the project Definition Phase and the conceptual design. Approval of CD-1 provides the authorization to begin the project Execution Phase and allows funding of Project Engineering and Design.

exclusions identified in the DOE NEPA Implementing Procedures. Categorical exclusions are "classes of actions that DOE has determined do not normally have a significant effect on the human environment" (10 CFR 1021.102(a)). Examples of the actions related to pit production could include (1) offsite leases of existing storage buildings to temporarily store procured equipment until ready for installation, and (2) relocation of support buildings (e.g., trailers) during construction. Because these actions receive a separate NEPA review and are unlikely to substantively contribute to environmental impacts, they are not further evaluated in this PEIS.

In addition to the construction activities, NNSA would procure the remaining engineered equipment (e.g. gloveboxes, process equipment, balance of plant equipment) and commodities. Turnover of systems to testing would occur in parallel with completion of construction, and testing would be initiated and completed. In parallel with the construction and testing activities, NNSA would authorize readiness preparation activities (e.g., operator training, procedure development), utilizing the HFTOC. Following completion of testing and readiness preparations, readiness to operate would be demonstrated in accordance with DOE Order 425.1D, "Verification of Readiness to Start Up or Restart Nuclear Facilities." Once authorization to operate has been obtained, nuclear operations would commence in accordance with a startup plan, and production would be optimized until at least the 50-ppy capacity has been achieved. These operations are addressed in the Multi-Site and Single Site alternatives.

Table 2.4-3 provides key construction parameters for constructing the SRPPF complex at SRS. The table includes the total construction parameters that were estimated in the 2020 SRS Pit Production EIS (NNSA 2020b), as well as the revised construction parameters associated with completing construction following a ROD for this PEIS (estimated in 2027). Figure 2.4-2 shows the existing facilities in F Area at SRS. Figure 2.4-3 provides a conceptual layout of the SRPPF complex in F Area. It should be noted that although these revised construction parameters are larger than those in the 2020 SRS ROD and supporting SRS EIS, they have been included the No-Action Alternative in this PEIS to provide the reader with a clearer understanding of the potential impacts of construction actions. If NNSA implemented the No-Action Alternative, those actions would be limited to only those identified in the 2020 SRS ROD (85 FR 70601).

Table 2.4-3 Key Construction Parameters for the SRPPF Complex at SRS

Resource	Construction Parameters from the 2020 SRS EIS	Revised Construction Parameters for the SRPPF Complex
Total land disturbance/development (acres)	48	107
Permanent disturbance (after restoration/revegetation of temporary disturbance) (acres)	48	65
Disturbance of previously undisturbed land (acres)	0	9.3
Construction duration	6 years	7 years
Peak construction workforce	1,800	4,500
Peak electricity use	2–3 MW/yr	2–3 MW/yr
Fuel	700,000 GPY	700,000 GPY
Peak water use	16.6 MGPY	16.6 MGY

EIS = Environmental Impact Statement; GPY = gallons per year; MGY = million gallons per year; MW = megawatts; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site; yr = year

Source: NNSA 2020b; SRNS 2026

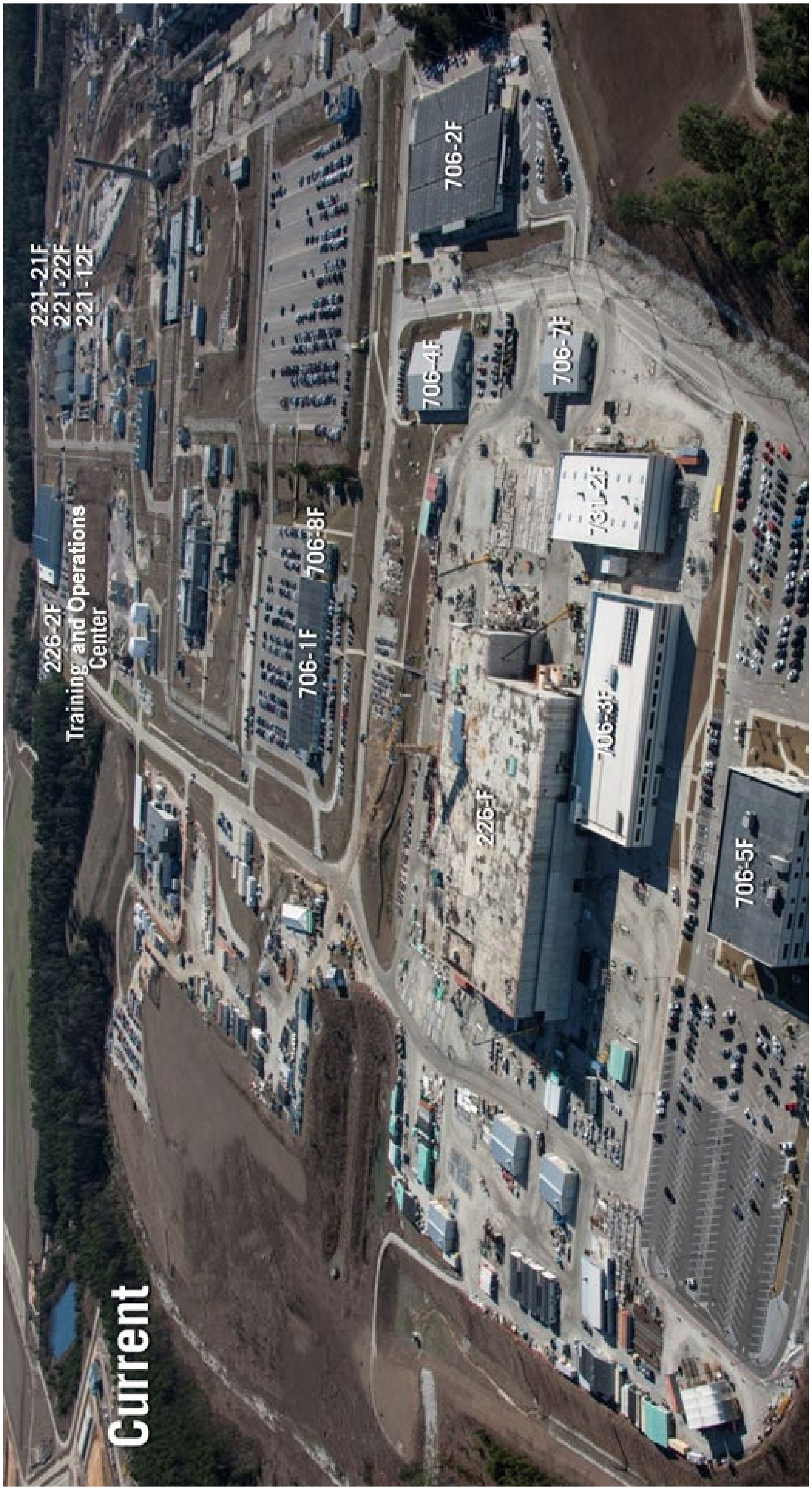

Figure 2.4-2 Existing F Area Facilities at SRS

Figure 2.4-3 Notional Layout of the SRPPF Complex

The land disturbance and development all would be in F Area and include the total area that would undergo groundwork for the SRPPF and supporting infrastructure. The estimate includes the following:

- 52 acres of previously disturbed land around the SRPPF (18 acres would be restored after construction);
- 33 acres of previously disturbed land southeast of the SRPPF that will include the Vehicle Inspection Facility and parking areas (13 acres would be restored after construction);
- 3.1 acres of previously disturbed land around the HFTOC (2 acres would be restored after construction);
- 6 acres of previously disturbed land north of the HFTOC that was previously the location of the concrete batch plant for the MFFF and could be used for temporary construction trailers (all of which would be restored after construction);
- 3.7 acres of previously disturbed land at the south end of F Area to be used for warehousing (2.7 acres would be restored after construction); and
- 9.3 acres of newly developed pine forest due west of the SRPPF to be used for employee parking.

In total, 107 acres would be developed for the SRPPF complex; 9.3 of those acres are currently undisturbed and about 42 acres would be restored after construction was completed.

2.5 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would produce pits concurrently at LANL and SRS. At the maximum annual production rate analyzed, NNSA would produce up to 80 pits at LANL and up to 125 pits at SRS, such that a total of up to 205 pits could be produced annually. In addition, this PEIS evaluates lower production rates at both LANL and SRS for the Multi-Site Alternative. At the steady-state, near-term production capacity, this PEIS analyzes the production of 30 ppy at LANL and 50 ppy at SRS, which is the pit production rate that would satisfy current national policy and the overall requirement to produce 80 pits in total, pursuant to congressionally mandated requirements (50 U.S.C. § 2538a). At the lowest annual production rate analyzed, the production of 10 ppy at LANL and 50 ppy at SRS is considered a reasonable “capability-based production capacity” if pit production requirements were reduced in the future.

Regardless of the ultimate pit production capacity at LANL or SRS, the construction activities described for the No-Action Alternative (*see* Section 2.4 and the accompanying construction parameters in Tables 2.4-1 and 2.4-3) would occur. The operational parameters presented in Table 2.4-2 for producing 30–80 pits at LANL are also applicable. In addition, Table 2.5-1 presents the operational parameters if LANL pit production capacity were ever reduced to a capability-based production capacity of 10 ppy.

Under the Mult-Site Alternative, operations at the SRPPF complex would commence after construction was complete, as described in detail in Section 2.1.3 of the 2020 SRS Pit Production EIS (NNSA 2020b) and summarized in Section 2.4 above. The SRPPF complex would include0m plutonium processing and manufacturing support areas; analytical chemistry and materials characterization support; waste handling; control rooms; support facilities for operations personnel; utilities such as heating, ventilation, and air conditioning systems; HEPA filters; breathing/plant/instrument air compressor rooms; electrical rooms and backup diesel generators; process support equipment rooms; and miscellaneous support space. Normal electrical power would be supplied to the SRPPF complex by two independent, offsite power supplies. An uninterruptible power supply and backup diesel generators would provide power for critical systems. This arrangement would ensure continued operation of critical systems during any interruption of offsite power. Table 2.5-2 presents the key operational parameters associated with producing a range of pits (50−125 ppy) at the SRPPF.

Table 2.5-1 Key Operational Parameters at LANL (10 Pits Per Year)

Resource	No-Action Alternative (30 ppy at LANL)	10 ppy at LANL	Percent Reduction
Land occupied by new projects after restoration of laydown areas	70 acres	No change	0
Operational workforce	2,609 employees	No change	0
Electricity	5.92 million kW-hr/yr Peak load: 1.9 MW	4.2 million kW-hr/yr Peak load: 1.3 MW	~30
Fuel (oil, gasoline) usage	10,500 GPY	No change	0
Water use	20 MGY	No change	0
Wastewater	65,225 GPD	No change	0
Radiological air emissions (annual)	4.5×10^{-8} Ci of PuEq	1.5×10^{-8} Ci of PuEq	67
Radiological workers	1,028	1,028	0
Average dose to radiological worker	360 mrem/yr	160 mrem/yr	56
Hazardous waste	169 MT/yr	118 MT/yr	30
Solid sanitary waste	778 MT/yr	778 MT/yr	0
LLW (solid)	3,029 m^3/yr	953 m^3/yr	69
LLW (liquid)	660,000 GPY	529,000 GPY	20
MLLW	102 m^3/yr	33 m^3/yr	68
TRU wastes	280 m^3/yr	90 m^3/yr	68
LLW shipments	252/yr	80/yr	68
MLLW shipments	68/yr	22/yr	68
TRU waste shipments to WIPP	82/yr	23/yr	72
Secure shipments (pits, Pu, HEU)	90/yr	57/yr	37

Ci = curie; GPD = gallons per day; GPY = gallons per year; HEU = highly enriched uranium; kW = kilowatt; LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; m^3 = cubic meters; MGY = million gallons per year; MLLW = mixed low-level radioactive waste; mrem = millirem; MT = metric ton; MW = megawatt; ppy = pit per year; Pu = plutonium; PuEq = plutonium-239 equivalent; TRU = transuranic; WIPP = Waste Isolation Pilot Plant; yr = year
Source: LANL 2026

Table 2.5-2 Key Operational Parameters for the SRPPF Complex at SRS – Multi-Site Alternative

Resources	Baseline Data	Multi-Site Alternative (50 ppy at SRPPF)	Multi-Site Alternative (80 ppy at SRPPF)	Multi-Site Alternative (up to 125 ppy at SRPPF)
Land occupied by new projects after restoration of laydown areas and other project areas	198,344 acres of federal land	65 acres (9.3 acres previously undisturbed)	65 acres (9.3 acres previously undisturbed)	65 acres (9.3 acres previously undisturbed)
Operational workforce	12,691 workers	Increase of 1,705 workers	Increase of 1,895 workers	Increase of 2,840 workers
Electricity	320,000 MWh 60 MW peak demand	<30,000 MWh <11 MW peak	<30,000 MWh <11 MW peak	30,000 MWh 11 MW peak
Fuel (oil, gasoline) usage	425,772 GPY (A, F, and K areas)	Increase of 15,000 GPY	Increase of 15,000 GPY	Increase of 15,000 GPY
Water use	288 MGY	Increase of 12.1 MGY	Increase of 13.3 MGY	Increase of 19 MGY
Wastewater	115 MGY	Increase of 10.7 MGY	Increase of 11.8 MGY	Increase of 17.8 MGY
Radiological air emissions	≤ 39,300 Ci tritium < 23,000 Ci Krypton-85 <1.06×10^{-3} Ci Pu	Increase of 5.2×10^{-5} Ci/yr Pu	Increase of 8.4×10^{-5} Ci/yr Pu	Increase of 1.3×10^{-4} Ci/yr Pu
Radiological workers	4,192	Increase of 1,280	Increase of 1,420	Increase of 2,130
Average dose to radiological worker	31.9 mrem/yr	110 mrem/yr (2 rem max)	160 mrem/yr (2 rem max)	167 mrem/yr (2 rem max)
Hazardous waste	12.1 m^3/yr	Increase of 16 m^3/yr	Increase of 26 m^3/yr	Increase of 40 m^3/yr
Solid sanitary waste	445 MT/yr	Increase of 196 MT/yr	Increase of 218 MT/yr	Increase of 327 MT/yr
LLW (solid)	4,681 m^3/yr	Increase of 4,650 m^3/yr	Increase of 6,550 m^3/yr	Increase of 9,400 m^3/yr
LLW (liquid)	4.3 MGY	Increase of 1.5 MGY	Increase of 1.5 MGY	Increase of 1.5 MGY
MLLW (solid)	4.2 m^3/yr	Increase of 7.6 m^3/yr	Increase of 11.5 m^3/yr	Increase of 15 m^3/yr
MLLW (liquid)	4.3 MGY	Increase of 11,157 GPY	Increase of 17,852 GPY	Increase of 27,893 GPY
TRU wastes	128 m^3/yr	Increase of 459 m^3/yr	Increase of 673 m^3/yr	Increase of 765 m^3/yr
LLW shipments (offsite)	1/yr	Increase of 242/yr[a]	Increase of 387/yr[a]	Increase of 604/yr[a]
MLLW shipments	5/yr	Increase of 5/yr	Increase of 8/yr	Increase of 10/yr
TRU waste shipments	11/yr	Increase of 135/yr	Increase of 198/yr	Increase of 225/yr
Secure shipments (pits, Pu, and HEU)	0	55/yr	73/yr	97/yr

Ci = curie; GPY = gallons per year; HEU = highly enriched uranium; LLW = low-level radioactive waste; m^3 = cubic meters; MGY = million gallons per year; MLLW = mixed low-level radioactive waste; MW = megawatt; MWh = megawatt-hour; mrem = millirem; MT = metric ton; ppy = pit per year; Pu = plutonium; rem max = maximum permitted radiation does, in rems; SRPPF = Savannah River Plutonium Processing Facility; TRU = transuranic; yr = year

a. For transportation purposes, this PEIS conservatively assumes that the annual LLW inventory at SRS generated during pit production is shipped to NNSS for disposal. In practice, the large majority of LLW generated at SRS would be disposed of onsite in E area.

Source: SRNS 2026

2.6 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. Single-site production at LANL would be the same as the No-Action Alternative, however, while 80 ppy is considered the maximum achievable production capacity at LANL without construction of another facility, it is not considered sustainable for long periods. Under single-site production at SRS, NNSA would produce 50−125 ppy at SRS only. NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby. In this mode, NNSA would perform activities equivalent to producing a minimal number of pits (e.g., 10 ppy) to maintain production competencies. In addition, plutonium research and development (R&D), surveillance, testing, and other plutonium missions would continue at LANL, as these activities are independent of pit production.

At SRS, NNSA would complete the SRPPF complex as described in Section 2.4, with the construction parameters shown in Table 2.4-3. Operational parameters for SRS would be the same as those in Table 2.5-2 for 50–125 ppy. Not producing pits for the stockpile at LANL could reduce operational impacts at LANL compared to the impacts of producing 30 ppy under the No-Action Alternative. Table 2.5-1 presents the operational parameters if the existing LANL pit production capability were placed in standby. In that mode, the environmental impacts at LANL would be the same as the capability-based production capacity analyzed under the Multi-Site Alternative.

2.7 Project Enhancements Under Consideration

As introduced in Section 2.2.7, NNSA is currently evaluating potential enhancements that could be implemented at LANL or SRS to improve the overall pit production capability and efficiency. These enhancements are in the early stages of development and subject to additional design evolution. This PEIS considers the currently available information to determine what, if any, effects such enhancements may have on the impacts of the Proposed Action. These effects are addressed for each resource area at each site in Chapter 4. The following paragraphs provide the available information for each of the project enhancements under consideration.

Increase Material Limits at RLUOB (LANL). Increasing the MAR inventory limit for RLUOB beyond the current 400 grams of PuEq could improve the efficiency of the facility to support the analytical chemistry and materials characterization needs for PF-4 and increase the potential throughput of the facility. The MAR increase would allow some activities currently performed at CMR to be transferred to RLUOB. Prior to implementation, this revised inventory would be evaluated for facility hazard category and security category requirements. This potential change would potentially affect the facility emissions, operational workforce, human health, and accidents; therefore, it is only addressed in Sections 4.1.5.4, 4.1.9.4, 4.1.13.4, and 4.1.14, respectively. Other resources would be unaffected.

Move Other Missions from PF-4 To Achieve 80 ppy Steady-State Capacity (LANL). NNSA considered an enhancement that would move the plutonium-238 and Advanced Recovery and Integrated Extraction System missions out of PF-4 to create additional space for pit production.[18] Moving these out of PF-4 would free up about 15,000 square feet that could be repurposed for pit production. NNSA is not considering this as a near-term solution because it would cause disruptions

18 The plutonium-238 mission produces general-purpose heat sources and radioisotope thermoelectric generators for the Nation's space missions. The Advanced Recovery and Integrated Extraction System mission supports the Surplus Plutonium Disposition Program by preparing surplus weapons-grade plutonium for final disposition.

to ongoing missions in PF-4 that could jeopardize achieving the 30 ppy capability planned in PF-4 (NNSA 2017). If this proposal is revisited in the future, the mission relocation and construction activities at LANL would undergo their own NEPA review. Because this enhancement is not being considered for implementation at this time, Chapter 4 does not include an evaluation of potential impacts of relocation of these missions or the reconfiguration of PF-4.

Install a Portable, Radioactive Waste Supercompactor (LANL and/or SRS). The Idaho National Laboratory (INL), managed by the DOE Office of Environmental Management (DOE-EM), has a signature piece of equipment in the Advanced Mixed Waste Treatment Project at INL referred to as the Supercompactor. This equipment consists of a giant hydraulic ram capable of exerting 4 million pounds of force that can reduce a 35-inch-tall, 55-gallon barrel to a 5-inch puck. By compacting waste, DOE-EM is able to place more waste in the limited storage space of the WIPP facility. One-half of all waste permanently disposed of at WIPP has been treated at INL; the majority of that waste was compacted by the Supercompactor. Compaction also reduces the number of trips required to transport waste to WIPP. The implementation of the Supercompactor at INL was evaluated in the *Advanced Mixed Waste Treatment Project Final EIS* (DOE 1999b).

To improve efficiencies at LANL and/or SRS and reduce the risks associated with staging TRU waste in the event of an interruption in WIPP's ability to receive TRU waste, NNSA is considering implementation of a portable supercompactor at either the LANL site, SRS, or both sites. The portable supercompactor would have many of the same capabilities as the INL Supercompactor, albeit on a smaller scale. The preliminary details associated with this project enhancement are as follows:

- The supercompactor would be a mobile unit that closely resembles a large semi-truck trailer. The mobile supercompaction system comes with a four-column hydraulic press with the same compaction force as the INL Supercompactor (i.e., 4 million pounds). For transport means, the supercompactor is integrated in a semi-truck trailer together with the ventilation system and the hydraulic and electrical components.
- The core components include the vertical hydraulic press cylinder, the hydraulic unit, and an automated loading device for the drums and an unloading device for the compacted pucks. The system also includes an off-gas system with HEPA filtration and handling/conveying systems for the drums/pucks and overpacks for waste packaging.
- Because the supercompactor would be mobile, there would be no new construction or land disturbance at either site. If used at LANL and/or SRS, the mobile unit would be sited temporarily on previously disturbed land (e.g., parking lot or cleared, level property on site). Management of TRU waste drums before and after compaction would be in accordance with DOE waste management orders and applicable site procedures.
- The current *Resources Conservation and Recovery Act* (RCRA; 42 U.S.C. § 6901) permit for the INL Supercompactor indicates that the average size reduction is about 80 percent (Idaho 2025). The size reduction for a mobile unit may be somewhat less than the INL unit and would be dependent on the actual waste drums being compacted.
- Prior to implementation at either site, NNSA would evaluate whether additional NEPA review would be required.

Plutonium Metal Preparation in K Area (SRS). To accelerate the SRPPF to the first production unit pit, NNSA is considering using the gloveboxes and facilities in K Area, which are being developed and installed for the disposition of surplus plutonium, to supplement the planned facilities in the SRPPF to perform plutonium purification activities. These activities, partially described in Section 2.2.3, would include preparation of plutonium metal for eventual transfer to the SRPPF once the new facility is operational and ready to begin pit production. In the future, plutonium prepared in K Area could also be sent to LANL to supplement the pit production process at PF-4. The rate of purified plutonium production in K Area is not tied to a specific pit production throughput. It is limited by the surplus plutonium disposition footprint and processing infrastructure. The basic parameters associated with this enhancement that are important to evaluate potential impacts include the following (SRNS 2026):

- There would be no additional construction footprint since these facilities and equipment are being installed in existing facilities to support surplus plutonium disposition (NNSA 2024b).
- There would be additional workers associated with this expansion of the pit production mission; however, the addition of these workers was previously evaluated in the *Surplus Plutonium Disposition Program Final Environmental Impact Statement* (SPDP EIS; NNSA 2024b). This program, with few exceptions, was halted by Executive Order 14302, "Reinvigorating the Nuclear Industrial Base." Assuming that the same size workforce that was proposed for surplus plutonium disposition downblend operations in K Area would be used for metal preparation to support pit production, the total operational workforce addition would be about 285 workers per year (SRNS 2023b). These workers are all considered radiological workers for the purposes of this PEIS. The projected average annual dose for workers performing this activity would be about 500 millirem per year. Metal preparation activities are typically the activity in pit production with the highest personnel exposure.
- Utilization of existing K Area facilities to support pit production is being considered primarily for operations prior to the SRPPF becoming operational to provide initial purified plutonium feed to the SRPPF. However, there is the possibility that this enhancement could be extended to the full duration of pit production. Therefore, this PEIS considers the scenario in which K Area metal preparation continues to support pit production for the stockpile for the 50-year analytical period.
- Operational radiological air emissions associated with these activities would be minimal since all glovebox operations are HEPA filtered and monitored prior to release. For purposes of analysis, if the entire Surplus Plutonium Disposition Program is repurposed for plutonium metal production, then the air emissions would be less than the projected SRPPF radiological air emissions (*see* Table 2.5-3).
- Metal preparation in K Area would generate residual, plutonium-bearing materials that could either be (1) further processed in the SRPPF to recover the plutonium or (2) discarded as waste. Option 2 would result in a higher volume of TRU waste sent to WIPP for disposal; however, this increase would be offset partially by the volume of waste decreasing from this material removed from downblending as part of the reduced surplus plutonium disposition mission. In this early stage of conceptual design development, this PEIS evaluates the two options: (1) accumulate the residues and transfer them via secure transfer to SRPPF for processing in aqueous recovery or (2) package the residues for direct disposal in accordance with the WIPP waste acceptance criteria. Because the amount of plutonium metal prepared to support the required pit production capacity would be the same whether the action is completed in K Area or inside the SRPPF, the amount of waste generated under Option 1 would not change with implementation of this enhancement. The details associated with Option 2 waste generation are further discussed in Chapter 4, Section 4.2.12, of this PEIS.

Analytical Receipt Inspection Center (ARIC) (SRS). To potentially support a critical supply chain of material, components, and consumables to the HFTOC and the SRPPF, a dedicated receipt inspection facility could be constructed to support startup and sustainment after reaching rate production. This facility would ensure that materials undergo thorough testing and verification at a tempo necessary to support required production rates. The functions of the ARIC would include:

1. **Materials Testing Laboratory:** Equipped for testing of nonradiological materials to ensure compliance with quality and safety standards.
2. **Personnel Housing and Offices:** Accommodating office space for administrative and technical staff involved in inspection and management activities.
3. **Temporary Storage Capacity:** A dedicated warehouse to manage inventory and storage before further processing and prior to dispatch.

The preliminary assumptions regarding the ARIC facility include a footprint of about 30,000 square feet, housing laboratory space, office space, and warehouse storage. The tentative site location is within the SRPPF complex footprint, which would provide the availability to tie into existing utilities. The facility would not receive or process any radiological materials.

Weapons Support Building (SRS). An existing building in F Area, formerly known as the Waste Solidification Building, was analyzed and constructed for the Surplus Plutonium Disposition Program. The building is located within the SRPPF complex; southeast of the SRPPF and northeast of the HFTOC (*see* Figure 2.5-2). The building is proposed to be repurposed as the Weapons Support Building to support pit production operations. The mission scope proposed for the Weapons Support Building would be implemented over time to support pit production. The building currently has been outfitted with tanks, piping, and other equipment, however, there have been no hazardous or radiological operations introduced to the building thus far. Examples of potential reutilization initiatives include development of a Weapons Support Building control room, house a simulator for the SRPPF aqueous recovery system, provide a production assurance laboratory, and a waste characterization laboratory.

Machine Shops (SRS). NNSA is considering the construction and operation of new infrastructure to produce classified and unclassified tooling, fixturing, and parts in support of pit production at SRPPF. The functions of the machine shops would include: (1) classified and unclassified machining and manufacturing and (2) advanced processing and materials development. None of the activities within the proposed machine shops would use radiological materials (SRNS 2026). These facilities may also be used for other SRS missions.

The planning for the machine shops includes either a single building or multiple buildings with dedicated access, parking, administrative areas, and utility infrastructure. The preliminary permanent facility footprint for the machine shops and associated infrastructure would be approximately 100,000 square feet. The proposed new infrastructure would be built on the general site area in proximity to the necessary utilities. The development of the machine shops and associated infrastructure (e.g., parking, access roads, security fencing, and utilities) would disturb approximately 40 acres of land west of F Area and east of the cloverleaf on the north side of C Road, within an area that was clear-cut for timber harvesting in 2020. After construction is completed, approximately 10 acres of the disturbed land would be restored via landscaping (SRNS 2026). The tentative location for the machine shop area is shown in Figure 2.7-1.

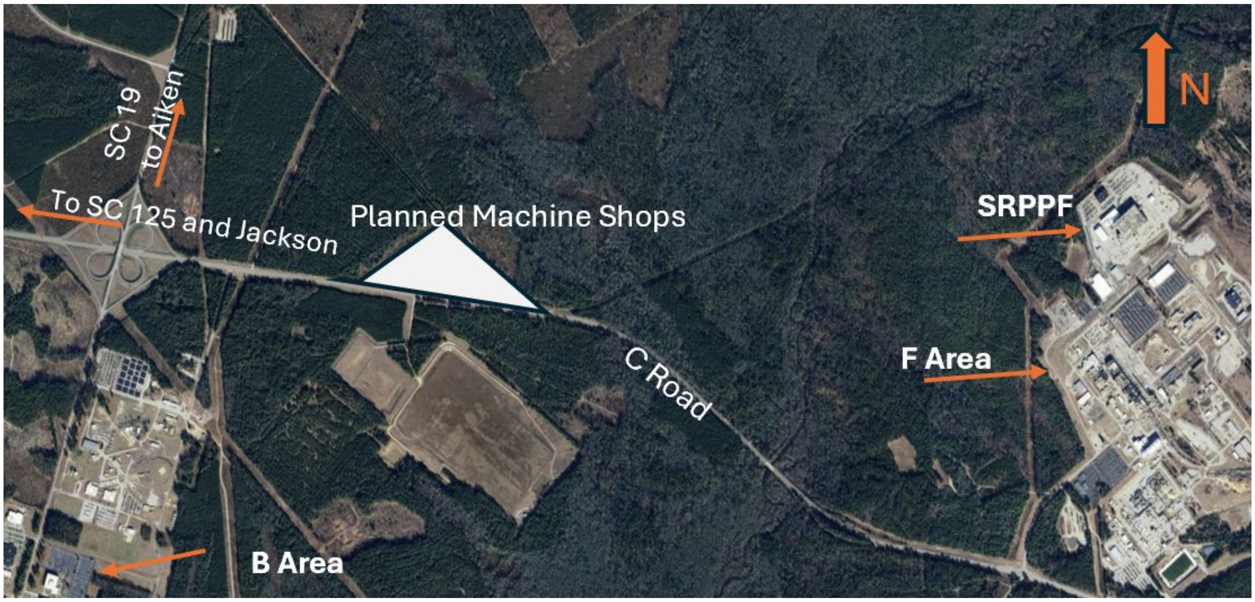

Figure 2.7-1 Potential Location of Machine Shops at SRS

2.8 Alternatives Considered but Eliminated from Detailed Analysis

Redesign Weapons to Require Less or No Plutonium. The pits in the enduring nuclear weapons stockpile were designed and built with plutonium in an era when underground nuclear testing was being conducted to verify these designs. Replacing these pits with new pits that would use little or no plutonium (i.e., use instead HEU) for the sole reason of not building a long-term, assured pit production facility would not be feasible. Underground nuclear testing likely would be required to verify performance of any new designs that use uranium instead of plutonium. In addition, these new pits would require costly changes in the weapon delivery systems. Finally, the *Atomic Energy Defense Act* also requires plutonium pits, so this alternative would not support the purpose and need for agency action (50 U.S.C. § 2538a). Consequently, this alternative was eliminated from detailed analysis.

Only Reuse Existing Pits. NNSA currently stages most plutonium pits at Pantex. Like the pits in the active stockpile, those pits are aging and this alternative would not mitigate plutonium aging risks or enable NNSA to implement enhanced safety features to pits to meet NNSA and DOW requirements. As identified in Chapter 1, Section 1.2.1 of this PEIS and similar to the SRS Pit Production EIS (NNSA 2020b), NNSA has analyzed the judicious reuse of pits from the existing stockpile; however, the *Atomic Energy Defense Act* requires the production of new pits, so this alternative would not support the purpose and need for agency action (50 U.S.C. § 2538a). Consequently, this alternative was eliminated from detailed analysis.

Locate the Pit Production Mission at Other DOE/NNSA Sites. LANL and SRS are the only NNSA sites with available facilities and existing infrastructure that handle plutonium and could be used to produce pits to meet the mandated schedule and current capacity requirements. The *Fiscal Year 2026 National Defense Authorization Act*, enacted by Congress on December 18, 2025, specifies production of plutonium pits at LANL and SRS (Public Law 119-60). Paragraph 10 of the Settlement Agreement (DOE 2025b) states, "The Parties agree that any compromise is based on the law as it exists on the date of execution and that this Agreement may be superseded by future Acts of Congress."

Regarding the potential use of non-NNSA sites, NNSA considered the refurbishment/retrofit of the Fuel Processing Facility, an existing HC-2 facility at INL (NNSA 2017). While refurbishing this facility offered many of the same benefits as refurbishing MFFF, the Fuel Processing Facility is an older and smaller facility, and NNSA determined that it carries greater risk of unexpected delays and cost increases due to changes to hazard, seismic, and security category standards since its construction. The Fuel Processing Facility option would also involve hosting a major NNSA mission at a non-NNSA site, and ongoing legal issues between the State of Idaho and DOE further complicate this option.[19] Because federal law currently requires NNSA to implement a strategy to provide the enduring capability and capacity to produce not less than 80 ppy beginning during 2030 at LANL and SRS (50 U.S.C. § 2538a), this alternative was eliminated from detailed analysis.

Construct a New Greenfield Pit Production Facility. NNSA had previously considered the alternative of building a new greenfield[20] pit production facility at LANL, SRS, and other sites, including building new production "modules" at LANL (NNSA 2017). This 2017 NNSA report estimated that it would take 15–20 years before a new facility or LANL modules could be operational. Based on NNSA's experience in constructing other complex nuclear production facilities (e.g., the Uranium Processing Facility at Y-12), NNSA believes that 15–20 years is a reasonable estimate. Because any new facility or production module would introduce significant schedule risk compared to upgrading PF-4 and/or repurposing the MFFF into the SRPPF, this alternative was eliminated as unreasonable. While NNSA could consider also constructing a greenfield capability, such as modules at LANL, as a risk mitigation to the two-site solution, it was determined that such additional cost was not warranted. Consequently, this alternative was eliminated from detailed analysis.

Utilize Other SRS Facilities. The canyon facilities in F Area and H Area at SRS were designed to recover plutonium (F-Canyon) and uranium (H-Canyon) from reactor fuel. Only the New Special Recovery Facility in F-Canyon is set up to purify plutonium material from recycled pits. Because F-Canyon is in a cold standby status after de-inventory and partial decommissioning in the early 2000s, extensive modifications, with significant costs, would be required to generate an adequate capacity for the duration of the pit production mission. Major deficiencies associated with utilizing the canyons to support the pit production mission include:

- Project risks are increased when using existing facilities due to the higher number of unknown conditions that may be encountered during the project and the challenges of coordinating construction activities with any ongoing facility operations.
- The service life of the renovated facility may not meet the 50-year SRPPF design requirement.
- The existing robust canyon structures cannot be modified significantly and would therefore result in inefficient equipment arrangement, material handling, and storage locations.
- Imbedded infrastructure such as shielding, ventilation systems, electrical cable/switchgear, and process piping/drains likely would not be suitable for a revised facility mission.

Based on these factors, NNSA determined that canyon facilities are not reasonable alternatives for supporting the pit production mission (NNSA 2020b) and were eliminated from detailed analysis.

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19 INL is currently operating under a consent decree with the State of Idaho dealing with onsite radioactive waste, which may make it difficult to establish new activities that require bringing plutonium on site (NNSA 2017).

20 Greenfields are lands on which no development has previously taken place.

Evaluate Alternatives for Plutonium Pit-Related Activities (such as R&D and Plutonium Staging) in the PEIS. While these activities are an important element of the overall operations of the NSE, they have no bearing on the need to produce pits to meet national security and legal requirements or whether pits are produced at multiple or single sites. Consequently, NNSA does not intend to evaluate alternatives for these activities in this PEIS. However, the PEIS includes a description of the functions that each site plays in the NSE (*see* Chapter 1, Section 1.4) and discusses any effects that pit production capacity and location alternatives could have on the functions at these other sites.

2.9 Summary Comparison of Impacts

Table 2.9-1 provides a summary comparison of the environmental consequences for plutonium pit production at LANL and SRS; Table 2.9-2 provides additional details regarding infrastructure. The tables compare the potential impacts to environmental resources associated with pit production under the No-Action Alternative (construction at LANL and SRS; production at LANL only) and the two action alternatives (Multi-Site and Single-Site), as described in Sections 2.5 and 2.6. The information in Table 2.9-1 includes data for both construction and operations. A summary of accident risks related to pit production at LANL and SRS are presented in Tables 2.9-3 and 2.9-4, respectively. Detailed analyses supporting the summary comparisons within these tables are provided in Chapter 4 of this PEIS.

Table 2.9-1 Comparison of Environmental Consequences

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
Land Use		
	LANL (*see* Section 4.1.1)	
Total permanent land development would be about 70 acres (13.5 acres building footprint; 43.5 acres roads – access/pull-in, retaining walls, sidewalks; 13 acres staff parking). Temporary development of 29 acres for construction laydown areas, which would eventually be restored. About 27 acres of the total disturbance are currently undisturbed. No change to the current or future land use designation. Activities represent a continuation of existing land uses and would be compatible with existing and approved future land uses at and surrounding the site.	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.1)	
Total permanent development of 65 acres within F Area to construct the SRPPF complex. Temporary development of 42 acres for construction laydown and staging areas, which would eventually be restored. About 9.3 acres of current pine forest would be converted to a parking lot. No change to the current or future land use designation. Activities represent a continuation of existing land uses and would be compatible with existing and approved future land uses at and surrounding the site.	Same as No-Action Alternative.	Same as Multi-Site Alternative.
Aesthetic and Scenic Resources		
	LANL (*see* Section 4.1.2)	
Construction activities would result in temporary changes to the visual appearance due to the presence of cranes, construction equipment, demolition, facilities in various stages of construction, and possibly increased dust. All affected planning areas would retain their existing VRM classes.	Same as No-Action Alternative.	Same as No-Action Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	SRS (*see* Section 4.2.2)	
Construction activities would result in additional temporary changes to the visual appearance within F Area due to the presence of cranes, construction equipment, demolition, facilities in various stages of construction, and possibly increased dust. Because all actions are internal to the site, there would be no short- or long-term impacts to the offsite visual environment.	Same as No-Action Alternative.	Same as Multi-Site Alternative.
Geology and Soils		
	LANL (*see* Section 4.1.3)	
Disturbance of about 27 acres of previously undisturbed soil would occur. Any new facility would be designed and constructed to meet seismic design criteria commensurate with the risk category requirements.	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.3)	
All but 9.3 acres of the disturbance at SRS would be within previously disturbed areas. Any new facility would be designed and constructed to meet seismic design criteria commensurate with the risk category requirements.	Same as No-Action Alternative.	Same as Multi-Site Alternative.
Water Resources		
	LANL (*see* Section 4.1.4)	
<u>Surface Water</u>: Approximately 27 acres of impervious surfaces would be newly introduced from new facilities and infrastructure projects. New facilities would increase impervious surfaces, which could increase stormwater runoff. LANL meets stormwater compliance monitoring requirements, and implementation of a stormwater pollution prevention plan would minimize any pollution that might leave the site by stormwater. There would be no construction and operations projects that would affect the floodplains at LANL.	Same as No-Action Alternative.	Same as No-Action Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
Groundwater: Any discharge from facilities to groundwater would be monitored, managed, and subject to the requirements of applicable permits.		
SRS (*see* Section 4.2.4)		
Surface water: Because all but 9.3 acres of projected disturbances are in previously disturbed areas, there would be a 9.3-acre increase in impervious surfaces. SRS has permits, plans, and procedures in place to minimize the potential for stormwater runoff to carry soil particles or any potential surface water contaminant away from construction areas. SRS has a BMP plan; spill prevention, control, and countermeasures plan; and stormwater pollution prevention plan to comply with NPDES permit requirements. There would be no construction projects that would affect the floodplains at SRS. Groundwater: Because the site is already a developed area, infiltration and groundwater recharge rates from precipitation are expected to be very similar to those under existing conditions.	Same as No-Action Alternative. Surface Water: There would be no operational activities that would affect the floodplains at SRS. Groundwater: Operations would not result in discharges to groundwater.	Same as Multi-Site Alternative.
Air Quality		
LANL (*see* Section 4.1.5)		
Fugitive dust would be generated during clearing, grading, and other earth-moving operations. Construction emissions would not exceed *de minimis* thresholds for criteria pollutants. LANL has implemented measures to maintain emissions below the threshold. No radiological emissions would be expected during construction activities; radiological emissions during pit production would include 4.5×10^{-8} Ci of PuEq for production of 30 ppy and 1.2×10^{-7} Ci of PuEq for 80 ppy. Annual GHG emissions would increase by more than 2,300 metric tons of CO_2e from transportation of nuclear materials and waste associated with production of up to 80 ppy.	Same as No-Action Alternative.	Same as No-Action Alternative if LANL is the single site. If SRS is the single site, radiological emissions would be reduced. The average annual radiological emissions at LANL would be about 1.5×10^{-8} curies per year of PuEq. Annual GHG emissions would be reduced compared to the No-Action Alternative. There would only be about 350 metric tons of CO_2e from transportation of nuclear materials and waste associated with production of 10 ppy.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	SRS (*see* Section 4.2.5)	
Fugitive dust would be generated during clearing, grading, and other earth-moving operations. Construction emissions would not exceed *de minimis* thresholds for criteria pollutants. No radiological emissions would be expected during construction activities.	Construction impacts would be the same as the No-Action Alternative. Radiological emissions during pit production would range from 8.4×10^{-5} to 1.2×10^{-7} Ci of PuEq for production of 50 to 125 ppy. Annual GHG emissions would increase by a range of 2,410 to 5,450 metric tons of CO2e from transportation of nuclear materials and waste associated with production of up to 50 to 125 ppy.	Same as Multi-Site Alternative if SRS is the single site. No operational emissions if LANL is the single site.
Noise		
	LANL (*see* Section 4.1.6)	
Although construction activities would cause temporary noise impacts, activities would be confined to the LANL property boundary and more than 800 feet from residential areas or businesses.	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.6)	
Construction of the SRPPF complex at SRS would temporarily increase local noise levels from heavy equipment and vehicle traffic, but sound would attenuate quickly and not affect the public or wildlife beyond about 400 feet from the site.	Same as No-Action Alternative.	Same as Multi-Site Alternative.
Biological Resources		
	LANL (*see* Section 4.1.7)	
About 27 acres of previously undisturbed land would be developed. Some project sites overlap buffer habitat for the Mexican spotted owl, a federally listed threatened species. The proposed projects that occur within either core or buffer habitat would be reviewed before implementation to ensure compliance with the HMP, and further consultation with the USFWS would be conducted, as required. Construction would have no appreciable impact on native vegetation, plant species of concern, or wetlands. Operations would be consistent with current activities and would have no appreciable impact on biological resources.	Same as No-Action Alternative.	Same as No-Action Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	SRS (*see* Section 4.2.7)	
No additional development beyond current environment.	Potential impacts from construction could include habitat loss, human disturbance, and noise. Terrestrial resources would not be adversely affected because SRPPF is highly developed and does not support habitat that attracts a wide variety of wildlife. Threatened or endangered species would not be impacted because habitat for these species does not exist in F Area	Same as Multi-Site Alternative.
Cultural and Paleontological Resources		
	LANL (*see* Section 4.1.8)	
Potential impacts to cultural resources would be avoided or reduced by locating projects in areas previously disturbed and with modern developments already present; re-routing construction to avoid resources; marking or fencing cultural resources that are at risk; and monitoring construction activities to ensure that erosion is controlled and inadvertent impacts do not happen. For projects that have not yet been sited, NNSA would comply with the Section 106 Programmatic Agreement and CRMP to identify significant cultural resources and avoid, reduce, and/or mitigate any impacts in accordance with federal, state, and local policies.	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.8)	
No additional development beyond current environment.	With the exception of a 9.3-acre wooded area that would be developed, proposed construction and operational activities at SRS would occur on previously disturbed lands and would utilize BMPs with no notable impacts to cultural resources. Any ground-disturbing activities would employ archaeological monitoring in accordance with the Programmatic Memorandum of Agreement.	Same as Multi-Site Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
Socioeconomics		
	LANL (*see* Section 4.1.9)	
The following range of socioeconomic impacts could occur for production of 30–80 ppy: • Additional direct employment: 864–2,083 • Additional indirect employment: 531–1,279 • Additional direct earnings: $117.5M–$283.2M • Anticipated value added from LANL: $181.7M–$438.1M There would be an average of 250 construction workers per year, peaking at 300 workers in any given year, through 2035. Due to the low potential for impacts on the ROI population, steady-state operations would not be expected to affect community services and schools.	Same as No-Action Alternative.	Same as No-Action Alternative if LANL is the single site. If SRS is the single site, socioeconomic impacts would be reflective of the lower end of the range of the No-Action Alternative.
	SRS (*see* Section 4.2.9)	
The following socioeconomic impacts are associated with peak construction periods at SRS: • Additional direct employment: 4,500 • Additional indirect employment: 1,328 • Additional direct earnings: $359.6 • Anticipated value added from SRS construction: $659.0M There would be a peak of 4,500 construction workers in any given year of construction. The average construction workforce would be smaller.	The following range of socioeconomic impacts could occur for production of 50–125 ppy: • Additional direct employment: 1,705–2,840 • Additional indirect employment: 1,044–1,739 • Additional direct earnings: $224.6M–$374.1M • Anticipated value added from SRS: $363.1M–$604.9M There would be a peak of 4,500 construction workers in any given year of construction. Due to the low potential for impacts on the ROI population, steady-state operations would not be expected to affect community services and schools.	Same as Multi-Site Alternative if SRS is the single site. If LANL is the single site, impacts would trend back toward the levels of the No-Action Alternative

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
Transportation and Traffic		
	LANL (*see* Section 4.1.10)	
Traffic and Parking: Construction activities would utilize the existing transportation infrastructure in the region and could potentially cause periodic light-to-moderate adverse impacts to local traffic flows from construction worker commuting and the intermittent presence of additional construction vehicles. A gradual increase (i.e., less than or equal to about 2 percent per year in the first four years) in the LANL workforce would not significantly impact operation of the primary and secondary road networks at LANL. Radiological Transport: During operations, LANL would transport radiological waste and secure shipments to and from the LANL site. The range of estimated annual impacts of these shipments for production of 30–80 ppy would be: • Dose to transport crews: 6.5–16.9 person-rem per year • LCF risk to transport crews: 0.0039–0.010 LCF per year • Incident-free dose to general public: 2.5–6.4 person-rem per year • LCF risk to public: 0.0015–0.0038 LCF • Accident risk to public: $5.9 \times 10^{-6} - 1.6 \times 10^{-5}$ LCF • Number of traffic fatalities from accidents: 0.0097–0.025 per year	Same as No-Action Alternative.	Traffic and Parking: Same as No-Action Alternative. Radiological Transport: Same as No-Action Alternative if LANL is the single site. If SRS is the single site, there would be less radiological transportation than the No-Action Alternative and the following health impacts would be expected for pit production of 10 ppy: • Dose to transport crews: 2.2 person-rem per year • LCF risk to transport crews: 0.0013 LCF per year • Incident-free dose to general public: 1.0 person-rem per year • LCF risk to public: 0.0006 LCF • Accident risk to public: 1.9×10^{-6} LCF • Number of traffic fatalities from accidents: 0.0032 per year
	SRS (*see* Section 4.2.10)	
Traffic and Parking: Construction activities and commuter traffic would represent less than 1 percent of the total employment in the ROI and would not adversely affect the LOS of local roads.	Traffic and Parking: Same as No-Action. Radiological Transport: During operations, SRS would transport radiological waste and secure shipments to and from SRS. The range of estimated annual impacts of these shipments for production of 50–125 ppy would be: • Dose to transport crews: 23–46 person-rem per year	Same as Multi-Site Alternative if SRS is the single site. If LANL is the single site, impacts would trend back toward the levels of the No-Action Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	• LCF risk to transport crews: 0.014–0.028 LCF per year • Incident-free dose to general public: 8.3–16.5 person-rem per year • LCF risk to public: 0.0050–0.0099 LCF • Accident risk to public: 1.3×10^{-5} – 3.3×10^{-5} LCF • Number of traffic fatalities from accidents: 0.027–0.060 per year	
Infrastructure		
	LANL (*see* Section 4.1.11)	
Existing infrastructure would be adequate to meet all requirements (*see* Table 2.9-2).	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.11)	
Existing infrastructure would be adequate to meet all requirements (*see* Table 2.9-2).	Same as No-Action Alternative.	Same as Multi-Site Alternative.
Waste Management		
	LANL (*see* Section 4.1.12)	
Construction would not generate radioactive waste. Any hazardous waste would be shipped off site for treatment and disposal. Production of 30–80 ppy would generate the following projected range of annual quantities of waste: • LLW (m^3/yr): 3,029–7,627 • MLLW (m^3/yr): 102–262 • TRU/ waste (m^3/yr): 280–634 • Hazardous waste (MT/yr): 169–451 • Solid Sanitary waste (MT/yr): 778–1,141	Same as No-Action Alternative.	Same as No-Action Alternative if LANL is the single site. If SRS is the single site, production of 10 ppy would generate the following annual quantities of waste: • LLW (m^3/yr): 953 • MLLW (m^3/yr): 33 • TRU/ waste (m^3/yr): 90 • Hazardous waste (MT/yr): 118 • Solid sanitary waste (MT/yr): 778
	SRS (*see* Section 4.2.12)	
Construction would not generate radioactive waste. • Solid sanitary waste (MT/yr): 517	Construction would not generate radioactive waste. Any hazardous waste would be shipped off site for treatment and disposal. Production of 50–125 ppy would generate the following projected range of annual quantities of waste: • LLW (m^3/yr): 4,650–9,400 • MLLW (m^3/yr): 7.6–15 • TRU/ waste (m^3/yr): 459–765 • Hazardous waste (m^3/yr): 16–40 • Solid sanitary waste (MT/yr): 196–327	Same as Multi-Site Alternative if SRS is the single site. If LANL is the single site, impacts would trend back toward the levels of the No-Action Alternative.
Human Health		

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	LANL (*see* Section 4.1.13)	
Construction activities would be expected to result in the following human health impacts: • Lost days due to injury/illness: 72 • Occupational fatalities: 0.6 Production of 30-80 ppy would result in: Nonradiological Worker Impacts: • Lost days due to injury/illness per year: 23–56 • Occupational fatalities per year: 0.05–0.1 Radiological Impacts: *Public:* • MEI dose and collective dose to population: Very small additional contribution above baseline *Workers:* • Number of radiological workers: 1,028–2,003 • Average annual dose to individual radiological worker: 360–465 mrem • Average annual radiological worker risk: 2.2×10^{-4} to 2.8×10^{-4} LCF • Collective annual dose to radiological workers: 370–931 person-rem • Total annual radiological worker risk: 0.22–0.56 LCF	Same as No-Action Alternative.	Same as No-Action Alternative if LANL is the single site. If SRS is the single site, construction impacts and impacts to the population would be the same as No-Action Alternative. Production of 10 ppy would result in the following human health impacts to workers: • Number of radiological workers: 1,028 • Average annual dose to individual radiological worker: 160 mrem • Average annual radiological worker risk: 9.6×10^{-5} LCF • Collective annual dose to radiological workers: 164 person-rem • Total annual radiological worker risk: 0.10 LCF
	SRS (*see* Section 4.2.13)	
Construction activities would be expected to result in the following human health impacts: • Lost days due to injury/illness: 441 • Occupational fatalities: 6 • Production of 50–125 ppy would result in: • Nonradiological Worker Impacts. • Lost days due to injury/illness per year: 36–60 • Occupational fatalities per year: 0.07–0.12	Construction impacts would be the same as the No-Action Alternative. Nonradiological Worker Impacts: • Lost days due to injury/illness per year: 36–60 • Occupational fatalities per year: 0.07–0.12 Radiological Impacts: *Public:* MEI dose and collective dose to population: Very small additional contribution above baseline *Workers*: • Number of radiological workers: 1,280–2,130 • Average annual dose to individual radiological worker: 110–167 mrem	Same as Multi-Site Alternative if SRS is the single site. If LANL is the single site, impacts would trend back toward the levels of the No-Action Alternative.

No-Action Alternative	Multi-Site Alternative	Single-Site Alternative
	• Average annual radiological worker risk: 6.6×10^{-5} to 1.0×10^{-4} LCF • Collective annual dose to radiological workers: 141–356 person-rem • Total annual radiological worker risk: 0.08–0.21 LCF	
Accidents and Intentional Destructive Acts		
	LANL (*see* Section 4.1.14)	
The range of potential accident risks from production of 30–80 ppy are presented in Table 2.9-3. Potential impacts from intentional destructive acts are classified but may be similar to or could exceed the range of potential accident impacts presented in this PEIS.	Same as No-Action Alternative.	Same as No-Action Alternative.
	SRS (*see* Section 4.2.14)	
No potential accidents involving radiological material.	The range of potential accident risks from production of 50–125 ppy are presented in Table 2.9-4. Potential impacts from intentional destructive acts are classified but may be similar to or could exceed the range of potential accident impacts presented in this PEIS.	Same as Multi-Site Alternative.

BMP = best management practice; Ci = curies; CO_2e = carbon dioxide equivalent; CRMP = Cultural Resources Management Plan; GHG = greenhouse gas; HMP = Threatened and Endangered Species Habitat Management Plan; LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; LOS = level of service; m^3/yr = cubic meters per year; MEI = maximally exposed individual; mrem = millirem; MT/yr = metric ton per year; NNSA = National Nuclear Security Administration; NPDES = National Pollutant Discharge Elimination System; PEIS = programmatic environmental impact statement; ppy = pits per year; PuEq = plutonium-239 equivalent; ROI = region of influence; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site; TRU = transuranic; USFWS = U.S. Fish and Wildlife Service; VRM = Visual Resource Management

Table 2.9-2 Summary of Consequences Related to Infrastructure

Resource Parameter	Existing Capacity	Baseline Average (2017–2023)	Alternative		
			No-Action[a]	Multi-Site[a]	Single-Site[a]
Domestic water (MGY)	LANL: 542	271.5	20–30	20–30	20–30
	SRS: 788	288	16.6	12–19	12–19
Electricity – power consumption (MkW-hr/yr)	LANL: 651[b]	440	5.92–5.94	5.92–5.94	4.2–5.94
	SRS: 4,400	320	17.5	30	0–30
Electricity – average annual peak demand (MW)	LANL: 116.0[b]	70.0	1.9	1.9	1.9
	SRS: 500	60	2–3	11	0–11

LANL = Los Alamos National Laboratory; MGY = million gallons per year; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt; SRS = Savannah River Site

a Impacts represent increase above baseline.

b Electrical consumption and import capacity are expected to increase from 651 to 1,100 million kW-hr per year and from 116 MW to 200 MW, respectively, upon completion of the EPCU project at LANL.

Table 2.9-3 Summary of Accident Risks Applicable to Alternatives at LANL (LCF/year)

Accident	Maximally Exposed Individual[b]	Offsite Population[c]	Noninvolved Worker[d]
TA-55, PF-4 glovebox fire	1.2×10^{-6}	1.1×10^{-4}	7.8×10^{-6}
Vehicle impact while transporting TRU waste containers with ensuing fire	1.0×10^{-7}	2.2×10^{-6}	4.2×10^{-7}
Refueling vehicle crash into TRU storage array with ensuing fire	8.3×10^{-7}	1.1×10^{-5}	1.4×10^{-6}
Large combustible fire in TRU storage array	1.0×10^{-7}	3.3×10^{-6}	2.6×10^{-7}
Facility-wide seismic event and fire in PF-4	3.7×10^{-8}	4.1×10^{-6}	2.7×10^{-6}
Nuclear criticality	8.4×10^{-10}	2.2×10^{-7}	4.5×10^{-7}

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area; TRU = transuranic

a Impacts presented for 80 ppy would bound potential impacts for 30 ppy.

b See Table D.3-6 of the 2026 LANL SWEIS (NNSA 2026a) for the specific distance of the MEI for each accident presented.

c Based on a projected future population (year 2032) of approximately 552,115 persons residing within 50 miles of PF-4.

d At a distance of 100 meters.

Source: NNSA 2008a, 2026a; LANL 2026

Table 2.9-4 Summary of Accident Risks Applicable to Action Alternatives at SRS (LCF/year)

Accident	Maximally Exposed Individual[b]	Offsite Population[c]	Noninvolved Worker[d]
Process module fire, initiated in a process enclosure	8.8×10^{-7}	4.6×10^{-3}	8.4×10^{-5}
Fire in shipping and receiving	5.5×10^{-6}	0.028	4.0×10^{-4}
Explosion in a laboratory enclosure	5.6×10^{-8}	2.9×10^{-4}	1.0×10^{-4} [e]
Over-pressurization of a TRU waste enclosure	5.1×10^{-11}	2.7×10^{-7}	4.1×10^{-8}
Energetic impact and loss of confinement of molten plutonium	1.1×10^{-6}	5.5×10^{-3}	7.1×10^{-5}
Energetic impact and loss of confinement of material in container	2.2×10^{-7}	1.1×10^{-3}	3.0×10^{-4}
Nuclear criticality in solution systems	2.0×10^{-11}	1.0×10^{-7}	9.0×10^{-9}
Loss of glovebox inerting system results in release	1.4×10^{-6}	7.1×10^{-3}	3.0×10^{-4}
Loss of power causes loss of vessel purge and fires	3.0×10^{-8}	1.6×10^{-4}	5.0×10^{-6}
Vehicle crash into waste storage pad with fire	2.1×10^{-6}	8.3×10^{-3}	0.01[e]
Seismic event with ensuing fires	5.5×10^{-8}	2.2×10^{-4}	9.0×10^{-6}

LCF = latent cancer fatality; ppy = pits per year; SRS = Savannah River Site; TRU = transuranic
a Impacts presented for 125 ppy would bound impacts for 50 and 80 ppy.
b At site boundary, approximately 6.7 miles from release.
c Based on projected future population (year 2032) of 1.0 million persons residing within 50 miles of the SRPPF.
d Calculated at a distance of 100 meters.
e Considers prompt fatality (nonradiological) of a worker during event occurrence.
Source: SRNS 2025a, 2025b, 2026

2.10 Preferred Alternative

The preferred alternative is the alternative that NNSA believes would fulfill its statutory missions and responsibilities, considering economic, environmental, technical, and other factors. This PEIS provides information on the potential environmental impacts of the alternatives. NNSA prepares cost, schedule, and technical analyses separately and will consider all relevant factors in preparation of its ROD. For this Pit Production PEIS, the Multi-Site Alternative is the preferred alternative based on national policy and considerations of environmental, economic, technical, and other factors. The Multi-Site Alternative would enable NNSA to meet statutory requirements and improve the resiliency, flexibility, and redundancy of the NSE by not relying on a single production site. This alternative is considered the best way to manage the cost, schedule, and risk of such a vital undertaking (DoD 2018).

3.0 AFFECTED ENVIRONMENT

This chapter describes the human and natural environment (the affected environment) to support NNSA's analysis of environmental impacts presented in Chapter 4. Summaries for resource areas at both LANL and SRS, along with additional details provided in Appendix C, serve as reference points for evaluating any environmental changes that could result from implementing the alternatives. The affected environments at LANL and SRS are summarized in Sections 3.1 and 3.2, respectively. The existing conditions for the environmental resource areas were developed from information provided in previous environmental studies, other reports, and databases and generally reflect publicly available data sources for the years 2017–2023. The details of the numerical data for each resource are provided in Appendix C.

This PEIS evaluates the environmental impacts of the alternatives that affect each site within defined regions of influence (ROIs). The ROIs are specific to the type of effect evaluated and encompass geographic areas within which any significant impact would be expected to occur. For example, human health risks to the general public from exposure to airborne contaminant emissions are assessed for an area within a 50-mile radius of the center of the proposed activities at the specific site. Potential impacts beyond that distance have been shown to be negligible. The ROIs are provided below for each site.

The methodologies used to evaluate impacts for each resource area are the same as those used in the 2026 LANL SWEIS (NNSA 2026a) and the 2020 SRS Pit Production EIS (NNSA 2020b). These methodologies are described in Appendix C of the LANL SWEIS (NNSA 2026a) and Appendix A of the SRS Pit Production EIS (NNSA 2020b).

3.1 Los Alamos National Laboratory

Sections 3.1.1 through 3.1.13 provide summaries of the affected environment for each environmental resource area within the ROIs for the LANL site. The LANL ROIs are presented in Table 3.1-1. Appendix C, Section C.1 provides additional details for the LANL affected environment sections. Figure 3.1-1 presents the locations of the TAs at the LANL site.

Table 3.1-1 General Regions of Influence for the LANL Site Existing Environment

Environmental Resource	Region of Influence
Land use	LANL site (focused on TA-55) and nearby offsite areas
Aesthetic and scenic resources	LANL site (focused on TA-55) and nearby offsite areas
Geology and soils	LANL site (focused on TA-55) and nearby offsite areas
Water resources	LANL site and adjacent surface water and groundwater under the LANL site, nearby offsite areas, and extending northward into southern Colorado (with a focus on the Rio Grande)
Air quality (and climate)	LANL site and nearby offsite areas within local air quality control region (Upper Rio Grande Valley)
Noise	LANL site, nearby offsite areas, and access routes to and from the LANL site
Biological resources	LANL site (focused on TA-55) and nearby offsite areas
Cultural and paleontological resources	LANL site (focused on TA-55) and nearby offsite areas

Environmental Resource	Region of Influence
Socioeconomics	The five-county region where the majority of LANL employees reside and tribal governments within a 50-mile radius of the LANL site
Traffic and radiological transportation	Transportation corridors between LANL and other sites where wastes/materials are transported
Infrastructure	LANL site (focused on TA-55) and nearby offsite areas
Waste management	LANL site (focused on TA-55) and nearby offsite areas, plus offsite waste disposal areas
Human health and safety	LANL site and offsite areas within a 50-mile radius

LANL = Los Alamos National Laboratory; TA = technical area

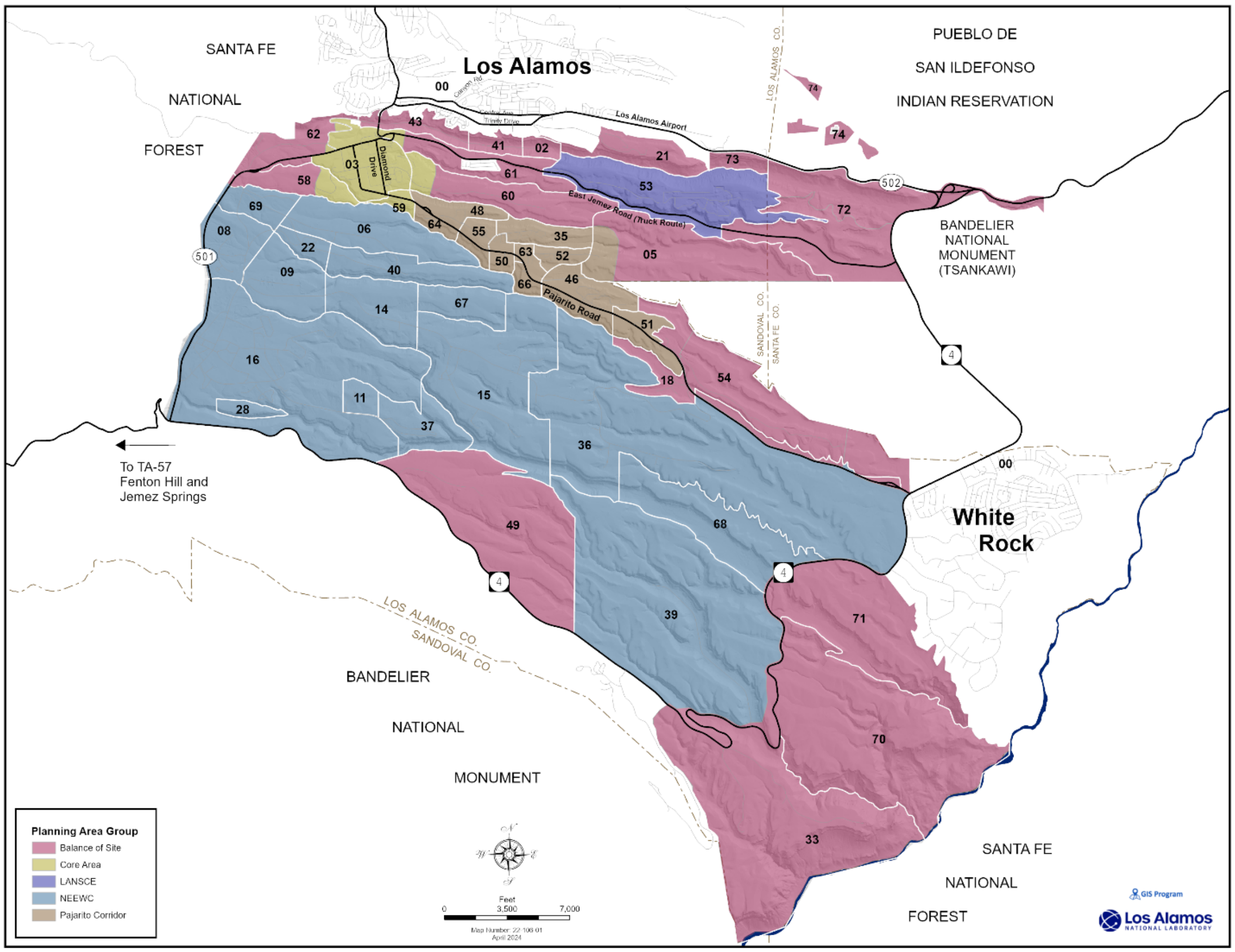

Figure 3.1-1 Identification and Location of Technical Areas Comprising the LANL Site

3.1.1 Land Use

Location and Setting. LANL is sited on the Pajarito Plateau, part of the Jemez Mountains – the southernmost reach of the Rocky Mountains. The Pajarito Plateau features a series of mesas separated by deep, east-to-west-trending canyons. Development of LANL is concentrated on the flat mesa tops with onsite elevations ranging from approximately 6,200 to 7,800 feet above sea level. LANL is physically bounded to the west by the Sierra de los Valles range of the Jemez Mountains and to the east by White Rock Canyon, containing the Rio Grande (NNSA 2026a).

LANL encompasses approximately 40 square miles (25,536 acres) across both Los Alamos and Santa Fe counties and is divided into TAs (Figure 3.1-1). Portions of Sandoval County border the site. LANL is surrounded by land managed by other federal agencies, including the National Park Service (NPS), the U.S. Forest Service (USFS), and Bureau of Land Management (BLM), as well as the Pueblo de San Ildefonso. The towns of Los Alamos and White Rock border the site to the north and east, respectively (NNSA 2026a).

Existing Onsite Land Uses. At the end of 2023, LANL operations comprised 899 buildings containing about 8,500,000 square feet of space (NNSA 2026a).[21] Nearly 71 percent of LANL's land is classified as unbuildable (primarily due to slope), placing physical constraints on future expansion.

Planning and Technical Areas. As shown in Figure 3.1-1, LANL is divided into 50 TAs. The onsite TAs are grouped into five major planning areas based on aggregated capabilities and physical location: (1) Core Area, (2) Pajarito Corridor, (3) National Energetic and Engineering Weapons Complex (NEEWC), (4) Los Alamos Neutron Science Center (LANSCE), and (5) Balance of Site. Pit production activities are primarily located in the Pajarito Corridor (NNSA 2026a).

Situated near the geographic center of LANL, the Pajarito Corridor Planning Area functions as the principal hub for nuclear research and production. The area contains facilities supporting weapons production, testing, verification, and scientific operations.

The Pajarito Corridor encompasses a total land area of 1,148 acres, of which approximately 616 acres are classified as buildable based on topographic suitability. Of the buildable area, approximately 62 percent has already been developed.

Surrounding Land Uses: Lands in the vicinity of LANL are largely undeveloped and left in a natural state. These are categorized into three classes:

- **Private Land** – including the population centers of Los Alamos and White Rock;
- **Pueblo Lands** (i.e., Indian reservations) – Pueblo de San Ildefonso (abutting LANL) and Pueblo of Santa Clara (noncontiguous to LANL nearby). Pueblo de Cochiti and Pueblo of Jemez, also Accord Pueblos (*see* Section 3.1.8), are noncontiguous to LANL to the south and southwest, respectively; and
- **Federal Land** – Santa Fe National Forest, managed by USFS, and Bandelier National Monument, managed by the NPS.

Additional details about land use are provided in the following subsections of Appendix C, Section C.1.1:

- Location and Setting (C.1.1.1)
- Existing Onsite Land Uses (C.1.1.2)
- Planning and Technical Areas (C.1.1.3)
- Surrounding Land Uses (C.1.1.4)

[21] This value is subject to annual variation due to the dynamic nature of the site's infrastructure. As facilities reach the end of their operational lifecycles, the Laboratory implements DD&D) activities to remove such structures, followed by the construction of replacement facilities as necessary to support ongoing mission requirements.

3.1.2 Aesthetic and Scenic Resources

Pit production activities at LANL are primarily located on site, chiefly in the Pajarito Corridor. The visual ROI is the location of the actions outlined in Chapter 2 and views of the facilities from onsite and public viewpoints from off site. Special consideration is given to actions within visually sensitive locations and viewpoints from visually sensitive locations.

Onsite Visual Environment. NNSA's mission at LANL necessitates the presence of developed areas and significant alterations to the natural landscape. This development is primarily concentrated within the Core, Pajarito Corridor, and LANSCE planning areas. The harsh topography and largely undisturbed lands to the south of the Core and Pajarito Corridor planning areas function as buffer zones, providing separation between LANL operations and adjacent lands to the northwest, southwest, and southeast.

Pajarito Corridor. The Pajarito Corridor Planning Area is characterized by high- and medium-intensity development and substantial alterations to the natural landscape, making it one of the most developed areas within LANL. Development within the Pajarito Corridor dominates the visual landscape of the area. Situated within the interior of the LANL site, the corridor is generally screened from offsite public viewpoints due to its distance from the Laboratory's boundaries, intervening topography, and vegetation. However, with the recent opening of Pajarito Road to public access, individuals traveling through the corridor by motor vehicle are now exposed to the development and operational activities occurring within this planning area.

Offsite Visual Environment. The visual environment surrounding LANL is an extension of the onsite landscape. Neighboring properties include the Bandelier National Monument, Pueblo de San Ildefonso, Santa Fe National Forest, and the communities of Los Alamos and White Rock. Topography and vegetation throughout the viewshed generally constrain sightlines, although there are vantage points with sweeping vistas.

Of the identified neighboring properties, Bandelier National Monument, Pueblo de San Ildefonso, and the Santa Fe National Forest are considered visually sensitive locations.

Additional details about aesthetics and scenic resources are provided in the following subsections of Appendix C, Section C.1.2:

- Onsite Visual Environment (C.1.2.1)
- Offsite Visual Environment (C.1.2.2)

3.1.3 Geology and Soils

The geology of the LANL region has resulted from complex faulting, sedimentation, volcanism, and erosion. LANL is situated on the Pajarito Plateau, a landform composed of volcanic tuffs (fused volcanic ash). This plateau is heavily incised, featuring numerous mesas separated by deep canyons. These canyons contain streams that flow eastward and southeastward across the plateau, ultimately draining into the Rio Grande (LANL 2022a).

The geologic strata beneath LANL identifies a sequence of rock layers exposed in the area's deep canyons. These canyons, ranging from 600 to 1,000 feet deep with steep sides, are cut into the Pajarito Plateau, revealing the varying properties of the underlying layers. Softer, lighter-colored formations tend to form slopes, while harder, darker units create prominent vertical cliffs.

The dormant Valles Caldera within the Jemez Mountains to the west of LANL showed signs of the last lava flow about 40,000 years ago (Zimmerer et al. 2016; NMBGMR 2010).

The Pajarito Fault system poses the primary seismic risk to LANL. Studies indicate that the last ruptures for the fault system occurred under 1,700 years ago (Lettis et al. 2019). Over the past 50 years, 7 earthquakes with magnitudes greater than 2.5 (the largest was a magnitude 3.5) occurred within 62 miles of TA-55; however, none within the LANL site boundary (USGS 2025a). The U.S. Geological Survey (USGS) seismic hazard map indicates a maximum probabilistic peak ground acceleration (PGA)[22] of between approximately 0.13g and 0.20g for TA-55, with an annual probability of about 1 in 2,500 (USGS 2025b). DOE/NNSA has completed several seismic hazard analyses and the 2007 Probabilistic Seismic Hazard Analysis (PSHA) is expected to be updated and a new PSHA released in early 2026. The PSHA process uses information available from the USGS, but also incorporates more detailed, site-specific geologic, geophysical, and geotechnical information to determine seismic hazard criteria.

The LANL region features diverse soils, formed by the interaction of bedrock, topography, and climate on decomposed volcanic and sedimentary rocks. These soils range in texture from clay to gravel. Soils on the Pajarito Plateau mesa tops are well-drained and vary from very shallow (0–10 inches) to moderately deep (20–40 inches). Most surface soils in developed areas within the LANL site have been disturbed by construction activities for buildings, parking lots, and roadways. Surface soil sampling is an institutional program. Most institutional soil-sampling stations are on undisturbed mesa tops, often near and downwind from major LANL facilities. The LANL annual site environmental reports provide detailed information on soil-sampling locations and monitoring results.

LANL's potential mineral resources primarily consist of rock, soil, sand, gravel, and pumice. The only active onsite borrow pit is in TA-61. For additional materials, LANL relies on commercial, offsite borrow pits and quarries (NNSA 2026a).

Additional details about geology and soils are provided in the following subsections of Appendix C, Section C.1.3:

- Geologic and Topographic Setting (C.1.3.1)
- LANL Stratigraphy (C.1.3.2)
- Volcanism (C.1.3.3)
- Faulting and Seismicity (C.1.3.4)
- Soils and Foundation Stability (C.1.3.5)
- Mineral Resources (C.1.3.6)

3.1.4 Water Resources

This section addresses surface water, groundwater, sediments, and floodplains located on the LANL site and in vicinity of TA-55. Wetlands are discussed in Section 3.1.7 of this PEIS as part of biological resources. Water resources in the LANL region are used for human consumption, traditional and ceremonial uses by Native Americans, aquatic and wildlife habitat, domestic livestock watering, irrigation, industry, and commercial purposes. Water resources in proximity to LANL have the potential to be affected by water withdrawals, effluent discharges, waste disposal, spills and unplanned releases, soil erosion, or stormwater runoff from LANL operations, DD&D, or

[22] PGA is the maximum horizontal acceleration of the ground during an earthquake. It is an important parameter in earthquake engineering, representing the intensity of ground shaking at a specific location during an earthquake. PGA is expressed as a percentage or fraction of the acceleration due to gravity (g).

environmental remediation. The LANL area contains all or parts of seven watersheds that drain into the Rio Grande basin.

Surface Water. TA-55 is located on a narrow mesa between Two-Mile Canyon to the south (a tributary to Pajarito Canyon) and the Mortandad Canyon Complex to the north. The southern portion of TA-55 lies within the Pajarito watershed, although the majority of the TA-55 buildings lie within the Mortandad watershed (LANL 2008, 2013). The northern portion of TA-55 drains to Effluent Canyon, a tributary to Mortandad Canyon.

The 10.4-square mile Mortandad watershed originates on LANL property, extends 10 miles across the LANL site and San Ildefonso Pueblo, and joins the Rio Grande at an elevation of 5,450 feet above sea level (LANL 2006a). No perennial springs or stream reaches exist in the Mortandad watershed, and no significant snowmelt runoff occurs in the watershed (LANL 2006a).

Laboratory personnel routinely monitor surface water, stormwater, and sediments as part of the Laboratory's ongoing environmental monitoring and surveillance program. The Laboratory maintains and complies with several permits related to protection of surface water and stormwater runoff.

Groundwater. Groundwater in the LANL region occurs in three characteristic locations: (1) perched alluvial groundwater in canyon-bottom sediments, (2) zones of intermediate-depth perched groundwater whose location is controlled by availability of recharge and by changes in rock permeability, and (3) the regional aquifer beneath the Pajarito Plateau.

The main source of contaminants in Mortandad Canyon has been discharge from the TA-50 RLWTF into Effluent Canyon. Historically, the largest amount of contamination released to the Mortandad watershed has come from the RLWTF outfall (051), which began operations in July 1963, and water treatment continues today (LANL 2006b, 2025b). Advanced treatment technologies and stricter regulatory requirements have resulted in reduced contaminant concentrations in effluent. In 2023, all sample results from treated effluent discharges from the RLWTF were less than the applicable groundwater standards or screening levels. Groundwater monitoring well samples, collected as part of this permitted discharge, met groundwater quality standards and screening levels except for detections of nitrate, perchlorate, chromium, and 1,4-dioxane at well MCOI-6 (LANL 2025b).

Within Mortandad Canyon, the total per- and polyfluoroalkyl substances level was above the screening level at well MCO-7 in 2023 (LANL 2025b). For Mortandad Canyon samples obtained from the regional aquifer general surveillance wells in 2023, no constituents exceeded the screening levels (LANL 2025b).

Monitoring in 2023 showed that hexavalent chromium (originating from historical releases in Sandia Canyon) exceeded the groundwater standard in intermediate-depth perched and regional aquifer wells in Mortandad Canyon (LANL 2025b). Data show the chromium plume continuing to evolve, with increasing concentrations in some wells. The data indicate that the ongoing interim measures to control the chromium plume (extraction of contaminated groundwater and reinjection after treatment) may be reducing concentrations along the downgradient edge of the plume (LANL 2025b). Additional investigations are underway to determine the vertical extent of chromium contamination where it occurs at depths greater than 1,000 feet in the regional aquifer (LANL 2022a). At the direction of the New Mexico Environment Department (NMED), injection of treated water was suspended on April 1, 2023, due to questions about the configuration of injection wells. This effectively shut down the chromium interim measure treatment system. The DOE-EM Los

Alamos Field Office and NMED have been negotiating the terms of restarting the system (LANL 2025b).

Plutonium has negligible solubility in water under typical environmental conditions (Reilly et al. 2016) but could be transported as an oxide precipitated on or adsorbed to soil particles. LANL includes plutonium isotope analyses in selected groundwater monitoring. This has yielded mostly non-detects and no exceedances of screening levels or water quality standards (Intellus 2025). Plutonium-239/240 was detected at one alluvial well (MCOI-6 in Mortandad Canyon, TA-05) in 2024 at an activity of 0.0186 picocuries per liter (pCi/L) (Intellus 2025), well below the derived concentration standard (400 pCi/L) (LANL 2025b).

Floodplains. Floodplains are areas adjacent to watercourses that can become inundated with surface waters during high flows from runoff due to precipitation or snowmelt. At LANL, the floodplains are generally located in canyons that lie between the mesa fingers. DOE regulations (10 CFR Part 1022) consider the critical action floodplain to be those areas affected during a 500-year flood (with a 0.2-percent chance of occurrence in any given year). The base floodplain is defined as the 100-year floodplain, which has a 1.0-percent chance of flooding in any year. The RCRA permit for LANL also utilizes the 100-year floodplain definition (NNSA 2018a).

Additional details about water resources are provided in the following subsections of Appendix C, Section C.1.4:

- Surface Water (C.1.4.1)
- Groundwater (C.1.4.2)
- Floodplains (C.1.4.3)

3.1.5 Climate and Air Quality

Climate and Meteorology. The climate of the LANL area is characterized as semi-arid. This region experiences seasonal variability in both rainfall and temperature. Annual average (water equivalent) precipitation is about 17 inches and daily air temperatures range from 30 degrees Fahrenheit (°F) in the winter to near 90°F in the summer. Weather data relevant to TA-55 is collected from a meteorological station in TA-6.

Air Quality. Air quality describes the level of contaminants in the air. Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. The *Clean Air Act* (CAA; 42 U.S.C. § 7401 et seq.), as amended, is the basis for most federal air pollution control programs.

Nonradiological

Emissions of criteria and hazardous air pollutants from activities at LANL are regulated under the Title V Operating Permit (Permit No. P100-R2M5), issued by the NMED Air Quality Bureau. This permit establishes federally enforceable emission limits, operational requirements, and reporting obligations for all regulated sources at LANL, including limits on visible emissions (LANL 2024b).

LANL reports emissions subject to the air operating permit on an annual and semiannual basis to the NMED to document compliance with permit limits. Emissions primarily arise from combustion sources, including boilers and emergency generators, with vehicle emissions considered part of background concentrations. Emission data from LANL operations are provided in Appendix C, Section C.1.5.

<u>Radiological</u>

The two largest contributors to radioactive air emissions are typically tritium from the Weapons Engineering Tritium Facility and activation products from LANSCE. For the period 2017–2023, the radioactive air emissions from monitored stacks at LANL averaged about 61 curies of tritium, 168 curies of gaseous mixed activation products, and trace amounts of other radionuclides (e.g., plutonium, americium, uranium). Diffuse emissions (not monitored from facility exhausts) of radioactive air emissions are also present at LANL. In most years, diffuse emissions are generally small compared with stack emissions. In 2023, diffuse emissions totaled approximately 5 curies (LANL 2025d). The health effects of these releases are reported in Section 3.1.13.

Additional details about climate and air quality are provided in the following subsections of Appendix C, Section C.1.5:

- Climate and Meteorology (C.1.5.1)
- Air Quality (C.1.5.2)
- Visibility (C.1.5.3)

3.1.6 Noise

Noise is unwanted sound that can disrupt activities, degrade environmental quality, or cause discomfort and hearing loss. Sensitive receptors include residences, schools, and hospitals. The closest sensitive receptors are about 1,000 meters (0.62 miles) from TA-55. These residences are in the Elk Ridge mobile home community. Other sensitive receptors are more than a mile from TA-55.

Existing noise levels at LANL arise from various sources, including onsite transport, high explosives tests, and firearms practice (NNSA 2026a). Air blasts, which accompany explosive detonations, are audible to both workers and the public. These blasts consist of high-frequency air pressure waves, while lower-frequency waves may create secondary noises within testing structures. Most noise and vibrations at LANL result from aboveground explosives research that does not occur in TA-55 (NNSA 2026a). Noise immediately surrounding TA-55 controlled facilities primarily is limited to commuter traffic and waste transport operations, as described in the 2026 LANL SWEIS.

Sound and vibrations are also perceived by animals in the vicinity of TA-55. A 2018 study found that noise levels in key Mexican spotted owl habitat had not changed since 2005, prior to the construction of the asphalt plant (LANL 2018). The well-being of area wildlife and sensitive, federally protected bird populations suggest that these environmental conditions are present at levels within an acceptable tolerance range for most wildlife species and sensitive nesting birds found along the Pajarito Plateau (NNSA 2008b). Biological resources are addressed in Section 3.1.7.

Additional details about noise, including regulatory review and administrative requirements, are provided in Appendix C, Section C.1.6.

3.1.7 Biological Resources

This section discusses biological resources by habitat type (terrestrial and aquatic/wetland) and status (threatened, endangered or other special designation).

Terrestrial Resources. Vegetation within the LANL ROI for biological resources includes five vegetation zones along a gradient associated with the increasing elevation, decreasing temperature, and increasing moisture from the Rio Grande to the Jemez Mountains. A detailed description of the vegetation cover types can be found in Appendix A, Table A.4.6-1 of the 2026 LANL SWEIS (NNSA 2026a).

The diversity of vegetation, topographic features, and range of elevations on the LANL site provides habitat for a diversity of wildlife. These include approximately 57 species of mammals, 200 species of birds, 28 species of reptiles, 9 species of amphibians, and over 1,200 species of arthropods (NNSA 2026a).

Aquatic Resources. Aquatic resources include the aquatic environment and the plants and animals that inhabit it for all or part of its lifecycle. Wetlands are areas inundated or saturated by surface- or groundwater at a frequency and duration sufficient to support, under normal circumstances, vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, and similar areas. Diagnostic criteria used to identify wetlands include vegetation, soil, and hydrology (Environmental Laboratory 1987; USACE 2008).

Other aquatic resources on LANL property are limited. The Rio Grande and Rito de los Frijoles in Bandelier National Monument are the only truly perennial streams within the ROI. The canyons crossing the Pajarito Plateau through the LANL site drain the Jemez Mountain watersheds to the Rio Grande. Some of the canyon floors contain reaches of perennial surface water, such as the streams draining LANL property from lower Pajarito and Ancho canyons to the Rio Grande. No fish species have been found within LANL boundaries (NNSA 2026a).

Threatened, Endangered, or Other Special Designation. Protected species are plant and animal species that receive specific protection under federal or state regulations. Federal regulations applicable to LANL include the *Endangered Species Act of 1973*, as amended (ESA; 16 U.S.C. § 1531 et seq.), *Migratory Bird Treaty Act of 1918*, as amended (MBTA; 16 U.S.C. §§ 703–712), and the *Bald and Golden Eagle Protection Act of 1973*, as amended (BGEPA; 16 U.S.C. §§ 668–668d). State of New Mexico regulations include the *Wildlife Conservation Act* (Chapter 17, Article 2, Sections 37–46 of the New Mexico Statutes Annotated) and Title 19 of the *New Mexico Administrative Code,* "Natural Resources and Wildlife." Threatened and endangered species on the LANL site are managed in accordance with the LANL *Threatened and Endangered Species Habitat Management Plan* (HMP; LANL 2022b), which received U.S. Fish and Wildlife Service (USFWS) concurrence in 1999 (USFWS consultation numbers 2-22-98-I-336 and 2-22-95-I-108) and is periodically reviewed to update the status of species or changes in management strategies; the most recent update was January 2022.

Additional details about biological resources are provided in the following subsections of Appendix C, Section C.1.7:

- Terrestrial Resources (C.1.7.1)
- Aquatic Resources (C.1.7.2)
- Threatened, Endangered, or Other Special Designation (C.1.7.3)

3.1.8 Cultural and Paleontological Resources

Approximately 90 percent of the LANL property has been surveyed, with more than 1,900 archaeological sites identified. Most of the archaeological sites date prior to the arrival of Europeans in the upper Rio Grande Valley in the mid-17th century. Other sites at LANL correspond to later eras such as the Homestead, Manhattan Project, and Cold War periods, often consisting of scattered refuse and other non-structural remnants (NNSA 2026a).

LANL has more than 300 buildings and structures associated with the Manhattan Project and the Cold War period. These built resources have been evaluated for listing on the National Register of Historic Properties (NRHP), with 162 determined eligible as of the end of 2023. LANL actively monitors and protects 52 facilities, which are part of the Manhattan Project National Historical Park and/or are considered a LANL Protected Historical Facility (formerly Candidate for Preservation), a DOE Headquarters Heritage Asset, and/or a DOE Headquarters-acknowledged Cold War Signature Facility (NNSA 2026a).

Management of cultural resources at LANL is conducted in accordance with Section 106 of the *National Historic Preservation Act* (54 U.S.C. § 300101 et seq.) and implementing regulations (36 CFR 800.3). Under 36 CFR 800.14, agencies are permitted to adopt an alternate procedure or a Programmatic Agreement, and NNSA did so, adopting the *Amendment to Programmatic Agreement among the U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office, the New Mexico State Historic Preservation Office and the Advisory Council on History Preservation Concerning Management of the Historic Properties of Los Alamos National Laboratory, Los Alamos, New Mexico* (LANL 2022c), implemented through *A Plan for the Management of the Cultural Heritage at Los Alamos National Laboratory, New Mexico* (Cultural Resources Management Plan; CRMP) (LANL 2019). For projects and undertakings occurring at LANL, the documents address consideration and identification of cultural resources; assessment of potential effects to significant resources (historic properties); and development and implementation of measures to avoid or minimize effects or measures to mitigate effects to historic properties. LANL (2019) also outlines the responsibilities and requirements for long-term management of the cultural heritage at LANL.

NNSA established cooperative agreements with nearby Pueblo nations, including Cochiti, Jemez, San Ildefonso, and Santa Clara, to strengthen government-to-government relations, address shared concerns, and to enhance involvement with project planning and environmental assessments while safeguarding Pueblo rights and resources. In addition, these four Pueblos have Accord agreements with DOE (NNSA 2026a).

Within the LANL boundaries, only one paleontological fossil has been documented (NNSA 2003). The specimen has been identified as a bison bone, with an estimated date range from approximately 50,000 and 100,000 years ago (Drakos et al. 2007). Overall, the likelihood of encountering paleontological materials at LANL is considered low due to the near-surface stratigraphy, which is unfavorable for the preservation of plant and animal remains. The surface layers are composed of volcanic ash and pumice that were extremely hot when deposited, likely vaporizing or burning most carbon-based materials, such as bones or plant remains (NNSA 2026a).

Additional details about cultural and paleontological resources are provided in the following subsections of Appendix C, Section C.1.8:

- Cultural Resources Management (C.1.8.1)
- Cultural Resources at LANL (C.1.8.2)
- Paleontological Resources at LANL (C.1.8.3)

3.1.9 Socioeconomics

Socioeconomics examines the social and economic attributes related to a proposed action and its impacts on an ROI. For this PEIS, the ROI includes Los Alamos, Santa Fe, Rio Arriba, Bernalillo, and Sandoval counties, defined by where most LANL full-time employees live and spend their income. As of 2023, LANL employed 16,620 people; 93 percent of which reside within the ROI (NNSA 2026a).

Regional Income and Economic Characteristics. Income levels and economic health vary significantly across the ROI. Los Alamos County leads with a median household income over twice the New Mexico state average and the highest per capita income, while Rio Arriba County features the lowest income and highest poverty rate.

Between 2010 and 2023, the ROI experienced a 7.1 percent labor force increase and an 11.8 percent rise in employment, with unemployment nearly halving from 7.3 percent to 3.3 percent, indicating economic recovery. Similar trends occurred statewide (BLS 2025a).

Population and Demographic Characteristics. The ROI population was approximately 1,040,609 in 2023, showing steady growth since 2010 at about 0.3 percent annually. Projections indicate the ROI population will peak around 1.08 million by 2040 before a slight decline. Population growth is uneven among counties: Sandoval County has seen strong growth (15.1 percent since 2010), while Rio Arriba County population has slightly declined. Los Alamos County is the smallest in population but is projected to grow moderately, while Bernalillo County remains the largest with modest growth (USCB 2010, 2023a).

There are 16 tribes and pueblos within a 50-mile radius of LANL, covering parts of multiple counties in New Mexico. DOE maintains its trust responsibilities to federally recognized tribal nations near LANL. These responsibilities include consulting tribal governments before actions that may affect them, protecting tribal people and their natural resources, safeguarding "reserved" rights like hunting and fishing, preserving cultural and religious sites on DOE-managed lands, and respecting tribal sovereignty.

Housing. In 2023, the ROI had roughly 467,086 housing units with a 92.4-percent occupancy rate. Vacancy rates vary widely, from a low of 5.2 percent in Los Alamos County to a high of 24.0 percent in Rio Arriba County. Despite increases in total housing units, especially in Sandoval and Santa Fe counties, housing markets in some areas remain constrained due to demand and limited land availability, spurring interest in higher-density developments (USCB 2023b).

Los Alamos County has seen modest growth in housing stock (3.1 percent since 2010) but with very low vacancy and high median home values. Other counties, such as Santa Fe and Sandoval, have experienced more substantial housing growth but still experience low vacancies.

Local Government Finances. LANL significantly influences the economies of the counties in the ROI. Changes in LANL employment or procurement directly affect local government revenues, including property and gross receipts taxes. General fund revenues vary widely, with Bernalillo County having the largest revenue base followed by Sandoval and Los Alamos counties. Los Alamos County's fire services for LANL and the community receive dedicated funding through DOE contract payments (Bernalillo County 2023; Los Alamos County 2023; Rio Arriba County 2024; Sandoval County 2023; Santa Fe County 2023).

Community Services. The ROI is supported by extensive community services including fire districts, law enforcement, medical care, and school services.

Additional details about socioeconomics are provided in the following subsections of Appendix C, Section C.1.9:

- Regional Income and Economic Characteristics (C.1.9.1)

- Population and Demographic Characteristics (C.1.9.2)
- Housing (C.1.9.3)
- Local Government Finances (C.1.9.4)
- Community Services (C.1.9.5)

3.1.10 Traffic and Transportation

Northern New Mexico is bisected by U.S. Interstate-25 (I-25) in a generally northeast-to-southwest direction. This highway connects Santa Fe with Albuquerque. Regional transportation routes connecting LANL with Albuquerque and Santa Fe include US 84/285, New Mexico State Road (NM)-502, NM-30, and NM-4. Hazardous and radioactive material shipments primarily leave or enter LANL from East Jemez Road to NM-4 to NM-502. NM-502 and NM-4 directly access Los Alamos County, with the volumes on these two highways primarily being associated with Laboratory activities. Most commuter traffic to/from LANL originates from Los Alamos County or east of Los Alamos County (Rio Grande Valley and Santa Fe), as the majority of Laboratory employees live in these areas. The site is bounded by NM-4 to the south and east, NM-501 (West Jemez Road) to the northeast, and NM-502 to the north. The primary route designated by the State of New Mexico to be used for radioactive and other hazardous material shipments to and from LANL is the approximately 40-mile corridor between LANL and I-25 at Santa Fe.

Approximately 83 miles of paved roads have been developed on site, with roughly 8,500 parking stalls available for employees and visitors. Pajarito Road is a principal roadway on LANL used for accessing TA-55 and other major site areas. Level-of-Service (LOS) ratings of "C" or "D" are normal along the length of Pajarito Road between NM-4/White Rock and Diamond Drive, especially during peak-travel hours. The traffic can be characterized as stable (but constricted) to congested. Overall vehicle accident and fatality rates in Santa Fe and Los Alamos counties have regularly measured significantly lower than New Mexico state averages over recent years.

Hazardous, radioactive, and nonhazardous materials, including wastes, are transported to, from, and on the LANL site. Regulations and requirements from the USDOT, U.S. Nuclear Regulatory Commission (NRC), and DOE govern the transportation of hazardous and radioactive materials. The offsite transport of radioactive materials associated with TA-55 (and other site-wide operations) exclusively uses commercial tractor-trailers and/or DOE safe-secure trailers. Transported radioactive materials include, but are not limited to pits, plutonium metals, plutonium oxides, tritium, uranium (both depleted and enriched), and radioactive wastes (LLW, MLLW, and TRU).

Additional details about traffic and transportation are provided in the following subsections of Appendix C, Section C.1.10:

- Regional and Site Transportation Routes (C.1.10.1)
- Onsite Parking (C.1.10.2)
- Traffic Accident – Historical Data (C.1.10.3)
- Los Alamos National Laboratory Shipments (C.1.10.4)

3.1.11 Infrastructure

Site infrastructure includes the physical resources and services required to support the construction and operation of LANL facilities. Utility infrastructure at LANL encompasses electrical power, fuel (e.g., natural gas and petroleum), water supply, Sanitary Wastewater System (SWWS), and telecommunications. DOE/NNSA owns and distributes most utility services to LANL facilities, and Los Alamos County provides utility services to the communities of White Rock and Los Alamos (LANL 2024c). Roads and parking at LANL are addressed in Section 3.1.10 above. Table 3.1.11-1 presents information about the LANL site-wide infrastructure and capacity.

Electricity. Under the Electric Coordination Agreement between DOE/NNSA and Los Alamos County, the parties share power-generation resources and infrastructure through the Los Alamos Power Pool (LAPP). The LAPP supplies LANL with electricity primarily through hydroelectric, coal, and natural gas power generators throughout the western U.S. Import capacity is limited by the physical capability (thermal rating) of the Norton Transmission line import capacity of 116 megavolt amperes (MVA) (LANL 2024c). The installation of a third transmission line as part of the Electrical Power Capacity Upgrade (EPCU) project is projected to increase the import capacity from 116 to 200 MVA, thereby allowing loads to be fully served by offsite generation and enable future mission growth (LANL 2024b). The EPCU will include additional improvements to onsite transmission, upgrades for the Western Technical Area Substation, and expansion of several distribution feeder circuits. The EPCU project was evaluated in the *Los Alamos National Laboratory Electric Power Capacity Upgrade Project Final Environmental Assessment* (NNSA 2024c), and a Finding of No Significant Impact was issued on August 12, 2025 (NNSA 2025). The EPCU project was also an element of the No-Action Alternative in the 2026 LANL SWEIS (NNSA 2026a). Until the EPCU is implemented, onsite generation can be used to supplement import capacity to meet LANL power needs as necessary (LANL 2024c).

Table 3.1.11-1 LANL Site-Wide Infrastructure

Resource	Current Estimated Use[a]	Capacity	Available Capacity[b]
Electricity – power consumption (MW-hr/yr)	440,000	651,000–1,440,000[c]	~210,000–1,000,000[c]
Electricity – average annual peak demand (MW)	70	116–200[c]	46–130[c]
Natural gas (decatherms per year)	1,177,000	8,070,000	6,893,000
Fuel – oil (GPY)	901,484	NA	NA
Domestic water (GPY)	271,500,000	542,000,000	270,500,000
Sanitary wastewater (GPD)	311,689	602,800	~291,000

EPCU = Electrical Power Capacity Upgrade; GPD = gallons per day; GPY = gallons per year; kWh = kilowatt-hour; MW = megawatt; MW-hr/yr = megawatt-hours per year;
NA = not applicable

a Average value from 2017 to 2023 (NNSA 2026a).

b Available capacity is calculated by subtracting Current Estimated Use from Capacity.

c Presuming completion of the EPCU project, import capacity would increase from 116 MW to 200 MW; capacity for electrical consumption would increase to 1,440,000 MW-hr per year (based on 7,200 hours/year and 200 MW import capacity).

Fuel. Natural gas is the primary heating fuel used at LANL and in Los Alamos County. Approximately 40 percent of the gas used by LANL in 2023 was for heat production. The remainder was for electricity production, mainly by the combustion gas turbine generator within the TA-3 Co-Generation Complex (LANL 2024c). Natural gas is not used for the pit production process and is not further evaluated in this PEIS. Fuels, such as oil, diesel, and gasoline, are used at LANL and are brought on site as needed (LANL 2022a). The average annual fuel consumption (2017–2023) was 901,184 gallons (LANL 2025c).

Domestic Water. The Los Alamos County water production system consists of deep wells, main distribution lines, pump stations, and storage tanks. The system supplies potable water to all of Los Alamos County, LANL, and Bandelier National Monument. The deep wells are located in three well fields (Guaje, Otowi, and Pajarito). DOE/NNSA has a contract with Los Alamos County to supply water to the Laboratory. The County owns and operates the main water production system, while LANL owns and maintains an internal distribution system. LANL's average annual water use (2017–2023) was approximately 271.5 million gallons. LANL's annual water use ceiling is 542 million gallons (NNSA 2018a). Any water use exceeding this ceiling can be considered an indicator of an environmental impact, requiring further NEPA analysis. Water use below this ceiling is not expected to have impacts to the regional aquifer (LANL 2021).

Sanitary Wastewater. DOE operates the TA-46 SWWS to treat liquid sanitary waste. The SWWS is designed to treat up to 220 million gallons per year (about 603,000 gallons per day) of wastewater (NNSA 2008b). A portion of the treated SWWS effluent is pumped to the Sanitary Effluent Reclamation Facility, where it is treated for reuse as cooling-tower makeup water. Treated water is reused in LANL cooling towers and is ultimately released at permitted Outfall 001 in the Sandia Canyon.

Additional details about infrastructure are provided in the following subsections of Appendix C, Section C.1.11:

- Electricity (C.1.11.1)
- Fuel (C.1.11.2)
- Domestic Water (C.1.11.3)
- Sanitary Wastewater (C.1.11.4)

3.1.12 Waste and Materials Management

Operations, DD&D, and environmental remediation at LANL generate radioactive and nonradioactive wastes. Radioactive wastes are classified as LLW, MLLW, and TRU waste. Nonradioactive wastes include hazardous waste, municipal solid waste, construction waste, and sanitary waste. Wastes from LANL are regulated by federal and state regulations, applicable to specific waste classifications. The LANL waste management program, annual waste generation rates and offsite shipments for disposal are described and explained in the 2026 LANL SWEIS.

Radioactive Waste Categories

Low-Level Radioactive Waste (LLW) – LLW is r*adioactive waste that is not high-level radioactive waste; used nuclear fuel; TRU waste; byproduct material (as defined in Section 11e(2) of the Atomic Energy Act of 1954, as amended), or naturally occurring radioactive material (DOE Manual 435.1-1).*

Mixed Low-Level Waste (MLLW) – MLLW is LLW with at least one waste defined as hazardous under the *Resources Conservation and Recovery* Act (RCRA).

Transuranic (TRU) Waste – Per the WIPP Land Withdrawal Act, TRU waste is *radioactive waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) high-level radioactive waste; (2) waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the EPA, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) waste that the U.S. Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. Includes mixed TRU waste.*

Radioactive Waste. The *Atomic Energy Act of 1954, as amended* (42 U.S.C. § 2011 et seq.), gave DOE regulatory authority for the management of its own radioactive waste. Subsequent rulings have limited or clarified that this authority is specific only to the radioactive component of its waste; other elements of waste streams are subject to other regulatory requirements as applicable. The overriding set of requirements the Laboratory must meet in its management of LLW and TRU waste is established in DOE Order 435.1.

Site-wide, activities at LANL generated an average of 4,985 cubic meters of LLW annually from 2017 through 2023. The plutonium facilities in TA-55 generated an average of 302 cubic meters of LLW during the same period (6 percent of the site-wide total). Almost all LANL LLW is sent off site for disposal at the NNSS and commercial, licensed treatment, storage, and disposal (TSD) facilities. LANL can dispose of some LLW on site (NNSA 2026a, Section A.4.11.1.1).

Site-wide, activities at LANL generated an average of 640 cubic meters of MLLW annually from 2017 through 2023. The plutonium facilities in TA-55 generated an average of 45 cubic meters of MLLW during the same period (7 percent). MLLW is sent off site to RCRA-regulated TSD facilities.

Site-wide, activities at LANL generated an average of 388 cubic meters of TRU waste annually from 2017 through 2023. The plutonium facilities in TA-55 generated an average of 205 cubic meters of TRU waste during the same period (27 percent). TRU waste is sent to WIPP for disposal.

Hazardous Waste. Hazardous wastes include all solid wastes that are (1) listed as hazardous by the EPA (listed wastes) or (2) ignitable, corrosive, reactive, or toxic (characteristic wastes). Commonly generated LANL hazardous waste includes many types of research chemicals, solvents, acids, bases, carcinogens, compressed gases, metals, and other solid waste contaminated with hazardous material. Hazardous waste may include equipment, containers, structures, and other items intended for disposal that are considered hazardous (e.g., compressed gas cylinders, contaminated cleanup materials or protective gear) (LANL 2024d).

Other Waste. New Mexico Special Waste (NMSW) is a nonhazardous solid waste that has unique handling, transportation, and/or disposal requirements to assure protection of the environment and the public health, welfare, and safety. NMSW includes treated formerly characteristic hazardous waste, asbestos waste, ash, infectious waste, sludge, industrial solid waste, spill of a commercial chemical product, dry chemicals that become characteristic hazardous waste when wetted, and petroleum-contaminated soil. LANL generates NMSW in various facilities and processes.

Solid sanitary waste materials that are not radioactive or hazardous and cannot be diverted for reuse or recycling are collected through a normal trash collection system operated by Laboratory personnel. Filled garbage trucks take the waste to offsite commercial landfills that have the appropriate permits to receive the waste.

Construction and demolition debris is regulated as a separate category of solid waste under New Mexico Solid Waste regulations and typically consists of soils, broken-up concrete, scrap metals, and various building material waste or rubble.

The Laboratory treats liquid sanitary waste on site at the Sanitary Wastewater Treatment Plant located at TA-46. Treated water is reused in LANL cooling towers and is ultimately discharged at permitted Outfall 001.

Additional details about waste and materials management are provided in the following subsections of Appendix C, Section C.1.12:

- Radioactive Waste (LLW, MLLW, TRU) (C.1.12.1)
- Hazardous Waste (C.1.12.2)

- Other Waste (C.1.12.3)
- Materials Management (C.1.12.4)

3.1.13 Human Health and Safety

Routine operations at LANL have the potential to affect the health of the public and workers. This section characterizes the current baseline for human health for the public and workers at LANL.

3.1.13.1 Public Health

Radiological

Releases of radionuclides into the environment from LANL operations are a source of radiation dose to individuals in the vicinity of LANL. The dose to the maximally exposed individual (MEI)[23] resulting from LANL operations is approximately 4 percent of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) standard of 10 millirem per year. Statistically, the risk of the hypothetical MEI developing a latent cancer fatality (LCF) from exposure to LANL radiological air emissions would be a maximum of 2.4×10^{-7} (or about 1 chance in 4.2 million).

> **Radiation Dose Measurement**
>
> In this PEIS, radiation doses are measured in units of either "person-rem" or "rem."
>
> **Person-rem** is used to measure the total collective radiation dose for a group of people. To determine the population dose, this PEIS sums up the individual dose of every person within a 50-mile radius of LANL. Statistically, approximately 1,667 person-rem would result in one latent cancer fatality (LCF) in that population.
>
> **Rem** is used to measure the radiation dose for a single individual. Individual doses are converted to LCFs by multiplying the dose by 0.0006 (DOE 2003a). For example, an individual who receives a dose of 1.5 rem would have a 0.0009 chance of developing an LCF.

The annual collective dose to the population within 50 miles of LANL averaged approximately 0.09 person-rem over 2020–2023. Statistically, the LCF risk to the population within a 50-mile radius of LANL would be about 5.4×10^{-5} (or about 1 chance in about 18,500). Additionally, as demonstrated by the low radionuclide releases from TA-55 over the past five years (*see* Section C.1.5.2), the contribution to these MEI and population doses from radiological air emissions from TA-55 is very small. The annual doses for more than 30 years of LANL operations show a general downward trend, which is the result of improved engineering controls and ongoing remediation (LANL 2025b, 2025d; NNSA 2026a).

Nonradiological

Effective administrative and design controls that decrease hazardous chemical releases to the environment and help achieve compliance with permit requirements (e.g., via NPDES and NESHAP permits) contribute to minimizing health impacts on the public. The Laboratory's emissions of regulated pollutants are below the amounts allowed in LANL's CAA Title V Operating Permit. There are no measurable health effects to the public from the Laboratory's current air emissions (LANL 2025b).

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[23] The MEI is a hypothetical member of the public who receives the greatest possible dose from LANL operations. This PEIS assumes the site-wide MEI is located at 95 Entrada Drive, close to environmental air-monitoring station 396, per the 2026 LANL SWEIS (NNSA 2026a). This was the location of the MEI dose in 2022. The MEI location potentially changes annually.

3.1.13.2 Worker Health

Radiological

An average of approximately 4,039 workers at LANL received a measurable radiation dose from 2021 through 2023. The annual average individual worker dose from LANL operations is approximately 80 millirem (averaged over the same period). These doses fall within the regulatory limits. The annual LCF risk to an average LANL worker due to radiation exposure from LANL operations is estimated to be 4.8×10^{-5}. Statistically, the probability of a worker developing a fatal cancer at some point in the future from radiation exposure associated with one year of LANL operations is about 1 in 21,000. No excess fatal cancers are projected in the total worker population from one year of normal operations. Since 2020, no worker has exceeded the 2 rem per year LANL administrative control level established for external exposures. Consistent with the past, the TA-55 PF-4 operations accounted for the majority of occupational doses at LANL in 2023. For 2023, the collective dose for workers at TA-55 accounted for 85 percent of the total site-wide worker dose (LANL 2025b, 2025d).

Nonradiological

LANL is a research site in which a large variety of hazardous materials are used. LANL operations represent a potential for exposure of some workers to hazardous materials (such as solvents, metals, and carcinogens). Typically, operations are controlled through specific work control documents so that those workers are only exposed to low levels of chemicals that are below a threshold of concern.

Occupational Injuries

LANL's occupational health and safety performance is measured by injury and illness rates (total recordable cases and days away, restricted, or transferred) pursuant to DOE Orders that use Occupational Safety and Health Administration (OSHA) criteria. The number of total recordable cases at LANL has varied between 201 and 248 for the period 2021–2023, averaging approximately 234 work-related injuries or illnesses annually that result in either death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. During normal operations, LANL workers may be exposed to hazardous conditions that can cause injury or death. The potential for health impacts varies among facilities and workers. In 2023, 72 percent of recordable injury cases resulted from three common causes: struck against/by (30 percent), slip/trip/fall (29 percent), and lift/push/pull cases (13 percent). No work-related fatalities occurred at LANL between 2020 and 2023 (LANL 2025d; NNSA 2026a).

Additional details about human health and safety are provided in the following subsections of Appendix C, Section C.1.13:

- Public Health (C.1.13.1)
- Worker Health (C.1.13.2)

3.2 Savannah River Site

Sections 3.2.1 through 3.1.13 provide a summary of the affected environment for each environmental resource area within the ROIs for the SRS site. The SRS ROIs are presented in Table 3.2-1. Appendix C, Section C.2, provides additional details for the SRS affected environment sections. Figure 3.2-1 presents the locations of planning and management areas within SRS and its location along the Savannah River.

Table 3.2-1 General Regions of Influence for the SRS Existing Environment

Environmental Resource	Region of Influence
Land use	SRS (focused on F Area) and nearby offsite areas
Aesthetic and scenic resources	SRS (focused on F Area) and nearby offsite areas
Geology and soils	SRS (focused on F Area) and nearby offsite areas
Water resources	SRS and adjacent surface water and groundwater under SRS, nearby offsite areas (with a focus on the Savannah River and its tributaries)
Climate and air quality	SRS and nearby offsite areas within local air quality control region (Augusta-Aiken)
Noise	SRS, nearby offsite areas, and access routes to and from SRS
Biological resources	SRS (focused on F Area) and nearby offsite areas
Cultural and paleontological resources	SRS (focused on F Area) and nearby offsite areas
Socioeconomics	The four-county area (i.e., Aiken and Barnwell counties, South Carolina, and Columbia and Richmond counties, Georgia) where the majority of SRS employees reside
Traffic and transportation (including radiological transportation)	Transportation corridors between SRS and other sites where wastes/materials are transported
Infrastructure	SRS (focused on F Area) and nearby offsite areas
Waste and materials management	SRS (focused on E and F Area) and nearby offsite areas, plus offsite waste disposal areas
Human health and safety	SRS and offsite areas within a 50-mile radius

SRS = Savannah River Site

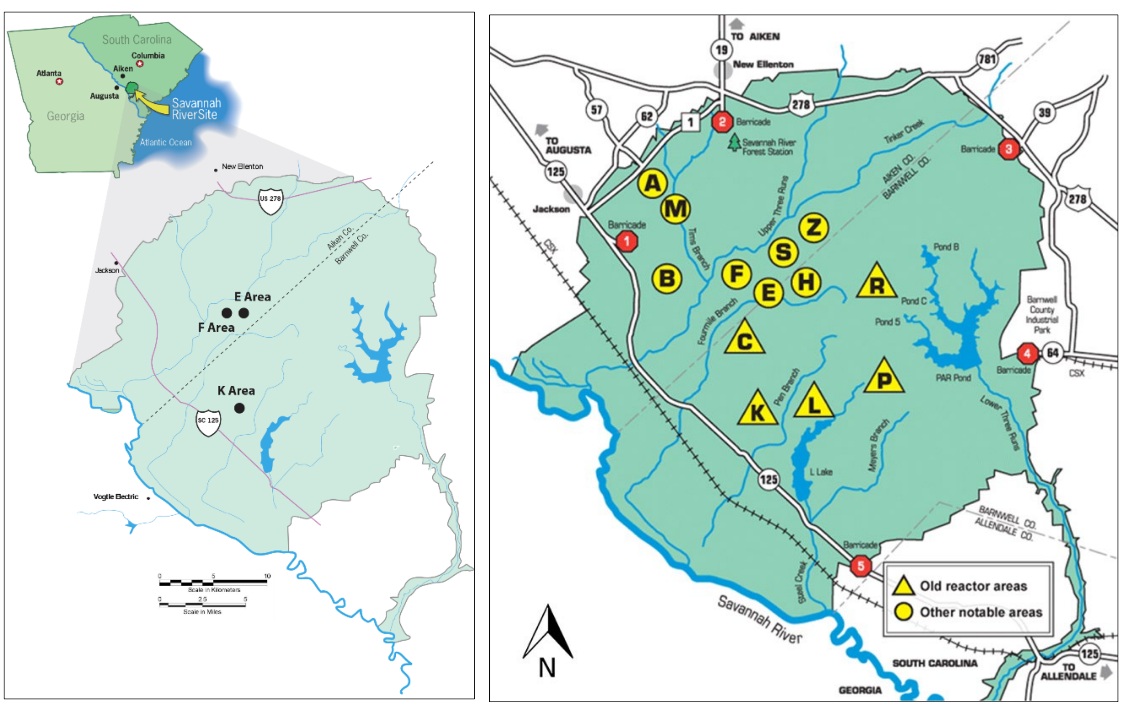

Figure 3.2-1 Location of Areas Within SRS

3.2.1 Land Use

3.2.1.1 Location and Setting

SRS is a 198,344-acre (approximately 310-square-mile) federal reservation located in rural western South Carolina across Aiken, Allendale, and Barnwell counties. It lies about 15 miles southeast of Augusta, Georgia, and 12 miles south of Aiken, South Carolina. Originally acquired in the 1950s for nuclear materials production, the site is primarily forested and undeveloped, with development concentrated in core industrial zones (Figure 3.2-1).

SRS land use is divided into three areas (1) forest/undeveloped land – 73 percent; (2) wetlands, streams, lakes – 22 percent; and (3) developed/industrial areas – 5 percent. Designated as a National Environmental Research Park in 1972, SRS supports energy and environmental research. A "set-aside" program designates over 14,000 acres for ecological study and environmental monitoring. SRS is also managed for natural resources, military training, and mission support (NNSA 2020a).

3.2.1.2 Planning (Management) Areas

The site is divided into six management areas, the largest of which is the Industrial Core Management Area (38,444 acres). The primary objective of this area is to support facilities and site missions. This zone includes F Area, a heavily developed 364-acre section that houses major industrial facilities, including the repurposed MFFF, now being developed into the SRPPF.

Historical and Current Operations. F Area has historically supported chemical separation and nuclear materials processing missions. Three key legacy facilities, F-Canyon, FB Line, and 235-F (also referred to as the F Area Materials Storage facility), remain in surveillance and maintenance status under long-term site stewardship (SRS 2023).

Surrounding Land Uses. Lands in the vicinity of SRS are predominantly undeveloped, forested, or used for agricultural purposes, consistent with land use patterns of the upper Coastal Plain. For the purposes of this analysis, surrounding lands are categorized into four general classes:

1. **Federal** – SRS itself and proximate areas under conservation/stewardship.
2. **State** – Yuchi Wildlife Management Area and the Chem-Nuclear LLW Disposal Facility (GDNR 2025; SCDES 2025).
3. **Private** – Farms, forests, low-density residences, and light industrial use.
4. **Utility infrastructure** – Includes Plant Vogtle, a nearby nuclear power plant (largest in the U.S. by capacity as of 2024) (Southern Nuclear 2025).

Nearby towns include New Ellenton and Jackson, with Augusta serving as the primary urban center.

Additional details about land use are provided in the following subsections of Appendix C, Section C.2.1:

- Location and Setting (C.2.1.1)
- Existing Onsite Land Uses (C.2.1.2)
- Planning (Management) Areas (C.2.1.3)
- Surrounding Land Uses (C.2.1.4)

3.2.2 Aesthetic and Scenic Resources

SRS is largely screened from public view due to dense vegetation and relatively flat terrain.

Onsite Visual Environment. Facilities are concentrated in interior areas like F Area and surrounded by forest. Most structures are hidden from external view, and no visually sensitive areas are present on site. Lighting is present in industrial areas, but distant from the public. There are no visually sensitive locations on SRS. The only areas visually impacted by the SRS facilities are those within the view corridors of South Carolina State Highway (SC) 125 and US 278.

F Area. The F Area is located approximately 3.5 miles from SC 125 and approximately 6.0 miles from US 278. The F Area is not visible to the public due to dense forests and flat topography. Structures range from 10 to 73 feet in height, with some towers up to 200 feet.

Offsite Visual Environment. Neighboring lands include forests, farms, and state recreation areas. No national parks, tribal lands, or scenic viewsheds are nearby. The only potentially sensitive offsite area is the Yuchi Wildlife Management Area across the river, but vegetation blocks most views.

Overall, visual impacts of existing or proposed SRS activities are minimal due to natural screening, distance from public viewpoints, and lack of sensitive visual receptors nearby.

Additional details about aesthetic and scenic resources are provided in the following subsections of Appendix C, Section C.2.2:

- Onsite Visual Environment (C.2.2.1)
- Offsite Visual Environment (C.2.2.2)

3.2.3 Geology and Soils

SRS is situated on the Aiken Plateau, a heavily eroded part of the Atlantic Coastal Plain. This region, characterized by a wedge of unconsolidated river and marine sediments, features gently sloping layers of sand, clay, limestone, and gravel that thicken to about 4,000 feet near the coast (CB&I AREVA 2015). The older, eroded geological formations are covered by these younger, loosely consolidated sediments. The Aiken Plateau itself has broad, flat areas intersected by steep-sided valleys, while the southwestern parts of SRS lie on erosional terraces formed by past marine retreats (NNSA 2015). Notably, there has been no volcanic activity at the site for over 230 million years, and none is expected in the future due to its location on a passive continental margin.

The sedimentary rock strata at SRS include the Tinker/Santee formation, a 50- to 70-foot-thick layer of sand and limestone (CB&I AREVA 2015). This formation is notable for its "soft zones," which are discontinuous areas of calcium carbonate-rich sand. These zones are susceptible to dissolution by water, which can cause ground subsidence. Found throughout SRS, including F Area, these soft zones are not open cavities but are limited in size, typically less than 15 feet thick, and are poorly interconnected. Despite being susceptible to dissolution, these soft zones have been stable under static conditions and have a history of withstanding past earthquakes (NNSA 2020a).

The main seismic risk to SRS is the Charleston seismic zone, located about 70 miles to the southeast of F Area. While there are no faults visible at the surface near SRS, subsurface profiling has identified several minor reverse faults. Despite the proximity, earthquake activity is generally low, with most magnitudes at or below 3.0 (NRC 2005a). The most significant event in the region was the 1886 Charleston earthquake, estimated at a magnitude of 6.8, which caused extensive damage and fatalities in Charleston, but only resulted in an estimated PGA of 0.10g at SRS (NRC 2005a). Between 1973 and 2024, only six earthquakes of magnitude 2.5 or greater were recorded on or near

SRS. The latest USGS data indicate a maximum probabilistic horizontal PGA of 0.13g to 0.20g for the SRS F Area, with most of this risk attributed to the Charleston seismic zone rather than local activity (USGS 2025c). Therefore, earthquakes that could cause structural damage are not expected to originate near the site.

SRS has a wide variety of soils, from sandy and permeable to clay-rich and impermeable. Due to extensive construction, many areas, including F Area, have highly disturbed soil profiles up to six feet deep, often consisting of compacted rock spoil or refuse (NNSA 2015). The site also features Carolina bays, which are shallow, elliptical depressions with sand rims, likely formed by strong winds affecting standing water (CB&I AREVA 2015). The F Area's engineered slopes, located more than 400 feet from the SRPPF, provide proper drainage and erosion control. Site evaluations have confirmed that the SRPPF's location is safe from liquefaction (a process where saturated soil loses strength and stiffness in response to stress, such as from an earthquake) and post-earthquake settlement, ensuring the structure's stability (CB&I AREVA 2015).

Past activities have resulted in soil contamination at SRS. In 2023, the surveillance program collected soil samples from 24 locations, including five on site, 12 at the perimeter, and seven off site. The analysis found naturally occurring uranium isotopes (uranium-233/234, uranium-235, and uranium-238) in all samples. Other radionuclides detected above natural background levels included cesium-137, plutonium-238, plutonium-239/240, americium-241, and curium-233/244. The highest levels of plutonium-238 and plutonium-239/240 were found in the F Area, at 0.039 pCi per gram and 0.139 pCi per gram, respectively. While contamination exists, all dose assessments from soil exposure remain below regulatory limits (SRNS 2024).

The mixed sands, gravels, and clays commonly found beneath SRS are widespread and therefore are of limited commercial value. A possible exception might be well-sorted quartz sand, which is valuable as a filtration medium, an abrasive, and engineering backfill. No sizable, economically valuable deposits of quartz sand occur in F Area (NNSA 2015).

Additional details about geology and soils are provided in the following subsections of Appendix C, Section C.2.3:

- Geologic and Topographic Setting (C.2.3.1)
- SRS Stratigraphy (C.2.3.2)
- Faulting and Seismicity (C.2.3.3)
- Soils and Foundation Stability (C.2.3.4)
- Mineral Resources (C.2.3.5).

3.2.4 Water Resources

This section addresses surface water, groundwater, sediments, and floodplains located on SRS. Wetlands are discussed in Section 3.2.7 as part of biological resources. Water resources in proximity to SRS may be affected by water withdrawals, effluent discharges, waste disposal, spills and unplanned releases, soil erosion, or stormwater runoff from SRS operations. The consumption of domestic water is addressed in Section 3.2.11 as an element of infrastructure.

Surface Water. SRS lies almost entirely within the Savannah River Basin and within the smaller area designated the Middle Savannah River watershed (SCDHEC 2025; Seaber et al. 1987). Surface water drainage within the SRS is generally toward the Savannah River, the predominant surface water feature of the region, or toward tributaries that flow to the Savannah River. The river borders the southwest side of the site and provides the demarcation between the states of South Carolina and

Georgia. The only portion of SRS not draining toward the Savannah River is a small area on the northeast side, where drainage is eastward toward the Salkehatchie River and within the Salkehatchie River watershed (SCDHEC 2025). F Area drains toward the Savannah River.

SRS personnel routinely monitor surface water, stormwater, and sediments as part of their ongoing environmental monitoring and surveillance program. SRS maintains and complies with permits related to protection of surface water and stormwater runoff.

Groundwater. SRS, along with large portions of Alabama, northern Florida, Georgia, and South Carolina, is located over an area designated the Southeastern Coastal Plain Aquifer System, which contains multiple regional aquifers separated by multiple regional confining units as well as many aquifers and confining units of local extent (Miller 1990). There are four aquifer layers beneath SRS that are separated by layers that act as confining units (SRNS 2019). In Aiken County, where roughly the northern third of SRS is located, the Crouch Branch aquifer occurs from approximately 200 to 300 feet below land surface, and the McQueen Branch occurs from approximately 325 to 450 feet below land surface. Most of the wells in Aiken County are screened across both of these aquifers (USGS 2019).

Groundwater contamination at F Area is a result of separations and waste management activities. Maximum groundwater contaminant concentrations in F Area during 2023 exceeded water quality standards for tritium, trichloroethylene, gross alpha, nonvolatile beta, strontium-90, and technetium-99 (SRNS 2025c). Groundwater contamination from SRS operations does not extend beyond SRS boundaries (SRNS 2020a, 2022, 2025c).

Floodplains. There are significant floodplain swamps associated with the Savannah River in the SRS area. Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, as well as the online South Carolina Watershed Atlas (SCDHEC 2025), show the river's 100-year flood zone extending as far as three miles into the SRS along parts of the site's southwest border. At its nearest, F Area is about seven miles from the river. FEMA Flood Insurance Rate Maps also show a 100-year flood zone for Upper Three Runs Creek, the nearest waterbody to the SRPPF. The irregular floodplain for this creek appears to extend several hundred feet toward SRPPF in places, but the distance between the creek's normal bed and the nearest edge of the cleared area around SRPPF is approximately 2,000 feet. In 2000, SRS reported the results of a hydrologic study to develop facility-specific probabilistic flood hazard curves to determine flood elevations as a function of return period for SRS facilities. The study concluded that water elevations in either stream from a 100,000-year flood event would not reach F Area (Chen 2000).

Additional details about water resources are provided in the following subsections of Appendix C, Section C.2.4:

- Surface Water (C.2.4.1)
- Groundwater (C.2.4.2)
- Floodplains (C.2.4.3)

3.2.5 Climate and Air Quality

3.2.5.1 Climatology and Meteorology

The climate at SRS is subtropical, characterized by mild winters and long, humid summers. Meteorological data have been collected at SRS for nearly 35 years. The total annual precipitation over this period averages nearly 46 inches. The annual average temperature is roughly 64°F. Average daily temperatures range from 40°F in January to 80°F in July and August, with extreme temperatures dipping near 20°F in the winter and peaking around 100°F in the summer (SRNL 2021).

Quality. Air quality describes the level of contaminants in the air. Air pollution is a general term that refers to one or more chemical substances that degrade the quality of the atmosphere. The CAA is the basis for most federal air pollution control programs.

Nonradiological

SRS holds a Title V Operating Permit (TV-0080-0041) issued by the South Carolina Department of Health and Environmental Control (SCDHEC)[24] for criteria and hazardous air pollutants. Similar to LANL, the permit establishes emission limits; operational requirements; and testing, monitoring, and reporting obligations for all regulated sources at SRS (SRNS 2024).

SRS uses nonradioactive volatile chemicals (gasoline and toluene), fuels, and combustion products that can adversely affect the environment if released into the air in sufficient quantities. However, the site uses most of these materials in very small quantities, and the environmental impact from their potential release is negligible. Due to the nature and quantity of potential air emissions, regulators do not require SRS to sample or monitor the ambient air for chemical pollutants. Following South Carolina Department of Environmental Services (SCDES) requirements, SRS uses process data to calculate emissions (SRNS 2024).

Radiological

Atmospheric emissions of radionuclides from SRS are regulated under the EPA's NESHAP regulations. Monitoring systems continuously track airborne radionuclide releases from process area stacks, with tritium and krypton-85 accounting for most of the radioactivity released annually. Total annual tritium released from SRS operations from 2017 to 2023 has ranged from about 7,000 to 40,000 curies per year, with an annual average tritium release of 16,600 curies. SRS tritium releases fluctuate from year to year due to deactivation of legacy process buildings, the amount of tritium released during routine operations, and natural decay of tritium (about 5 percent per year) (SRNS 2024). The annual health effects of these releases are presented in Section 3.2.13.

Additional details about climate and air quality are provided in the following subsections of Appendix C, Section C.2.5:

- Climate and Meteorology (C.2.5.1)
- Air Quality (C.2.5.2)
- Visibility (C.2.5.3)

3.2.6 Noise

At SRS, major noise sources in active areas include industrial equipment such as cooling systems, transformers, engines, vents, paging systems, construction, materials handling equipment, and vehicles. Outside these zones, noise mainly arises from vehicular and rail traffic. Most industrial facilities are situated far from site boundaries, resulting in noise levels at the perimeter that are near background conditions, thereby limiting impacts on nearby environments and sensitive receptors (NNSA 2020a).

[24] SCDHEC is now referred to as South Carolina Department of Environmental Services (SCDES).

Additional details about noise, including regulatory review and administrative requirements, are provided in Appendix C, Section C.2.6.

3.2.7 Biological Resources

This section discusses biological resources by habitat type (terrestrial and aquatic/wetland) and status (threatened, endangered, or other special designation). The Natural Resources Management Plan for the Savannah River Site describes how biological resources are managed by DOE (DOE 2019).

Terrestrial Resources. Vegetation on SRS reflects past disturbances and manipulations that have occurred since the land was acquired by the U.S. Government in 1950 and can be broadly classified into forested and non-forested cover types. The vegetation is dominated by bottomland hardwood forests, pine forests, mixed forests and forested, and forested wetland (NNSA 2020a).

The mild climate and varied plant communities host a variety of animal species at SRS. Wildlife known to inhabit SRS includes 44 species of amphibians, 59 species of reptiles, 255 species of birds, and 55 species of mammals (Wike et al. 2006).

Aquatic Resources. Aquatic resources include the aquatic environment and the plants and animals that inhabit it for all or part of its lifecycle. Open water habitats can be flowing rivers and streams such as the Savannah River and its tributaries or manmade ponds and reservoirs with open water not dominated by hydrophytes (i.e., plants growing in standing water or saturated soils). SRS has more than 50 manmade impoundments that support populations of bass and sunfish. The Savannah River is adjacent to SRS along the western border.

Wetlands are areas inundated or saturated by surface- or groundwater at a frequency and duration sufficient to support, under normal circumstances, vegetation typically adapted for life in saturated soil conditions. Wetlands include swamps, marshes, bogs, and similar areas. Diagnostic criteria used to identify wetlands include vegetation, soil, and hydrology (Environmental Laboratory 1987; USACE 2008).

Threatened, Endangered, or Other Special Designation. Protected species are plant and animal species that receive specific protection under federal or state regulations. Federal regulations applicable to SRS include the ESA, MBTA, and BGEPA. State of South Carolina regulations include the *Nongame and* E*ndangered Species Conservation Act* (Section 50-15-10 et seq.). DOE, in collaboration with USFS, has a long history of managing and protecting threatened, endangered, and other special-status species on SRS (DOE 2019; Wike et al. 2006). There are two plant species and seven animal species known to occur on SRS with threatened or endangered status at a state or federal level (NNSA 2020a). The affected plant species are the smooth purple coneflower and pondberry, both federally and state endangered. The affected animal species are bald eagle – state threatened; red-cockaded woodpecker – federally and state threatened; wood stork – federally threatened and state endangered; American alligator – federally threatened; shortnose sturgeon – federally and state endangered; American swallow-tailed kite – state endangered; gopher tortoise – state endangered; and Rafinesque’s big-eared bat – state endangered. The American alligator is recognized as federally threatened due to similarity of appearance to threatened American crocodile.

Additional details about biological resources are provided in the following subsections of Appendix C, Section C.2.7:

- Terrestrial Resources (C.2.7.1)
- Aquatic Resources (C.2.7.2)
- Threatened, Endangered or Other Special Designation (C.2.7.3)

3.2.8 Cultural and Paleontological Resources

Survey efforts at SRS have documented a total of 2,043 archaeological sites and 7 historic buildings or structures dating prior to 1950 (SRNS 2020b). Of the 1,303 pre-contact sites identified at SRS, 82 have been deemed eligible for the NRHP. Similarly, 64 of the 740 historic archaeological sites have been found eligible for listing. All seven historic buildings or structures have been determined eligible for the NRHP (SRNS 2020b).

There are no National Historic Landmarks at SRS. All Cold War-era resources at SRS, built between 1950 and 1989, were inventoried in 2004 (New South Associates 2004). These Cold War-era properties include buildings and structures linked to the development of nuclear materials and technologies for weapons, power generation, and medical applications. One Cold War-era historic district, which includes landscape features, archaeological sites, and built structures, has been determined eligible for NRHP listing (SRNS 2020b).

All potential work related to the current undertaking would take place in F Area. Development of this area in the 1950s likely disturbed much of the existing intact archaeological context; however, while constructing the MFFF and Waste Solidification Building, several NRHP-eligible sites were identified, at least two of which were pre-contact (DOE 2005a). These eligible resources were mitigated through a combination of data recovery and archaeological monitoring, in accordance with a data recovery plan approved by the South Carolina State Historic Preservation Office and the Programmatic Memorandum of Agreement among the DOE Savannah River Operations Office, South Carolina State Historic Preservation Office, and Advisory Council on Historic Preservation (NRC 2005a; SRARP 1989).

Native American tribes with traditional links to the SRS area include the Apalachee, Cherokee, Chickasaw, Creek, Shawnee, Westo, and Yuchi. No traditional cultural properties—such as Native American village sites, ceremonial places, cemeteries, or important natural resource areas—were found within the F Area. Given the developed nature of F Area, DOE determined it would be unlikely that plants of concern to Native American cultures would be present in the project zone (NNSA 2015).

While several facilities in F Area are recognized as NRHP-eligible for their association with SRS's Cold War production mission and the Atomic Energy Commission's peaceful atomic energy, none are expected to be adversely affected by the proposed undertaking (NNSA 2015).

Although fossil-bearing layers exist at SRS, none have been identified in the F Area to date. Due to significant disturbance in the F Area, paleontological resources are unlikely to exist.

Additional details about biological resources are provided in the following subsections of Appendix C, Section C.2.8:

- Cultural Resources Management at SRS (C.2.8.1)
- Cultural Resources at SRS (C.2.8.2)
- Paleontological Resources (C.2.8.3)

3.2.9 Socioeconomics

Socioeconomics examines the social and economic attributes related to a proposed action and its impacts on the ROI. For this PEIS the ROI for SRS includes Aiken and Barnwell counties in South Carolina, and Columbia and Richmond counties in Georgia, defined by where most SRS full-time employee live and spend their income. As of 2023, SRS employed 12,691 people, with around 85 percent residing within the ROI.

Regional Income and Economic Characteristics. Income levels and economic conditions vary across the ROI. Columbia County has the highest median household and per capita income, while Barnwell County experiences the lowest income and highest poverty rate. Aiken County shows moderate economic health with a median household income slightly above the state average. The distribution of SRS employees reflects this economic landscape, with the majority residing in Aiken County, where SRS is a primary employer (BLS 2025a).

Population and Demographic Characteristics. The ROI population was approximately 558,192 in 2023, up from 507,322 in 2010, with steady growth averaging 0.6 percent annually. Aiken County is the largest and fastest-growing county in population, followed by Columbia County with strong growth, Richmond County with stable population, and Barnwell County experiencing decline. Federally recognized tribes are not present within the ROI, but the state-recognized Beaver Creek Indian Tribe is headquartered in Aiken County (USCB 2010, 2023a).

Housing. In 2023, the ROI had about 241,680 housing units with an 84.4 percent occupancy rate and a 15.7 percent vacancy rate, higher than state averages. Aiken, Columbia, and Richmond counties saw growth in housing stock with moderate to high vacancy rates, while Barnwell County's housing stock declined. Median home values ranged from approximately $97,200 in Barnwell County to $287,400 in Columbia County (USCB 2023b).

Local Government Finances. SRS significantly influences local economies, affecting tax revenues and government funding. The four counties' general funds support government operations and community services, such as police and parks. Richmond County has the largest revenue base, followed by Columbia, Aiken, and Barnwell counties (Aiken County 2024, Barnwell County 2024, Columbia County 2023, Richmond County 2024).

Community Services. The ROI is supported by a network of fire departments, law enforcement officers, medical services, and schools.

Additional details about socioeconomics are provided in the following subsections of Appendix C, Section C.2.9:

- Regional Income and Economic Characteristics (C.2.9.1)
- Population and Demographic Characteristics (C.2.9.2)
- Housing (C.2.9.3)
- Local Government Finance (C.2.9.4)
- Community Services (C.2.9.5)

3.2.10 Traffic and Transportation

SRS is surrounded by a system of Interstate highways, U.S. highways, State highways, and local roads. The regional transportation network services the four South Carolina counties (Aiken, Allendale, Bamberg, and Barnwell) and two Georgia counties (Columbia and Richmond) that generate nearly all of the SRS commuter traffic. The closest Interstate highway to SRS is Interstate

20 (I-20), northwest of Aiken and Augusta, and is the major transportation route from the local area to Columbia, South Carolina, and Atlanta, Georgia, and points beyond. Truck shipments to and from SRS primarily enter the region on I-20**.** Trucks to and from SRS primarily use the I-520 loop and SC 125.

Vehicular access options to SRS are provided via SC 19, 64, 125, and 781, and US 278. The northern perimeter of the site is located approximately 10 miles from downtown Aiken. Another primary road, US 301, crosses the Savannah River directly to the south of SRS. Level of service (LOS) ratings of "B," "C," and/or "D" are typically prevalent along the critical transportation corridors that surround SRS, particularly during peak commuting hours. Within the site itself, there are approximately 130 miles of primary and 1,100 miles of secondary roads that connect the site's operational areas, along with several-thousand designated spaces and other marked/unmarked areas for parking.

In 2023, there were approximately 4,700 motor vehicle accidents collectively within Aiken, Barnwell, and Allendale counties, resulting in 45 total fatalities. None of these fatalities occurred on site or on the roads immediately surrounding the SRS perimeter. When extending outward to the other surrounding counties within the full 50-mile ROI, the total collective number of motor vehicle accidents over the entire ROI in 2023 was approximately 30,200, with an associated resulting 215 collective fatalities.

Hazardous, radioactive, and nonhazardous materials, including wastes, are transported to, from, and on SRS. Regulations and requirements from the USDOT, NRC, and DOE govern the transportation of hazardous and radioactive materials. Offsite transport of radioactive materials associated with site-wide operations exclusively occurs using commercial tractor-trailers and/or DOE safe-secure trailers. Transported radioactive materials include, but are not limited to plutonium metals and oxides, MLLW, and TRU wastes.

Additional details about traffic and transportation are provided in the following subsections of Appendix C, Section C.2.10:

- Regional and Site Transportation Routes (C.2.10.1)
- Onsite Parking (C.2.10.2)
- Traffic Accidents – Historical Data (C.2.10.3)
- SRS Shipments (C.2.10.4)

3.2.11 Infrastructure

Site infrastructure includes those basic resources and services required to support planned construction and operations activities and the continued operation of existing facilities. For the purposes of this PEIS, infrastructure is defined as electricity, fuel, water, sanitary wastewater, and steam. Table 3.2.11-1 presents information about the SRS site-wide infrastructure and capacity.

Table 3-2.11-1 Savannah River Site Site-Wide Infrastructure

Resource	Current Estimated Use	Capacity	Available Capacity[a]
Electricity – power consumption (MW-hr/yr)[b]	320,000[c]	4,400,000[b]	4,080,000
Electricity – peak load (MW)[b]	60	500	440
Fuel – Diesel and oil (GPY) (A, F, and K areas)	425,772[d]	NA[e]	NA[e]
Biomass (tons per year)	300,000	20,000,000	19,700,000
Steam (million pounds per year)	571[c]	2,628[c]	2,057
Domestic water (GPY)	288,000,000	788,000,000	500,000,000
Sanitary wastewater (GPY)[b]	115,000,000[c]	383,000,000[f]	268,000,000

GPY = gallons per year; MW = megawatts; MW-hr/yr = megawatt-hours per year; NA = not applicable

a Available capacity equals capacity minus current estimated use.

b Data are from NNSA 2015.

c Data are from SRNS 2023a.

d Fuel usage results from estimated oil use (NNSA 2015) and present diesel use (SRNS 2023a). Current use at F Area is 718 GPY (NNSA 2020a).

e Capacity is generally not limited, as delivery frequency can be increased to meet demand.

f Capacity includes the Central Sanitary Wastewater Treatment Facility and smaller treatment units in K Area and L Area.

The SRPPF complex is located in F Area. Table 3.2.11-2 summarizes the current use of F Area resources.

Table 3.2.11-2 Current Use of Resources at F Area

Resource	F Area
Electricity – power consumption (MW-hr/yr)	46,000
Electricity – peak load (MW)	10
Diesel/fuel oil (GPY)	718
Domestic water (GPY)	61,000,000

GPY = gallons per year; MW = megawatts; MW-hr/yr = megawatt-hours per year
Source: NNSA 2015; SRNS 2020b

Electricity. Most of the electrical power consumed by SRS is generated by offsite coal-fired and nuclear power plants. Power is supplied by three transmission lines. Approximately 320,000 megawatt-hours per year of electricity is used at SRS, with an available capacity of 4,080,000 megawatt-hours per year (NNSA 2015). The peak load use is estimated to be 60 megawatts, with a peak load capacity of 500 megawatts.

The current estimated power consumption for F Area is approximately 46,000 megawatt-hours per year, which accounts for approximately 14 percent of current site-wide electrical usage and represents about 1 percent of the site-wide capacity. The theoretical maximum peak load that F Area could experience is 10 megawatts, compared to a site-wide peak load of 60 megawatts (SRNS 2020a).

Fuel. Biomass, backed up with fuel oil, is used at SRS to produce steam in boiler plants (SRNS 2018). Fuel oil is also used to power emergency generators. Natural gas is not used at SRS (DOE 2005b).

Domestic Water. Three large domestic water supply systems at SRS deliver the vast majority of the site's requirements. These water treatment facilities are located in A Area and K Area. A smaller system located in B Area is a backup to the facility in A Area. The A Area supply system supplies most of the site and has a maximum capacity of 1.58 billion gallons per year when two wells are operating; however, it normally operates one well at 788 million gallons per year (SRNS 2023a). Raw water is drawn from subsurface aquifers through 20-inch-diameter production wells. Once treated, the potable water is stored in five elevated storage tanks and distributed to the various facilities through a network of piping (DOE 2005b).

Sanitary Wastewater. The Central Sanitary Wastewater Treatment Facility collects and treats 97 percent of sanitary wastewater generated at SRS. The remaining balance of sanitary wastewater is treated at three smaller, independent facilities located in D Area, K Area, and L Area (NNSA 2020a).

Steam. The current mission for the steam generation and distribution system is to provide an uninterrupted steam supply for chemical processing or building heat. The steam generation and distribution system at SRS is composed of four steam production facilities and multiple feed line headers. The site is estimated to use about 571 million pounds of steam annually. The site capacity to produce steam is approximately 2,600 million pounds per year (SRNS 2023a).

Additional details about infrastructure are provided in the following subsections of Appendix C, Section C.2.11:

- Electricity (C.2.11.1)
- Fuel (C.2.11.2)
- Domestic Water (C.2.11.3)
- Sanitary Wastewater (C.2.11.4)
- Steam (C.2.11.5)

3.2.12 Waste and Materials Management

SRS operations generate radioactive and nonradioactive wastes. Radioactive wastes are classified as high-level radioactive waste (HLW), LLW, MLLW, and TRU waste. Nonradioactive wastes include hazardous waste, municipal solid waste, construction waste, and sanitary waste. Wastes from SRS operations are regulated by federal and state regulations, applicable to specific waste classifications. Although the Proposed Action would not generate HLW, HLW management at SRS is a significant element of SRS waste management operations, and elements of HLW management are included in the management of other radioactive wastes. Therefore, HLW is discussed in this section and Appendix C but is not discussed in sections that address impacts to waste management.

Radioactive Waste. The primary waste materials managed as HLW at SRS are the radioactive liquid wastes being held in the site's tank farm facilities and the solidified product generated from its treatment. SRS currently has about 34 million gallons of HLW stored in 43 underground tanks in F Area and H Area tank farms (SRS 2022). As noted above, HLW management is not affected by proposed pit production activities.

LLW typically includes miscellaneous job control waste, equipment, plastic sheeting, gloves, and soil that are contaminated with radioactive materials. At SRS, the LLW category also includes waste streams from large-scale waste management operations; i.e., liquid LLW going to the Effluent Treatment Facility (ETF) and treated salt waste. Most SRS LLW is disposed of on site in E Area. From 2020 to 2023, SRS generated an average of 4,681 cubic meters of LLW per year. MLLW is generated by various SRS activities and operations, including environmental cleanup, DD&D, and construction. MLLW is sent off site to RCRA-regulated TSD facilities. From 2020 to 2023, SRS generated an average of 4.2 cubic meters of MLLW per year.

TRU waste generated at SRS typically consists of radiologically contaminated items, such as clothing, tools, rags, residues, and debris. TRU waste is sent to WIPP for disposal. From 2020 to 2023, SRS generated an average of 128.2 cubic meters of TRU waste per year.

Hazardous Waste. Hazardous wastes include all solid wastes that are (1) listed as hazardous by the EPA (listed wastes) or (2) ignitable, corrosive, reactive, or toxic (characteristic wastes). Typical hazardous waste at SRS includes RCRA metals, solvents, paints, pesticides, and hydrocarbons. PCB wastes, though regulated under the *Toxic Substances Control Act of 1979* (15 U.S.C. § 2601 et seq.) rather than RCRA, are managed under the SRS Hazardous Waste Program.

Other Waste. Nonhazardous solid waste is neither hazardous nor radioactive and consists of two categories: solid sanitary waste commonly disposed of in municipal sanitary landfills, and construction and demolition waste.

Liquid sanitary waste at SRS is treated on site at the Central Sanitary Wastewater Treatment Facility and discharges the output to NPDES-permitted outfalls.

Additional details about waste and materials management are provided in the following subsections of Appendix C, Section C.2.12:

- Radioactive Waste (C.2.12.1)
- Hazardous Waste (C.2.12.2)
- Other Waste (C.2.12.3)
- Materials Management (C.2.12.4)

3.2.13 Human Health and Safety

Routine operations at SRS have the potential to affect the health of the public and workers. This section characterizes the current baseline for human health for the public and workers at SRS.

3.2.13.1 Public Health

Radiological

Releases of radionuclides into the environment from SRS operations are a source of radiation dose to individuals in the vicinity of SRS. The dose to the MEI[25] resulting from SRS operations (0.25 millirem) is less than 1 percent of the NESHAP standard of 10 millirem per year. Statistically, the risk of the hypothetical MEI developing an LCF from exposure to SRS radiological air emissions would be a maximum of 1.4×10^{-8} (or about 1 chance in 72 million) (SRNS 2024).

The annual collective dose to the population within 50 miles of SRS averaged approximately 3.5 person-rem for the period 2020–2023. Statistically, the LCF risk to the population within a 50-mile radius of SRS would be about 2.1×10^{-3} (or about 1 chance in about 500). Over the past 10 years of SRS operations, the annual doses (airborne pathways plus liquid pathways) to a representative person living around SRS have been steady, ranging from about 0.16 to 0.36 millirem per year (SRNS 2024).

[25] The MEI is a hypothetical member of the public who receives the greatest possible dose from SRS operations.

Nonradiological

Effective administrative and design controls that decrease hazardous chemical releases to the environment and help achieve compliance with permit requirements (e.g., via NPDES and NESHAP permits) contribute to minimizing health impacts on the public. Emissions of regulated pollutants from SRS operations are below the amounts allowed in SRS's CAA Title V Operating Permit. There are no measurable health effects to the public from SRS's current air emissions (SRNS 2024).

3.2.13.2 Worker Health

Radiological

There are approximately 4,192 workers at SRS who receive a measurable radiation dose. The annual average individual worker dose from SRS operations is approximately 32 millirem (averaged over the period 2020–2023). These doses fall within the regulatory limits. The annual LCF risk to an average SRS worker due to radiation exposure from SRS operations is estimated to be 1.9×10^{-5}. Statistically, the probability of a worker developing a fatal cancer at some point in the future from radiation exposure associated with one year of SRS operations is about 1 in 52,000. No excess fatal cancers are projected in the total worker population from one year of normal operations. Since 2007, no worker exceeded the 500 millirem per year SRS administrative control level established for external exposures (SRNS 2024).

Nonradiological

SRS is an NNSA production site in which a large variety of hazardous materials are used. SRS operations represent a potential for exposure of some workers to hazardous materials (e.g., solvents, metals, and carcinogens). Typically, operations are controlled through specific work control documents so that those workers are only exposed to low levels of chemicals that are below a threshold of concern.

Occupational Injuries

SRS's occupational health and safety performance is measured by injury and illness rates (total recordable cases and days away, restricted, or transferred) pursuant to DOE Orders that use OSHA criteria. The number of total recordable cases at SRS has varied between 50 and 87 for the period 2021–2023, averaging approximately 66 work-related injuries or illnesses annually that result in either death, days away from work, restricted work or transfer to another job, medical treatment beyond first aid, or loss of consciousness. The most common types of recordable injury cases resulted from three common causes: struck against/by, slip/trip/fall, overexertion, exposure to a caustic/noxious/allergenic substance, and repetitive motion. The last work-related fatality at SRS was December 2018 at the Salt Waste Processing Facility.

Additional details about human health and safety are provided in the following subsections of Appendix C, Section C.2.13:

- Public Health (C.2.13.1)
- Worker Health (C.2.13.2)

4.0 ENVIRONMENTAL CONSEQUENCES

In this chapter, NNSA discusses the potential direct and indirect environmental consequences (or impacts) of the alternatives described in Chapter 2. NNSA compared these impacts with the baseline conditions described in Chapter 3, Affected Environment. The potential impacts are presented separately for each pit production site. Impacts within the LANL ROI (*see* Section 3.1) are presented in Section 4.1 and impacts within the SRS ROI (*see* Section 3.2) are presented in Section 4.2. The potential impacts (e.g., Sections 4.1.1 through 4.1.13) are presented in the same order as the resource descriptions in Chapter 3. In addition, this chapter presents potential consequences associated with accidents (e.g., Section 4.1.14) and with the eventual DD&D of the pit production facilities (e.g., Section 4.1.15). The comparison of impacts among alternatives is presented in respective tables in Chapter 2, Section 2.9.

Each of the resource areas for both sites evaluate the potential effects of the project enhancements that are being considered for implementation, as described in Section 2.7. These effects are addressed based on currently available information. As the design details of the project enhancements become more mature, additional NEPA review may be necessary.

Section 4.3 presents potential impacts that could occur in those resource areas that could be additive if both sites were producing pits concurrently under the Multi-Site Alternative.

4.1 Los Alamos National Laboratory

Under the No-Action Alternative, NNSA will continue to implement the decision announced in the amended ROD (85 FR 54544, September 2, 2020) to produce 30 ppy at LANL with surge capability up to 80 ppy. This decision was reaffirmed in the ROD, based on the 2026 LANL SWEIS (NNSA 2026a). This applies to all resources in this section.

4.1.1 Land Use

The analysis in this section presents the potential impacts on land use from each of the alternatives. Key metrics presented in the land use analysis include: (1) the number and footprint of new facilities and infrastructure; (2) the total area of land disturbance and the conversion of currently undeveloped land; (3) operational changes that could affect land use patterns or site functionality; and (4) a qualitative analysis of consistency with current land use plans, classifications, and policies. This analysis focuses on the Pajarito Corridor, which contains the majority of pit production activities.

4.1.1.1 No-Action Alternative

The potential impacts to land use associated with pit production are a subset of the site-wide impacts described in Section 5.1 of the LANL SWEIS and are incorporated by reference into this PEIS. A summary of key impacts is presented below.

Implementation of the No-Action Alternative will increase facility square footage and result in additional land disturbance within the Pajarito Corridor, as summarized in Tables 4.1-1 and 4.1-2. Table 4.1-1 identifies the permanent changes to developed land area, and Table 4.1-2 identifies the facility and infrastructure footprint. The impacts associated with this development have been analyzed and considered in the 2026 LANL SWEIS (NNSA 2026a).

Under the No-Action Alternative, approximately 99 acres of development are associated with pit production activities that will occur on site at LANL, consisting of about 70 acres of permanent disturbance for facility and infrastructure development and about 29 acres of temporary disturbance for construction laydown areas.[26] Of the 70 acres of facility and infrastructure development, approximately 66 acres will be located within the Pajarito Corridor and 4 acres elsewhere at LANL. These 4 acres will be used for TRU waste storage areas within the NEEWC and Balance of Site planning areas. Of the 29 acres of laydown areas, approximately 23 acres will be within the Pajarito Corridor, and the remaining 6 acres will be developed in the Balance of Site and Core Area planning areas. The total permanent development within the Pajarito Corridor (66 acres) is summarized in in Table 4.1-1.

Table 4.1-1 Developed Land Area in Pajarito Corridor (acres)

Condition	Total Land Area	Buildable Land Area	Developed Land Area	Percent of Buildable Developed	Percent Increase
Baseline	1,148	616	383	62	NA[a]
Pit Production at LANL			449	72	17

LANL = Los Alamos National Laboratory; NA = not applicable
a Indicates the baseline conditions; therefore, percent increase is not applicable.
Note: Laydown areas are considered temporary disturbances and are not captured in this table.

Table 4.1-2 Gross Square Feet and Development Density in Pajarito Corridor

Condition	Gross Square Feet	Development Density[a]	Percent Increase
Baseline	1,892,000	3,071	NA[b]
Pit Production at LANL	2,527,000	4,100	34

LANL = Los Alamos National Laboratory; NA = not applicable
a development density = gross square feet/buildable land area.
b Indicates the baseline conditions; therefore, percent increase is not applicable.

Distributed across the assumed nine-year construction period, the total land disturbances reflect an average of approximately 10 acres of disturbance per year, representing a 25-percent increase over baseline conditions. As reflected in Table 4.1-2, this alternative also would include approximately 30 new facilities with a combined footprint of about 635,000 square feet. This represents a 34-percent increase over existing conditions. Of the 70-acre permanent onsite development footprint, 43 acres would occur on previously developed land, and 27 acres are currently undeveloped.

The estimates presented in this analysis do not include any recovery of land through ongoing DD&D activities at LANL, which are expected to offset some of the impacts of the planned development. Impacts associated with DD&D were evaluated in the No-Action Alternative and Modernized Operations Alternative in the 2026 LANL SWEIS (NNSA 2026a). Accordingly, the values presented above and in Tables 4.1-1 and 4.1-2 represent bounding estimates; actual impacts likely would be lower.

The No-Action Alternative would not result in offsite impacts to land use plans or programs. No land would be acquired, conveyed, or withdrawn from existing ownership or jurisdiction. Proposed activities are largely confined to the Pajarito Corridor and will not extend beyond LANL's site boundaries with the exception of material shipments and other transportation activities. Accordingly,

[26] A laydown area is a temporary construction support zone used for the staging of materials, equipment, and related activities. These areas are not classified as permanent land disturbances for this analysis and would be restored to pre-construction conditions upon completion of construction activities.

there will be no actions on adjacent or non-federal lands, and no conflicts with local, regional, or federal land use plans, policies, or programs.

During steady-state operations (after completion of construction and recovery of the construction laydown areas), land disturbance and facility use within the Pajarito Corridor will be limited to routine maintenance, operations, and any minor modifications necessary to support production. No additional permanent land development beyond that described above is anticipated. Consequently, impacts on land use and the facility footprint are minimal, and overall conditions remain consistent with the bounding estimates presented in Tables 4.1-1 and 4.1-2.

4.1.1.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.1.2 for the potential land use impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy.

For all three production levels, the land use impacts at LANL would be consistent with those described in Section 4.1.1.1. No efficiencies in land use would be realized from reducing production because the full complement of supporting facilities and infrastructure would be constructed and maintained irrespective of the production level.

A standby level of production would still require site-specific operational features—for example, safety buffers, access corridors, and utility provisions—to remain in place, preventing any reduction in the permanent development footprint or land disturbance within the Pajarito Corridor.

4.1.1.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and land use impacts associated with operations would be the same as those described in Section 4.1.1.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to sustain production competencies. This reduced production at LANL would not lessen potential land use impacts relative to the No-Action Alternative for the reasons described in Section 4.1.1.2.

4.1.1.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a suitable location on site. A suitable location likely would be a previously disturbed area within LANL that is already in use for industrial activities. Land use impacts would not be expected from this enhancement. There are no other project enhancements being evaluated that could affect land use impacts at LANL.

4.1.2 Aesthetic and Scenic Resources

The analysis in this section presents the potential impacts on aesthetics and scenic resources for the alternatives. Key metrics in this analysis include: (1) the type, extent, and footprint of land disturbances or new features (e.g., structures, lighting, or ground modifications) that could alter the visual landscape; (2) BLM Visual Resource Management (VRM) classification changes resulting from these alterations; (3) operational changes that could affect the visibility or character of the landscape; and (4) a qualitative assessment of scenic quality and viewer experience, particularly in areas of high visual sensitivity. This analysis primarily focuses on visual impacts on the Pajarito

Corridor, which contains the majority of pit production activities, but addresses other areas on and off site that may be impacted by the Proposed Action.

4.1.2.1 No-Action Alternative

Visual impacts are primarily driven by the scale of land disturbance. Under the No-Action Alternative, total disturbance will be approximately 99 acres (89 acres in the Pajarito Corridor and 10 acres elsewhere at LANL). A summary of key impacts is presented below.

Onsite Visual Environment

The primary visual impacts under the No-Action Alternative will result from the development of facilities and infrastructure required to support pit production. Chapter 2, Section 2.4 identifies the specific facilities and infrastructure planned. Offices, warehouses, and TRU waste staging areas comprise the majority of new facility development, while roadways, parking areas, and buffer zones account for most of the associated infrastructure.

Construction activities will generate short-term visual impacts from the presence of heavy equipment, buildings in various stages of construction, and localized dust. Cranes and temporary laydown areas also will contribute to temporary visual effects; however, such activities are not atypical for LANL. Nearly all development will occur within the interior of the Pajarito Corridor, and construction-related activities will not be visible at or beyond the LANL boundary. Those activities that would be visible from at or beyond the LANL boundary (for example, TRU waste staging facilities in the NEEWC and Balance of Site planning areas) would be similar to the form and function of the existing built environment at LANL. Observers, on and off site, will view these activities as consistent with past construction or other developed areas at LANL.

Long-term visual impacts are not anticipated. New facilities and infrastructure will be driven by function and purpose and will be visually consistent with the existing built environment. Because the Pajarito Corridor is already classified as VRM Class IV—the lowest rating—no further downgrade is possible. Class IV areas are characterized by high-intensity, dense development; therefore, the addition of new or replacement facilities and infrastructure would remain compatible with the existing visual setting.

Offsite Visual Environment

Construction of the planned pit production facilities and infrastructure will not result in offsite visual impacts due to their interior location within LANL, where sightlines are constrained by distance, intervening topography, and vegetation. During operations of the facilities, no offsite visual impacts are anticipated, as continued operations at PF-4 will not increase the intensity or extent of activities beyond existing operational conditions. The only change relative to the offsite visual environment would be the increased traffic and radiological transportation associated with increased commuting personnel and shipments of waste and nuclear materials. This is addressed in Section 4.1.10 as part of traffic and transportation impacts.

4.1.2.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.2.2 for the visual resource impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy.

For all three production levels, the visual impacts at LANL would be consistent with those described in Section 4.1.2.1. Visual impacts during construction are primarily a function of land disturbances and construction activities. Accordingly, because no efficiencies in land use would be realized from reducing production, there would be no corresponding change in visual impacts.

A standby level of production would still require site-specific operational features—for example, as safety buffers, access corridors, and utility provisions—to remain in place, preventing any reduction in the permanent development footprint or land disturbance within the Pajarito Corridor. Any minor visual benefits from reduced production during steady-state operations (e.g., a reduction in shipments) likely would be negligible to the public.

4.1.2.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy, and visual impacts associated with operations would be the same as those described in Section 4.1.2.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to sustain production competencies. This reduced production at LANL would not lessen potential visual impacts relative to the No-Action Alternative for the reasons described in Section 4.1.1.2. The only exception would be the reduction of traffic and transportation of radiological materials, which are discussed in Section 4.1.10.3.

4.1.2.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. An additional truck and trailer in an industrialized area would not notably contribute to visual impacts. There are no other project enhancements being evaluated that could affect aesthetic and scenic resources at LANL.

4.1.3 Geology and Soils

The analysis in this section presents the potential impacts on geology and soils for the alternatives and includes hazards to facilities and infrastructure from geologic conditions. Key metrics in this analysis include: (1) the total area of soil disturbance, (2) the potential for causing erosion or soil loss, and (3) analysis of whether soils and geologic features would support new or modified facilities (e.g., potential for landslides and other soil instabilities). In addition, the analysis identifies and discusses seismic parameters for facilities.

4.1.3.1 No-Action Alternative

The potential geology and soils hazards and impacts associated with pit production are a subset of the site-wide impacts described in Section 5.3 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a).

The total disturbance of land is expected to involve approximately 99 acres for projects related to the production of up to 80 ppy. This includes about 29 acres of temporary disturbance for construction laydown areas that would eventually be restored. Although activities associated with the No-Action Alternative are not expected to significantly impact geology and soils, there are some geological hazards that apply to LANL facilities, such as the potential for seismic events. A summary of key impacts is presented below.

The No-Action Alternative does not include any new activities that would result in additional slope instability or other soil movement impacts. In general, the majority of existing facilities and activities associated with the No-Action Alternative have occurred on previously disturbed land that has been engineered for necessary foundation stability to ensure facility and infrastructure integrity. Therefore, potential impacts involving slope stability, subsidence, or liquefaction are considered negligible.

None of the projects or actions identified for the No-Action Alternative include activities that could activate or modify the movement of magma, initiate volcanic activity or movement of faults, or increase the probability of seismic events at the LANL site or in the region. Faulting and seismic events, however, could result in potential hazards to existing and planned pit production and associated facilities at the LANL site. A site-specific, comprehensive update to the 2007 and 2009 probabilistic seismic hazard analyses to be used for input to design of critical facilities and infrastructure is currently underway for new construction and for evaluating upgrades and modifications to existing facilities to ensure safe parameters during operations and potential accidents. Potential accidents at LANL and subsequent impacts applicable to all alternatives resulting from seismic events are evaluated in Section 4.1.14 of this PEIS.

Most of LANL is not industrialized, so the majority of the soil column is not disturbed, and few LANL processes involve subsurface work, so there is limited interaction with geological materials. Although approximately 99 acres of soils could be affected, the No-Action Alternative does not include any activities that would significantly impact the potential for soil erosion or the level of past chemical or radiological contamination from legacy activities. As identified in Section 4.1.1, the total disturbance of 99 acres includes many areas that have already been developed. NNSA estimates that about 27 acres of this development would be in areas that have not been previously disturbed.

The No-Action Alternative will not affect the mineral resources in use at LANL. The potential mineral resources at LANL and nearby locations include sand, gravel, and pumice. These materials are used for backfill and grading, cover material during remediation efforts, concrete preparation, and landscaping. The activities associated with the No-Action Alternative are not expected to impact the availability of borrow material.

4.1.3.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.3.2 for geology and soils hazards and impacts at SRS). As discussed in Chapter 2, Section 2.5, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. Regardless of the level of annual pit production, the impacts at LANL would be the same as described in Section 4.1.3.1.

4.1.3.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy, and geology and soils hazards and impacts associated with operations would be the same as those described in Section 4.1.3.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to sustain production competencies. This reduction in pit production at LANL would not change the potential geology and soils hazards and impacts relative to the No-Action Alternative for the same reasons as described in Section 4.1.1.2.

4.1.3.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor that could be driven to a previously disturbed area within LANL is already in use for industrial activities. There would be no additional land disturbance and no impact on the surrounding soil. The trailer would be configured with containment systems to ensure that liquids would not be released to the environment during or after the compaction (LANL 2026a). There are no other project enhancements being evaluated that could affect geology and soils at LANL.

4.1.4 Water Resources

The analysis in this section presents the potential impacts on water resources for the alternatives and includes both surface water and groundwater impacts. Key metrics presented in this analysis include: (1) increases in impervious areas and effects on stormwater; (2) analysis of effluents and the potential for surface/groundwater contamination; and (3) potential floodplain impacts. Potential impacts to wetlands are discussed in Section 4.1.7 of this PEIS. Potential impacts associated with water use (consumption) at LANL are discussed in Section 4.1.11.

4.1.4.1 No-Action Alternative

The potential water resources impacts associated with pit production are a subset of the site-wide impacts described in Section 5.4 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a). A summary of key impacts is presented below.

Surface Water

Under the No-Action Alternative, total land disturbance would be about 99 acres (about 70 acres associated with the construction of new support facilities/infrastructure and upgrades to existing facilities and 29 acres for construction laydown areas, which would eventually be restored). About 27 of these acres are previously undisturbed. This is a subset of the total land disturbance evaluated in the 2026 LANL SWEIS under the Expanded Operations Alternative (total of 1,137 acres, 806 of which were previously undisturbed). In the long term, the potential for impacts to stormwater would be small because TA-55 is already highly developed, and the introduction of new impervious surfaces would be negligible.

During construction associated with the No-Action Alternative, the Laboratory will meet stormwater compliance monitoring requirements of the NPDES construction general permit. Implementation of the general permit, stormwater pollution prevention plan, and low-impact development controls would minimize potential erosion, impacts to stormwater quality from sediment, and alteration of existing drainage patterns during construction and operations. The Laboratory would follow mitigation steps outlined in its spill prevention, control, and countermeasures plan in the event of a spill of potential contaminants. Implementation of such plan would minimize any impacts from spills during construction and operations. Surface water monitoring would continue in accordance with the Laboratory's ongoing environmental monitoring and surveillance program and permit requirements to determine whether any radioactive or nonradioactive constituents released on the LANL site might have a negative impact on public health and the environment. Stormwater monitoring would continue in accordance with the Laboratory's multi-sector general permit and individual permit. Wastewater monitoring would continue in accordance with the NPDES Industrial Point-Source Outfall Program (i.e., NPDES-permitted outfalls). Because the new facilities associated with the No-Action Alternative support ongoing missions and operations, there would be no notable changes in liquid effluents. No impacts to downstream receiving surface waters would be expected.

Groundwater

During construction and operations of facilities under the No-Action Alternative, groundwater resources would be protected from potential contaminant releases. Potential contaminant sources could include construction materials; spills of hydraulic fluid, oil, and diesel fuel; and releases from transportation or waste handling accidents. The Laboratory would follow prevention and mitigation steps from its spill prevention, control, and countermeasures plan in the event of a hazardous material spill. Since employees are trained in spill response procedures, any spills likely would be cleaned up before they reach perched groundwater or the regional aquifer. Impacts to groundwater quality from surface water recharge would be minimized by complying with NPDES and Wastewater Discharge Permit limits and requirements.

Floodplains

At LANL, the floodplains are generally located in canyons that lie between the mesa fingers. The No-Action Alternative would not affect the floodplains at LANL. If construction were to occur within or near floodplains, this would require compliance with Executive Order 11988, "Floodplain Management," which requires floodplain assessment and floodplain protection measures.

4.1.4.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.4.2 for the water resources impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. Impacts from the production of 30 and 80 ppy would be the same as described in Section 4.1.4.1. Impacts from the production of 10 ppy are described in Section 4.1.4.3.

4.1.4.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and water resources impacts associated with operations would be the same as those described in Section 4.1.4.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. In this case, total land disturbance would be the same as described in Section 4.1.4.1, and the potential impacts to stormwater, surface water, groundwater, and floodplains would be same as the No-Action Alternative. No adverse impacts to water resources are expected under the Single-Site Alternative.

4.1.4.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. The trailer would be configured with containment systems to ensure that liquids would not be released to the environment during the compaction (LANL 2026a). Therefore, this enhancement would not adversely impact surface water, groundwater, or floodplains. There are no other project enhancements being evaluated that could affect water resources at LANL.

4.1.5 Air Quality

The analysis in this section presents the potential impacts on air quality for the alternatives. Key metrics presented in the air quality analysis are quantities of projected air emissions (both nonradiological and radiological) from new construction activities, operations, and waste transport compared to applicable air quality standards.

4.1.5.1 No-Action Alternative

The potential air quality impacts associated with pit production are a subset of the site-wide impacts described in Section 5.5 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a). A summary of key impacts is presented below.

Radiological Emissions. As reported in the 2026 LANL SWEIS, pit production is expected to provide a minor contribution to the increase in radiological emissions (NNSA 2026a). The radioactive air emissions from production of 30 ppy would be about 4.5×10^{-8} curies per year of PuEq. The radioactive air emissions from production of 80 ppy are estimated to increase to 1.2×10^{-7} curies per year of PuEq (NNSA 2026a, Appendix H, Section H.1.3.1). The increased dose to the public from these radiological emissions is described in Section 4.1.13.

Nonradiological Emissions. Sources of nonradiological criteria air pollutant emissions at LANL include the operation of facilities and laboratory testing; heating and cooling; use of construction equipment during construction, DD&D, and remediation; land disturbance; commuting personnel; and transporting waste and other materials. Emissions from these activities meet annual standards, with the exception of PM_{10}[27] from land clearing. PM_{10} represents larger soil particles that can become airborne after vegetation removal during land clearing; $PM_{2.5}$[28] (discussed later) is more representative of smaller particles generated from combustion emissions. LANL is expected to take reasonable precautions to control dust from building construction and demolition, road grading, or land clearing to reduce fugitive dust and maintain air quality standards for PM_{10}. As reported above, the nonradiological emissions associated with construction and operation of facilities related to pit production are a subset of the emissions evaluated in the LANL SWEIS, which were shown to be below *de minimis* thresholds.

Emissions from transporting nuclear materials and waste were calculated based on vehicle-type mileage for shipments and escort vehicles (Table 4.1.5-1). Exhaust emissions for heavy-duty diesel and light-duty gasoline vehicles at projected rates for 2030 were applied to calculate carbon monoxide, nitrogen oxides, and $PM_{2.5}$ for the various pit production rates (Table 4.1.5-2 and Table 4.1.5-3). The heavy-duty trucks were assumed to average 6.5 miles per gallon of diesel while light-duty vehicles average 25 miles per gallon (FreightWaves 2021; BTS 2023).

Table 4.1.5-1 Annual Transport Mileage to LANL (Waste and Materials)

Pit Production Rate	Heavy-Duty Diesel Vehicle (miles)	Light-Duty Gasoline Vehicle (miles)
30 ppy	382,720	221,940
80 ppy	967,700	485,787
10 ppy	145,000	116,280

ppy = pits per year

27 Particulate matter less than 10 microns in diameter.
28 Particulate matter less than 2.5 microns in diameter.

Table 4.1.5-2 U.S. Average Emissions Rates

Exhaust Pollutant	2030 Projected	
	Heavy-Duty Diesel	Light-Duty Gasoline
carbon monoxide (MT/yr)	1.626	4.013
nitrogen oxides (MT/yr)	2.742	0.201
$PM_{2.5}$ (MT/yr)[a]	0.043	0.060

MT/yr = metric tons per year, $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter

a $PM_{2.5}$ represents fine particles (<2.5 microns) from combustion-related emissions vs. larger particle PM_{10} emissions.

Source: BTS 2023

Table 4.1.5-3 Projected 2030 Exhaust Emissions (Waste and Materials)

Pit Production Rate	Heavy-Duty Diesel Exhaust (MT/yr)			Light-Duty Gasoline Exhaust (MT/yr)		
	CO	NOx	$PM_{2.5}$	CO	NOx	$PM_{2.5}$
30 ppy	0.6	1.0	0.0	0.9	0.04	0.0013
80 ppy	1.6	1.0	0.0	1.9	0.1	0.0
10 ppy	0.2	1.0	0.0	0.5	0.0	0.0

CO = carbon monoxide; MT/yr = metric tons per year, NOx = nitrogen oxides; $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter; ppy = pits per year

Greenhouse gas (GHG) emissions from the transportation of waste and other materials were calculated based on the EPA GHG emissions rate of 10.18×10^{-3} metric tons of carbon dioxide (CO_2) per gallon of diesel fuel (EPA 2023). This rate of CO_2 per gallon was multiplied by the estimated mileage in Table 4.1.5-1. Calculations for nitrous oxide (N_2O) and methane (CH_4) were based on rates from *Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles-Phase 2* (81 FR 73478, October 25, 2016). EPA set the N_2O and CH_4 standards at 0.05 grams per mile for both pollutants. These three pollutants (N_2O, CH_4, and CO_2) were summed while applying emissions factors of 265 and 28 to N_2O and CH_4, respectively, to calculate the GHG emissions, also referred to as carbon dioxide equivalent (CO_2e), for the estimated mileage (IPCC 2014). Table 4.1.5-4 lists the results of CO_2e emissions for each pit production rate and includes the aggregated CO_2, N_2O, and CH_4.

4.1.5.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.5.2 for the potential air quality impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy.

The radiological and nonradiological emissions associated with construction and operation of pit production facilities at LANL would be the same as presented in Section 4.1.5.1. The CO_2e emissions generated from transport of nuclear materials and waste range from 224 to 1,124 metric tons per year from the annual production of 10–80 ppy, respectively (Table 4.1.5-4).

Table 4.1.5-4 CO_2e Emissions from Transporting Waste and Materials

Pollutant	Fuel Economy (mpg)[a]	LANL No-Action 30 ppy (MT/yr)	LANL No-Action 80 ppy (MT/yr)	LANL Multi-Site & Single-Site 10 ppy (MT/yr)
CO_2	**Total**	911	2,304	345
	6.5	599	1,516	227
	25	312	788	118
N_2O	**Total**	0.04	0.09	0.01
	6.5	0.03	0.07	0.01
	25	0.01	0.02	0.00
CH_4	**Total**	0.04	0.09	0.01
	6.5	0.03	0.07	0.01
	25	0.01	0.02	0.00
CO_2e[b]	**NA**	922	2,331	349

CH_4 = methane; CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; LANL = Los Alamos National Laboratory; mpg = miles per gallon; mpg = miles per hour; MT/yr = metric ton per year, N_2O = nitrous oxide, NA = not applicable; ppy = pits per year

a The 6.5 mpg fuel economy is related to heavy-duty diesel trucks, and the 25 mpg is related to light-duty gasoline vehicles.

b CO_2e emissions were calculated from $CO_2+N_2O*265+CH_4*28$, where 265 and 28 are the emission factors for N_2O and CH_4, respectively (IPCC 2014).

Source: EPA 2023

4.1.5.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy, and air quality impacts associated with operations would be the same as those described in Section 4.1.5.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to sustain production competencies. As discussed below, this reduction in pit production at LANL would reduce air emissions compared to the No-Action Alternative.

Radiological Emissions. At a pit production rate of 10 ppy, NNSA estimates that annual radiological emissions would decrease by approximately 67 percent compared to the No-Action Alternative. Therefore, the average annual radiological emissions would be about 1.5×10^{-8} curies per year of PuEq.

Nonradiological Emissions. A pit production rate of 10 ppy would also reduce emissions from transporting nuclear materials and waste compared to the No-Action Alternative (30 ppy). There would be a reduction of nearly 70 percent in CO_2e (Table 4.1.5-4). In addition, nonradiological air emissions from onsite operations would be negligible.

4.1.5.4 Effects of Project Enhancements

There are two project enhancements that potentially could affect air quality at LANL: the increase in the MAR inventory limit at RLUOB and the portable supercompactor. The activities that are proposed to be performed at RLUOB (if the MAR limit is increased) are currently being performed at the CMR Building. Since the building air filtration system at the RLUOB is more advanced than that at CMR, the projected overall releases of radionuclides under normal operations likely would decrease if this project enhancement is implemented (LANL 2026a).

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. The trailer would be configured with HEPA filtration to minimize potential radiological emissions to the environment during the compaction (LANL 2026a). This enhancement would be analogous to the functions currently employed at LANL at the Waste Characterization, Reduction, and Repackaging Facility, although it would be portable and have an increased ability for size reduction through hydraulic compaction. As a comparison, when the Waste Characterization, Reduction, and Repackaging Facility operated between 2008 and 2017, the peak annual radionuclide emissions occurred in 2023 and were 3×10^{-4} curies of plutonium-239, less than 1 percent of the projected releases from PF-4 during pit production (LANL 2015).

4.1.6 Noise

The analysis in this section presents the potential impacts on the noise environment for the alternatives. Key metrics that influence human response to noise presented in this analysis include: (1) the type and characteristics of the noise, (2) distance from source, and (3) time of day. This section describes the potential noise impacts from the alternatives. Overall, LANL would remain compliant with current local noise regulations at all times.

4.1.6.1 No-Action Alternative

The potential noise impacts associated with pit production are a subset of the site-wide impacts described in Section 5.5 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS.

Temporary noise from construction activities is expected; however, this noise will be confined to the area immediately around construction equipment (focused primarily in the Pajarito Corridor) and not expected to be perceived beyond the LANL property boundary. No blasting or other airborne vibrations will be generated during construction activities, and therefore not expected to be noticed off site. Operations associated with the No-Action Alternative are expected to be the same as the existing noise environment and contained within facilities and the LANL property boundary. Obstructions from trees would attenuate noise and best management practices (BMPs) would be implemented as needed to reduce the impacts to surrounding wildlife. As discussed in Appendix C, Section C.1.7.3, TA-55 overlaps with the buffer area for the area of environmental interest for the Mexican spotted owl. Per the LANL HMP, noise restrictions apply to these buffer zones during the owl's breeding season (LANL 2022b).

4.1.6.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.6.2 for the potential noise impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy.

The potential noise impacts associated with construction and operation of pit production facilities at LANL would be the same as presented in Section 4.1.6.1.

4.1.6.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and noise impacts associated with operations would be the same as those described in Section 4.1.4.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. This reduced production at LANL would not lessen potential noise impacts relative to the No-Action Alternative because the large majority of impacts would be generated during construction and there is no discernible noise associated with operations. Therefore, reduction of pit production rates would not result in a change to noise impacts.

4.1.6.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. The supercompactor would generate localized noise during its operation. LANL would consider noise generation and timing when selecting a suitable location for parking the supercompactor. This would ensure that noise impacts would be managed to minimize offsite impacts to sensitive receptors and that noise would not disturb sensitive habitat during specific time periods throughout the year (*see* Sections 4.1.6.1 and 4.1.7.1). There are no other project enhancements being evaluated that could affect the noise environment at LANL.

4.1.7 Biological Resources

The analysis in this section presents the potential impacts on biological resources for the alternatives and includes impacts on terrestrial and aquatic resources and threatened, endangered, and species with other special designations. Key metrics presented in this analysis include: (1) identification of disturbances to land/vegetation and discussion of impacts on habitats, fish and wildlife, and special status species and (2) identification and discussion of aquatic and wetland impacts. Impacts from human activity, noise, erosion, and sedimentation were evaluated qualitatively considering location and type of activity relative to ecological resources.

4.1.7.1 No-Action Alternative

The potential impacts to biological resources associated with pit production are a subset of the site-wide impacts described in Section 5.6 of the LANL SWEIS and are incorporated by reference into this PEIS. A summary of key impacts is presented below.

The implementation of increased pit production at LANL will result in the development of a total of about 99 acres. This includes about 29 acres of temporary disturbance for construction laydown areas across the site. Of these 99 acres, approximately 27 acres have not been previously disturbed. This can be compared to the estimate of 806 acres of development in previously undisturbed areas under the Expanded Operations Alternative, which was analyzed and selected in the 2026 LANL SWEIS and ROD (NNSA 2026a, 2026b). Similar to the conclusion from the LANL SWEIS, most of the development for pit production will occur in juniper woodlands (sparse and dense) with smaller areas of regenerating ponderosa pine (*Pinus ponderosa*), mixed conifer, and submontane grassland.

Terrestrial Resources

The specific projects identified in the No-Action Alternative will disturb previously undisturbed areas of vegetation. Vegetation types are based on the LANL land cover map updated in 2018 (Hansen et al. 2019).

The most direct impact to terrestrial wildlife would be the loss of habitat and fragmentation from clearing of previously undisturbed vegetation. The conservation of habitat for the Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), and

Jemez Mountains salamander (*Plethodon neomexicanus*) (all federally listed threatened and endangered species) will continue to also provide open space and movement corridors for a variety of wildlife including deer, elk, black bear, mountain lions, bobcat, and coyotes (Bennett et al. 2014; Gadek et al. 2023), although there could be localized areas of corridor restrictions from development and human activity. Vehicle collisions with deer and elk during seasonal migration occur along the primary commuter routes through the Pajarito Corridor, the LANSCE Planning Area, and the Los Alamos Canyon into the Core Area Planning Area and likely will increase with additional development and traffic.

Terrestrial resources within TA-55 are not expected to be adversely affected by the No-Action Alternative because TA-55 is highly developed and does not support habitat that attracts a wide variety of wildlife. Nearby offsite areas and those immediately surrounding TA-55 (e.g., TA-46 and TA-63) may be adversely affected by the No-Action Alternative through potential corridor restrictions from development and human activity. The impacts of this construction are addressed in the 2026 LANL SWEIS (NNSA 2026a, Section 5.6.1).

Aquatic Resources

Aquatic resources and wetlands are limited on the LANL site. Wetlands and limited reaches of perennial streams on LANL do not contain fish populations. None of the projects associated with pit production will directly impact aquatic resources in the Rio Grande that borders the southeastern side of the LANL site. Wetlands on the LANL site are generally located in canyon bottoms; however, a small area of wetlands occurs adjacent to TA-55 along the fenceline. None of the projects associated with pit production will directly impact wetlands. The 2026 LANL SWEIS evaluates specific projects that occur upstream from wetland areas and that cross the canyon bottoms, which can potentially create erosion, runoff, and sedimentation of wetland areas (NNSA 2026a). However, LANL implements standard BMPs for erosion control to minimize sediment runoff from construction sites. Impacts to wetlands from implementation of the projects associated with pit production are not expected.

Aquatic resources are not expected to be impacted by the No-Action Alternative because TA-55 does not overlap with these resources.

Threatened, Endangered, or Other Special Designation

As identified in Chapter 3, Section 3.1.7, and Appendix C, Section C.1.7.3 of this PEIS, LANL manages threatened and endangered species in accordance with the HMP (LANL 2022b). LANL has established areas of environmental interest for three species: Mexican spotted owl, southwestern willow flycatcher, and Jemez Mountains salamander. Core habitat and buffer habitat have been identified and mapped within each area of interest for each species. To assess potential impacts to these three species, NNSA compared locations of projects associated with pit production to mapped core and buffer habitats. The only area of environmental interest that overlaps with TA-55 is the buffer zone for the Mexican spotted owl, which is presented in a graphic in Appendix C, Section C.1.7.3. Noise impacts may extend into undeveloped core habitat for the Mexican spotted owl, which does not overlap with TA-55. Importantly, recent measurements indicate that the ambient noise levels in the vicinity of existing operations in the Pajarito Corridor do not extend into the canyon bottoms where Mexican spotted owls are known to nest. Tree cover helps to dampen noise, and BMPs are implemented as necessary to minimize impacts on surrounding wildlife. The proposed projects that occur within either core or buffer habitat would be reviewed before implementation to ensure compliance with the HMP, and further consultation with the USFWS would be conducted, as required.

Previous consultation with the USFWS has determined that threatened, endangered, or other special designation species would not be adversely affected by the projects associated with pit production in the Pajarito Corridor (LANL 2022d). The Laboratory is committed to continued consultation with the USFWS on such matters. As noted in Appendix C, Section C.1.7.3, the potential ranges of Suckley's cuckoo bumble bee (*Bombus suckleyi*) and the monarch butterfly (*Danaus plexippus*) potentially overlap with TA-55.[29] There is significant uncertainty about the range of Suckley's cuckoo bumble bee and there have been no known sitings in New Mexico through 2022 (USFWS 2024). In 2022 and 2023, bumblebee surveys were conducted in an area around TA-55 and no Suckley's cuckoo bumble bees were documented on site (Mora et al. 2023). TA-55 is highly developed and likely does not include the habitat required for this species. The presence of monarch butterflies or milkweeds (*Asclepias* spp.) has been documented near TA-55 but not within TA-55. Monarchs feed on nectar from many flower species but breed only where there are milkweeds. The primary threats to monarchs are milkweed removal and roadside mowing during the breeding season. These impacts can be minimized by scheduling mowing outside the breeding period or inspecting milkweed plants for eggs and caterpillars before mowing during that time.

Construction activities in industrial areas in TA-55 may impact migratory birds known to be in those areas. Construction would not affect bald and golden eagles (*Aquila chrysaetos*) since they do not occur within the area of TA-55. Migratory eagles are known to occur at LANL during the winter (November 1–March 31), most commonly along the Rio Grande. Golden eagles nest on cliffs or large trees in open woodland and typically avoid developed areas such as TA-55 (USFWS 2011).

4.1.7.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.7.2 for the potential biological resources impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. For all production rates, the biological impacts at LANL would be the same as described in Section 4.1.7.1. No changes in impacts would be expected from reducing production because the full complement of supporting facilities and infrastructure would be constructed and maintained irrespective of the production level.

4.1.7.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and biological resources impacts associated with operations would be the same as those described in Section 4.1.7.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. This reduced production at LANL would not lessen potential biological resources impacts relative to the No-Action Alternative for the reasons described in Section 4.1.7.2.

[29] The species was proposed as endangered in December 2024 (89 FR 102075).

4.1.7.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. The supercompactor would generate localized noise during its operation, which would be a consideration when selecting a suitable location. LANL would comply with the requirements and guidance in the HMP for the operations of the supercompactor if parked in core or buffer habitat zones in areas of environmental interest. There are no other project enhancements being evaluated that could affect biological resources at LANL.

4.1.8 Cultural and Paleontological Resources

The analysis in this section presents the potential direct and indirect impacts to cultural and paleontological resources for the alternatives. Key metrics presented in this analysis include the types of impacts that could affect physical destruction or damage to cultural and paleontological resources at LANL; however, paleontological specimens are not anticipated to be discovered (*see* Chapter 3, Section 3.1.8 of this PEIS). Thus, impacts to paleontological resources at LANL are unlikely and were not carried forward for analysis.

4.1.8.1 No-Action Alternative

The potential impacts to cultural resources associated with pit production are a subset of the site-wide impacts described in Section 5.8 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS. A summary of key impacts is presented below.

Many of the projects associated with pit production will be located in previously disturbed areas or among existing modern structures. Thus, many projects and their impacts (operational or otherwise) will not affect cultural resources (NNSA 2026a). Some specific facility designs associated with pit production may not yet be completed or specifically sited (e.g., TRU waste staging areas). As project plans evolve, NNSA will comply with the Section 106 Programmatic Agreement (LANL 2022c) and CRMP (LANL 2019) to identify significant cultural resources and avoid, reduce, and/or mitigate any impacts in accordance with federal, state, and local policies.

4.1.8.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.8.2 for the potential cultural resources impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. Impacts from the production of 30 and 80 ppy would be the same as described in Section 4.1.8.1. Impacts from the production of 10 ppy are described in Section 4.1.8.3.

4.1.8.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and cultural resources impacts associated with operations would be the same as those described in Section 4.1.8.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. This reduced production at LANL would not lessen potential cultural resources impacts relative to the No-Action Alternative because the full complement of supporting facilities and infrastructure would be constructed and maintained irrespective of the production level.

4.1.8.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL that is already in use for industrial activities. Because there would be no land disturbance and noise would be localized to the site, impacts to cultural resources would not be expected. There are no other project enhancements being evaluated that could affect cultural or paleontological resources at LANL.

4.1.9 Socioeconomics

The analysis in this section presents the potential impacts from changes in employment and economic activity for the alternatives. Approximately 93 percent of the LANL workforce reside in New Mexico. The ROI, as described in Chapter 3, Section 3.1.9, is a five-county area surrounding LANL. Key metrics presented in the socioeconomics analysis include: (1) changes to employment and population; (2) changes in economic activity (e.g., earnings/monetary value added); and (3) impacts to housing and community services.

4.1.9.1 No-Action Alternative

The potential impacts to socioeconomics associated with pit production are a subset of the site-wide impacts described in Section 5.9 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a).

Activities under the No-Action Alternative would result in potential impacts on employment, economic activity, population, housing, and community services. Tables 4.1.9-1 and 4.1.9-2 present the estimated potential impacts for producing 30 ppy and 80 ppy at LANL, respectively. The 2026 LANL SWEIS evaluated the impacts associated with workforce increases related to pit production, recognizing that the additional workers for this activity are a major contributor to the total workforce considered under the Expanded Operations Alternative. Under that alternative, the direct workforce was projected to reach as high as 20,169 employees, which is greater than the workforce projected for the No-Action Alternative in this PEIS. This evaluation helps provide a comprehensive understanding of the potential employment and economic impacts under expanded production scenarios. A summary of key socioeconomics impacts for this PEIS analysis is presented below.

Employment and Economic Activity

Under the No-Action Alternative, producing 30–80 ppy at LANL will require an average of 180 construction workers annually, with a potential peak of 300 construction workers in any given year by 2035. Considering the total increases in personnel to support construction and operations, production of 30–80 ppy will require the addition of 864–2,083 personnel above the 2023 baseline staffing. Overall, direct employment at LANL will increase by approximately 5.2 percent (for 30 ppy) to 12.5 percent (for 80 ppy) compared to the 2023 baseline workforce.

Impacts to employment and economic activity include direct, indirect, and induced economic impacts that potentially could result from project activities. As project-related direct expenditures are made in the ROI, these dollars begin to circulate in the economy. As funds are expended to pay employees and to buy goods and services, the recipients then make purchases, causing successive rounds of local spending, until the original expenditures eventually exit the ROI.

Increases in direct employment at LANL may also cause increases in indirect employment and associated economic activity, such as project-related expenditures, local spending, and revenue from taxes. These indirect increases were derived using multipliers provided from the Bureau of Economic Analysis (BEA)-developed Regional Input-Output Modeling System (RIMS II) for the region (BEA 2023). The multiplier of 1.6142 was used for indirect employment for total workforce increases under the No-Action Alternative; a multiplier of 1.2462 was used for construction workforce increases (BEA 2023). These multipliers were developed for an aggregation of the five-county ROI. Producing 30 ppy would create an additional 1,395 total jobs in the ROI by 2035 (864 direct and 531 indirect jobs), representing about 0.3 percent of the projected labor force. In contrast, producing 80 ppy would nearly triple the impact, generating around an additional 3,362 total jobs (2,083 direct and 1,279 indirect), accounting for approximately 0.6 percent of the projected 2035 ROI labor force.

From 2023 to 2035, the total labor force in the ROI is expected to increase from 503,747 persons to 532,758 persons, which would equate to 5.8 percent (BLS 2025a), largely driven by non-LANL-related employment. By 2035, the total employment impact associated with the No-Action Alternative (28,223 total workers, consisting of 17,484 direct and 10,739 indirect) represents approximately a 5.2-percent increase in total direct and indirect employment from 2023 and would account for 5.3 percent of the projected 2035 ROI labor force. In contrast, producing 80 ppy would increase total employment to 30,190 (18,703 direct and 11,487 indirect), representing an approximately 12.5-percent increase over the 2023 baseline and accounting for about 5.7 percent of the projected 2035 ROI labor force.

The anticipated value added from the direct economic activity to the local economy includes employee compensation, tax on production and imports, and proprietary and other property income and indirect employment compensation. A portion of this increased payroll likely would enter the local economy as the new workers purchase additional goods and services. It is anticipated that some portion of construction and operational materials would be purchased locally and that most construction and operational workers would be drawn from within the ROI, resulting in regional increases in jobs. The additional anticipated expenditures by workers potentially could generate additional income and employment opportunities within the ROI if the expenditures filter throughout the economy. Producing 30 ppy under the No-Action Alternative is expected to generate approximately $181.7 million in value added and over $117.5 million in direct labor income within the ROI. In comparison, producing 80 ppy would substantially increase these impacts, resulting in about $438.1 million in value added and over $238.2 million in direct labor income.

Table 4.1.9-1 Socioeconomic Impacts – No-Action Alternative (30 Pits Per Year)

Resource/Metric	Baseline (existing environment) 2023	Change to Baseline as a Result of the No-Action Alternative Producing 30 ppy		No-Action Alternative (by end of 2035)	Percentage Increase Over Baseline
		Construction (peak year)	Operations (by the end of 2035)		
Direct jobs at LANL (persons)	16,620[a]	250	864	17,484	5.2
Indirect jobs from LANL (persons)	10,208[b]	62[c]	531[b]	10,739	5.2
Total Direct and Indirect employment	26,828	312	1,395	28,223	5.2
Total ROI labor force (persons)	503,747	NA	NA	521,510[d]	5.8[e]
Earnings from direct jobs at LANL (millions of dollars)	$2,259.8[f]	$16.9[g]	$117.5[f]	$2,377.3	5.2
Earnings from indirect jobs from LANL in ROI (millions of dollars)[g,h]	$1,388.0	$4.2	$72.2	$1,460.2	5.2
Anticipated value added from LANL (millions of dollars)	$3,495.4[i]	$23.7[j]	$181.7[i]	$3,677.1	5.2
TOTAL ROI POPULATION	**1,040,609**	**936[k]**	**4,185[k]**	**1,074,951[l]**	**3.3[m]**

LANL = Los Alamos National Laboratory; NA = not applicable; ppy = pits per year; ROI = region of influence

a Direct LANL employment is based on 2023 employment.
b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6142 (BEA 2023).
c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2462 (BEA 2023).
d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).
e ROI labor force increase of 3.5 percent would largely occur independent of LANL activities. The direct and indirect employment increase from LANL activities would contribute a 0.6-percent increase.
f Earnings were estimated using a final-demand earnings multiplier of 0.4684 applied to the change in jobs / change in final-demand multiplier of 3.4449 (BEA 2023).
g Earnings were estimated using a final-demand earnings multiplier of 0.4812 applied to the change in jobs / change in final-demand multiplier of 7.1322 (BEA 2023).
h Derived from earnings from direct jobs / indirect jobs.
i Value added was estimated using a final-demand value added multiplier of 0.7245 applied to the change in jobs / change in final-demand multiplier of 3.4449 (BEA 2023).
j Value added was estimated using a final-demand value added multiplier of 0.6768 applied to the change in jobs / change in final-demand multiplier of 7.1322 (BEA 2023).
k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct LANL workers and indirect workers would move with their families.
l Population projection for year 2035 for counties in the ROI derived from New Mexico “state Population Trends” (New Mexico 2021).
m ROI population increase of 3.3 percent would largely occur independent of LANL activities. The population increase from LANL activities would contribute a 0.4-percent increase.

Source: BEA 2023; USCB 2023c

Table 4.1.9-2 Socioeconomic Impacts – No-Action Alternative (80 Pits Per Year)

Resource/Metric	Baseline (existing) environment) 2023	Change to Baseline as a Result of the No-Action Alternative Producing 80 ppy		No-Action Alternative (by end of 2035)	Percentage Increase Over Baseline
		Construction (Peak year)	Operations (by the end of 2035)		
Direct jobs at LANL (persons)	16,620[a]	300	2,083	18,703	12.5
Indirect jobs from LANL (persons)	10,208[b]	74[c]	1,279[b]	11,487	12.5
Total Direct and Indirect employment	26,828	374	3,362	30,190	12.5
Total ROI labor force (persons)	503,747	NA	NA	532,758[d]	5.8[e]
Earnings from direct jobs at LANL (millions of dollars)	$2,259.8[f]	$20.2[g]	$283.2[f]	$2,543.0	12.5
Earnings from indirect jobs from LANL in ROI (millions of dollars)[g,h]	$1,388.0	$5.0	$174.0	$1,562.0	12.5
Anticipated value added from LANL (millions of dollars)	$3,495.4[i]	$28.5[j]	$438.1[i]	$3,933.5	12.5
TOTAL ROI POPULATION	**1,040,609**	**1,122[k]**	**10,086[k]**	**1,074,951[l]**	**3.3[m]**

LANL = Los Alamos National Laboratory; NA = not applicable; ppy = pits per year; ROI = region of influence

a Direct LANL employment is based on 2023 employment.
b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6142 (BEA 2023).
c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2462 (BEA 2023).
d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).
e ROI labor force increase of 3.5 percent would largely occur independent of LANL activities. The direct and indirect employment increase from LANL activities would contribute a 0.6-percent increase.
f Earnings were estimated using a final-demand earnings multiplier of 0.4684 applied to the change in jobs / change in final-demand multiplier of 3.4449 (BEA 2023).
g Earnings were estimated using a final-demand earnings multiplier of 0.4812 applied to the change in jobs / change in final-demand multiplier of 7.1322 (BEA 2023).
h Derived from earnings from direct jobs / indirect jobs.
i Value added was estimated using a final-demand value added multiplier of 0.7245 applied to the change in jobs / change in final-demand multiplier of 3.4449 (BEA 2023).
j Value added was estimated using a final-demand value added multiplier of 0.6768 applied to the change in jobs / change in final-demand multiplier of 7.1322 (BEA 2023).
k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct LANL workers and indirect workers would move with their families.
l Population projection for year 2035 for counties in the ROI derived from New Mexico "state Population Trends" (New Mexico 2021).
m ROI population increase of 3.3 percent would largely occur independent of LANL activities. The population increase from LANL activities would contribute a 0.9-percent increase.
Source: BEA 2023; USCB 2025a

Population and Demographics

Population. The population in the ROI in 2035 is projected to be 1,074,951 persons, which represents a 3.3-percent increase over the 2023 baseline population of 1,040,609 (USCB 2023c; New Mexico 2021). Under the No-Action Alternative 30 ppy scenario, total employment is projected to be 28,223 workers (17,484 direct and 10,739 indirect), representing approximately 2.6 percent of the projected 2035 ROI population. The increase of 1,395 direct and indirect jobs is 0.1 percent of the projected population. Because this increase is minimal relative to the population, a large influx of workers and families due to LANL employment into the ROI is not expected. However, if all 1,395 new jobs were filled by in-migrants, the population could increase by approximately 4,185 persons, assuming three persons per household (or 1,395 new jobs multiplied by three persons per household),[7] which is about 0.4 percent of the projected ROI population.

In contrast, under the No-Action Alternative 80 ppy scenario, total employment is projected to rise to 30,190 workers (18,703 direct and 11,487 indirect), representing approximately 2.8 percent of the projected 2035 ROI population. The increase of 3,362 direct and indirect jobs would constitute about 0.3 percent of the population. If these jobs were filled by in-migrating workers and their families, the population could increase by approximately 10,086 persons (assuming three persons per household), or about 0.9 percent of the projected 2035 population. Although this increase in population is larger than under the 30 ppy scenario, even if all the jobs were filled by in-migrating workers, the resulting population growth would still be relatively small compared to the overall projected population in 2035.

Federally Recognized Tribes and Pueblos. DOE will continue to implement its obligations to tribal nations, as discussed in Appendix C, Section C.1.9.2.

Housing

In 2023, there were 35,197 vacant housing units in the ROI (USCB 2023d). For context, there were 449 vacant housing units in Los Alamos County in 2023. The increase in population from the additional workforce (by the end of 2035) under the No-Action Alternative to produce 30 ppy is estimated at 1,395 workers (864 direct and 531 indirect). It is anticipated that direct workers relocating to the ROI will settle in all counties within the ROI, likely in proportion to current LANL workforce residence patterns. Table 4.1.9-3 presents the anticipated workforce housing distribution within the ROI under the No-Action Alternative for the range of pit production capacities.

This influx of direct employees may further increase housing needs within Los Alamos County or change the future distribution, indicating that future personnel may be forced to reside farther from the Laboratory. Approximately 36.2 percent, or 554, direct workers would be expected to settle in Los Alamos County, splitting between the Los Alamos townsite and White Rock. Because housing markets, workforce patterns, policy, and regional development can change over decades, estimates of housing distribution or needs will evolve over the next 50 years. Current housing statistics discussed in Appendix C, Section C.1.9.3 suggest that the current housing market in the ROI and Los Alamos County, specifically, have unmet needs; this influx of direct employees may further increase housing needs. There would be adequate housing within the ROI, just not potentially in Los Alamos County (*see* Table 4.1.9-3).

Appendix C, Section C.1.9.3 presents the median value of owner-occupied homes (in 2023) in each county within the ROI. This PEIS does not predict changes in housing prices; however, the latest

[7] Assumes one worker per household and an average of three persons per household for the ROI (USCB 2021).

trends in New Mexico are following those of other states as median housing prices increase. Because of the smaller inventory of available housing in Los Alamos County versus other counties in the ROI, it stands to reason that housing prices in Los Alamos County could increase more than other counties.

Table 4.1.9-3 Anticipated Workforce Housing Distribution – No-Action Alternative

County/Area	2023 Percent of Total Site Employment[a]	2023 Vacant Housing Units[b]	Anticipated Direct Workforce Housing Distribution[c]	
			30 ppy	80 ppy
Los Alamos	35.8	449	309	745
Santa Fe	27.0	8,338	233	561
Rio Arriba	16.7	4,723	144	347
Bernalillo	8.9	17,669	77	185
Sandoval	5.0	4,018	43	104
Other counties in New Mexico	6.8	89,306	58	141
Total Workforce	NA	NA	**864**	**2,083**

NA = not applicable; ppy = pits per year
a From Appendix C, Table C.1.9-1.
b From Appendix C, Table C.1.9-6.
c Distribution is based on 864 (30 ppy) and 2,083 (80 ppy) direct jobs at LANL under the No-Action Alternative.

Community Services

Due to the low potential for impacts on the population, the No-Action Alternative would not affect fire protection, police protection services, or medical services. By approximately 2030, NNSA plans to construct a new 20,000-square-foot fire station facility, providing additional resources for fire protection. As discussed above, the No-Action Alternative would result in a population increase in the ROI of approximately 4,185 persons under the 30 ppy scenario, or about 0.4 percent of the projected 2035 ROI population of 1,082,222. Under the 80 ppy scenario, the population increase could be approximately 10,086 persons, or about 0.9 percent of the projected 2035 population. In both cases, this increase would not significantly change demand for these services compared to current conditions.

Regarding schools, assuming an average of 0.34 school-age children per housing unit (NAHB 2020), the maximum number of school-age children associated with the additional direct and indirect workforce potentially migrating into the ROI would be approximately 475 children (1,395 workers × 0.34) under the 30 ppy scenario and approximately 1,145 children (3,362 workers × 0.34) under the 80 ppy scenario by 2035. Compared to the 2023/2024 school year, these increases in school enrollment would be less than 1 percent and represent a smaller proportion of future enrollment. This minimal increase would have a negligible effect on school services in the ROI.

Overall, impacts to employment, income, population, and housing would be minor within the ROI but would be concentrated primarily in the Los Alamos area.

4.1.9.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.9.2 for the potential socioeconomics impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL (10, 30, and 80 ppy). Regardless of the level of annual pit production, the impacts at LANL would be the same as described in Section 4.1.9.1.

4.1.9.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and socioeconomics impacts associated with operations would be the same as those described in Section 4.1.9.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. As mentioned above, this reduction in pit production at LANL would not be expected to reduce the workforce below the value projected for production of 30 ppy. Therefore, socioeconomic impacts would be the same as presented in Section 4.1.9.1 for 30 ppy.

4.1.9.4 Effects of Project Enhancements

There are two project enhancements that potentially could affect the operational workforce at LANL: the increase in the MAR inventory limit at RLUOB and the use of a portable supercompactor for TRU waste. The activities that are proposed to be performed at RLUOB (if the MAR limit is increased) are currently being performed at the CMR Building, where there is adequate and existing staff to perform these functions. These personnel would be transferred from the CMR Building to RLUOB and not affect the overall site employment in the ROI (LANL 2026).

The potential utilization of a portable supercompactor for TRU waste would involve a small staff of LANL waste management personnel working with contractor staff. This enhancement would result in the addition of 10–20 personnel during the period that the unit is located on site. Changes to the socioeconomic impacts presented in Section 4.1.9.1 would be minimal.

4.1.10 Traffic and Transportation

The analysis in this section presents the potential impacts on traffic and transportation for the alternatives, including shipping nuclear material and wastes under both incident-free and accident conditions. Analysis to support this section is provided in Appendix E of this PEIS.

Construction activities under all three alternatives would utilize the existing transportation infrastructure in the LANL region. Key metrics presented in the traffic and transportation analysis include the potential to cause periodic, light-to-moderate adverse impacts to local traffic flows from (1) construction worker commuting and (2) the intermittent presence of additional construction vehicles.

4.1.10.1 No-Action Alternative

The potential impacts to traffic and transportation associated with pit production are a subset of the site-wide impacts described in Section 5.12 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a).

<u>**Traffic and Onsite Transportation**</u>

Local-Area Traffic, Onsite Traffic, and Onsite Parking. Under the No-Action Alternative, a range of 864 to 2,083 additional pit production workers would commute to LANL depending on the pit production rate. This would be a subset of the workforce additions analyzed in the 2026 LANL SWEIS, which evaluated increases in workforce of as much as 3,549 from the 2023 baseline for the

Expanded Operations Alternative (NNSA 2026a). The analysis found that the incremental annual increases in traffic due to this employment growth would not change the LOS's on roads in the immediate vicinity of LANL, nearly all of which are deemed to presently operate between LOS "C" and LOS "D" (as discussed in Chapter 3, Section 3.1.10), which is above the LOS "E" designation that is used to denote a major deficiency condition in traffic flow. Within the LANL site boundary, any resulting traffic increases due to the presence of more pit production-related staff would be expected to pose small-to-moderate impacts on the site's existing road network. The potential addition of up to 2,083 pit production workers would represent about a 12-percent increase over the present-day number of workers site-wide at LANL (16,620 persons as of December 2023). These traffic increases from additional workers could be reduced through the implementation of ride sharing, multiple-shift work periods, busing, and staggered start times, many of which are currently being implemented at LANL. Additional information regarding these conclusions is provided in Appendix E of this PEIS.

Transportation of Radiological and Hazardous Materials to and from LANL

Under the No-Action Alternative, NNSA would ship nuclear materials associated with pit production (pits, pit-related materials, and HEU) to and from LANL, Pantex, SRS, Y-12, and NNSS. These nuclear materials are collectively referred to as "secure shipments." For a pit production rate of 30 ppy, there would be an estimated 90 secure shipments annually for a total annual mileage of about 110,950 miles. For 80 ppy, there would be about 173 secure shipments annually for a total annual mileage of about 242,950 miles.

In addition to secure shipments, NNSA would transport shipments of LLW/MLLW and TRU waste off site for disposal. For a pit production rate of 30 ppy, there would about 320 annual LLW/MLLW offsite shipments (assumed to go to NNSS) and 82 annual TRU waste shipments to the WIPP facility. For 80 ppy, there would be about 853 LLW/MLLW offsite shipments and 219 TRU waste annual shipments. More details about these shipments are provided in Appendix E.

Annual hazardous waste offsite shipments are expected to increase by modest levels under the No-Action Alternative. For the range of 30–80 ppy, a range of 169–451 metric tons per year of hazardous waste would be sent off site for treatment and disposal. The analysis of these shipments is included in Appendix E.

Impacts of Incident-Free Transportation. The estimated annual radiation dose to transportation crews from all offsite transportation activities under this alternative would range from 6.5 to 16.9 person-rem annually from all waste and secure shipments depending on the pit production rate. The estimated annual doses to the general population along these routes would range from 2.5 to 6.4 person-rem annually from all shipments. Incident-free transportation of all materials would result in an annualized total of 0.0039–0.010 excess LCF among all transportation workers and 0.0015–0.0038 annualized excess LCF in all affected public populations.

Impacts of Accidents During Transportation. Under all three alternatives evaluated in this PEIS, the maximum offsite truck transportation radiological accident was conservatively bounded by a truck carrying a maximum allowable capacity of plutonium-oxide powder, even though very few of these shipments would be carrying this material form in any appreciable quantity nor in the particulate size required for maximizing theoretical doses such as those conservatively postulated in the analyzed accident scenario. Resulting unmitigated public impacts (neglecting the probability of the accident occurring) are estimated to be less than 4.4 rem (<0.003 LCF) to an MEI and less than

7,900 person-rem (<5 LCFs) to nearby populations along any given route segment. Additional information associated with this scenario is provided in Appendix E of this PEIS.

Under the No-Action Alternative, the total estimated annualized transportation accident risk (calculated by summing the individual annual accident probabilities times their associated unmitigated consequences) for all projected accidents involving radioactive shipments, regardless of type, was determined to range from 5.9×10^{-6} to 1.6×10^{-5} LCF to the general population. This can be directly compared to the estimated nonradiological accident risk (traffic accidents) of 0.0097–0.025 fatality per year from shipments of the same materials.

Impacts of Construction, Operations, and Hazardous Material Transportation Associated with Pit Production Activities. As discussed above, this PEIS evaluates the impacts of transporting various nonradiological, hazardous materials associated with pit production activities. These impacts are presented in terms of annual shipment miles and expected traffic fatalities. The cumulative transportation impacts under the No-Action Alternative's 50-year analytical period would not be expected to exceed 0.0089 traffic fatalities (i.e., ~0) for an assumed maximum of 42 shipments of nonradiological, hazardous materials conducted per year.

4.1.10.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.10.2 for the potential traffic and transportation impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates two production capacities at LANL (30 and 80 ppy) under this Alternative. For pit production rates of 30–80 ppy at LANL, the contribution to the impacts of this Alternative from those shipments would be the same as presented in Section 4.1.10.1. The combination of impacts from shipments associated with LANL and SRS is provided in Section 4.3.1.

4.1.10.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and transportation impacts associated with operations would be the same as those described in Section 4.1.10.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. LANL's contributions to the impacts for this case are described in Section 4.1.10.2. The combination of impacts for LANL and SRS is presented in Section 4.3.1 and are comprehensively evaluated in Appendix E.

4.1.10.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste at LANL would involve a single semi-truck/trailer combination that would use existing roads to access a suitable location on the LANL site. Additional support vehicles could also accompany the truck. These few vehicles would not notably contribute to traffic impacts. From a radiological standpoint, the truck would follow all USDOT regulations regarding packaging and transportation (*see* Appendix E, Section E.2.2) to ensure that crew and members of the public are protected from potential radiation exposure. The additional number of radiological shipments associated with this enhancement would be minimal. In comparison, use of the supercompactor would reduce the total number of TRU waste shipments that would leave LANL by reducing the total volume shipped to WIPP. Therefore, overall, this enhancement would reduce the potential impact of transportation of TRU waste. There are no other project enhancements being evaluated that could affect traffic and transportation at LANL.

4.1.11 Infrastructure

This section presents an analysis of potential direct or indirect impacts to infrastructure at LANL for the alternatives. Key metrics presented in this analysis include: (1) quantities of water, sanitary wastewater, electricity, and petroleum fuels[30] associated with the alternatives and (2) analysis of the current infrastructure to meet demands. Site-wide transportation and parking are discussed in Section 4.1.10.

4.1.11.1 No-Action Alternative

The potential infrastructure impacts associated with pit production are a subset of the site-wide impacts described in Section 5.10 of the LANL SWEIS (NNSA 2026a). Table 4.1.11-1 presents the expected utility and fuel usage for the No-Action Alternative during construction and operations.

Table 4.1.11-1 also presents the parameter values for utility usage that were evaluated in the 2026 LANL SWEIS under the Expanded Operations Alternative (which was selected in the ROD) (NNSA 2026a, 2026b). These projections include the operational requirements for LANL pit production and several other major projects. As discussed in the LANL SWEIS, no adverse impacts to utility resources are expected from the Expanded Operations Alternative, which envelopes any potential impacts from pit production. As such, no adverse impacts are expected from pit production, as summarized below.

Table 4.1.11-1 Potential Infrastructure Impacts at LANL – No-Action Alternative

Resource Parameter	Baseline	Construction Requirements	Operations Requirements		NEPA Evaluation[a]	Capacity
			30 ppy	80 ppy		
Domestic water (MGY)	271.5	6.4	20	30	504	542
Sanitary wastewater (GPD)	311,689	7,500	65,225	95,700	400,414	602,800
Electricity – power consumption (MkW-hr/yr)	440	3.1	5.92	5.94	810 average; 1,174 peak	651[d]
Electricity–peak load (MW)	70	1	1.9	1.9	110 average; 171 peak	116[d]
Petroleum fuel (GPY)	901,000	1,099,000[b]	10,500[c]	10,500[c]	1,739,484	NA

EPCU = Electric Power Capacity Upgrade; GPD = gallons per day; GPY = gallons per year; MGY = million gallons per year; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt; NA = not applicable

a The listed resource parameter values were analyzed for impacts under the Expanded Operations Alternative in the 2026 LANL SWEIS (NNSA 2026a).

b Diesel fuel.

c Oil, gasoline.

d Capacity for electrical consumption will increase from 651 to 1,440 MkW-hr/yr and import capacity will increase from 116 MW to 200 MW upon completion of the EPCU project.

[30] The 2026 LANL SWEIS also evaluated consumption of natural gas; however, since natural gas would not be consumed for pit production, it is not addressed in this PEIS.

Domestic Water. Construction would require 6.4 million gallons per year. Operations for pit production would require 20 million gallons per year (for 30 ppy) and 30 million gallons per year (for 80 ppy). Water usage would largely be attributed to the increased workforce, as the pit production process consumes minor amounts of water. The capacity of the LANL domestic water system is approximately 542 million gallons per year, which is adequate to meet the water demand under the No-Action Alternative.

Sanitary Wastewater. During construction, sanitary wastewater treatment needs are likely to be less than projected in Table 4.1.11-1 because portable toilets would be used during some activities. During operations, sanitary wastewater generation would be about 65,225 gallons per day (for 30 ppy) and 95,700 gallons per day (for 80 ppy). The SWWS is designed to treat up to 602,800 gallons per day. There is sufficient capacity within the LANL system to handle the increased wastewater discharges.

Electricity Consumption. Construction would require 3.1 million kilowatt-hours per year (MkW-hr/yr) with a peak load of 1 MW. Operations would require 5.92 MkW-hr/yr (for 30 ppy) and 5.94 MkW-hours/yr (for 80 ppy), with a peak load of 1.9 MW. LANL's capacity for electrical consumption is approximately 651 MkW-hr/yr, and for peak load is approximately 116 MW. Notably, capacity for electrical consumption will increase from 651 to 1,440 MkW-hr/yr and import capacity will increase from 116 MW to 200 MW after completion of the EPCU project. There would be sufficient electrical capacity to meet demands under the No-Action Alternative.

Petroleum Fuel Consumption. During construction, petroleum fuel use would be about 1,099,000 gallons per year. This would be more than double the current baseline consumption and would represent 63 percent of the total estimated site-wide fuel use evaluated in the 2026 LANL SWEIS (NNSA 2026a). During operations, both pit production rates would require about 10,500 gallons per year. Fuel capacity would generally not be limited, as delivery frequency would be increased to meet demand.

4.1.11.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.11.2 for the potential infrastructure impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. Impacts from the production of 30 and 80 ppy would be the same as described in Section 4.1.11.1. Impacts from the production of 10 ppy are described in Section 4.1.11.3.

4.1.11.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and infrastructure impacts associated with operations would be the same as those described in Section 4.1.11.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. This reduction in pit production at LANL would slightly decrease impacts to infrastructure compared to the No-Action Alternative. Specifically, electrical consumption would reduce from 5.94 MkW-hr/yr to 4.2 kW-hr/yr. Consumption of other infrastructure resources would remain the same as the No-Action Alternative, as shown in Table 4.1.11-1.

4.1.11.4 Effects of Project Enhancements

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL. The truck/trailer configuration would be self-contained and powered by an onboard generator, with potential hookups for site-based power supply. The operation of the supercompactor would not notably contribute to the annual infrastructure demands presented in Section 4.1.11.1. There are no other project enhancements being evaluated that could affect impacts to infrastructure at LANL.

4.1.12 Waste and Materials Management

The analysis in this section presents the potential impacts on waste and materials management for the alternatives, including waste generation. This section also addresses the impacts of managing radioactive and hazardous materials used at LANL. NNSA does not expect waste or hazardous materials associated with these activities to be unique or substantially different from the types of waste and materials already managed at LANL, although quantities could increase from those presented in Chapter 3, Section 3.1.12. Key metrics for the waste analysis include: (1) the capacity of the existing LANL waste management system to appropriately manage any expected increases in waste quantities, and (2) the capacity of offsite facilities to receive additional LANL waste for subsequent treatment and/or disposal. For all waste types and alternatives, NNSA notes that the projections are annual values and there could be temporary excursions or increases in any given year, but these higher projections have been accounted for in the total projected waste quantities.

4.1.12.1 No-Action Alternative

The potential impacts to waste and materials management associated with pit production are a subset of the site-wide impacts described in Section 5.11 of the 2026 LANL SWEIS and are incorporated by reference into this PEIS (NNSA 2026a).

Radioactive Waste

Radioactive waste is categorized by LLW, MLLW, and TRU waste. As identified in the 2026 LANL SWEIS, projected volumes of radioactive waste generated at the LANL site are expected to increase over the next several years from activities such as increased pit production, DD&D, legacy waste cleanup, and environmental remediation of the LANL site (NNSA 2026a). As noted in Section 1.6 of this PEIS, DOE/NNSA decided to implement the Expanded Operations Alternative from the 2026 LANL SWEIS (NNSA 2026b). The potential waste management impacts associated with the increased waste volumes for that alternative were fully evaluated in the LANL SWEIS. The tables below present a comparison of the baseline (seven-year average between 2017 and 2023 for site-wide total and contribution from TA-55), the projected waste generation from pit production, and the site-wide total from the Expanded Operations Alternative in the 2026 LANL SWEIS.

LLW. Table 4.1.12-1 summarizes the estimates of LLW that would be generated annually under the No-Action Alternative. For comparison, the table also shows the average volume of LLW generated site-wide at LANL over the past seven years and that from TA-55, which includes PF-4. As identified in the table, the baseline contribution of LLW from TA-55 is about 6 percent of the total LLW generated from site-wide activities. Under the No-Action Alternative, the LLW generation estimates associated with future pit production would range from 3,029 to 7,627 cubic meters per year. This reflects a future contribution between 19 and 37 percent of the LLW being generated from pit production, depending on the pit production rate for that year.

Table 4.1.12-1 LANL Generation of LLW – No-Action Alternative

LLW	Baseline Annual Average (m^3/yr)	Annual Projection (m^3/yr)
Site-wide total	4,985	16,276–20,874[a]
TA-55/PF-4 (30 ppy)	302	3,029
TA-55/PF-4 (80 ppy)		7,627

LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; m^3/yr = cubic meters per year; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area

a Site-wide projections from the LANL SWEIS assume production of 30 ppy. The range presented in this table represents the site-wide total for years in which 80 ppy are produced.

NNSA expects that final disposition of the LLW generated under the No-Action Alternative would be the same as described for current operations (i.e., sent off site for disposal). As noted in Appendix C, Section C.1.12.2, LANL sends almost all of its solid LLW off site to the NNSS and to commercial, licensed TSD facilities.

MLLW. Table 4.1.12-2 summarizes the estimates of MLLW that would be generated annually under the No-Action Alternative. For comparison, the table also shows the average volume of MLLW generated site-wide at LANL over the past seven years and that from TA-55, which includes PF-4. As identified in the table, the baseline contribution of MLLW from TA-55 is about 7 percent of the total MLLW generated from site-wide activities. Under the No-Action Alternative, the MLLW generation estimates associated with future pit production would range from 102 to 262 cubic meters per year. This reflects a future contribution between 15 and 32 percent of the MLLW being generated from pit production, depending on the pit production rate for that year.

Table 4.1.12-2 LANL Generation of MLLW – No-Action Alternative

MLLW	Baseline Annual Average (m^3/yr)	Annual Projection (m^3/yr)
Site-wide total	640	653–813[a]
TA-55/PF-4 (30 ppy)	45	102
TA-55/PF-4 (80 ppy)		262

LANL = Los Alamos National Laboratory; m^3/yr = cubic meters per year; MLLW = mixed low-level radioactive waste; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area

a Site-wide projections from the LANL SWEIS assume production of 30 ppy. The range presented in this table represents the site-wide total for years in which 80 ppy are produced.

LANL manages its MLLW through a combination of onsite treatment followed by offsite disposal as LLW, or shipment to commercial facilities for treatment and disposal. Use of commercial facilities is limited to those able to show adequate capacity and compliance with applicable permitting and regulatory requirements. NNSA expects that final disposition of the MLLW generated under the No-Action Alternative would be consistent with current operations.

TRU Waste. LANL generates TRU waste. All TRU waste goes to DOE's WIPP facility for management and disposal.

Table 4.1.12-3 summarizes the estimates of TRU waste that would be generated annually under the No-Action Alternative. For comparison, the table also shows the average volume of TRU waste generated site-wide at LANL over the past seven years and that from TA-55, which includes PF-4. As identified in the table, the baseline contribution of TRU waste from TA-55 is about 52 percent of the total TRU waste generated from site-wide activities. Under the No-Action Alternative, the TRU waste generation estimates associated with future pit production would range from 280 to 634 cubic meters per year. This reflects a future contribution between 33 and 53 percent of the TRU waste being generated from pit production, depending on the pit production rate for that year.

Table 4.1.12-3 LANL Generation of TRU Waste – No-Action Alternative

TRU Waste	Baseline Annual Average (m^3/yr)	Annual Projection (m^3/yr)
Site-wide total	388	849–1,203[a]
TA-55/PF-4 (30 ppy)	205	280
TA-55/PF-4 (80 ppy)		634

LANL = Los Alamos National Laboratory; m^3/yr = cubic meters per year; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area; TRU = transuranic

a Site-wide projections from the LANL SWEIS assume production of 30 ppy. The range presented in this table represents the site-wide total for years in which 80 ppy are produced.

The volume of TRU waste projected to be generated from pit production (280–634 cubic meters per year) is one contributor to the total TRU waste sent to WIPP. TRU waste estimates from DOE sites that would send TRU waste to WIPP change frequently due to retrieval, treatment, characterization, and shipping activities. Consequently, TRU waste inventory and projected generation estimates are collected annually from generator/storage sites from which the DOE prepares an annual transuranic waste inventory report (ATWIR). The current ATWIR shows that WIPP has the capacity to dispose of all stored and projected LANL TRU waste. This is addressed in more detail in Section 4.3.2 and in Chapter 5, Section 5.4.3.2.

<u>Hazardous Waste</u>

Table 4.1.12-4 summarizes the estimates of hazardous waste that would be generated annually under the No-Action Alternative. For comparison, the table also shows the average amount of hazardous waste generated site-wide at LANL over the past seven years and that from TA-55, which includes PF-4. As identified in the table, the baseline contribution of hazardous waste from TA-55 is less than 2 percent of the total hazardous waste generated from site-wide activities. Under the No-Action Alternative, the hazardous waste generation estimates associated with future pit production would range from 169 to 451 metric tons per year. This reflects a future contribution between 5 and 18 percent of the hazardous waste being generated from pit production, depending on the pit production rate for that year.

Table 4.1.12-4 LANL Generation of Hazardous Waste – No-Action Alternative

Hazardous Waste	Baseline Annual Average (MT/yr)	Annual Projection (MT/yr)
Site-wide total	2,547	3,574–3,856[a]
TA-55/PF-4 (30 ppy)	32.9	169
TA-55/PF-4 (80 ppy)		451

LANL = Los Alamos National Laboratory; m^3/yr = cubic meters per year; MT/yr = metric tons per year; PF-4 = Plutonium Facility building 4; ppy = pits per year; SWEIS = Site-wide Environmental Impact Statement; TA = technical area

a Site-wide projections from the LANL SWEIS assume production of 30 ppy. The range presented in this table represents the site-wide total for years in which 80 ppy are produced.

After material is declared to be hazardous waste, the waste is characterized, labeled, collected in appropriate storage areas, and then transported to a variety of offsite commercial TSD facilities for final disposal.

Other Waste

NMSW. NMSW is a nonhazardous solid waste with unique handling, transportation, and/or disposal requirements to ensure protection of the environment and the public health, welfare, and safety. LANL generates NMSW in various facilities and processes. The largest quantities generated at LANL are the filter cakes from the Sanitary Effluent Reclamation Facility. Under the No-Action Alternative, there would be no differences in NMSW generation associated with pit production.

Solid Sanitary Waste. Table 4.1.12-5 summarizes the estimates of nonhazardous solid waste that would be generated annually under the No-Action Alternative. For comparison, the table also shows the average amount of solid

Table 4.1.12-5 LANL Generation of Solid Sanitary Waste – No-Action Alternative

Solid Sanitary Waste	Baseline Annual Average (MT/yr)	Annual Projection (MT/yr)
Site-wide total	1,633	2,411–2,774[a]
TA-55/PF-4 (30 ppy)	N/A	778
TA-55/PF-4 (80 ppy)		1,141

LANL = Los Alamos National Laboratory; MT/yr = metric tons per year; N/A = not available; PF-4 = Plutonium Facility building 4; ppy = pits per year; SWEIS = Site-wide Environmental Impact Statement; TA = technical area

a Site-wide projections from the LANL SWEIS assume production of 30 ppy. The range presented in this table represents the site-wide total for years in which 80 ppy are produced.

Sanitary waste generated site-wide at LANL over the past seven years. The increase in site-wide, solid sanitary waste is attributed to the increase in workers at LANL. The projected difference between the production rates of 30 ppy and 80 ppy is the increase in the number of workers associated with the higher production rate.

Construction and Demolition (C&D) Debris. Over the past seven years, LANL generated an average of 657 metric tons of C&D debris that was disposed of as nonhazardous solid waste (NNSA 2026a). Under the No-Action Alternative in the LANL SWEIS, LANL is projected to generate approximately 4,229 metric tons of C&D debris based on planned construction, DD&D, and environmental remediation projects to be completed. C&D waste associated with pit production is a small subset of the amount previously evaluated in the 2026 LANL SWEIS since pit production includes minimal DD&D and no environmental remediation.

Materials Management

LANL's materials management operations are conducted pursuant to DOE Orders and various federal, state, and local laws and regulations. Regulatory oversight lies with various federal, state, and local agencies. LANL uses radioactive materials and chemicals in the ongoing pit production mission.

A key element of LANL's strategy in managing its radioactive/hazardous inventory is to ensure that those materials are used safely and appropriately. For new or planned actions, this is done largely through implementing the following hierarchy of controls, in order of preference: (1) select materials and process designs that avoid or minimize use of radioactive/hazardous materials; (2) use engineered controls to confine, shield, or remove hazards; (3) use administrative or procedural controls; and (4) use personal protective equipment.

By conducting operations in accordance with DOE Orders and the applicable federal, state, and local laws and regulations, NNSA does not expect any significant impacts associated with radioactive/ hazardous material management. More details about LANL's materials management can be found in Section 5.11.1.3 of the 2026 LANL SWEIS (NNSA 2026a).

4.1.12.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.12.2 for the potential waste management impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy and three production capacities at SRS (50, 80, and 125 ppy). For the 30 and 80 ppy scenarios, the impacts at LANL would be the same as described in Section 4.1.12.1. For the annual production of 10 pits, the impacts at LANL are described in Section 4.1.12.3. The combination of waste management impacts from pit production at LANL and SRS is provided in Section 4.3.2.

4.1.12.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and waste and materials management impacts associated with operations would be the same as those described in Section 4.1.12.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. For the reduced pit production rate of 10 ppy, there would be reductions in waste generation for all waste types. The radioactive and hazardous waste generation rates for 10 ppy are presented in Table 4.1.12-6 along with the baseline and projected generation rates for 30 ppy for comparison. Because these rates are all below those evaluated in Section 4.1.12.1, waste management impacts would be less than those presented in Section 4.1.12.1.

Table 4.1.12-6 LANL Radioactive/Hazardous Waste – Multi- and Single-Site Alternatives (10 Pits Per Year)

Waste Type	Baseline[a]	Waste Generation Rates	
		30 ppy	10 ppy
TA-55/PF-4 LLW (m^3/yr)	302	3,029	953
TA-55/PF-4 MLLW (m^3/yr)	45	102	33
TA-55/PF-4 TRU waste (m^3/yr)	388	280	90
TA-55/PF-4 Hazardous waste (MT/yr)	111	169	118

LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; m^3/yr = cubic meters per year; MLLW = mixed low-level radioactive waste; MT/yr = metric tons per year; ppy = pits per year; TA = technical area; TRU = transuranic

a Baseline values reflect the seven-year average between 2017 and 2023 for the contribution from TA-55. The waste generation rate columns reflect the additional waste that would be expected for that production rate.

4.1.12.4 Effects of Project Enhancements

There are two project enhancements that potentially could affect the waste generation volumes at LANL: the increase in the MAR inventory limit at RLUOB and the use of a portable supercompactor for TRU waste. The activities that are proposed to be performed at RLUOB (if the MAR limit is increased) are currently being performed at the CMR Building, where the waste volume generated is already included in the projections for pit production, which was evaluated in the 2026 LANL SWEIS (LANL 2026a, NNSA 2026a).

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within LANL. Packaged TRU waste could be transferred to the location and processed through the supercompactor to reduce its overall volume before being transported to WIPP. The operation of the unit could reduce the volume by as much as 80 percent, depending on the concentrations of radionuclides in the waste. This would have an overall positive effect on the impacts presented in Section 4.1.12.1 by lowering the volume shipped off site. The potential impacts on the WIPP facility also would be lessened because a smaller volume would require disposal. Small quantities of LLW/MLLW potentially could be generated as secondary waste during operation of the supercompactor (e.g., wipes, protective clothing). This would not change the projected volumes of LLW/MLLW in Section 4.1.12.1.

4.1.13 Human Health and Safety

The analysis in this section presents the potential impacts on human health and safety for the alternatives. Key metrics presented in the human health analysis include: (1) radiological doses and potential LCFs to the public and workers from normal operations, (2) occupational injuries/deaths to workers, and (3) health impacts to workers and the public from normal operations involving chemicals.

4.1.13.1 No-Action Alternative

Radiological Impacts

Construction activities would not be expected to occur in areas that would pose radiological risks to workers or the public. However, prior to construction, soils in construction areas would be sampled and tested for any contaminants. If any contamination is found, remediation of the area would be conducted prior to construction and waste forms would be appropriately disposed of with the LANL waste management program. Consequently, construction activities would not be expected to result in any radiological health impacts to the public or workers.

Radiation doses would occur from airborne releases from routine (incident-free) continued operations. In addition, increased pit production under the No-Action Alternative would have the potential to increase the radioactive air emissions, the number of radiological workers, and the dose to LANL workers. As identified in Section 4.1.5, NNSA estimates an additional 4.5×10^{-8} curies of PuEq could be released to the air annually from producing 30 ppy. During surge operations (producing 80 ppy), this value could increase to 1.2×10^{-7} curies of PuEq annually. Table 4.1.13-1 lists incremental radiation doses estimated for the public (offsite MEI and collective population) and corresponding incremental health impacts, in terms of LCFs. As shown in the table, the annual radiation dose to the offsite MEI would be much less than the NESHAP limit of 10 millirem per year set by both the EPA (40 CFR Part 61, Subpart H) and DOE (DOE Order 458.1) for airborne releases of radioactivity. The risk of an LCF to the MEI from operations would be 2.4×10^{-7} per year, which reflects a very small incremental addition that results in no change compared to the current baseline.

The projected number of annual LCFs to the population within a 50-mile radius would be 5.4×10^{-5}, which also reflects a very small incremental addition that results in no change compared to the current baseline.

Table 4.1.13-1 Annual Radiological Impacts to the Public from Operational Radiological Emissions at LANL

Receptor/Dose/Risk	Baseline (site-wide existing environment)	No-Action Alternative (30 ppy)	No-Action Alternative (80 ppy)
Offsite MEI[a]			
Dose (mrem)	0.40	0.40	0.40
LCF risk[b]	2.4×10^{-7}	2.4×10^{-7}	2.4×10^{-7}
Population Within 50 Miles[c]			
Collective dose (person-rem)	0.09	0.09	0.09
LCF[b]	5.4×10^{-5}	5.4×10^{-5}	5.4×10^{-5}

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; MEI = maximally exposed individual; mrem = millirem; ppy = pits per year

a This PEIS assumes the site-wide MEI is located at 95 Entrada Drive, close to environmental air-monitoring station 396 per the 2026 LANL SWEIS (NNSA 2026a). This was the location of the MEI dose in 2022. The MEI location potentially changes annually.

b Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).

c Based on about 371,000 people living within 50 miles of LANL.

Source: LANL 2026; NNSA 2026a

For perspective of the relative contribution that pit production makes to the overall potential exposure to the MEI and the public around LANL, the 2026 LANL SWEIS reports that the potential MEI dose under the Expanded Operations Alternative would be 3.66 millirem based on the potential release of over 3,400 curies of various radionuclides (e.g., tritium, mixed activation products, plutonium, uranium), which is still well below the EPA 10-millirem limit at the site boundary (NNSA 2026a).

NNSA estimates that the number of pit production radiological workers would increase from 585 persons (i.e., the number of workers assigned to pit production as of the end of 2023) to 1,028 under the No-Action Alternative to support 30 ppy. The average pit production worker dose is estimated to increase from a site-wide average of 79.7 millirem per year to 360 millirem per year. Table 4.1.13-2 provides estimates of annual radiological doses to workers under the No-Action Alternative for the range of pit production rates. The annual doses to individual workers would be well below the DOE limit of 5,000 millirem (10 CFR Part 835) and the LANL administrative control level of 2 rem per year that has been established for external exposures (LANL 2026). For 30 ppy, the total annual collective dose to pit production radiological workers would be about 370 person-rem, which would result in 0.22 LCF annually.

Occupational and Nonradiological/Chemical Health Impacts

Potential human health impacts to workers were evaluated using U.S. Bureau of Labor Statistics (BLS) occupational injury/illness/fatality rates. Injury/illness/fatality rates at DOE/NNSA sites are historically lower than BLS values due to the increased focus on safety fostered by ongoing health and safety processes. Table 4.1.13-3 shows estimates of injuries/illnesses and fatalities for both the peak year of construction and the total seven-year construction period. In any given year of construction, a maximum of 6.3 days of lost work from illness/injury and less than one fatality would be expected.

Table 4.1.13-2 Annual Radiological Impacts to LANL Workers – Operations

Receptor/Dose/Risk	Baseline (existing environment)	No-Action Alternative (30 ppy)	No-Action Alternative (80 ppy)
Number of pit production radiological workers who receive a measurable dose	585	1,028	2,003 (975 more than 30 ppy)
Average annual dose to pit production radiological worker (mrem)	79.7	360	465
Average annual pit production radiological worker risk (LCFs)[a]	4.8×10^{-5}	2.2×10^{-4}	2.8×10^{-4}
Collective annual dose to pit production radiological workers (person-rem)	46.6	370	931
Total annual pit production radiological worker risk (LCFs)[a]	0.028	0.22	0.56

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; mrem = millirem; ppy = pits per year
a Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).
Source: LANL 2026; NNSA 2026a

No hazardous chemicals have been identified that would pose a risk to members of the public from construction activities. Construction workers would be protected from overexposure to hazardous chemicals by adherence to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and implementation of integrated safety management programs that provide hazards identification and control measures for construction activities.

Table 4.1.13-3 Occupational Injury/Illness and Fatality Estimates at LANL – Construction

Injury, Illness, and Fatality Categories	Results
Peak Construction	
Peak construction workforce (persons)	300
Lost days due to injury/illness[a]	6.3
Number of fatalities[b]	0.06
Total Construction	
Total construction (worker-years)	3,450[c]
Lost days due to injury/ illness	72
Number of fatalities	0.6

LANL = Los Alamos National Laboratory
a Based on 2.1 injuries in New Mexico per 100 workers for construction.
b Based on 18.4 fatalities in New Mexico per 100,000 workers for construction.
c Total construction worker-years determined as follows: 250 workers for years 1–9 of construction for 30 ppy; 300 workers for years 10–13 for 80 ppy.
Source: BLS 2025b

Table 4.1.13-4 shows estimates of injuries/illnesses and fatalities for operations for the production capacities analyzed. In any given year of operation, a maximum of 56 days of lost work from illness/injury and less than one fatality would be expected.

Table 4.1.13-4 Occupational Injury/Illness and Fatality Estimates at LANL – Operations

Injury, Illness, and Fatality Categories	30 ppy[c]	80 ppy[d]
Lost days due to injury/illness[a]	23	56
Number of fatalities[b]	0.05	0.1

LANL = Los Alamos National Laboratory; ppy = pits per year

a Based on 2.7 injuries in New Mexico per 100 workers for manufacturing.

b Based on 6.2 fatalities in New Mexico per 100,000 workers for all occupations (operations). Note: Data for manufacturing-related fatalities are not available for New Mexico.

c Based on 864 pit production-related operational workers.

d Based on 2,083 pit production-related operational workers.

Source: BLS 2025b

Regarding health impacts associated with nonradiological air emissions, the Laboratory's emissions of regulated pollutants are below the limits allowed in LANL's Title V Operating Permit, and there are no measurable nonradiological/chemical health effects to the public from LANL air emissions (LANL 2025b). Regarding health impacts associated with nonradiological effluents, based on annual analyses, NNSA has concluded that there is no measurable risk to the public from exposure to surface water and sediment resulting from either current or legacy LANL releases (LANL 2025b). Workers would be protected from overexposure to hazardous chemicals by adherence to regulatory occupational standards that limit concentrations of potentially hazardous chemicals. Overall site usage of chemicals would not increase notably because of increased pit production under the No-Action Alternative. Potential impacts from chemical accidents are presented in Section 4.14 of this PEIS.

4.1.13.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.2.13.2 for the potential human health impacts at SRS). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at LANL: 10, 30, and 80 ppy. Impacts from the production of 30 and 80 ppy would be the same as described in Section 4.1.13.1. Impacts from the production of 10 ppy are described in Section 4.1.13.3.

4.1.13.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If LANL were the single site for pit production, NNSA would produce 30–80 ppy and human health impacts associated with operations would be the same as those described in Section 4.1.13.1. If SRS were the single site for pit production, NNSA would not produce pits for the stockpile at LANL but would maintain the existing LANL pit production capability in standby and produce a minimal number of pits (e.g., 10 ppy) to maintain production competencies. As discussed below, this reduction in pit production at LANL would result in a decrease of potential human health impacts compared to the No-Action Alternative.

Radiological Impacts

Reduced pit production (to 10 ppy) would have the potential to decrease the radioactive air emissions and the collective dose to workers at LANL. NNSA estimates that annual radioactive air emissions would decrease from 4.5×10^{-8} curies of PuEq to 1.5×10^{-8} curies of PuEq, which would represent a 67-percent reduction compared to the No-Action Alternative. However, as shown in Table 4.1.13-5, because pit production radiological emissions account for much less than 0.1 percent of the public dose (NNSA 2026a), the potential human health impacts to the public would not change compared to the No-Action Alternative.

Table 4.1.13-5 Annual Radiological Impacts to the LANL Public – 10 Pits Per Year

Receptor/Dose/Risk	No-Action Alternative (30 ppy)	No-Action Alternative (80 ppy)	Single-Site Alternative (10 ppy)
Offsite MEI[a]			
Dose (mrem)	0.40	0.40	0.40
LCF risk[b]	2.4×10^{-7}	2.4×10^{-7}	2.4×10^{-7}
Population Within 50 Miles[c]			
Collective dose (person-rem)	0.09	0.09	<0.09
LCF[b]	5.4×10^{-5}	5.4×10^{-5}	5.4×10^{-5}

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; MEI = maximally exposed individual; mrem = millirem

a This PEIS assumes the site-wide MEI is located at 95 Entrada Drive, close to environmental air-monitoring station 396 per the 2026 LANL SWEIS (NNSA 2026a).

b Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).

c Based on about 371,000 people living within 50 miles of LANL.

Source: LANL 2026; NNSA 2026a

For workers, NNSA estimates that the number of pit production radiological workers would not change compared to the No-Action Alternative (30 ppy). However, the average dose to a pit production worker would be reduced to 160 millirem per year. Consequently, the annual radiological impacts to collective worker population from operations would decrease, as shown in Table 4.1.13-6.

Table 4.1.13-6 Annual Radiological Impacts to Workers at LANL – Single-Site Alternative

Receptor/Dose/Risk	No-Action Alternative (30 ppy)	Single-Site Alternative (10 ppy)
Number of pit production radiological workers who receive a measurable dose	1,028	1,028
Average annual dose to pit production radiological worker (mrem)	360	160
Average annual pit production radiological worker risk (LCFs)[a]	2.2×10^{-4}	9.6×10^{-5}
Collective annual dose to pit production radiological workers (person-rem)	370	164
Total annual pit production radiological worker risk (LCFs)[a]	0.22	0.10

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; mrem = millirem; ppy = pits per year

a Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).

Source: LANL 2026; NNSA 2026a

<u>**Occupational and Nonradiological/Chemical Health Impacts**</u>

Because the number of pit production workers would not change compared to the No-Action Alternative (30 ppy), there would be no change to the number of injuries/illness/fatalities at LANL. In addition, there would continue to be no measurable nonradiological/chemical health effects to the public or workers from LANL air emissions.

4.1.13.4 Effects of Project Enhancements

There are two project enhancements that potentially could affect human health and safety at LANL: the increase in the MAR inventory limit at RLUOB and the use of a portable supercompactor for TRU waste. As discussed in Section 4.1.5.4, the increased MAR inventory limit at RLUOB would not cause a site-wide increase in emissions because the functions are currently performed in the CMR Building; a transfer to RLUOB likely would decrease normal operational releases. Similarly, for worker dose, annual radiation exposure to personnel that transfer to RLUOB that are performing the same activities as currently performed in the CMR Building would be the same or lower than currently projected (LANL 2026). Increases in accident risk are addressed in Section 4.1.14.1.

Any potential radiological impacts to the offsite public would be associated with potential releases from RLUOB, as identified in Section 4.1.5.3, which would be expected to be smaller than those projected for PF-4. Like the results shown in Table 4.1.13-1, the offsite MEI would not be expected to receive a dose measurably above background.

The potential utilization of a portable supercompactor for TRU waste would involve a small staff of LANL waste management personnel working with contractor staff. This enhancement would add an estimated 10–20 radiological workers during the period that the unit is located on site. Average annual worker exposure for personnel working with the supercompactor would be lower than that estimated for pit production radiological workers in PF-4. This would result in an increase of about 1 percent in the total worker collective dose as compared to the results presented in Table 4.1.13-2.

4.1.14 Accidents and Intentional Destructive Acts

If an accident involving the release of radioactive or chemical materials were to occur, members of the public and workers would be at risk. This section presents the impacts to the public and workers from potential accidents involving pit production operations at LANL. Additional details supporting the analysis are provided in Appendix D to this PEIS. There are no differences in accident impacts among the LANL alternatives because the actions under each alternative would not affect the location, frequency, scenario, or MAR of the postulated accidents. Consequently, the impacts of potential accidents at LANL would be the same for all alternatives, and the information below is relevant to all LANL alternatives.

<u>**Radiological Accidents**</u>

Table 4.1.14-1 shows the frequencies and consequences of the postulated set of accidents for the public (offsite MEI and the general population living within 50 miles) and a hypothetical noninvolved worker for the production of 80 ppy. The accidents presented in Table 4.1.14-1 represent a spectrum of accident frequencies and consequences ranging from “anticipated” to

"extremely unlikely."[31] For each of the accidents presented in Table 4.1.14-1, fatal or serious non-fatal injuries to *involved* workers may be expected because of such a worker's proximity to an accident.

As shown in Table 4.1.14-1, the accident with the highest potential consequences to the offsite population is a fire in a TRU storage array caused by a vehicle crash and is thus considered the maximum reasonably foreseeable accident. Approximately 1.1 LCFs in the offsite population could result from such an accident in the absence of mitigation. This accident has a probability of occurring once every 100,000 years. An offsite MEI would receive a dose of approximately 69 rem.

Table 4.1.14-1 Radiological Accident Frequency and Consequences – 80 Pits Per Year[a]

Radiological Accident	Frequency (per year)	Maximally Exposed Individual[b,e]		Offsite Population[c]		Noninvolved Worker[d,e]	
		Dose (rem)	Latent Cancer Fatality[f]	Dose (person-rem)	Latent Cancer Fatality	Dose (rem)	Fatality[f]
TA-55, PF-4 glovebox fire	3×10^{-4}	6.4	3.84×10^{-3}	629	0.38	22	0.026
Vehicle impact while transporting TRU waste containers with ensuing fire	1×10^{-5}	17	0.01	375	0.22	35	0.042
Refueling vehicle crash into TRU storage array with ensuing fire	1×10^{-5}	69	0.083	1,800	1.1	120	0.14
Large combustible fire in TRU storage array	1×10^{-5}	17	0.01	561	0.33	22	0.026
Facility-wide seismic event and fire in PF-4	7.2×10^{-6}	8.57	5.14×10^{-3}	945	0.57	316	0.38
Nuclear criticality	1×10^{-2}	0.00014	8.4×10^{-8}	0.037	2.2×10^{-5}	0.075	4.5×10^{-5}

LANL = Los Alamos National Laboratory; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area; TRU = transuranic

a Impacts presented for 80 ppy. Impacts for 30 ppy would be bounded by analysis for 80 ppy.

b See Table D.3-6 of the 2026 LANL SWEIS (NNSA 2026a) for the specific distance of the MEI for each accident presented.

c Based on a projected future population (year 2032) of approximately 552,115 persons residing within 50 miles of PF-4.

d At a distance of 100 meters.

e The MEI and the noninvolved worker scenarios each assume that one person was exposed. If more than one person was exposed in either of these scenarios, then that scenario's dose would be per person and the fatalities would be multiplied by the number of persons exposed.

f The LCF values were calculated using a dose-to-LCF conversion factor of 0.0006 LCF per rem (MEI and worker) or person-rem (population). If the dose to an MEI or worker exceeds 20 rem, the dose-to-risk conversion factor is doubled to 0.0012.

Source: NNSA 2008a, 2026a; LANL 2026

[31] Accident frequencies are generally grouped into bins, such as the following:
- "anticipated" (annual frequencies ≥ 1 in 100 [1×10^{-2}]);
- "unlikely" (annual frequencies < 1 in 100 to ≥ 1 in 10,000 [1×10^{-2} to 1×10^{-4}]);
- "extremely unlikely" (annual frequencies < 1 in 10,000 to ≥ 1 in 1 million [1×10^{-4} to 1×10^{-6}]); and
- "beyond extremely unlikely" (< 1 in 1 million [1×10^{-6}]).

Statistically, the MEI would have a 0.083 chance of developing an LCF, or about 1 in 12. The accident with the highest potential consequences to the noninvolved worker is a facility-wide seismic event with ensuing fire in PF-4. A noninvolved worker located 100 meters from the accident would receive a dose of approximately 316 rem. Statistically, the noninvolved worker would have a 0.38 chance of developing an LCF, or about 1 in 3. For each of the accidents presented in Table 4.1.14-1, fatal or serious non-fatal injuries to *involved* workers may be expected because of such a worker's proximity to an accident.

Table 4.1.14-2 shows the accident risks (per year) of the production of 80 ppy, obtained by multiplying the accident consequences (in LCFs) by the frequency of the accident. As shown in that table, when frequencies are considered, the accident with the highest risk to the MEI is a glovebox fire in PF-4 in TA-55. For this accident, the LCF risk to the MEI would be 1.2×10^{-6} per year, or approximately one statistical fatality in 833,000 years. For the population, the LCF risk would be approximately 1.2×10^{-6} per year, meaning that an LCF in the population would statistically occur once every 9,000 years. A noninvolved worker would have a 7.8×10^{-6} chance of developing an LCF, or about 1 in 128,000.

Table 4.1.14-2 Annual LCF/Fatality Risks at LANL – 80 Pits Per Year[a]

Radiological Accident	Maximally Exposed Individual[b]	Offsite Population[c]	Noninvolved Worker[d]
TA-55, PF-4 glovebox fire	1.2×10^{-6}	1.1×10^{-4}	7.8×10^{-6}
Vehicle impact while transporting TRU waste containers with ensuing fire	1.0×10^{-7}	2.2×10^{-6}	4.2×10^{-7}
Refueling vehicle crash into TRU storage array with ensuing fire	8.3×10^{-7}	1.1×10^{-5}	1.4×10^{-6}
Large combustible fire in TRU storage array	1.0×10^{-7}	3.3×10^{-6}	2.6×10^{-7}
Facility-wide seismic event with ensuing fire in PF-4	3.7×10^{-8}	4.1×10^{-6}	2.7×10^{-6}
Nuclear criticality	8.4×10^{-10}	2.2×10^{-7}	4.5×10^{-7}

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; PF-4 = Plutonium Facility building 4; ppy = pits per year; TA = technical area; TRU = transuranic

a Impacts presented for 80 ppy. Impacts for 30 ppy would be bounded by analysis for 80 ppy.

b See Table D.3-6 of the 2026 LANL SWEIS (NNSA 2026a) for the specific distance of the MEI for each accident presented.

c Based on a projected future population (year 2032) of approximately 552,115 persons residing within 50 miles of PF-4.

d At a distance of 100 meters.

Source: NNSA 2008a, 2026a; LANL 2026

Hazardous Chemical Accidents

The adverse effects of exposure vary greatly among chemicals. They range from physical discomfort and skin irritation to respiratory tract tissue damage and, at the extreme, death. For this reason, allowable exposure levels differ from substance to substance. This analysis used the American Industrial Hygiene Association's Emergency Response Planning Guide (ERPG) values to develop hazard indices for chemical exposures, as follows:

- **ERPG-1** is the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing other than mild transient adverse health effects or perceiving a clearly defined objectionable odor.
- **ERPG-2** is the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair their abilities to take protective action.
- **ERPG-3** is the maximum airborne concentration below which nearly all individuals could be exposed for up to one hour without experiencing or developing life-threatening health effects.

The analysis used estimated impacts of the potential release of the most hazardous chemicals used for pit production at LANL. A chemical's vapor pressure, acceptable concentration (ERPG-2), and quantity available for release are factors used to rank a chemical's hazard. The accident scenario postulates a major leak, such as a pipe or tank rupture, and the released chemical forming a pool about 1-inch deep in the area around the point of release. Table 4.1.14-3 provides information on each chemical and the frequency and consequences of an accidental release. The source term shown represents the amount of the chemical that is accidentally released.

Table 4.1.14-3 Chemical Accident Frequency and Consequences – 80 Pits Per Year

Chemical Released	Quantity Released (kg)	ERPG-2		Concentration		Frequency (per year)
		Limit (ppm)	Distance to Limit (km)	At 100 m (ppm)	At Site Boundary[a] (ppm)	
Nitric acid	3,420	10	0.38	110 (constant)	3.4 (constant)	1×10^{-4}
Hydrofluoric acid	340	20	0.68	300–900[b]	8–19[b]	1×10^{-4}
Hydrochloric acid	384	20	1.4	~0–4,200[c]	~0–90[c]	1×10^{-4}

ERPG = Emergency Response Planning Guide; kg = kilogram; km = kilometer; m = meter; ppm = parts per million

a Site boundary is at a distance of 0.7 mile.

b Concentrations for hydrofluoric acid vary considerably during the 60-minute period post release. As inferred by the presented values, the ERPG-2 limit for hydrofluoric acid will be exceeded for the noninvolved worker (at 100 meters) throughout the entire 60-minute period, whereas concentrations will exclusively remain under the limit for the MEI (at the site boundary) during the 60-mimute measured period.

c Concentrations for hydrochloric acid vary considerably during the 60-minute period post release. As inferred by the presented values, the ERPG-2 limit for hydrochloric acid will be exceeded for a portion of the noninvolved worker's (at 100 meters) exposure time (i.e., during the first ~10 minutes post release, immediately followed by a rapid drop-off) and the MEI (at the site boundary) exposure time (i.e., during the period of 5–15 minutes post release, followed by a rapid drop-off).

Source: NNSA 2008a, LANL 2026

The impacts of chemical releases are measured in terms of ERPG-2 protective concentration limits given in parts per million. The distances at which the limit is reached are also provided for the ERPG-2 limit. The concentration of the chemical at the noninvolved worker location (i.e., 100 meters from the accident) is shown for comparison with the concentration limit for ERPG-2. The distance to the site boundary and the concentration at the site boundary are also shown for comparison with the ERPG-2 concentration limits and for determining if the limits are exceeded off site. Conservative modeling of chemical release over the period of one hour was based on a spill and subsequent pool with evaporation resulting in calculated downwind concentrations. Table 4.1.14-3 shows the consequences of the dominant loss of containment accident scenarios. Nitric acid and hydrofluoric acid released in the accident would not exceed ERPG-2 limits off site. Hydrochloric acid released in the accident would exceed ERPG-2 limits off site during the period of 5 to 15 minutes after release. Concentrations at the location of a noninvolved worker at a distance of 100 meters from any of the chemical releases would exceed ERPG-2 limits and would require mitigation (i.e., controls) and/or protective measures (e.g., evacuation, shelter-in-place).

Intentional Destructive Acts

The 2026 LANL SWEIS (NNSA 2026a) and the Complex Transformation SPEIS (NNSA 2008a) include classified appendices that analyze the potential impacts of intentional destructive acts (e.g., sabotage, terrorism). The impacts of some terrorist incidents would be similar to the accident impacts described in this accident analysis, while some incidents may have more severe impacts. In preparing this PEIS to address intentional destructive acts, NNSA reviewed the 2026 LANL SWEIS and the Complex Transformation SPEIS classified appendices and concluded that they are reasonable and adequate to represent intentional destructive acts that could occur at LANL and SRS and do not need to be revised to support decisions related to this PEIS.

Effects of Project Enhancements

There are two project enhancements that potentially could affect accident risk at LANL: the increase in the MAR inventory limit at RLUOB and the use of a portable supercompactor for TRU waste. The increase of the MAR inventory limit would increase the potential controlling accident for the HC-3 RLUOB facility; however, based on preliminary results of the revised accident analyses, the potential consequences of an accident would be limited to the localized area, consistent with the expectations of a HC-3 facility per DOE-STD-1027. Additionally, these accidents would be bounded by the higher impact accidents at the HC-2 PF-4 facility, which are evaluated in Appendix D. Before the MAR inventory limit is increased, LANL would finalize the updated safety analysis and evaluate whether additional NEPA review was necessary.

The potential utilization of a portable supercompactor for TRU waste at LANL would involve compacting a single waste drum at a time. The contents of a precompacted drum would include TRU-contaminated waste such as protective clothing, wipes, and small waste items. Hydraulic compaction of the single drum could result in drum rupture; however, an energetic event would be highly unlikely. Therefore, the potential for an accidental release would be contained within the trailer confinement and be mitigated by the existing HEPA filters. Offsite releases and consequences would not be expected.

4.1.15 Decontamination, Decommissioning, and Demolition

Eventually, the facilities associated with the Proposed Action would be subject to DD&D. Once NNSA decided to terminate use of the pit production facilities at LANL, select facilities could be added to the list of surplus or excess facilities and require DD&D. Because these DD&D actions are not expected until after the 50-year analytical period and thus the details of DD&D are not currently available, these impact discussions are provided at a general and programmatic level.

Regardless of the alternative selected in a ROD based on this PEIS, there will be contaminated and uncontaminated facilities that would require DD&D. The primary DD&D goal would be to decontaminate any facilities to the extent that residual radioactivity would be at an acceptable level. The facility decontamination would be conducted in accordance with applicable regulations and requirements and in a manner that would minimize potential impacts to the health and safety of workers, the general public, and the environment.

Prior to the initiation of DD&D activities, the facility operator would prepare a detailed DD&D plan for NNSA approval. NNSA would work cooperatively with DOE-EM during the DD&D. The DD&D plan would contain a detailed description of the site-specific DD&D activities to be performed and would be sufficient to allow an independent reviewer to assess the appropriateness of the decommissioning activities; the potential impacts on the health and safety of workers, the public, and the environment; and the adequacy of the actions to protect health and safety and the environment. All buildings and systems would require regulatory planning, document preparation, and characterization and deactivation before any DD&D activities would be allowed to commence. Facilities would be characterized to identify waste types (e.g., radiological and chemical waste), construction material types (e.g., steel, roofing, concrete), presence of equipment, levels of contamination, expected waste volumes, and other information that would be used to support safe demolition and clarify requirements for developing facility-specific plans. Active systems (e.g., electric, water, telecommunications) would be identified and deactivated, as appropriate. Adaptive reuse of such infrastructure would be considered, and recyclable materials would be sorted and managed separately, to the extent practicable.

Because the pit production and waste management facilities at LANL that could be subject to DD&D have been operable for several years, there would be extensive contamination that would be evaluated during the DD&D plan. Types of locations will include:

- Surface contamination in and on building structures, such as equipment (e.g., gloveboxes), inventory vaults, internal conveyance systems, tanks, walls, ceilings, roof, floors, sinks, laboratory hoods, and air ventilation ducts;
- Solid and liquid contaminated waste from normal operations and off-normal and accident events; and
- Land contamination from normal and off-normal operations and accident events.

The extent and amount of DD&D associated with the facilities would be notable but cannot be estimated without a detailed assessment of the facilities, which would not be conducted until the decision is made to terminate operations and to proceed with DD&D. However, this PEIS acknowledges that all alternatives could involve DD&D of PF-4, RLUOB, and other facilities within TA-55. Any LLW would be disposed of at NNSS or other appropriate permitted disposal facility, while nonradioactive and nonhazardous waste (i.e., construction and demolition debris and sanitary solid waste) likely would be disposed of at landfills in the LANL area.

Although DD&D activities would generate nonradiological air emissions, there is a potential for radiological air emissions to occur. The intermittent nature of DD&D emission sources, like those that have recently occurred at LANL (e.g., TA-22 and TA-54), would result in dispersed concentrations of air pollutants adjacent to DD&D activities. The transport distance of DD&D emissions from TA-55 to the closest member of the public (about 1,000 meters) would result in additional dispersion and reduced concentrations of air pollutants at the LANL boundary. Ambient air concentrations at LANL are in compliance with the applicable standards or guidelines, as discussed in Chapter 3, Section 3.1.5. As a result, air pollutant concentrations generated from DD&D activities are expected to remain below the applicable National Ambient Air Quality Standards (NAAQS).

Potential impacts to ecological resources during DD&D operations could occur from changes in land use and human disturbance and noise. However, given the minimal ecological resources in TA-55, impacts would not be notable. NNSA would evaluate potential impacts to core and buffer habitat for sensitive species as part of the DD&D plan development. Infrastructure demands associated with DD&D are expected to be less than construction demands, and the LANL infrastructure has adequate supply to meet demand.

DD&D activities also would cause health and safety impacts to workers (occupational and radiological), as well as potential health impacts to the public through the release of radiological materials. DD&D planning would follow radiological protection guidelines to ensure that radiation doses to employees are kept below administrative guidelines and that airborne releases, which could impact the public, are kept to *de minimis* levels. Lessons learned from DD&D at other DOE sites would be applied to minimize impacts to workers and the public. Experience with other DD&D operations has shown that while occupational impacts to workers are expected, BMPs can reduce impacts.

While DD&D activities would also produce socioeconomic impacts, it would be speculative to quantify the number of jobs that would be created; however, DD&D activities at other DOE sites (e.g., East Tennessee Technology Park in Oak Ridge, Tennessee) have created a significant number of temporary jobs relative to the number of operational jobs that were lost when a facility ceased operations.[32]

It is expected that most surface contamination would be easily removed and reduced to acceptable levels. Any wastes from such decontamination likely would be categorized as LLW. These wastes (e.g., clothing, gloves, equipment, rags, paper, filters, and plastic) likely would be disposed of at NNSS. TRU waste would be generated by DD&D activities. Because DD&D would not likely occur until at least 2070, quantities of TRU waste from DD&D activities cannot be quantified until facility-specific DD&D plans are prepared. Any TRU waste would be managed and disposed of in accordance with all applicable regulatory requirements.

4.1.16 Design Features, Best Management Practices, and Mitigation Measures

As specified in DOE NEPA Implementing Procedures (DOE 2025a, Section 8.0), mitigation measures are those that avoid, minimize, or compensate for effects caused by a proposed action or alternatives as described in an environmental document or ROD and that have a nexus to those effects. Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing effects by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

Each of the alternatives at LANL has the potential to affect one or more resource areas. If mitigation measures above and beyond those required by regulations are needed to reduce impacts, NNSA will describe these mitigation commitments in the ROD. As stated in the DOE NEPA Implementing Procedures (DOE 2025a), an EIS shall demonstrate DOE's consideration of "any means identified to mitigate adverse environmental effects of the proposed action. DOE is mindful that in this respect NEPA itself does not require or authorize DOE to impose any mitigation measures." The Laboratory currently operates under the *Mitigation Action Plan for Los Alamos National Laboratory Operations*

[32] https://ucor.com/who-we-are/

(LANL MAP) (DOE 2020). The LANL MAP provides a comprehensive list of all current mitigations that have been identified in the 2008 LANL SWEIS and other LANL NEPA documents. The LANL MAP explains how, before implementing any of the alternatives, certain measures must be planned and implemented to mitigate adverse environmental impacts. NNSA will be preparing a new LANL MAP to include past mitigation commitments prior to implementation of the selected projects. The 2026 LANL SWEIS did not identify any mitigation measures specifically for the projects related to plutonium pit production (NNSA 2026a).

The Laboratory implements a combination of design features and BMPs to avoid or reduce potential environmental impacts that could result from implemented projects. Facility designs could include features such as HEPA filtration and seismically qualified confinement structures that could minimize potential impacts to worker and public safety. BMPs are policies, practices, and measures that reduce the environmental impacts of proposed activities, functions, or processes. Information about design features and BMPs that are implemented during activities at LANL are presented in the 2026 LANL SWEIS (NNSA 2026a, Appendix A, Section A.5.1).

4.1.17 Unavoidable Adverse Impacts

Pit production activities at LANL under any of the alternatives analyzed in this PEIS could result in unavoidable adverse impacts on the human environment. In general, these impacts would be minimal and would come from incremental impacts attributed to ongoing LANL operations. This PEIS (Sections 4.1.1–4.1.15) has identified potential adverse impacts that could occur at LANL and measures that could be taken to minimize or avoid these impacts. The residual adverse impacts of actions remaining after design features and BMPs are credited, if any, are considered to be unavoidable. In accordance with the NEPA statute and DOE NEPA Implementing Procedures, this section discusses any adverse environmental effects that cannot be avoided should the proposal be implemented.

Development of new facilities and infrastructure at the Laboratory as a result of pit production activities would disturb approximately 27 acres of previously undisturbed land. However, because activities associated with pit production activities represent a continuation of existing land uses, they would be compatible with existing and approved future land uses at and surrounding the site.

Ongoing activities at LANL will continue to result in unavoidable radiation and chemical exposure to workers and the public. Generation of radioactive isotopes under any of the alternatives is unavoidable. Radioactive waste generated during operations and DD&D would be collected, treated, stored, and eventually removed for suitable recycling or disposal in accordance with applicable federal and state regulations.

Operations at LANL under any of the alternatives would have unavoidable adverse impacts from air emissions. Air emissions include various chemical or radiological constituents in the routine emissions typical of nuclear facility operations. DD&D associated with the refurbishment of PF-4 could result in the one-time generation of radioactive and nonradioactive waste material that could affect storage requirements. This could produce unavoidable impacts on the amount of available and anticipated storage space and the requirements of disposal facilities at LANL.

Temporary construction impacts associated with the construction of new facilities at LANL also would be unavoidable. These impacts would include generation of fugitive dust and noise, as well as increased construction vehicle traffic. The additional staffing associated with pit production will also cause an unavoidable increase in commuter traffic.

4.1.18 Relationship Between Short-Term Uses and Enhancement of Long-Term Productivity

Pit production activities at the Laboratory under any of the alternatives would require short-term commitments of resources and permanent commitments of certain resources (such as energy). These pit production resources are a subset of the total resource commitments evaluated in the 2026 LANL SWEIS. Environmental resources have already been committed to continuing operations at LANL. Additional commitments would serve to maintain existing environmental conditions with little or no impact on the long-term productivity of the environment.

Land Use, Facilities, and Waste Management

Short-term commitments of resources would include space and materials required to construct new buildings, new operations support facilities, transportation, and disposal resources and materials related to pit production.

Management and disposal of additional sanitary solid waste and nonrecyclable radiological waste would require the use of energy and space at LANL treatment and storage facilities or at offsite disposal facilities (e.g., NNSS or WIPP). Regardless of where solid waste management activities occur, a long-term commitment of land would be required to meet solid waste needs. Activities being considered at LANL, such as expansion of facilities and infrastructure, would result in further disturbance, use, and commitment of previously undisturbed land. Ultimately, after closure of facilities at LANL, NNSA plans to DD&D the buildings and equipment and restore them to brownfield sites that could be made available for future reuse.[33]

Human Health and Waste Management

Workers, the public, and the environment could be exposed to increased amounts of hazardous and radioactive materials over the 50-year analytical period of this PEIS due to process emissions and handling of radioactive and hazardous waste.

Air Quality

Regardless of alternative, additional air emissions could introduce small amounts of radiological and nonradiological constituents to the air in the region around LANL. These emissions would result in additional exposure but would not be expected to impact compliance with air quality or radiation exposure standards at LANL. There would be no significant residual environmental effects on long-term environmental viability.

4.1.19 Irreversible and Irretrievable Resource Commitments

Pit production at LANL under the alternatives requires the consumption of a number of resources. Table 4.1.11-1 shows the projected usage of water, electricity, and petroleum-based fuel across the PEIS alternatives. There also are many materials requirements for construction and maintenance of facilities, and operations require the consumption of the entire range of expected products and materials, such as chemicals. Commitments of capital, energy, labor, and materials are generally irreversible.

[33] Brownfield refers to land that has been previously developed or used for industrial, commercial, or other purposes, and that may be complicated for redevelopment by the presence or potential presence of contamination, infrastructure, or other legacy disturbances.

Energy expended would be in the form of fuel for equipment and vehicles, electricity for facility operations, and human labor. Pit production activities could generate nonrecyclable waste streams such as radiological and nonradiological solid waste and some wastewater. Certain materials and equipment used during operations, however, could be recycled when buildings such as PF-4 undergo refurbishment. Disposal of hazardous and radioactive wastes also would cause irreversible and irretrievable commitments of land, mineral, and energy resources.

4.2 Savannah River Site

Under the No-Action Alternative at SRS, NNSA will continue to implement the SRS ROD (85 FR 70601, November 5, 2020) to construct the SRPPF while also complying with the Settlement Agreement (DOE 2025b) discussed in Chapter 1, Section 1.6. The activities included in the No-Action Alternative at SRS are limited to construction activities. This applies to all resources in this section.

4.2.1 Land Use

The analysis in this section presents the potential impacts on land use for the alternatives. Key metrics presented in the land use analysis include: (1) the number and footprint of new facilities and infrastructure; (2) the total area of land disturbance and the conversion of currently undeveloped land; (3) operational changes that could affect land use patterns or site functionality; and (4) a qualitative analysis of consistency with current land use plans, classifications, and policies. The impacts presented in this section are associated with the ROI for SRS for each alternative. This analysis focuses on F Area, which contains the majority of pit production activities.

4.2.1.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS land use impact analysis is incorporated by reference into this PEIS.

Implementation of this alternative would increase facility square footage and result in additional land disturbance within F Area beyond that evaluated in the 2020 SRS EIS. Construction of the SRPPF complex would involve a combination of actions at SRS: (1) modification and reuse of existing facilities—principally the MFFF; (2) construction of wholly new facilities and infrastructure; (3) installation of security infrastructure (including fencing) to surround the SRPPF; and (4) performing DD&D of obsolete facilities. The largest single action is the repurposing of the partially constructed MFFF into the SRPPF. Because the MFFF is an existing structure, the majority of land disturbance associated with pit production at SRS would be attributable to proposed auxiliary and support facilities rather than the SRPPF itself.

In addition to the interior and exterior retrofit of the MFFF (conversion into the SRPPF), a number of new and auxiliary facilities are proposed within the security boundary around SRPPF (*see* Figure 2.4-3). These include (as examples) North and South Annexes to the SRPPF; Compressor Building; Diesel Generator Building; Chiller Building; Construction/Maintenance Building; waste storage buildings or staging areas for hazardous, TRU, LLW, and MLLW; sandfilter and fan house; and administrative buildings. Outside the security boundary around the SRPPF (but within F Area), the proposal includes repurposing existing buildings and construction of additional supporting infrastructure, including (but not limited to) the HFTOC; various warehouses; parking areas; and a RCRA Waste Storage Building, USDOT Inspection Station, and Shipping Package Maintenance Certification Facility.

Collectively, these actions would disturb about 107 acres within F Area, consisting of 65 acres of permanent disturbances for facilities and infrastructure and 42 acres of temporary disturbances for laydown and staging areas. The 65 acres of permanent disturbance represents approximately 18 percent of the 364 acres comprising F Area. The majority of the disturbances would be sited on previously disturbed lands and would not require conversion of greenfield areas. The Proposed Action would result in an increased development of an area of about 9.3 acres in F Area that is wooded with pine trees and would become a parking lot.

After construction, all temporarily disturbed areas would be restored in accordance with applicable regulations and site procedures. Once restoration is complete, there would be an increase in open space within F Area.

The No-Action Alternative would not result in offsite impacts to land use plans or programs. No land would be acquired, conveyed, or withdrawn from existing ownership or jurisdiction. All proposed activities are largely confined to F Area and would not extend beyond the SRS site boundary with the exception of material shipments and other transportation activities. Accordingly, there would be no actions on adjacent or non-federal lands, and no conflicts with local, regional, or federal land use plans, policies, or programs.

4.2.1.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.1.2 for the land use impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy. Because these are the same quantities evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b), the SRS Pit Production EIS land use impacts analysis is incorporated by reference into this PEIS.

Construction impacts to land use are the same as presented for the No-Action Alternative. During steady-state operations (after construction is complete and the laydown areas restored), land disturbance related to the SRPPF complex would be limited to routine maintenance, operations, and any minor modifications necessary to support production. No additional permanent land development would be expected. Consequently, future impacts on land use and the facility footprint would be minimal.

4.2.1.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Land use impacts for construction and operations would be the same as those described in Section 4.2.1.2.

4.2.1.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not require additional construction or land development. The use of these existing facilities would be consistent with their previously planned use.

The potential construction of the ARIC would result in additional construction of a 30,000-square-foot facility within the overall 107-acre construction footprint of the SRPPF complex. Its use would be consistent with other facilities in F Area.

The repurposing of the Weapons Support Building to support the pit production missions will not have land use impacts. The facility has already been constructed and is included within the 65-acre permanent development footprint of the SRPPF complex.

Development of the 40-acre area being considered for construction and operation of the machine shops and associated infrastructure would change the land use for the entire 40 acres. The area is currently used for harvesting timber, was logged as recently as 2020, and was not replanted with seedlings (SRNS 2026). If implemented, this project enhancement would change the land use to industrial, which would be consistent with the uses of nearby areas (B Area is about one mile to the southwest and SRPPF is about 1.7 miles to the east).

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a suitable location onsite. A suitable location would likely be a previously disturbed area within SRS that is already used for industrial or waste management activities. Land use impacts would not be expected from this enhancement.

4.2.2 Aesthetic and Scenic Resources

The analysis in this section presents the potential impacts on aesthetics and scenic resources for the alternatives. Key metrics presented in the aesthetic and scenic resource analysis include: (1) the type, extent, and footprint of land disturbances or new features (e.g., structures, lighting, or ground modifications) that could alter the visual landscape; (2) VRM classification changes resulting from these alterations; (3) operational changes that could affect the visibility or character of the landscape; and (4) a qualitative assessment of scenic quality and viewer experience, particularly in areas of high visual sensitivity. The impacts presented in this section are associated with the ROI for SRS for each alternative. This analysis focuses on F Area, which contains the production activities.

4.2.2.1 No-Action Alternative

Aesthetic and scenic resource impacts are primarily driven by the scale of land disturbance. Under the No-Action Alternative, development of the SRPPF complex would disturb approximately 107 acres at SRS (65 acres of permanent disturbance and 42 acres of temporary disturbance).

Onsite Visual Environment

The primary visual impacts would result from the development of facilities and infrastructure required to support pit production. Section 2.4 identifies the specific facilities and infrastructure proposed. Conversion of the MFFF and supporting facilities would comprise the majority of new development, while roadways, parking areas, buffer zones, and utility connections would account for most of the associated infrastructure.

Construction activities would generate short-term visual impacts from the presence of heavy equipment, buildings in various stages of construction, and localized dust. Cranes and temporary laydown areas would also contribute to temporary visual effects; however, such activities are not atypical for SRS. Nearly all development would occur within the interior of SRS within F Area, and construction-related activities would not be visible at or beyond the site boundary. Onsite observers, including employees and visitors, would view these activities as consistent with past construction or other developed areas at SRS.

The disturbance of 9.3 acres of existing pine forest on the north end of F Area would be noticeable to personnel in the area; however, the affected area is on the outskirts of the F Area developed area. Once cleared and the parking lot constructed, the area would again be surrounded by pine forest.

Following completion of construction and restoration of staging and laydown areas, long-term visual impacts are not anticipated. New facilities and infrastructure would be driven by function and purpose and would be visually consistent with the existing built environment. Because F Area is already classified as VRM Class IV—the lowest rating—no further downgrade is possible. Class IV areas are characterized by high-intensity, dense development; therefore, the addition of new or replacement facilities and infrastructure would remain compatible with the existing visual setting.

Offsite Visual Environment

Construction of the SRPPF complex would not result in offsite visual impacts because of its interior location within SRS. Sightlines are limited by distance, vegetation, and the generally flat intervening topography, which restricts offsite vantage points

4.2.2.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.2.2 for the aesthetic and scenic resources impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy. The construction-related impacts to aesthetic and scenic resource would be the same as presented for the No-Action Alternative in Section 4.2.2.1. There would be no additional impacts to these resources from operations of the SRPPF complex.

4.2.2.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Impacts to visual resources from construction and operations would be the same as those described in Section 4.2.2.2.

4.2.2.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not contribute to any differences related to aesthetic and scenic resources.

The potential construction of the ARIC in F Area would be consistent with other construction activities in the area and would not be visible from offsite locations. The Weapons Support Building is an existing building, and its use would not change the visual landscape.

Development of the area for the machine shops and associated infrastructure would change the appearance of a 0.5-mile area segment along and north of C Road, a primary transportation route on SRS. The area historically has been pine forest; however, it is currently clear cut after logging the specific site for timber. Under this potential proposal, the view from C Road would be converted to an industrial appearance, which would be consistent with other industrial areas on SRS. The closest public access point is about three miles to the west-northwest along C Road to the Jackson barricade at SC 125; however, the location is not visible from off site because of terrain and vegetation.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. An additional truck and trailer in an industrialized area would not notably contribute to visual impacts on site and would not be visible from offsite locations.

4.2.3 Geology and Soil

The analysis in this section presents the potential impacts on geology and soils for the alternatives and includes hazards to applicable SRS facilities and infrastructure from geologic conditions. Key metrics in this analysis include: (1) the total area of soil disturbance, (2) the potential for causing erosion or soil loss, and (3) analysis of whether soils and geologic features would support new or modified facilities (e.g., potential for landslides and other soil instabilities). In addition, the analysis identifies and discusses seismic parameters for facilities.

4.2.3.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS geology and soils impact analysis is incorporated by reference into this PEIS.

The total disturbance of land at SRS is expected to involve approximately 107 acres, 42 acres of which would be temporary disturbance. Although activities associated with the Proposed Action would not significantly impact geology and soils, there are some geological hazards that apply to SRS facilities, such as the potential for seismic events.

Repurposing the MFFF to include internal and external modifications to the facility for use as the SRPPF would not disturb additional land beyond the existing facility footprint. Construction of new ancillary and support facilities and buildings would occur on previously disturbed land and would not constitute additional impacts to geological resources.

There are no faults located within SRS that intersect the ground surface; therefore, ground displacement near the SRPPF is highly unlikely. While several faults have been mapped beneath SRS, their features stop several hundred feet below grade. The Pen Branch fault located southeast of K Area is the primary structural feature with the characteristics for producing an earthquake. However, the evidence collected to date suggests that movement along the fault has not occurred in the past 500,000 years and therefore the fault is not considered a capable fault. While the risk of an earthquake exists in association with faults within the Charleston seismic zone (approximately 70 miles southeast of SRS), ground shaking could occur and affect primarily the integrity of inadequately designed or non-reinforced structures; however, this movement would be unlikely to result in damage to specially designed facilities such as the SRPPF.

Soils within the vicinity of the SRPPF have been disturbed to accommodate buildings, parking lots, and roadways. While the soils near the SRPPF meet the definition of prime farmland, the disturbed area would not be converted for farming, as it is not presently farmed and would not be available for farming in the future due to the restricted status of the lands at SRS.

4.2.3.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.3.1 for the geology and soils hazards and impacts at LANL). As discussed in Chapter 2, Section 2.5, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

Construction impacts to geology and soils would be the same as presented for the No-Action Alternative in Section 4.2.3.1. During steady-state operations (after construction is complete and the laydown areas restored), soil disturbance related to the SRPPF complex would be limited to routine maintenance, operations, and any minor modifications necessary to support production. No additional permanent land development would be expected. Consequently, future impacts to geology and soils would be minimal.

4.2.3.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Geology and soils hazards and impacts associated with construction and operation would be the same as those described in Section 4.2.3.2.

4.2.3.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not involve disturbance of soils and the existing facility was designed to meet seismic design standards. Consequences of a potential seismic event are addressed in Section 4.2.14.4.

The potential construction of the ARIC would result in additional construction of a 30,000-square-foot facility within the overall 107-acre construction footprint of the SRPPF complex. The facility's location has not been finalized; however, it is not expected to be on previously undisturbed soil.

The Weapons Support Building is an existing building; therefore, it will not have any additional impact on soil.

Development of the area for the machine shops and associated infrastructure would involve disturbing as much as 40 acres of clear-cut land and grading the soils to support construction of the shop buildings and associated infrastructure. The geology and soils of this potential location are like those in F Area, as described in Sections 3.2.3 and Appendix C, Section C.2.3. The Natural Resources Conservation Service has designated this location as Lucy Sand, which consists of very deep, well drained, moderately permeable soils on uplands. This soil would provide good construction base and good drainage.

The potential utilization of a portable supercompactor would involve the temporary use of a previously disturbed area within SRS that is already used for industrial or waste management activities. There would be no additional land disturbance and no impact on the surrounding soil. The trailer would be configured with containment systems to ensure that liquids would not be released to the environment during or after the compaction (SRNS 2026).

4.2.4 Water Resources

The analysis in this section presents the potential impacts on water resources for the alternatives and includes both surface water and groundwater impacts. Key metrics presented in this analysis include: (1) increases in impervious areas and effects on stormwater; (2) analysis of effluents and the potential for surface/groundwater contamination; and (3) potential floodplain impacts. Potential impacts to wetlands are discussed in Section 4.2.7 of this PEIS. Potential impacts associated with water use (consumption) are discussed in Section 4.2.11.

4.2.4.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS water resources impact analysis is incorporated by reference into this PEIS. In addition, because some construction parameters associated with the SRPPF have changed since 2020, this PEIS analyzes the effects of these changes.

Surface Water

Potential impacts to surface water during construction would be associated with land disturbances that could affect stormwater runoff quality or quantity. The presence of construction equipment could increase the potential for spills or leaks of hazardous substances (i.e., fuels and lubricants) that could then find their way to surface waters. The SRPPF is already in place, but demolition of nearby buildings, construction of new support buildings, and construction of the security infrastructure (including fencing) would be expected to involve removal of structures down to bare ground along with excavation in some areas. All but 9.3 acres of projected disturbance are in previously disturbed areas. SRS has permits, plans, and procedures in place that would minimize the potential for stormwater runoff to carry soil particles or any potential surface water contaminant away from construction areas. To comply with NPDES permit requirements, SRS has developed a BMP plan, spill prevention, control, and countermeasures plan, and stormwater pollution prevention plan, all of which would address the installation of temporary and permanent stormwater controls, erosion controls, spill cleanup, and fuel storage (for construction equipment) (SRNS 2025c).

Groundwater

Potential impacts to groundwater during construction are related to changes to groundwater recharge rates, the release of hazardous substances that could migrate to groundwater, and water usage that could affect groundwater availability. Potential impacts to groundwater resources during operations would be minor. The potential for leaks or releases of contaminants during construction was described in the discussion of surface water. The measures that would be taken to keep contaminants from reaching surface water (e.g., taking actions to prevent leaks and releases and taking quick and appropriate cleanup responses, as necessary) would also be protective of groundwater.

Floodplains

The No-Action Alternative would not affect floodplains at SRS. In addition, facility-specific probabilistic flood hazard curves concluded that water elevations in the streams nearest F Area (Upper Three Runs and Four Mile Branch) would not reach F Area from a 100,000-year flood event (Chen 2000). Therefore, no adverse impacts from flooding are expected.

4.2.4.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.4.2 for the water resources impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

Surface Water

Impacts to surface waters from construction would be the same as the No-Action Alternative presented in Section 4.2.4.1. Potential impacts to surface waters during operations would involve only small changes compared to those of current SRS operations. There would be no direct discharges of water or wastewater to the environment from the SRPPF complex. SRS would employ their BMPs to ensure compliance with the requirements of the stormwater discharge permit. Sanitary wastewater from the SRPPF complex and possibly some process wastewater from inside the SRPFF would discharge to existing treatment facilities, specifically, the Central Sanitary Wastewater Treatment Facility and ETF, respectively. Effluents from the treatment facilities are discharged to local surface water (*see* Section 4.2.11). Accordingly, this alternative would involve additional volumes of water discharging from the treatment facilities; those discharges would still be subject to the applicable requirements from the existing discharge permits. As a result, adverse impacts to surface waters would not be expected.

Groundwater

Potential impacts to groundwater from construction would be the same as presented for the No-Action Alternative. The SRPPF operation would involve no discharges to groundwater; because the site is already a developed area, infiltration and groundwater recharge rates from precipitation are expected to be very similar to those under existing conditions.

Floodplains

Potential impacts to floodplains from construction would be the same as presented for the No-Action Alternative. Operation of SRPPF would not affect floodplains.

4.2.4.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Water resources impacts from construction and operations would be the same as those described in Section 4.2.4.2.

4.2.4.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not involve new construction, changes to impervious surfaces, or the addition of any effluents. Therefore, the use of these facilities would not have a potential impact to water resources.

The additional footprint of the ARIC (0.7 acre) would increase the amount of impervious surfaces within the SRPPF complex by about 1 percent. Existing permits would mitigate any adverse impacts to stormwater management.

The repurposing of the existing Weapons Support Building would not impact surface or groundwater at the site. The footprint of the building is included in the stormwater pollution prevention plan.

Development of the area for the machine shops would involve clearing as much as 40 acres of clear-cut land and grading the soils to support construction of the shop buildings and associated infrastructure. Creation of the 100,000 square feet of building footprint and the aboveground infrastructure (e.g., parking lots, road access, sidewalks) would increase the amount of impermeable surfaces; however, because the area surrounding this location is primarily undeveloped, the effects on groundwater recharge would be minimal. NNSA would implement BMPs and follow standard procedures and permit requirements for managing stormwater.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. The trailer would be configured with containment systems to ensure that liquids would not be released to the environment during the compaction (SRNS 2026). Therefore, this enhancement would not adversely impact surface water, groundwater, or floodplains.

4.2.5 Air Quality

The analysis in this section presents the potential impact on air quality for the alternatives. Key metrics presented in the air quality analysis are quantities of projected air emissions (both nonradiological and radiological) from new construction activities, operations, and waste transport compared to applicable air quality standards.

4.2.5.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS air quality impacts analysis is incorporated by reference into this PEIS. In addition, because some construction parameters associated with the SRPPF have changed since 2020, this PEIS analyzes the effects of these changes.

Radiological Emissions. There would be no radiological emissions associated with construction under the No-Action Alternative.

Nonradiological Emissions. Sources of nonradiological criteria air pollutant emissions under the No-Action Alternative include the operation of select nonradiological facilities, heating and cooling of those facilities, use of construction equipment, land disturbance, and commuting personnel. Emissions from these activities are described in the 2020 SRS Pit Production EIS (NNSA 2020b). Construction of the SRPPF in F Area would generate temporary emissions from diesel equipment and site preparation, but levels would be minimal compared to overall SRS emissions and would remain well below regulatory limits. Dust control measures and the distance from the SRPPF complex to the site boundary would further limit air quality impacts. Emissions would be minor and not affect public air quality.

4.2.5.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.5.2 for the air quality impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

Radiological Emissions. Pit production would have the potential to (1) increase potential radiological emissions released at the site and (2) increase the workforce required for pit production from that described in the 2020 SRS Pit Production EIS. These radiological emissions, including plutonium and uranium isotopes, would be minimal due to the use of gloveboxes, vaults, and multi-stage HEPA filtration systems. Even under higher production scenarios or design variations, total site radionuclide emission increases would range from 0.000084 to 0.00021 curies per year, which would represent an increase of less than 0.0000004 percent from the current baseline, resulting in negligible offsite impacts and continued compliance with all air quality and radiological safety standards.

Nonradiological Emissions. Sources of nonradiological criteria air pollutant emissions include the operation of facilities, heating and cooling, use of construction equipment during construction, land disturbance, commuting personnel, and transporting nuclear materials and waste. During operations, nonradiological emissions would mainly come from backup diesel generators and minor process sources, with most pollutants—such as carbon monoxide, nitrogen dioxide, and particulate matter—remaining well below national standards.

Methods used to calculate emissions from transporting nuclear materials and waste from the Multi-Site Alternative are described in Section 4.1.5.2. Table 4.2.5-1 below lists the results of CO_2e emissions for each alternative and includes the aggregated CO_2, N_2O, and CH_4.

Table 4.2.5-1 CO_2e Emissions from Transporting Waste and Materials

Pollutant	Fuel Economy (mpg)[a]	SRS Multi-Site & Single-Site 50 ppy (MT/yr)	SRS Multi-Site & Single-Site 80 ppy (MT/yr)	SRS Multi-Site & Single-Site 125 ppy (MT/yr)
CO_2	**Total**	2,379	3,699	5,383
	6.5	1,565	2,434	3,541
	25	814	1,265	1,842
N_2O	**Total**	0.10	0.15	0.22
	6.5	0.08	0.12	0.17
	25	0.02	0.03	0.05
CH_4	**Total**	0.10	0.15	0.22
	6.5	0.08	0.12	0.17
	25	0.02	0.03	0.05
CO_2e[b]	**NA**	2,407	3,743	5,447

CO_2 = carbon dioxide; CO_2e = carbon dioxide equivalent; CH_4 = methane; mpg = miles per gallon; MT/yr = metric ton per year, NA = not applicable; N_2O = nitrous oxide, ppy = pits per year; SRS = Savannah River Site

a The 6.5 mpg fuel economy is related to heavy-duty diesel trucks, and the 25 mpg is related to light-duty gasoline vehicles.

b CO_2e emissions were calculated from CO_2+N_2O*265+CH_4*28, where 265 and 28 are the emissions factors for N_2O and CH_4, respectively (IPCC 2014).

Source: EPA 2023

4.2.5.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Air quality impacts from construction and operations would be the same as those described in Section 4.2.5.2.

4.2.5.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would include additional radiological emissions; however, operational radiological air emissions associated with these activities would be minimal since all glovebox operations are HEPA filtered and monitored prior to release. For purposes of analysis, if the entire Surplus Plutonium Disposition Program is repurposed for plutonium metal production, then the air emissions would be less than the projected SRPPF radiological air emissions. As shown in Section 4.2.5.2, total projected radionuclide emissions would be no more than 0.000084 curies per year. Emissions from K Area would be less than this and would not vary by pit production rate. As was determined for the Proposed Action, these project enhancements would also result in negligible offsite impacts and continued compliance with all air quality and radiological safety standards. There would be no nonradiological emissions associated with metal preparation at K Area.

The additional construction footprint of the ARIC (0.7 acres) would increase the potential emissions of nonradioactive criteria pollutants; however, the collective emissions would remain below *de minimis* levels. There would be no radiological emissions associated with this facility.

The preliminary plans for the Weapons Support Building are not finalized but potential reutilization initiatives include development of a Weapons Support Building control room, house a simulator for the SRPPF aqueous recovery system, provide a production assurance laboratory, and a waste characterization laboratory. Therefore, some potential uses could involve radiological materials. This is consistent with the original design for the building (Waste Solidification Building to support surplus plutonium disposition) and, as such, the building is designed with HEPA filtration to minimize any potential radiological emissions.

Development of the area for the machine shops and associated infrastructure would involve clearing as much as 40 acres of clear-cut land and grading the soils to support construction of the shop buildings and associated infrastructure. As with the Proposed Action, construction would result in emissions from construction equipment and dust from grading during the land development. These emissions would be intermittent and temporary during the construction of the machine shops. Operations of the machine shops would be expected to release minimal volumes of criteria pollutants and would be in compliance with the SRS Title V operating permit (*see* Section 3.2.5.1).

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. The trailer would be configured with HEPA filtration to minimize potential radiological emissions to the environment during the compaction (SRNS 2026). As discussed in Section 4.1.5.4, the projected annual radionuclide emissions would be about 1.6×10^{-9} curies of plutonium-239; significantly less than the projected releases from SRPPF during pit production.

4.2.6 Noise

The analysis in this section presents the potential impacts on the noise environment for the alternatives. Key metrics that influence human response to noise presented in this analysis include: (1) the type and characteristics of the noise, (2) distance from source, and (3) time of day. Overall, SRS would remain compliant with current local noise regulations at all times.

4.2.6.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS noise impacts analysis is incorporated by reference into this PEIS.

Construction of the SRPPF complex at SRS would temporarily increase local noise levels from heavy equipment and vehicle traffic, but sound would attenuate quickly and not affect the public or wildlife beyond about 400 feet from the construction site. Noise would not be perceptible off site due to the six-mile distance to the site boundary, and worker exposure would be controlled through DOE hearing protection programs.

4.2.6.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.6.2 for the noise impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

Noise impacts under the Multi-Site Alternative would be the same for all three production capacities. No new construction noise would be expected beyond that discussed for the No-Action Alternative in Section 4.2.6.1. Operational noise from pit production activities would be similar to existing conditions and, due to the six-mile distance to the site boundary, would not be perceptible off site; worker exposure would be controlled through DOE hearing protection programs.

4.2.6.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Noise impacts for construction and operations would be the same as those described in Section 4.2.6.2.

4.2.6.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not involve any new construction and the activities associated with metal preparation would not generate noise that would be perceived outside of the facility. Therefore, this enhancement would not change noise impacts as presented in Section 4.2.6.2.

The additional construction of the ARIC would add to the construction noise within F Area; however, the contribution would be minor and temporary. Operations of the facility would not generate notable noise. Operations of the existing Weapons Support Building would not be expected to generate notable noise.

Development of the area for the machine shops and associated infrastructure would include noise from construction equipment. This noise would be intermittent and temporary during the construction of the machine shops. Operations of the machine shops would not be expected to generate notable noise. Because the shops would be located three miles from the site boundary, any construction noise would be unlikely to reach offsite locations.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. The operation of the supercompactor would generate localized noise during its operation. There are no sensitive noise receptors on site where the supercompactor could be located.

4.2.7 Biological Resources

The analysis in this section presents the potential impacts on biological resources for the alternatives and includes impacts on terrestrial and aquatic resources and threatened, endangered, and species with other special designations. Key metrics presented in this analysis include: (1) identification of disturbances to land/vegetation and discussion of impact on habitats, fish and wildlife, and special status species; and (2) identification and discussion of aquatic and wetland impacts. Impacts from human activity, noise, erosion, and sedimentation were evaluated qualitatively considering location and type of activity relative to ecological resources.

4.2.7.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS biological resources impact analysis is incorporated by reference into this PEIS.

Terrestrial Resources. The land disturbance for pit production at SRS would be about 107 acres, 42 of which would be temporary disturbances and restored after construction. Of the 65 acres permanently disturbed, 9.3 acres are an existing pine forest on the periphery of F Area. Potential impacts from construction could include habitat loss, human disturbance, and noise. Terrestrial resources would not be adversely affected because SRPPF is highly developed and does not support habitat that would attract a wide variety of wildlife. No new impacts to vegetation or wildlife species are expected from human presence or noise from construction. Although unique or sensitive habitat is not expected in the 9.3 acres of new disturbance, NNSA will follow existing site procedures that ensure the absence of sensitive resources before land clearing operations.

Aquatic Resources. No open water or wetlands exist within the SRPPF complex. Aquatic plants and animals do not occur within the SRPPF complex due to the absence of aquatic habitat. Aquatic resources would not be adversely affected because the SRPPF complex does not overlap with these resources.

Threatened, Endangered or Other Special Designation. Federally threatened or endangered species would not be impacted because habitat for these species does not exist in F Area. Migratory birds that are known to use industrial areas on SRS may see short-term impacts from construction activities. Construction would not affect bald and golden eagles since they do not occur within the SRPPF complex. The set-aside areas on SRS for sensitive or at-risk species do not overlap with the SRPPF complex and such species would not be impacted by construction.

4.2.7.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.7.2 for the biological resources impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy. The impacts from construction are presented in Section 4.2.7.1 and there would be no additional impacts from operations of the SRPPF for any pit production capacities.

4.2.7.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Biological resources impacts for construction and operations would be the same as those described in Section 4.2.7.2.

4.2.7.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not involve any new construction. Therefore, this enhancement would not change impacts to biological resources from those presented in Section 4.2.7.2.

The potential construction of the ARIC would be within the overall 107-acre construction footprint of the SRPPF complex and would not be in an area that was previously undisturbed or sensitive habitat. Repurposing the existing Weapons Support Building would not cause any additional impacts to biological resources.

Development of the area for the machine shops and associated infrastructure would involve clearing as much as 40 acres of clear-cut land and grading the soils to support construction of the shop buildings and associated infrastructure. Because this area has been used for timber harvesting recently, it does not provide suitable habitat for sensitive species. Development in this area would be unlikely to notably contribute to environmental impacts to biological resources at SRS; however, NNSA would follow site procedures regarding land clearance before grading.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. The operation of the supercompactor would not cause impacts to biological resources in the ROI.

4.2.8 Cultural and Paleontological Resources

The analysis in this section presents the potential direct and indirect impacts to cultural and paleontological resources for the alternatives. Key metrics presented in this analysis include the types of impacts that could affect physical destruction or damage to cultural and paleontological resources at SRS; however, paleontological specimens are not anticipated to be discovered (*see* Chapter 3, Section 3.2.8 of this PEIS). Thus, impacts to paleontological resources at SRS are unlikely and were not carried forward for analysis.

4.2.8.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS cultural resources impact analysis is incorporated by reference into this PEIS.

Construction activities for the Proposed Action would involve transforming the existing MFFF site in F Area into the SRPPF complex. Neither new nor repurposed facilities would visually impact or physically alter the integrity of historic properties in F Area. With the exception of 9.3 acres of pine forest that would be converted to a parking lot, all construction activities at SRS would occur on previously disturbed lands in line with BMPs with no notable impacts to cultural resources (NNSA 2020b). However, if construction of the SRPPF complex involved further ground-disturbing activities, archaeological monitoring would occur in accordance with the Programmatic Agreement (NRC 2005a; NNSA 2015). Any inadvertent discoveries during construction would be handled in accordance with SRS guidelines (NRC 2005a; SRARP 2013; NNSA 2015) and federal law.

4.2.8.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.8.2 for the biological resources impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

The impacts from construction are presented in Section 4.2.8.1 and there would be no additional impacts from operations of the SRPPF for any pit production capacities.

4.2.8.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Cultural resource impacts for construction and operations would be the same as those described in Section 4.2.8.2.

4.2.8.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities to support pit production would not involve any new construction. Therefore, this enhancement would not change impacts to cultural resources from those presented in Section 4.2.8.2.

The potential construction of the ARIC would be within the 107-acre construction footprint of the SRPPF complex and would not be in an area that was previously undisturbed or contains known cultural resources. Repurposing the existing Weapons Support Building would not cause any additional impact to cultural resources.

Development of the area for the machine shops and associated infrastructure would involve clearing as much as 40 acres of clear-cut land and grading the soils to support construction of the shop buildings and associated infrastructure. Because this area has been used for timber harvesting recently, it is highly unlikely that undiscovered cultural resources would be found at this location; however, NNSA would follow site procedures regarding land clearance before grading.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration that could be driven to a previously disturbed area within SRS that is already used for industrial or waste management activities. Because there would be no land disturbance and noise would be localized to the site, impacts to cultural resources would not be expected.

4.2.9 Socioeconomics

The analysis in this section presents the potential impacts from changes in employment and economic activity for the alternatives. The ROI, as described in Chapter 3, Section 3.2.9, is a four-county area surrounding SRS. Approximately 84.5 percent of the SRS workforce reside in the 4-county ROI in South Carolina and Georgia. Key metrics presented in the socioeconomics analysis include: (1) employment and population changes; (2) changes in economic activity (e.g. earnings/monetary value added); and (3) impacts to housing and community services.

4.2.9.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS socioeconomic impacts analysis is incorporated by reference into this PEIS.

Construction activities at SRS would result in potential impacts on employment, economic activity, population, housing, and community services. Table 4.2.9-1 presents the estimated socioeconomic impacts associated with construction of the SRPPF complex. The table reflects the peak construction year in which as many as 4,500 construction workers are assumed to be employed during any year between 2027 and 2034.

For this analysis it is assumed that by the completion of construction, the total employment impacts under the No-Action Alternative will return to their 2023 baseline values, with the further assumption that the SRPPF will not generate long-term operations. The PEIS recognizes the potential for a localized expansion–contraction dynamic. Peak construction will produce a temporary surge in employment, economic activity, population, housing demand, and services; if a meaningful share of construction workers or supporting businesses remain in the ROI after construction, impacts in the ROI could be similar to those described for the Multi-Site Alternative rather than returning to

Table 4.2.9-1 Socioeconomic Impacts – No-Action Alternative

Resource/Metric	Baseline (existing environment) 2023	Change to Baseline as a Result of the No-Action Alternative	No-Action Alternative (peak year)	Percentage Increase Over Baseline (%)
		Construction (peak year)		
Direct jobs at SRS (persons)	12,691[a]	4,500	17,191	35.5
Indirect jobs from SRS (persons)	7,772[b]	1,328[c]	9,100	17.1
Total Direct and Indirect employment	20,463	5,828	26,291	28.5
Total ROI labor force (persons)	240,178	NA	246,266[d]	2.5[e]
Earnings from direct jobs at SRS (millions of dollars)	$1,671.6[f]	$359.6[g]	$2,031.2	21.5
Earnings from indirect jobs from SRS in ROI (millions of dollars)[g]	$1,023.70[f]	$106.2	$1,129.9	10.4
Value added from SRS in ROI (millions of dollars)[h]	$2,703.10[g,i]	$659.0[j]	$3,362.1	24.4
TOTAL ROI POPULATION	**558,192**	**17,484[k]**	**589,173[l]**	**7.3[m]**

NA = not applicable; ppy = pits per year; ROI = region of influence; SRS = Savannah River Site

a Direct SRS employment is based on 2023 employment.

b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6124 (BEA 2025).

c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2952 (BEA 2025).

d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).

e ROI labor force increase of 2.5 percent would largely occur independent of SRS activities.

f Earnings were estimated using a final-demand earnings multiplier of 0.4074 applied to the change in jobs/change in final-demand multiplier of 3.0931 (BEA 2025).

g Earnings were estimated using a final-demand earnings multiplier of 0.4122 applied to the change in jobs/change in final-demand multiplier of 5.1582 (BEA 2025).

h Derived from earnings from direct jobs/indirect jobs.

i Value added was estimated using a final-demand value-added multiplier of 0.6588 applied to the change in jobs/change in final-demand multiplier of 3.0931 (BEA 2025).

j Value added was estimated using a final-demand value-added multiplier of 0.7554 applied to the change in jobs/change in final-demand multiplier of 5.1582 (BEA 2025).

k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct SRS workers and indirect workers would move with their families.

l Population projection for year 2030 for counties in the ROI derived from Georgia and South Carolina "state Population Trends" (Georgia 2025; South Carolina 2019).

m ROI population increase of 5.6 percent would largely occur independent of SRS activities.

Source: BEA 2025; USCB 2025a

baseline conditions. Conversely, if construction workers depart, businesses and service providers that expanded during peak-year construction could reduce their activity. Returning to baseline values is the assumed effect when construction is completed, with the recognition that localized, short-term workforce retention or indirect effects could produce impacts similar to those analyzed under the Multi-Site Alternative.

Employment and Economic Activity

NNSA would continue construction activities and procure the remaining engineered equipment and commodities. Chapter 2, Section 2.4 of this PEIS presents the total construction parameters that form the basis for this analysis. For the purposes of this analysis, NNSA anticipates that construction activities for the SRPPF would last about seven years and the results in this section present the annual impacts for the peak construction year. Operational impacts are presented in Section 4.2.9.2.

Because no long-term operations staff are anticipated under the No-Action Alternative, any increase in employment and economic activity associated with construction would be temporary. As project-related direct expenditures are made in the ROI, these dollars begin to circulate in the economy. As funds are expended to pay employees and to buy goods and services, the recipients then make purchases, causing successive rounds of local spending, until the original expenditures eventually exit the ROI.

Increases in direct employment at SRS may also cause increases in indirect employment and associated economic activity, such as project-related expenditures, local spending, and revenue from taxes. These indirect increases were derived using multipliers from the BEA-developed RIMS II for the region (BEA 2023). The multiplier of 1.2952 was used for construction workforce increases (BEA 2025). This multiplier was developed for an aggregation of the four-county ROI.

Peak-year construction activities would create an additional 5,828 total jobs in the ROI (4,500 direct and 1,328 indirect jobs). The anticipated value added during peak-year construction activities from the direct economic activity to the local economy includes employee compensation, tax on production and imports, and proprietary and other property income and indirect employment compensation. A portion of this increased payroll likely would enter the local economy as the new workers purchase additional goods and services. It is anticipated that some portion of construction materials would be purchased locally and that most construction workers would be drawn from within the ROI, resulting in regional increases in jobs. The additional anticipated expenditures by workers could generate additional income and employment opportunities within the ROI if the expenditures filter throughout the economy. During the peak-year construction activities, there would be a temporary increase in earnings and value added. This would consist of approximately $359.6 million in direct earnings, $106.2 million in indirect earnings, and about $659.0 million in peak-year value added.

From 2023 to completion of construction, the total labor force in the ROI is estimated to increase from 240,178 persons to 248,857 persons, a growth of 3.6 percent (BLS 2025a), largely driven by non-SRS-related employment. As discussed earlier, this analysis assumes that by the completion of construction, the total employment impacts under the No-Action Alternative are assumed to return to their 2023 baseline values, with the further assumption that the SRPPF will not generate long-term operations.

<u>**Population and Demographics**</u>

Population. Under the No-Action Alternative, construction activities are not expected to produce long-term population changes. There would be a temporary influx of construction workers, with a peak of about 4,500 workers, some of whom are anticipated to be drawn from the existing ROI labor force and some of whom would in-migrate for the construction period. During peak-year construction, the ROI population is projected to be approximately 589,173 (a 5.6-percent increase from the 2023 baseline of 558,192); this growth is expected to occur largely independent of SRS activities. For this analysis, construction employment is assumed to be temporary, and the ROI population is expected to return to near-baseline values after construction concludes.

Federally Recognized Tribes. Federally recognized tribes are not present within the ROI, but the state-recognized Beaver Creek Indian Tribe is headquartered in Aiken County. There would be no impacts to tribes.

<u>**Housing**</u>

Under the No-Action Alternative, impacts on housing are expected to be temporary. The peak construction workforce would create a short-term increase in housing demand as some workers are drawn from the existing ROI labor force while others in-migrate for the duration of the construction period. This influx could raise occupancy of short-term lodging, rentals, and temporary worker housing in the ROI. Because no long-term operations staff are expected, this analysis assumes that most construction-period housing demand would subside after construction ends and that there would be no lasting change in housing supply because of SRS activities.

<u>**Community Services**</u>

Under the No-Action Alternative, impacts on fire protection, police protection services, or medical services are expected to be temporary and concentrated during the construction period. The peak construction workforce additions would be short term. These increases are not expected to significantly change demand for fire protection, police protection, or medical services compared to current conditions.

Regarding schools, an assumed average of 0.34 school-aged children per housing unit (NAHB 2020) associated with the peak construction workforce potentially in-migrating to the ROI would equal approximately 1,530 children (4,500 workers × 0.34). Compared to the 2023/2024 school year, these increases in school enrollment would be less than 1 percent and represent a small proportion of future enrollment. This minimal increase is expected to have a negligible effect on school services within the ROI.

4.2.9.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at SRS and LANL (*see* Section 4.1.9.2 for the socioeconomic impacts associated with LANL). As discussed in Chapter 2, Section 2.5, this PEIS evaluates three production capacities at SRS (50, 80, and 125 ppy). Activities under the Multi-Site Alternative would result in potential impacts on employment, economic activity, population, housing, and community services. Tables 4.2.9-2–4.2.9-4 show the estimated socioeconomic impacts associated with producing 50 ppy, 80 ppy, and 125 ppy at SRS, respectively.

Table 4.2.9-2 Socioeconomic Impacts – Multi-Site Alternative (50 Pits Per Year)

Resource/Metric	Baseline (existing environment) 2023	Change to Baseline as a Result of the Multi-Site Alternative - 50 ppy		Multi-Site Alternative (by the end of 2034)	Percentage Increase Over Baseline (%)
		Construction (peak year)	Operations (by the end of 2034)		
Direct jobs at SRS (persons)	12,691[a]	4,500	1,705	14,396	13.4
Indirect jobs from SRS (persons)	7,772[b]	1,328[c]	1,044[b]	8,816	13.4
Total Direct and Indirect employment	20,463	5,828	2,749	23,212	13.4
Total ROI labor force (persons)	240,178	NA	NA	248,857[d]	3.6[e]
Earnings from direct jobs at SRS (millions of dollars)	$1,671.6[f]	$359.6[g]	$224.66[g]	$1,896.2	13.4
Earnings from indirect jobs from SRS in ROI (millions of dollars)[g]	$1,023.70[f]	$106.2	$137.5	$1,161.2	13.4
Value added from SRS in ROI (millions of dollars)[g,h]	$2,703.10[i]	$659.0[j]	$363.1[i]	$3,0662	13.4
TOTAL ROI POPULATION	**558,192**	**17,484[k]**	**8,247[k]**	**599,106[l]**	**7.3[m]**

NA = not applicable; ppy = pits per year; ROI = region of influence; SRS = Savannah River Site

a Direct SRS employment is based on 2023 employment.
b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6124 (BEA 2025).
c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2952 (BEA 2025).
d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).
e ROI labor force increase of 3.6 percent would largely occur independent of SRS activities. The direct and indirect employment increase from SRS activities would contribute a 1.1-percent increase.
f Earnings were estimated using a final-demand earnings multiplier of 0.4074 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
g Earnings were estimated using a final-demand earnings multiplier of 0.4122 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
h Derived from earnings from direct jobs / indirect jobs.
i Value added was estimated using a final-demand value added multiplier of 0.6588 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
j Value added was estimated using a final-demand value added multiplier of 0.7554 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct SRS workers and indirect workers would move with their families.
l Population projection for year 2034 for counties in the ROI derived from Georgia and South Carolina "state Population Trends" (Georgia 2025; South Carolina 2019).
m ROI population increase of 7.3 percent would largely occur independent of SRS activities. The population increase from SRS activities would contribute a 1.4-percent increase.

Source: BEA 2025; USCB 2025a

Table 4.2.9-3 Socioeconomic Impacts – Multi-Site Alternative (80 Pits Per Year)

Resource/Metric	Baseline (existing environment) 2023	Change to Baseline as a Result of the Multi-Site Alternative - 80 ppy		Multi-Site Production Alternative (by the end of 2034)	Percentage Increase Over Baseline (%)
		Construction (peak year)	Operations (by the end of 2034)		
Direct jobs at SRS (persons)	12,691[a]	4,500	1,895	14,586	14.9
Indirect jobs from SRS (persons)	7,772[b]	1,328[c]	1,160[b]	8,932	14.9
Total Direct and Indirect employment	20,463	5.828	3,055	23,518	14.9
Total ROI labor force (persons)	240,178	NA	NA	248,857[d]	3.6[e]
Earnings from direct jobs at SRS (millions of dollars)	$1,671.6	$359.6[g]	$249.6[f]	$1,921.2	14.9
Earnings from indirect jobs from SRS in ROI (millions of dollars)[g]	$1,023.70[f]	$106.2	$152.9	$1,176.6	14.9
Value added from SRS in ROI (millions of dollars)[g,h]	$2,703.10[i]	$659.0[j]	$403.6[i]	$3,106.7	14.9
TOTAL ROI POPULATION	**558,192**	**17,484[k]**	**9,165[k]**	**599,106[l]**	**7.3[m]**

NA = not applicable; ppy = pits per year; ROI = region of influence; SRS = Savannah River Site

a Direct SRS employment is based on 2023 employment.
b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6124 (BEA 2025).
c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2952 (BEA 2025).
d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).
e ROI labor force increase of 3.6 percent would largely occur independent of SRS activities. The direct and indirect employment increase from SRS activities would contribute a 0.6-percent increase.
f Earnings were estimated using a final-demand earnings multiplier of 0.4074 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
g Earnings were estimated using a final-demand earnings multiplier of 0. 4122 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
h Derived from earnings from direct jobs / indirect jobs.
i Value added was estimated using a final-demand value added multiplier of 0. 6588 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
j Value added was estimated using a final-demand value added multiplier of 0. 7554 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct SRS workers and indirect workers would move with their families.
l Population projection for year 2034 for counties in the ROI derived from Georgia and South Carolina “state Population Trends” (Georgia 2025; South Carolina 2019).
m ROI population increase of 7.3 percent would largely occur independent of SRS activities. The population increase from SRS activities would contribute a 1.5-percent increase.

Source: BEA 2025; USCB 2025a

Table 4.2.9-4 Socioeconomic Impacts – Multi-Site Alternative (125 Pits Per Year)

Resource/Metric	Baseline (existing environment) 2023	Change to Baseline as a Result of the Multi-Site Alternative - 125 ppy		Multi-Site Alternative (by the end of 2030)	Percentage Increase Over Baseline (%)
		Construction (peak year)	Operations (by the end of 2034)		
Direct jobs at SRS (persons)	12,691[a]	4,500	2,840	15,531	22.4
Indirect jobs from SRS (persons)	7,772[b]	1,328[c]	1,739[b]	9,511	22.4
Total Direct and Indirect employment	20,464	5,828	4,579	25,042	22.4
Total ROI labor force (persons)	240,178	NA	NA	248,857[d]	3.6[e]
Earnings from direct jobs at SRS (millions of dollars)	$1,671.6	$359.6[g]	$374.1[g]	$2,045.7	22.4
Earnings from indirect jobs from SRS in ROI (millions of dollars)[g]	$1,023.7 [f]	$106.2	$229.1	$1,252.8	22.4
Value added from SRS in ROI (millions of dollars)[g,h]	$2,703.1[i]	$659.0[j]	$604.9[j]	$3,308.0	22.4
TOTAL ROI POPULATION	**558,192**	**17,484[k]**	**13,737[k]**	**599,106[l]**	**7.3[m]**

NA = not applicable; ppy = pits per year; ROI = region of influence; SRS = Savannah River Site

a Direct SRS employment is based on 2023 employment.
b Indirect employment for operational workforce was estimated using a direct-effect employment multiplier of 1.6124 (BEA 2025).
c Indirect employment for construction was estimated using a direct-effect employment multiplier of 1.2952 (BEA 2025).
d Calculated using the average labor force growth rate of historic labor force in the ROI (BLS 2025a).
e ROI labor force increase of 3.6 percent would largely occur independent of SRS activities. The direct and indirect employment increase from SRS activities would contribute a 0.6-percent increase.
f Earnings were estimated using a final-demand earnings multiplier of 0.4074 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
g Earnings were estimated using a final-demand earnings multiplier of 0.4122 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
h Derived from earnings from direct jobs / indirect jobs.
i Value added was estimated using a final-demand value added multiplier of 0.6588 applied to the change in jobs / change in final-demand multiplier of 3.0931 (BEA 2025).
j Value added was estimated using a final-demand value added multiplier of 0.7554 applied to the change in jobs / change in final-demand multiplier of 5.1582 (BEA 2025).
k Based on an average of three persons per household for the ROI (USCB 2021) and the conservative assumption that new direct SRS workers and indirect workers would move with their families.
l Population projection for year 2034 for counties in the ROI derived from Georgia and South Carolina "state Population Trends" (Georgia 2025; South Carolina 2019).
m ROI population increase of 7.3 percent would largely occur independent of SRS activities. The population increase from SRS activities would contribute a 2.3-percent increase.

Source: BEA 2025; USCB 2025a

Employment and Economic Activity

Under this alternative, NNSA would continue construction activities of the SRPPF complex at SRS and produce pits to support national security requirements. The remaining engineered equipment and commodities would be procured, and construction would be completed. Chapter 2, Section 2.5 of this PEIS discusses the total construction parameters that were estimated in the 2020 SRS Pit Production EIS, as well as the remaining construction parameters that would be associated with completing construction following a ROD for this PEIS. For the purposes of this analysis, NNSA anticipates that construction activities for the SRPPF would be completed in 2034. Following construction, operations at the SRPPF complex would commence, as described in Section 2.2.

Increases in direct employment at SRS may also cause increases in indirect employment and associated economic activity. These indirect increases were derived using appropriate multipliers. The multiplier of 1.6124 was used for indirect employment for total workforce increases under the Multi-Site Alternative; a multiplier of 1.2952 was used for construction workforce increases (BEA 2025). These multipliers were developed for an aggregation of the four-county ROI. Producing 50 ppy would create an additional 2,749 total jobs in the ROI by 2034 (1,705 direct and 1,044 indirect jobs), representing about 1.1 percent of the projected labor force of 248,857 persons. Producing 80 ppy would nearly double that impact, generating around 3,055 additional jobs (1,895 direct and 1,160 indirect), accounting for approximately 1.2 percent of the projected 2034 ROI labor force. Producing 125 ppy would further increase employment, creating an additional 4,579 total jobs (2,840 direct and 1,739 indirect), representing about 1.8 percent of the projected labor force.

As noted in Section 4.2.9.1, the total labor force in the ROI is estimated to grow by 3.6 percent (BLS 2025a), largely driven by non-SRS-related employment. By completion of construction, the total employment impact associated with the Multi-Site Alternative for 50 ppy (23,212 total workers, consisting of 14,396 direct and 8,816 indirect) represents approximately a 13.4-percent increase in total direct and indirect employment from 2023 and would account for about 9.3 percent of the projected ROI labor force at the completion of construction. For 80 ppy, total employment would increase to 23,518 (14,586 direct and 8,932 indirect), representing approximately a 14.9-percent increase over the 2023 baseline and accounting for about 9.5 percent of the projected ROI labor force. At 125 ppy, total employment would rise to 25,042 (15,531 direct and 9,511 indirect), reflecting a 22.4-percent increase over 2023 and accounting for roughly 10.1 percent of the projected labor force.

The anticipated value added from the direct economic activity to the local economy includes employee compensation, tax on production and imports, and proprietary and other property income and indirect employment compensation. A portion of this increased payroll likely would enter the local economy as the new workers purchase additional goods and services. It is anticipated that some portion of construction and operational materials would be purchased locally and that most construction and operational workers would be drawn from within the ROI, resulting in regional increases in jobs. The additional anticipated expenditures by workers could generate additional income and employment opportunities within the ROI if the expenditures filter throughout the economy. Producing 50 ppy under the No-Action Alternative is expected to generate approximately $363.1 million in value added and over $224.6 million in direct labor income within the ROI. In comparison, producing 80 ppy would increase these impacts significantly, resulting in about $403.6 million in value added and over $249.6 million in direct labor income. Producing 125 ppy would further amplify economic benefits, generating approximately $604.9 million in value added and over $374.1 million in direct labor income within the ROI.

Population and Demographics

Population. As reported in Section 4.2.9.1, the population in the ROI in 2034 is projected to grow by 7.3-percent from the 2023 baseline population. Under the Multi-Site Alternative 50 ppy scenario, total employment is projected to be 23,212 workers (14,396 direct and 8,816 indirect), representing approximately 3.9 percent of the projected 2034 ROI population. The increase of 2,749 direct and indirect jobs is about 0.5 percent of the projected population. Because this increase is minimal relative to the population, a large influx of workers and families due to SRS employment into the ROI is not expected. However, if all 2,749 new jobs were filled by in-migrants, the population could increase by approximately 8,247 persons, assuming three persons per household (or 2,749 new jobs multiplied by three persons per household), which is about 1.4 percent of the projected ROI population.

Under the 80 ppy scenario, total employment is projected at 23,518 workers (14,586 direct and 8,932 indirect), representing approximately 3.9 percent of the projected population. The increase of 3,055 direct and indirect jobs is about 0.5 percent of the population. If all new jobs were filled by in-migrants, the population could increase by approximately 9,165 persons, assuming three persons per household (or 3,055 new jobs multiplied by three persons per household), or about 1.5 percent of the projected ROI population.

Under the 125 ppy scenario, total employment would be approximately 25,042 workers (15,531 direct and 9,511 indirect), representing about 4.2 percent of the projected population. The increase of 4,579 direct and indirect jobs corresponds to about 0.8 percent of the population. Should all these jobs be filled by in-migrants, the population could increase by approximately 13,737 persons, assuming three persons per household (or 4,579 new jobs multiplied by three persons per household), or about 2.3 percent of the projected ROI population. While this represents a larger increase compared to the 50 or 80 ppy scenarios, the overall population growth remains modest, indicating that a significant influx of new residents due to SRS employment is still unlikely.

Federally Recognized Tribes. As reported in Section 4.2.9.1, the Proposed Action would not impact any tribes.

Housing

In 2023, there were 37,861 vacant housing units in the ROI (USCB 2023d). For context, there were 10,109 vacant housing units in Aiken County in 2023. The increase in population from the additional workforce (by the end of 2034) under the Multi-Site Alternative to produce 50 ppy is estimated at 2,759 (1,705 direct and 1,044 indirect), 3,055 (1,895 direct and 1,160 indirect) for 80 ppy, and 4,579 (2,840 direct and 1,739 indirect) for 125 ppy. It is anticipated that direct workers in-migrating to the ROI would settle in all counties within the ROI, likely in proportion to current SRS workforce residence patterns. Table 4.2.9-5 presents the anticipated workforce housing distribution within the ROI under the Multi-Site Alternative.

Table 4.2.9-5 Anticipated Workforce Housing Distribution – Multi-Site Alternative

County/Area	2023 Percent of Total Site Employment[a]	2023 Vacant Housing Units[b]	Anticipated Direct Workforce Housing Distribution		
			50 ppy	80 ppy	125 ppy
Aiken	52.7	10,109	899	999	1,497
Barnwell	5.1	1,794	87	97	145
Columbia	14.6	8,329	249	277	415
Richmond	12.1	17,629	206	229	344
Other counties	15.5	769,247	264	294	440
Total Workforce	**NA**	**NA**	**1,705**	**1,895**	**2,840**

NA = not applicable; ppy = pits per year
a From Appendix C, Table C.2.9-1.
b From Appendix C, Table C.2.9-6.
c Distribution is based on 1,705 (50 ppy), 1,895 (80 ppy), and 2,840 (125 ppy) direct jobs at SRS under the Multi-Site Alternative.

This influx of direct employees may increase housing needs within Aiken County or alter future housing distribution, potentially requiring some personnel to reside farther from SRS. Current housing statistics discussed in Appendix C, Section C.2.9.3 suggest that the housing market in the ROI, and Aiken County specifically, may have unmet needs. Although there is a substantial housing inventory within the broader ROI, Aiken County is likely to absorb a majority of direct employees. Therefore, while adequate housing exists across the ROI overall, housing shortages in Aiken County could lead to increased demand pressures and possibly higher housing costs, necessitating some workers to live outside the immediate area. This PEIS does not predict changes in housing prices; however, the latest trends in South Carolina or Georgia are following those of other states as median housing prices increase.

Community Services

Due to the low potential for impacts on the population, the Multi-Site Alternative would not affect fire protection, police protection services, or medical services. The Multi-Site Alternative would result in a population increase in the ROI of approximately 8,247 persons under the 50 ppy scenario, or about 1.4 percent of the projected 2034 ROI population of 599,106. Under the 80 ppy scenario, the population could increase by approximately 9,165 persons, or about 1.5 percent of the projected population. For the 125 ppy scenario, the population could increase by approximately 13,737 persons, or about 2.3 percent of the projected population. In all cases, these increases are not expected to significantly change demand for fire protection, police protection, or medical services compared to current conditions.

Regarding schools, an assumed average of 0.34 school-aged children per housing unit (NAHB 2020), the maximum number of school-age children associated with the additional direct and indirect workforce potentially in-migrating to the ROI would be approximately 935 children (2,759 workers × 0.34) under the 50 ppy scenario, 1,039 children (3,059 workers × 0.34) under the 80 ppy scenario, and 1,557 children (4,579 workers × 0.34) under the 125 ppy scenario by 2034. Compared to the 2023/2024 school year, these increases in school enrollment would be less than 1 percent and represent a small proportion of future enrollment. This minimal increase is expected to have a negligible effect on school services within the ROI.

Overall, impacts to employment, income, population, and housing would be minor within the ROI but may be concentrated primarily in Aiken County.

4.2.9.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Socioeconomic impacts for construction and operations would be the same as those presented in Section 4.2.9.2.

4.2.9.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The use of these facilities would involve the addition of about 285 staff beyond that projected in Section 4.2.9.2 for metal preparation solely in SRPPF (*see* Section 2.7). These personnel would represent an increase in staffing ranging from 10 to 17 percent, depending on the rate of pit production. This increase would represent about 2.2 percent addition to the current baseline workforce. In general, the additional socioeconomic impacts would also increase by the same range from those impacts presented in Tables 4.2.9-2–4.

The potential construction of the ARIC would not notably increase the construction workforce evaluated in Section 4.2.9.2 and, because the functions of the facility were already accounted for in the SRPPF plan, there would not be a need for additional staffing.

Similarly, repurposing the existing Weapons Support Building would not require additional staffing above that planned for the SRPPF complex, because these functions are already planned; repurposing of the facility provides additional space to perform the functions.

Construction and operation of the machine shops and associated infrastructure would require additional personnel. Construction of the facilities and infrastructure would be expected to be accomplished within the estimated peak-construction personnel provided in Section 2.4 (4,500 workers). Operations of the machine shops would add about 50 workers to the site employment (SRNS 2026)—an increase of 2–3 percent over the estimated Proposed Action operational workforce. This would change the estimated socioeconomic impacts by roughly 2 percent.

The potential utilization of a portable supercompactor for TRU waste would involve a small staff of SRS waste management personnel working with contractor staff. This enhancement would result in the addition of 10–20 personnel during the period that the unit is located on site. Changes to the socioeconomic impacts presented in Section 4.2.9.2 would be minimal.

4.2.10 Traffic and Transportation

The analysis in this section presents the potential impacts on traffic and transportation for the alternatives, including shipping nuclear material and wastes under both incident-free and accident conditions. Analysis to support this section is provided in Appendix E of this PEIS.

Construction activities under the Multi-Site or Single-Site alternatives would utilize the existing transportation infrastructure in the SRS region. Key metrics presented in the traffic and transportation analysis include the potential to cause periodic, light-to-moderate adverse impacts to local traffic flows from (1) construction worker commuting and (2) the intermittent presence of additional construction vehicles.

4.2.10.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS traffic and transportation impact analysis is incorporated by reference into this PEIS.

The construction activities under this alternative would be ongoing through 2034, and the estimated peak-construction work force would be about 4,500 workers, which could occur at any point during the construction period. There would be no radiological transportation (or associated impacts) under the No-Action Alternative, but there would be moderate increases to local traffic on site roads and those roads used by commuters. Additional details regarding traffic are provided in Section 4.2.10.2, which presents the longer-term impacts associated with pit production operations.

4.2.10.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at SRS and LANL (*see* Section 4.1.10.2 for the transportation impacts associated with LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS (50, 80, and 125 ppy). Because these are the same quantities evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b), the SRS Pit Production EIS traffic and transportation impact analysis is incorporated by reference into this PEIS as applicable, alongside additional analytical assumptions employed via the methodologies discussed in Appendix E of this PEIS. The combination of impacts from shipments associated with concurrent operations of LANL and SRS is provided in Section 4.3.1 and supported by analysis in Appendix E.

Local-Area Traffic

Under the Multi-Site Alternative at SRS, estimated traffic impacts during the peak construction period would be the same as presented in Section 4.2.10.1. For operations, NNSA estimates that between 1,705 and 2,840 additional workers would commute to the site, depending on the rate of pit production.

The 2020 SRS Pit Production EIS evaluated impacts from traffic associated with pit production at SRS and acknowledged that SRPPF operations would generate commuter traffic (NNSA 2020b). However, this commuter traffic would represent less than 1 percent of the total employment in the ROI and would not adversely affect the LOS of local roads. More specifically, the roads in Aiken, Barnwell, and Allendale counties in South Carolina that have the highest levels of traffic to and from SRS would continue to operate at high levels of service. Roads in Augusta-Richmond County, Georgia, likewise would be expected to continue to operate at their currently designated LOS's.

Transportation of Radiological and Hazardous Materials from SRS

Under the Multi-Site Alternative, NNSA would ship nuclear materials associated with pit production (pits, pit-related materials, HEU) to and from SRS, Pantex, NNSS, LANL, and Y-12. These nuclear materials are collectively referred to as "secure shipments." For a pit production rate of 50 ppy, there would be an estimated 55 secure shipments annually for a total annual mileage of about 266,500 miles. For 80 ppy, there would be about 73 secure shipments annually for a total annual mileage of about 406,900 miles. For 125 ppy, there would be about 97 secure shipments annually for a total annual mileage of about 594,100 miles.

In addition to secure shipments, shipments of MLLW and TRU waste would be shipped off site for disposal. Most LLW would be disposed of on site in E Area; however, for the purpose of conservatively presenting potential impacts from transportation, this analysis evaluates offsite shipment of all LLW and MLLW. For a pit production rate of 50 ppy, there would about 247 annual LLW/MLLW offsite shipments (assumed to go to NNSS) and 135 annual TRU waste shipments to the WIPP facility. For 80 ppy, there would be about 395 LLW/MLLW offsite shipments and 198 TRU waste annual shipments. For 125 ppy, there would be about 614 LLW/MLLW offsite shipments and 225 TRU waste annual shipments. More details about these waste and secure shipments are provided in Appendix E.

Annual hazardous waste offsite shipments are expected to increase at SRS. For the range of 50–125 ppy, a range of 13–33 cubic meters per year of hazardous waste would be sent off site for treatment and disposal. The analysis of these 10–25 shipments per year is included in Appendix E.

Impacts of Incident-Free Transportation. The estimated annual dose to transportation crews from offsite transportation activities associated with SRS would range from 23-46 person-rem annually from all waste and secure shipments depending on the pit production rate. The estimated annual doses to the general populations along these routes would range from 8.3-16.5 person-rem annually from all shipments. Accordingly, incident-free transportation of all materials would result in an annualized associated total of 0.014-0.028 excess LCF among all transportation workers and 0.0050-0.010 annualized excess LCF in all affected public populations.

Impacts of Accidents During Transportation. The maximum offsite radiological transportation truck accident under the Multi-Site Alternative for SRS is bounded by the same assumptions and expected consequences as described in Section 4.1.10.1 for LANL.

Under the Multi-Site Alternative, the total estimated annualized transportation accident risk (calculated by summing the individual annual accident probabilities times their associated unmitigated consequences) for all projected accidents involving radioactive shipments to and from SRS, regardless of type, was determined to be 1.3×10^{-5} - 3.3×10^{-5} LCF to the general population. This can be directly compared to the estimated nonradiological accident risk (traffic accidents) of 0.027-0.060 fatality per year from shipments of the same materials.

Impacts of Construction, Operations, and Hazardous Material Transportation Associated with Pit Production Activities. As discussed above, this PEIS evaluates the impacts of transporting various nonradiological, hazardous materials associated with pit production activities. These impacts are presented in terms of annual shipment miles and expected traffic fatalities. The cumulative transportation impacts under the Multi-Site Alternative's 50-year analytical period would not be expected to exceed 0.0011 traffic fatalities (i.e., ~0) for an assumed associated maximum shipping rate of 25 shipments per year.

4.2.10.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50-125 pits annually at the SRPPF. Traffic and transportation impacts for construction and operations would be the same as those presented in Section 4.2.10.2.

4.2.10.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. As reported in Chapter 2, Section 2.7, 285 additional staff could be commuting to and from SRS. Additionally, as reported in Section 4.2.12.4, these activities have the potential to increase the volume of TRU waste that would be shipped to the WIPP facility. If implemented, there is the possibility of a 20–30 percent increase in the number of shipments to WIPP (*see* Section 4.2.12.4). This would only occur if the plutonium-bearing residues were not transferred back to SRPPF to be processed through the aqueous recovery system.

The potential construction and operations of the ARIC or repurposing the existing Weapons Support Building would not notably increase the workforce; therefore, there would be no additional traffic impacts.

As discussed in Section 4.2.9.4, construction and operation of the machine shops and associated infrastructure would require about 50 additional operations personnel: a 2-percent increase in operational workers for the SRPPF. This could increase the amount of traffic on either SC 125 from Jackson or SC 19 from New Ellenton. As reported in Appendix C, Table C.2.12-1, SC 19 has a current LOS rating of B, indicating the second-highest quality of traffic service. SC 125 has a current LOS rating of C, indicating a higher degree of potential congestion; however, even if all additional workers used SC 125, it would represent an increase of less than 0.4 percent.

The potential utilization of a portable supercompactor for TRU waste at SRS would involve a single semi-truck/trailer combination that would use existing roads to access a suitable location on SRS. Additional support vehicles could also accompany the truck. These few vehicles would not contribute to traffic impacts. From a radiological standpoint, the truck would follow all USDOT regulations regarding packaging and transportation (*see* Appendix E, Section E.2.2) to ensure that crew and members of the public are protected from potential radiation exposure. The additional number of radiological shipments associated with this enhancement would be minimal. In comparison, use of the supercompactor would reduce the total number of TRU waste shipments that would leave SRS by reducing the total volume shipped to WIPP. Overall, this enhancement would reduce the potential impact of transportation of TRU waste.

4.2.11 Infrastructure

The analysis in this section presents potential direct or indirect impacts to infrastructure at SRS for the alternatives. Key metrics presented in the infrastructure analysis include: (1) quantities of water, sanitary wastewater, electricity, and petroleum fuel associated with the alternatives; and (2) analysis of the current infrastructure to meet demands. Site-wide transportation is discussed in Section 4.2.10.

4.2.11.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS infrastructure impacts analysis is incorporated by reference into this PEIS. Because some construction parameters associated with the SRPPF have changed since 2020, this PEIS incorporates those changes into this analysis.

Table 4.2.11-1 provides a comparison of the current site-wide use of the resource parameters for domestic water, sanitary wastewater, electrical power consumption and peak load, and petroleum fuels. Impacts to infrastructure resources are not expected during construction because projected demands are well below capacity. Because the Multi-Site Alternative includes construction and operations, more detail on the potential impacts are provided in Section 4.2.11.2 for each resource parameter.

Table 4.2.11-1 Potential Construction Impacts to Infrastructure at SRS

Resource Parameter	Current Estimated Use	Construction Requirements	Capacity
Domestic water (MGY)	288	16.6	788
Sanitary wastewater (GPD)	315,068	15,068	1,049,315
Electricity–power consumption (MkW-hr/yr)	320	17.5	4,400
Electricity–peak load (MW)	60	2–3	500
Fuel–diesel and oil (GPY) (A, F, and K areas)	425,772	700,000	NA

GPD = gallons per day; GPY = gallons per year; MGY = million gallons per year; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt, ppy = pits per year; SRS = Savannah River Site

4.2.11.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.11.2 for the infrastructure impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy.

Table 4.2.11-2 presents the expected utility and fuel usage at SRS for the Multi-Site Alternative during construction and operations.

Table 4.2.11-2 Potential Impacts to Infrastructure at SRS – Multi-Site Alternative

Resource Parameter	Current Estimated Use	Construction Requirements	Operations Requirements			Capacity
			50 ppy	80 ppy	125 ppy	
Domestic water (MGY)	288	16.6	12.1	13.3	19	788
Sanitary wastewater (GPD)	315,068	15,068	29,315	32,329	48,767	1,049,315
Electricity–power consumption (MkW-hr/yr)	320	17.5	<30	<30	30	4,400
Electricity–peak load (MW)	60	2–3	<11	<11	11	500
Fuel–Diesel and oil (GPY) (A, F, and K areas)	425,772	700,000	15,000	15,000	15,000	NA

GPD = gallons per day; GPY = gallons per year; MGY = million gallons per year; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt, ppy = pits per year; SRS = Savannah River Site

Impacts to infrastructure resources are not expected because projected demands are well below capacity, as summarized below.

Domestic Water. Construction would require 16.6 million gallons per year. Operations for pit production would require from 12.1 to 19 million gallons per year for the range of production rates. Water usage would largely be attributed to the increased workforce, as pit production requires minor amounts of water. The capacity of the SRS domestic water system is approximately 788 million gallons per year, which is adequate to meet the water demand under the Multi-Site Alternative.

Sanitary Wastewater. During construction, sanitary wastewater treatment needs are likely to be less than projected in Table 4.2.11-1 because portable toilets would be used during some activities. Operations would generate from 29,315 to 48,767 gallons per day for the range of production rates. The available capacity of the Central Sanitary Wastewater Treatment Facility is 1,049,315 gallons per day. There is sufficient capacity within the SRS system to handle the increased wastewater discharges.

Electricity Consumption. Construction would require 17.5 MkW-hr/yr, with a peak load of 2–3 MW. Operations would require approximately 30 MkW-hr/yr, with a peak load of approximately 11 MW for the range of production rates. The available capacity for electrical power consumption is approximately 4,180 MkW-hr/yr and for peak load is approximately 440 MW. There is sufficient electrical capacity to handle demands under the Multi-Site Alternative.

Fuel Consumption. Construction would require approximately 700,000 gallons of diesel fuel annually. Operations would require approximately 15,000 gallons per year. Capacity generally would not be limited, as delivery frequency would be increased to meet demand. The delivery of fuel would have minimal impact on the existing SRS infrastructure.

4.2.11.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would construct and operate the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Infrastructure impacts for construction and operations would be the same as those presented in Section 4.2.11.2.

4.2.11.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. As reported in Chapter 2, Section 2.7, 285 additional staff would be added to the workforce and therefore further contribute to water consumption and wastewater discharge. The potential impacts to these resources would increase proportionately by 10–17 percent, depending on the pit production rate (*see* Section 4.2.9.4). Because the capacity for water and wastewater at SRS is notably higher than the demand (as demonstrated in Section 4.2.11.2), this increase would not result in adverse impacts to infrastructure at SRS.

The potential construction and operations of the ARIC or repurposing the existing Weapons Support Building would not notably increase the estimated demand for water, power, or fuel and would not cause a notable increase in the need for managing sanitary wastewater.

Construction and operation of the machine shops and associated infrastructure would connect to existing utilities in the area and would be required to support additional personnel. Domestic water, electricity, and communications infrastructure are available near the potential C Road location and their extension to the construction site would not require any unique construction methods (e.g., water body crossings, suspension). Once installed, the demand for domestic water, sanitary wastewater, or electricity would remain well below the site capacity (*see* Section 4.2.11.2).

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration driven to a previously disturbed area on SRS. The truck/trailer configuration would be self-contained and powered by an onboard generator, with potential hookups for site-based power supply. The operation of the supercompactor would not notably contribute to the annual infrastructure demands presented in Section 4.2.11.2.

4.2.12 Waste and Materials Management

The analysis in this section presents the potential impacts on waste and materials management for the alternatives, including waste generation. This section also addresses the impacts of managing radioactive and hazardous materials used at SRS. NNSA does not expect waste or hazardous materials associated with these activities to be unique or substantially different from the types of waste and materials already managed at SRS, although quantities could increase from those presented in Chapter 3, Section 3.2.12. Key metrics for the waste analysis include: (1) the capacity of the existing SRS waste management system to appropriately manage any expected increases in waste quantities, and (2) the capacity of offsite facilities to receive additional SRS waste for subsequent treatment and/or disposal. For all waste types and alternatives, NNSA notes that the projections are annual values and there could be temporary excursions or increases in any given year, but these higher projections have been accounted for in the total projected waste quantities.

4.2.12.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. There would be no radiological waste during construction under the No-Action Alternative. There would be increases in solid sanitary waste and construction debris. Sanitary wastewater is addressed in Section 4.2.11. At the peak of construction, when as many as 4,500 construction workers are on site, the Proposed Action would generate approximately 517 metric tons per year of solid sanitary waste. Table C.2.12-5 in Appendix C shows that SRS generated an average of 39,931 metric tons of C&D waste over the 4-year period 2020–2023. Construction debris associated with the SRPFF complex would generate about 343 metric tons per year during the peak construction period, a small percentage of the total C&D waste expected to be generated (NNSA 2020b).

4.2.12.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.12.2 for the potential waste management impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy. Because these are the same quantities evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b), the SRS Pit Production EIS waste and materials management impacts analysis is incorporated by reference into this PEIS. The estimates of wastes generated for pit production have been updated since 2020 and these updated projections are included in this analysis. The combination of waste management impacts from concurrent pit production at LANL and SRS is provided in Section 4.3.2.

Radioactive Waste

Radioactive waste is categorized by LLW, MLLW, and TRU waste. Chapter 3, Section 3.2.12 provides the current baseline for site-wide waste generation at SRS (excludes Naval Reactors waste generated off site and disposed of at SRS). Under the Multi-Site Alternative, SRS would generate increased amounts of radioactive waste when producing pits.

LLW – Solid. Table 4.2.12-1 summarizes the estimates of LLW that would be generated annually from the production of 50-125 ppy. For comparison, the table also provides the average annual volume of LLW generated site-wide at SRS. Specifically, 4,650 cubic meters per year of LLW would be generated for production of 50 ppy (up to 9,400 cubic meters of LLW would be generated in years with production of 125 ppy).

Table 4.2.12-1 SRS Generation of Solid LLW – Multi-Site Alternative

Solid LLW	Baseline Annual Average (m^3/yr)	Multi-Site Alternative[a] (m^3/yr)
Site-wide total	4,681	9,331–14,081
SRPPF: 50 ppy	0	4,650
SRPPF: 80 ppy		6,550
SRPPF: 125 ppy		9,400

LLW = low-level radioactive waste; m^3/yr = cubic meters per year; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site

a Increase due to pit production.

SRS currently disposes of LLW on site, and operation of the SRS LLW disposal facility is expected to continue well into the future as individual units are closed and others opened. SRS LLW disposal activities consist of a hierarchy of disposal options and are represented by a hierarchy of waste acceptance criteria. For simplicity, the discussion here refers to waste acceptance criteria for the SRS LLW disposal facility as if it were a single set of criteria.

The volume of LLW that would be generated, coupled with the long lifespan planned for the SRPPF, would represent an increase in current LLW management planning levels. The existing LLW disposal area (within E Area) would have to be expanded at some point if it were to accommodate the SRPPF LLW, and onsite disposal would be contingent upon the waste meeting the disposal facility's waste acceptance criteria and adherence to the associated performance assessment. The capacity of the SRS disposal operations is not only a matter of physical space but of limits set by DOE's performance assessment on the type and amount of radionuclides that can be disposed of that still allow the disposal site to meet necessary worker and public health and safety performance objectives, measures, and standards as well as any other applicable regulatory criteria. SRPPF LLW would be expected to meet acceptance criteria for onsite disposal.

In the unlikely event that some LLW generated did not meet waste acceptance criteria, the NNSS disposal facility would be considered a waste management approach alternative especially if the SRPPF generated classified LLW. Another option would be the use of a non-DOE commercial, licensed LLW disposal facility, consistent with DOE Order 435.1. From 2015 through 2021, the NNSS disposed of an average of 838,000 cubic feet (NNSA 2026a), or 23,700 cubic meters, of LLW per year in its land-based disposal cells. At production rates of 50/80/125 ppy, the estimated 4,650/6,550/9,400 cubic meters of LLW from the SRPPF would represent about 20/28/40 percent of the average amount of LLW going to the NNSS. To be accepted for disposal at the NNSS disposal site, the SRPPF LLW would have to meet NNSS waste acceptance criteria. As noted above in Section 4.2.10.2, transportation of LLW conservatively assumed that LLW would be shipped to NNSS for disposal.

LLW – Liquid. SRPPF operations would include liquid laboratory wastes from analytical chemistry and material characterization that would be sent to the SRS ETF through a connection to an existing pipeline. The ETF contains multiple treatment process units that treat the variety of wastewaters it receives. Treated wastewater discharged from the ETF is subject to an existing NPDES permit. The ETF currently processes approximately 55,000 gallons per day (or 20 million gallons per year) of liquid waste but is designed to process 100,000–250,000 gallons per day. The estimated annual liquid LLW waste generation is independent of the pit production rate and would be about 1.5 million gallons per year, which equates to about 4,100 gallons per day. This value (8-percent increase to the existing ETF loading) would not affect the ETF's treatment capacity or operational level.

Liquid LLW would be sent to the ETF only if it is amenable to the ETF's treatment processes and meets the appropriate waste acceptance criteria. Meeting the NPDES permit's discharge limits should validate the treatment processes' appropriateness for the additional liquid LLW and ensure that water quality standards set for the receiving water (i.e., Upper Three Runs Creek) are not exceeded. Adverse impacts from management of liquid LLW are not expected.

MLLW. Table 4.2.12-2 summarizes the estimates of MLLW that would be generated annually for the range of pit production capacities. For comparison, the table also shows the average volume of MLLW currently generated at SRS.

Currently, MLLW is managed under contract with large commercial enterprises that must show adequate capacity and compliance with applicable permitting and regulatory requirements in order to be considered for the contract. The small increase in MLLW production from the Proposed Action would not be expected to adversely impact the current approach to SRS management of MLLW.

Table 4.2.12-2 SRS Generation of Solid MLLW – Multi-Site Alternative

MLLW	Baseline Annual Average(m^3/yr)	Multi-Site Alternative[a] (m^3/yr)
Site-wide total	4.2	11.8–19.2
SRPPF: 50 ppy	0	7.6
SRPPF: 80 ppy		11.5
SRPPF: 125 ppy		15

MLLW = mixed low-level radioactive waste; m^3/yr = cubic meters per year; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site

a Increase due to pit production.

TRU Waste. TRU waste would be generated routinely during operation of the SRPPF. Waste streams would include process residues for which plutonium could not be practicably recovered and waste (e.g., tools, rags, protective clothing, and filters) from plutonium processing areas with enough contamination to qualify as TRU waste. As shown in Table 4.2.12-3, the Multi-Site Alternative would increase the amount of TRU waste generated at SRS. At a production rate of 125 ppy, the site's TRU waste generation rate would increase by a factor of six above the current site-wide generation rates; however, the site's projected TRU waste generation rate would be below the average generation rate from 2011 to 2015 (averaged 1,020 cubic yards [918 cubic meters] per year).

Table 4.2.12-3 SRS Generation of TRU Waste – Multi-Site Alternative

TRU	Baseline Annual Average (m^3/yr)	Multi-Site Alternative[a] (m^3/yr)
Site-wide total	128	587–893
SRPPF: 50 ppy	0	459
SRPPF: 80 ppy		673
SRPPF: 125 ppy		765

m^3/yr = cubic meters per year; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site; TRU = transuranic waste

a Increase due to pit production.

Despite the increase in the TRU waste generation rate (from that currently managed at SRS), adverse impacts to the site's existing waste management capabilities (e.g., equipment, facilities, labor force) would not be expected. TRU waste would be managed within the SRPPF complex; the equipment, facilities, and labor force needed to support such actions would be incorporated into planned operations. Waste generating operations would package TRU waste such that all containers ready for shipment to the WIPP facility would qualify as contact-handled waste. Further, storage needs for the additional TRU waste would be limited because the waste is expected to be regularly shipped off site to the WIPP facility for disposal. Staging within the security area adjacent to the SRPPF would provide surge storage to accommodate waste accumulation between shipments and any "more-than-normal" buildup of waste due to minor changes in waste generation rates or shipment schedules, with a storage capacity equivalent to approximately one year of storage. With additional storage capacity outside the Protected Area (for that portion of the TRU waste that can be stored outside the Protected Area), temporary storage capacity increases to two to three years.

<u>Hazardous Waste</u>

Under the Multi-Site Alternative, hazardous waste would be generated at a rate of 16–40 cubic meters per year (Table 4.2.12-4). Compared to an SRS-wide generation rate of 70 cubic meters per year, the added hazardous waste would represent increases of 23–57 percent. Similar to MLLW, hazardous waste is managed under contract with large commercial enterprises that must show adequate capacity and compliance with applicable permitting and regulatory requirements in order to be considered for the contract. Depending on its specific terms, an existing contract may have to be modified to cover the SRPPF waste, but these waste generation numbers are not large on a national, or even state level. Per EPA's records on hazardous waste biennial reports, there were almost 165,000 tons of hazardous waste generated in South Carolina in 2017 (EPA 2018) showing the 16–40 cubic meters (5–12 tons) of hazardous waste from the SRPPF would represent a significantly small portion (on the order of 0.001 percent) of the hazardous waste generated in the state.

<u>Other Waste</u>

Solid Sanitary Waste. As shown in Table 4.2.12-5, annual SRPPF solid sanitary waste generation rates are estimated to range from approximately 196 metric tons (50 ppy) to 327 metric tons (125 ppy). These amounts are small percentages of the 250,000 tons per year currently going to the Three Rivers Landfill. This quantity of waste would not impact operations at the municipal landfill. Any C&D waste from development of the SRPPF complex would also be sent to the Three Rivers Landfill.

Table 4.2.12-4 SRS Generation of Hazardous Waste – Multi-Site Alternative

Hazardous Waste	Baseline Annual Average (m^3/yr)	Multi-Site Alternative [a] (m^3/yr)
Site-wide total	12	28–52
SRPPF: 50 ppy	0	16
SRPPF: 80 ppy		26
SRPPF: 125 ppy		40

m^3/yr = cubic meters per year; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site

a Increase due to pit production.

Table 4.2.12-5 SRS Generation of Solid Sanitary Waste – Multi-Site Alternative

Solid Sanitary Waste	Baseline Annual Average (MT/yr)	Multi-Site Alternative [a] (MT/yr)
Site-wide total	445	641–772
SRPPF: 50 ppy	0	196
SRPPF: 80 ppy		218
SRPPF: 125 ppy		327

MT/yr = metric tons per year; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site

a Increase due to pit production.

Materials Management

SRS's materials management operations are conducted pursuant to DOE Orders and to various applicable federal, state, and local laws and regulations. Regulatory oversight lies with various federal, state, and local agencies. SRS uses radioactive materials and chemicals in the production of plutonium pits.

A key element of SRS's strategy in managing its radioactive/hazardous inventory is to ensure that those materials are used safely and appropriately. For new or planned actions, this is done largely through implementing the following hierarchy of controls, in order of preference: (1) select materials and process designs that avoid or minimize use of radioactive/hazardous materials; (2) use engineered controls to confine, shield, or remove hazards; (3) use administrative or procedural controls; and (4) use personal protective equipment.

By conducting operations in accordance with DOE Orders and the applicable federal, state, and local laws and regulations, NNSA does not expect any significant impacts associated with radioactive/hazardous material management.

4.2.12.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Waste and materials management impacts for construction and operations would be the same as those presented in Section 4.2.12.2.

4.2.12.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. As described in Section 2.7, waste materials from metal preparation activities could either be sent back to SRPPF for further processing in aqueous recovery (as in the baseline operations design) or could be directly disposed of as TRU waste. If sent back to SRPPF, there would be no change to the projected waste volumes since the same amount of waste would be generated regardless of whether the metal is prepared in SRPPF or in K Area. If the residual, plutonium-bearing materials were packaged for direct disposal, NNSA estimates that about 150 cubic meters per year of additional TRU waste would be generated by this project enhancement. This would represent an increase of 20–33 percent over the values presented in Table 4.2.12-3, depending on the pit production rate.

The potential construction and operations of the ARIC would not generate radiological waste and any potential hazardous waste would be minimal and handled consistently with other hazardous wastes on site.

Repurposing the existing Weapons Support Building would have the potential for generating radiological and hazardous waste. These wastes would be managed in accordance with existing site procedures and would not be expected to be a notable volume when added to projected wastes identified in Section 4.2.12.2.

Construction and operation of the machine shops and associated infrastructure would generate sanitary waste and small quantities of hazardous waste (e.g., RCRA metals, solvents, paints). There would be no radiological waste associated with these facilities. Hazardous and solid sanitary wastes would be managed like other SRS waste as described in Appendix C, Sections C.2.12.2 and C.2.12.3.

The potential utilization of a portable supercompactor for TRU waste would employ a trailer-mounted configuration driven to a previously disturbed area within LANL. Packaged TRU waste could be transferred to the location and processed through the supercompactor to reduce its overall volume before being transported to WIPP. The operation of the unit could reduce the volume by as much as 80 percent, depending on the concentrations of radionuclides in the waste. This would have an overall positive effect on the impacts presented in Section 4.2.12.2 by lowering the volume shipped offsite. The potential impacts on the WIPP facility would also be lessened because a smaller volume would require disposal. A potential exists that small quantities of LLW/MLLW could be generated as secondary waste during operation of the compactor (e.g., wipes, protective clothing). This would not change the projected volumes of LLW/MLLW in Section 4.2.12.2.

4.2.13 Human Health and Safety

The analysis in this section presents the potential impacts on human health and safety for the alternatives. Key metrics presented in the human health analysis include: (1) radiological doses and potential LCFs to the public and workers from normal operations, (2) occupational injuries/deaths to workers, and (3) health impacts to workers and the public from normal operations involving chemicals.

4.2.13.1 No-Action Alternative

NNSA will continue to construct the SRPPF complex as evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b) and as described in Section 2.4 of this PEIS. The SRS Pit Production EIS health and safety impacts analysis is incorporated by reference into this PEIS. Because the number of construction workers during the peak construction period has changed since 2020, this PEIS incorporates this change into this analysis.

Construction activities would not be expected to occur in areas that would pose radiological risks to workers or the public. However, prior to construction, soil in construction areas would be sampled and evaluated for any contaminants. If any contamination is found, remediation of the area would be conducted prior to construction. Consequently, construction activities would not be expected to result in any radiological health impacts to the public or workers.

Construction workers would be subject to occupational injuries, illness, and fatalities in the workplace. Potential human health impacts to workers were evaluated using BLS occupational injury/illness/fatality rates. Injury/illness/fatality rates at DOE/NNSA sites are historically lower than BLS values due to the increased focus on safety fostered by ongoing health and safety processes. Table 4.2.13-1 shows estimates of injuries/illnesses and fatalities for both the peak year of construction and the total seven-year construction period (conservatively assuming the peak workforce during the full period). In any given year of construction, a maximum of 63 days of lost work from illness/injury and 0.8 fatality would be expected. No hazardous chemicals have been identified that would pose a risk to members of the public from construction activities. Construction workers would be protected from overexposure to hazardous chemicals by adherence to regulatory occupational standards that limit concentrations of potentially hazardous chemicals and implementation of integrated safety management programs that provide hazards identification and control measures for construction activities.

Table 4.2.13-1 Occupational Injury/Illness and Fatality Estimates at SRS – Construction

Injury, Illness, and Fatality Categories	Results
Peak Construction	
Peak construction workforce (persons)	4,500
Lost days due to injury/illness[a]	63
Number of fatalities[b]	0.8
Total Construction	
Total construction (worker-years)[c]	31,500
Lost days due to injury/ illness	441
Number of fatalities	6

a Based on 1.4 injuries in South Carolina per 100 workers for construction.
b Based on 18.7 fatalities in South Carolina per 100,000 workers for construction.
c Conservatively assumes peak construction workforce throughout entire construction period (through 2034).
Source: BLS 2025b

4.2.13.2 Multi-Site Alternative

Under the Multi-Site Alternative, NNSA would concurrently produce pits at LANL and SRS (*see* Section 4.1.13.1 for the human health impacts at LANL). As discussed in Chapter 2, Section 2.3, this PEIS evaluates three production capacities at SRS: 50, 80, and 125 ppy. Because these are the same quantities evaluated in the 2020 SRS Pit Production EIS (NNSA 2020b), the SRS Pit Production EIS human health and safety impacts analysis is incorporated by reference into this PEIS. The estimated workforce required for pit production has been updated since 2020 and these updated projections are included in this analysis.

Radiological Impacts

Radiation doses would occur from airborne releases from continued operations not related to pit production. In addition, pit production would have the potential to increase the radioactive air emissions, the number of radiological workers, and the dose to SRS workers. As identified in Section 4.2.5, NNSA estimates a maximum of 2.1×10^{-4} curies of PuEq could be released to the air annually from producing 125 ppy at SRS.[34] Table 4.2.13-2 lists incremental radiation doses estimated for the public (offsite MEI and collective population) and corresponding incremental health impacts, in terms of LCFs. As shown in the table, the annual radiation dose to the offsite MEI would be much less than the limit of 10 millirem per year set by both the EPA (40 CFR Part 61, Subpart H) and DOE (DOE Order 458.1) for airborne releases of radioactivity for all three production capacities. The risk of an LCF to the MEI from operations would be a maximum of 1.4×10^{-8} per year, which reflects a very small incremental addition that results in no change compared to the No-Acton Alternative. The projected number of annual LCFs to the population within a 50-mile radius would be a maximum of 2.1×10^{-3} per year, which also reflects a very small incremental addition that results in no change compared to the No-Acton Alternative.

Table 4.2.13-2 Annual Radiological Impacts to the SRS Public – Operations

Receptor/Dose/Risk	No-Action Alternative[a] (0 ppy)	50 ppy	80 ppy	125 ppy
Offsite MEI[b]				
Dose (mrem)	0.023	0.023[e]	0.023[e]	0.023[e]
LCF risk[c]	1.4×10^{-8}	1.4×10^{-8}	1.4×10^{-8}	1.4×10^{-8}
Population Within 50 Miles[d]				
Collective dose (person-rem)[d]	3.5	3.53[f]	3.53[f]	3.53[f]
LCF[c]	2.1×10^{-3}	2.1×10^{-3}	2.1×10^{-3}	2.1×10^{-3}

LCF = latent cancer fatality; MEI = maximally exposed individual; mrem = millirem; ppy = pits per year; SRS = Savannah River Site

a Based on average data (2020–2023) from Table 3.2.13-3. The No-Action Alternative reflects the current baseline because there would be no pit production at SRS under the No-Action Alternative in this PEIS.

b For pit production, the offsite MEI is assumed to reside at the site boundary, approximately 6.7 miles away. An actual person may not currently be present at this location.

c Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).

d Based on about 838,833 people living within 50 miles of SRS.

e For the MEI doses shown, the contribution from pit production would be as follows: 5.0×10^{-7} millirem for 50 ppy; 8.0×10^{-7} millirem for 80 ppy; and 1.2×10^{-6} millirem for 125 ppy (NNSA 2020b).

f For the collective doses shown, the contribution from pit production would be as follows: 3.3×10^{-5} person-rem for 50 ppy; 5.2×10^{-5} person-rem for 80 ppy; and 8.2×10^{-5} person-rem for 125 ppy (NNSA 2020b).

Source: SRNS 2026

As of December 2023, there were approximately 4,192 radiological workers at SRS who received an average worker dose of 31.9 millirem per year. NNSA estimates that the number of radiological workers would increase by a maximum of 2,130 to produce 125 ppy at SRS.[35] The average pit production worker dose is estimated to receive about 167 millirem per year.[36] Table 4.2.13-3 provides estimates of annual radiological doses to SRS pit production workers under the Multi-Site

[34] Producing 50 ppy would release up to 8.4×10^{-5} curies of PuEq, while producing 80 ppy would release up to 1.3×10^{-4} curies of PuEq.

[35] Producing 50 ppy would require 1,280 workers, while producing 80 ppy would require approximately 1,420 workers.

[36] The average pit production worker dose is estimated to be 110 millirem per year for producing 50 ppy and 160 millirem per year for producing 80 ppy.

Alternative. The annual doses to individual workers would be well below the DOE limit of 5,000 millirem (10 CFR Part 835) and the SRS administrative control level of 500 millirem per year that has been established for external exposures (SRNS 2026). For production of 125 ppy, the total annual collective dose to pit production radiological workers would be about 355.7 person-rem, which would result in 0.21 LCF annually.

Table 4.2.13-3 Annual Radiological Impacts to SRS Workers – Operations

Receptor/Dose/Risk	No-Action Alternative (0 ppy)	Increase for 50 ppy	Increase for 80 ppy	Increase for 125 ppy
Number of radiological workers who receive a measurable dose	4,192	1,280	1,420	2,130
Average annual dose to radiological worker (mrem)	31.9	110	160	167
Average annual radiological worker risk (LCFs)[a]	1.9×10^{-5}	6.6×10^{-5}	9.6×10^{-5}	1.0×10^{-4}
Collective annual dose to radiological workers (person-rem)	133.3	140.8	227.2	355.7
Total annual radiological worker risk (LCFs)[a]	0.08	0.08	0.14	0.21

LCF = latent cancer fatality; mrem = millirem; ppy = pits per year; SRS = Savannah River Site
a Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).
Source: SRNS 2026

Occupational and Nonradiological/Chemical Health Impacts

Potential human health impacts to workers from occupational/nonradiological hazards during construction are presented in Section 4.2.13.1. Table 4.2.13-4 shows estimates of injuries/illnesses and fatalities for operations for the production capacities analyzed. In any given year of operation, a maximum of 60 days of lost work from illness/injury and less than one fatality would be expected.

Table 4.2.13-4 Occupational Injury/Illness and Fatality Estimates at SRS – Operations

Injury, Illness, and Fatality Categories	50 ppy[c]	80 ppy[d]	125 ppy[e]
Lost days due to injury/ illness[a]	36	40	60
Number of fatalities[b]	0.07	0.08	0.12

ppy = pits per year; SRS = Savannah River Site
a Based on 2.1 injuries in South Carolina per 100 workers for manufacturing.
b Based on 4.3 fatalities in South Carolina per 100,000 workers for manufacturing.
c Based on 1,705 pit production-related operational workers.
d Based on 1,895 pit production-related operational workers.
e Based on 2,840 pit production-related operational workers.
Source: BLS 2025b

4.2.13.3 Single-Site Alternative

Under the Single-Site Alternative, NNSA would produce pits at either LANL or SRS. If SRS were the single site for pit production, NNSA would complete the SRPPF complex as described in Chapter 2, Section 2.4. Once operational, NNSA would produce 50–125 ppy at the SRPPF. Human health and safety impacts for construction and operations would be the same as those presented in Section 4.2.13.2.

4.2.13.4 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. The additional human health impacts to the offsite public would be associated with the estimated radioactive air emissions from the facility. As noted in Section 4.2.5.4, no more than 0.000084 curies per year would be released annually. Since this value is equivalent to the amount projected from SRPPF, as shown in Table 4.2.13-1, there would be no notable difference in the human health risk to the offsite public than the No-Action Alternative.

Because the metal preparation activities typically involve the highest individual dose rates of the various work assignments in the pit production process, the projected 285 additional workers in K Area would receive an average annual dose of about 500 millirem. Combining the contribution of this project enhancement with the estimated impacts presented in Section 4.2.13.2 would affect the number of radiological workers, the average annual worker dose, and the total collective worker dose as shown in Table 4.2.13-5.

Table 4.2.13-5 Annual Radiological Impacts to SRS Workers including K Area Metal Preparation

Receptor/Dose/Risk	Increase for 50 ppy	Increase for 80 ppy	Increase for 125 ppy
Number of radiological workers who receive a measurable dose	1,565	1,705	2,415
Average annual dose to radiological worker (millirem)	182	217	206
Average annual radiological worker risk (LCFs)[a]	1.1×10^{-4}	1.3×10^{-4}	1.2×10^{-4}
Collective annual dose to radiological workers (person-rem)	285.3	369.7	498.2
Total annual radiological worker risk (LCFs)[a]	0.17	0.22	0.30

LCF = latent cancer fatality; ppy = pits per year; SRS = Savannah River Site
a Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).
Source: SRNS 2026

The potential construction and operations of the ARIC would be unlikely to add to the potential impacts to workers since it would not involve a notable additional staff nor include operations in a radiological environment.

Repurposing the existing Weapons Support Building would not notably increase the workforce; however, workers that staffed the facility could be subject to radiological exposure if the facility was used for waste characterization or radiological laboratory purposes. Because these functions are already planned in other buildings within the SRPPF complex, additional collective worker doses would not be expected.

Construction and operation of the machine shops and associated infrastructure would not increase the number of peak construction workers but would increase the operational workforce by 2–3 percent. This would result in an increase of 2–3 percent in the estimated occupational injuries and fatalities from those presented in Table 4.2.13-4. There would be no radiological impacts to the workforce at the machine shops. There would be no additional risk to the offsite public from operations of these facilities.

The potential utilization of a portable supercompactor for TRU waste would involve a small staff of SRS waste management personnel working with contractor staff for the mobile unit. This enhancement would add an estimated 10-20 radiological workers during the period that the unit is located onsite. Average annual worker exposure for personnel working with the supercompactor would be lower than those estimated for pit production radiological workers in SRPPF. This would result in an increase of less than 1 percent in the total worker collective dose as compared to the results presented in Table 4.2.13-3.

4.2.14 Accidents and Intentional Destructive Acts

If an accident involving the release of radioactive or chemical materials were to occur, members of the public and workers would be at risk. This section presents the impacts to the public and workers from potential accidents involving pit production operations at SRS. Additional details supporting the analysis are provided in Appendix D to this PEIS. Under the No-Action Alternative, NNSA would produce 30 ppy at LANL with surge capability to produce up to 80 ppy. The refurbishment of the SRPPF and construction of the supporting facilities within the SRPPF complex would be completed, however, no pit production would occur at SRS, therefore, there would be no additional accident risk under the No-Action Alternative.

There are no meaningful differences in accident impacts among the other SRS alternatives because the actions under each alternative would not have notable effects on the location, frequency, scenario, or MAR of the postulated accidents. Consequently, the impacts of potential accidents at SRS would be virtually the same for all action alternatives. This PEIS evaluates the accident impacts for the production of 125 ppy because impacts would be driven by the MAR in the building and that production rate would bound (or be representative of) impacts for other production rates.

Radiological Accidents

Table 4.2.14-1 shows the frequencies and consequences of the postulated set of accidents for the public (offsite MEI and the population living within 50 miles) and a hypothetical noninvolved worker for the production of 125 ppy. The accidents presented in Table 4.2.14-1 represent a spectrum of accident frequencies and consequences ranging from "anticipated" to "extremely unlikely." As described in Appendix D, the doses shown in the tables were calculated by the MACCS computer code[37] based on accident data. For each of the accidents presented in Table 4.2.14-1, fatal or serious non-fatal injuries to involved workers may be expected because of such a worker's proximity to an accident.

[37] https://maccs.sandia.gov/

Table 4.2.14-1 Radiological Accident Frequency and Consequences – 125 Pits Per Year[a]

Radiological Accident	Frequency (per year)	Maximally Exposed Individual[b,e]		Offsite Population[c]		Noninvolved Worker[d,e]	
		Dose (rem)	LCF[f,h]	Dose (person-rem)	LCFs[f,h]	Dose (rem)	LCF[f,h]
Process module fire initiated in a process enclosure	$1{\times}10^{-2}$	0.15	$8.8{\times}10^{-5}$	782	0.46	14	$8.4{\times}10^{-3}$
Fire in shipping and receiving	$1{\times}10^{-2}$	0.93	$5.5{\times}10^{-4}$	4,850	2.85	35	0.04
Explosion in a laboratory enclosure	$1{\times}10^{-4}$	0.96	$5.6{\times}10^{-4}$	5,006	2.94	3.5	1[g]
Over-pressurization of a TRU waste enclosure	$1{\times}10^{-4}$	$8.7{\times}10^{-4}$	$5.1{\times}10^{-7}$	5	$2.7{\times}10^{-3}$	0.69	$4.1{\times}10^{-4}$
Energetic impact and loss of confinement of molten plutonium	$1{\times}10^{-2}$	0.18	$1.1{\times}10^{-4}$	939	0.55	12	$7.1{\times}10^{-4}$
Energetic impact and loss of confinement of material in container	$1{\times}10^{-2}$	0.037	$2.2{\times}10^{-5}$	193	0.11	27	0.03
Nuclear criticality in solution systems	$1{\times}10^{-2}$	$3.4{\times}10^{-6}$	$2.0{\times}10^{-9}$	0.018	$1.0{\times}10^{-5}$	0.0015	$9.0{\times}1.0^{-7}$
Loss of glovebox inerting system results in release	$1{\times}10^{-2}$	0.23	$1.4{\times}10^{-4}$	1,199	0.71	23	0.03
Loss of power causes loss of vessel purge and fires	$1{\times}10^{-4}$	0.51	$3.0{\times}10^{-4}$	2,659	1.56	44	0.05
Vehicle crash into waste storage pad with fire	$1{\times}10^{-2}$	0.35	$2.1{\times}10^{-4}$	1,408	0.83	116	1[g]
Seismic event with ensuing fires	$1{\times}10^{-4}$	0.91	$5.5{\times}10^{-4}$	3,650	2.15	78	0.09

LCF = latent cancer fatality; MEI = maximally exposed individual; ppy = pits per year; SRPPF = Savannah River Plutonium Processing Facility; TRU = transuranic

a Impacts presented for 125 ppy. Impacts for 50 and 80 ppy are bounded by analysis for 125 ppy.
b At site boundary, approximately 6.7 miles from release.
c Based on a projected future population (year 2032) of approximately 1.0 million persons residing within 50 miles of the SRPPF.
d At a distance of 100 meters.
e The MEI and the noninvolved worker scenarios each assume that one person was exposed. If more than one person was exposed in either of these scenarios, then that scenario's dose would be per person and the fatalities would be multiplied by the number of persons exposed.
f The LCF values were calculated using a dose-to-LCF conversion factor of 0.0006 LCF per rem (MEI and worker) or person-rem (population). If the dose to an MEI or worker exceeds 20 rem, the dose-to-risk conversion factor is doubled to 0.0012.
g Considers prompt fatality (nonradiological) of a worker during event occurrence.

Note: Slight deviations in LCF calculations for the different scenarios may exist due to rounding.
Source: SRNS 2025a, 2025b; SRNS 2026

Table 4.2.14-2 shows the annual accident risks of the production of 125 ppy, obtained by multiplying the accident consequences (in LCFs) by the accident frequency. The accident selection process, screening criteria used, and conservative estimates of MAR and source term (*see* Appendix D) ensure that the accidents chosen for evaluation in this PEIS provide a conservative estimate of the impacts of all reasonably foreseeable accidents that could occur at SRS associated with pit production. Thus, if any other accident that was not evaluated in this PEIS were to occur, its impacts on workers and the public would be expected to be within the range of the impacts evaluated.

Table 4.2.14-2 Annual LCF/Fatality Risks – 125 Pits Per Year[a]

Radiological Accident	**Maximally Exposed Individual**[b]	**Offsite Population**[c]	**Noninvolved Worker**[d]
Process module fire, initiated in a process enclosure	8.8×10^{-7}	4.6×10^{-3}	8.4×10^{-5}
Fire in shipping and receiving	5.5×10^{-6}	0.028	4.0×10^{-4}
Explosion in a laboratory enclosure	5.6×10^{-8}	2.9×10^{-4}	1.0×10^{-4} [e]
Over-pressurization of a TRU waste enclosure	5.1×10^{-11}	2.7×10^{-7}	4.1×10^{-8}
Energetic impact and loss of confinement of molten plutonium	1.1×10^{-6}	5.5×10^{-3}	7.1×10^{-5}
Energetic impact and loss of confinement of material in container	2.2×10^{-7}	1.1×10^{-3}	3.0×10^{-4}
Nuclear criticality in solution systems	2.0×10^{-11}	1.0×10^{-7}	9.0×10^{-9}
Loss of glovebox inerting system results in release	1.4×10^{-6}	7.1×10^{-3}	3.0×10^{-4}
Loss of power causes loss of vessel purge and fires	3.0×10^{-8}	1.6×10^{-4}	5.0×10^{-6}
Vehicle crash into waste storage pad with fire	2.1×10^{-6}	8.3×10^{-3}	0.01[e]
Seismic event with ensuing fires	5.5×10^{-8}	2.2×10^{-4}	9.0×10^{-6}

LCF = latent cancer fatality; ppy = pits per year

a Impacts presented for 125 ppy. Impacts for 50 and 80 ppy are bounded by analysis for 125 ppy.

b At site boundary, approximately 6.7 miles from release.

c Based on projected future population (year 2032) of 1.0 million persons residing within 50 miles of SRPPF location.

d Calculated at a distance of 100 meters.

e Considers prompt fatality (nonradiological) of a worker during event occurrence.

Source: SRNS 2025a, 2025b; SRNS 2026

The accident with the highest potential consequences to the offsite population (Table 4.2.14-1) is an explosion in a laboratory enclosure and is thus considered the maximum reasonably foreseeable accident. Approximately 3 LCFs in the offsite population could result from such an accident in the absence of mitigation. This accident has a probability of occurring once every 10,000 years. An offsite MEI would receive a dose of approximately 0.96 rem. Statistically, the MEI would have a 5.6×10^{-4} chance of developing an LCF, or about 1 in 1,800. For a noninvolved worker, the accident with the highest potential consequences would be the vehicle crash into waste storage pad with a subsequent fire. The noninvolved worker located 100 meters from the accident would receive a dose of approximately 116 rem. A prompt fatality (nonradiological) of the worker during the event occurrence could be expected.

When frequencies are considered (*see* Table 4.2.14-2), the accident with the highest risk to the MEI is a fire in the shipping and receiving area. For this accident, the LCF risk to the MEI would be 5.5×10^{-6} per year, or approximately one statistical fatality in 182,000 years. This same accident would also be the highest risk event to the population, with the associated LCF risk being approximately 0.028 per year, meaning that an LCF in the population would statistically occur once every 36 years. For a noninvolved worker, the highest risk event would be a prompt fatality (nonradiological) resulting from a vehicle crash into a waste storage pad (with subsequent fire), which could be expected to occur once every 100 years.

Hazardous Chemical Accidents

The adverse effects of exposure vary greatly among chemicals. They range from physical discomfort and skin irritation to respiratory tract tissue damage and, at the extreme, death. For this reason, allowable exposure levels differ from substance to substance. This analysis used the American Industrial Hygiene Association's ERPG values to develop hazard indices for chemical exposures. ERPG definitions are provided in Section 4.1.14.

The analysis used estimated impacts of the potential release of the most hazardous chemicals used for pit production at SRS. A chemical's vapor pressure, acceptable concentration (ERPG-2), and quantity available for release are factors used to rank a chemical's hazard. The accident scenario postulates a major leak, such as a pipe or tank rupture, and the released chemical forming a pool about one inch deep in the area around the point of release. Table 4.2.14-3 provides information on each chemical and the frequency and consequences of an accidental release. The source term shown represents the amount of the chemical that is accidentally released.

Table 4.2.14-3 Chemical Accident Frequency and Consequences – 125 Pits Per Year

Chemical Released	Quantity Released (kg)	ERPG-2		Concentration		Frequency
		Limit (ppm)	Distance to Limit (km)	At 100 m (ppm)	At Site Boundary[a] (ppm)	
Nitric acid	10,500	10	0.4	135 (constant)	0	1×10^{-4}
Hydrochloric acid	600	20	1.0	~0–2,700[b]	0	1×10^{-4}

ERPG = Emergency Response Planning Guide; kg = kilogram; km = kilometer; m = meters; ppm = parts per million

a. Site boundary is at a distance of 6.7 miles; no discernible concentration levels exist at this distance; moreover, any stray particulates theoretically reaching this distance would arrive well beyond one hour post release, which falls outside the 60-minute measurement window for ERPG values.

b Concentrations for hydrochloric acid vary considerably during the 60-minute period post release. As inferred by the presented values, the ERPG-2 limit for hydrochloric acid will be exceeded for a portion of the noninvolved worker's (at 100 meters) exposure time (i.e., during the first ~10 minutes post release, immediately followed by a rapid drop-off).

Source: NNSA 2008b; SRNS 2026

The impacts of chemical releases are measured in terms of ERPG-2 protective concentration limits given in parts per million. The distances at which the limit is reached are also provided for the ERPG-2 limit. The concentration of the chemical at the noninvolved worker location (i.e., 100 meters from the accident) is shown for comparison with the concentration limit for ERPG-2. The distance to the site boundary and the concentration at the site boundary are also shown for comparison with the ERPG-2 concentration limits and for determining if the limits are exceeded off site. Conservative modeling of chemical release over the period of one hour was based on a spill and subsequent pool with evaporation resulting in calculated downwind concentrations. Table 4.1.14-3 shows the consequences of the dominant loss of containment accident scenarios. Neither of the chemicals released in the accidents would exceed ERPG-2 limits offsite. Concentrations at the location of the noninvolved worker (i.e., 100 meters) could exceed ERPG-2 limits and would require mitigation and/or protective measures.

Intentional Destructive Acts

As discussed in Section 4.1.14, the Complex Transformation SPEIS (NNSA 2008a) and 2026 LANL SWEIS (NNSA 2026a) include classified appendices that analyze the potential impacts of intentional destructive acts (e.g., sabotage, terrorism). The classified appendix in the Complex Transformation SPEIS includes an analysis of site-specific consequences for an event at SRS. The impacts of some terrorist incidents would be similar to the accident impacts described in this accident analysis, while some incidents may have more severe impacts. The classified appendix in the 2026 LANL SWEIS addresses potential impacts from intentional destructive acts to human health and safety and other resource areas. In preparing this PEIS to address intentional destructive acts, NNSA reviewed both classified appendices and concluded that they are reasonable and adequate to represent intentional destructive acts that could occur at SRS (NNSA 2026a). The information presented in the previously prepared appendices assists decision-makers in understanding the potential consequences of an incident at SRS.

4.2.14.1 Effects of Project Enhancements

Potential inclusion of metal preparation activities in K Area would repurpose existing facilities that were built to support surplus plutonium disposition. Because the activities associated with metal preparation would use similar equipment inside a glovebox and with a MAR that was lower than the MAR established for the SRPPF, the potential accident consequences and risks of metal preparation in K Area would be bounded by the assessment in SRPPF, which is provided in Section 4.2.14.

Of the other Project Enhancements, repurposing the existing Weapons Support Building would be the only one with the potential for accidents that could affect the offsite public. If the facility were to be used for waste characterization or as a radiological laboratory, it would operate under a MAR limit that would ensure that it was characterized as a radiological facility, less than HC-3. Therefore, any potential accidents in this facility would be bounded by accidents already considered in Section 4.2.14.

The potential utilization of a portable supercompactor for TRU waste at SRS would involve compacting a single waste drum at a time. The contents of a precompacted drum would include TRU-contaminated waste such as protective clothing, wipes, and small waste items. Hydraulic compaction of the single drum could result in drum rupture; however, an energetic event would be highly unlikely. Therefore, the potential for an accidental release would be contained within the trailer confinement and be mitigated by the existing HEPA filters. Offsite releases and consequences would not be expected.

4.2.15 Decontamination and Decommissioning

Eventually, the facilities associated with the Proposed Action would be subject to DD&D. If NNSA decides to conduct pit production operations at SRPPF, the SRPPF complex would undergo DD&D

at the project's end of life. If NNSA decides to not repurpose the MFFF, the MFFF would someday undergo DD&D.[38] For either the Multi-Site or Single-Site Alternative, the primary DD&D goal would be to decontaminate any facility to the extent that its residual radioactivity would be at an acceptable level. The facility decontamination would be conducted in accordance with all applicable regulations and requirements and in a manner that would minimize potential impacts to the health and safety of workers, the general public, and the environment.

Prior to the initiation of DD&D activities, the facility operator would prepare a detailed DD&D plan for NNSA approval. The DD&D plan would contain a detailed description of the site-specific DD&D activities to be performed and would be sufficient to allow an independent reviewer to assess the appropriateness of the decommissioning activities; the potential impacts on the health and safety of workers, the public, and the environment; and the adequacy of the actions to protect health and safety and the environment. All buildings and systems would require regulatory planning, document preparation, and characterization and deactivation before any DD&D activities would be allowed to commence. Facilities would be characterized to identify waste types (e.g., radiological and chemical waste), construction material types (e.g., steel, roofing, concrete), presence of equipment, levels of contamination, expected waste volumes, and other information that would be used to support safe demolition and clarify requirements for developing facility-specific plans. Active systems (e.g., electric, water, telecommunications) would be identified and deactivated, as appropriate. Adaptive reuse of such infrastructure would be considered, and recyclable materials would be sorted and managed separately, to the extent practicable.

Because the Multi-Site and Single-Site alternatives involve radiological materials, there is a potential for residual contamination, in the following areas:

- Surface contamination in and on building structures, such as equipment (e.g., gloveboxes), walls, ceilings, roof, floors, sinks, laboratory hoods, and air ventilation ducts;
- Solid and liquid contaminated waste from normal operations and off-normal and accident events; and
- Land contamination from normal and off-normal operations and accident events.

The extent and amount of DD&D associated with the Multi-Site and Single-Site alternatives cannot be estimated without a detailed assessment of the facilities, which would not be conducted until the SRPPF end of life is reached. However, this PEIS acknowledges that the Multi-Site and Single-Site alternatives could involve DD&D of approximately 400,000 square feet, which would account for the HC-2 space within the SRPPF. Any LLW would be disposed of at SRS, NNSS, or other appropriate permitted disposal facility, while nonradioactive waste likely would be disposed of at landfills in the SRS area.

Although DD&D activities would generate nonradiological air emissions, there is a potential for radiological air emissions to occur. The intermittent nature of DD&D emission sources would result in dispersed concentrations of air pollutants adjacent to DD&D activities. The substantial transport distance of DD&D emissions from F Area to the SRS boundary (at least six miles) would result in additional dispersion and minimal concentrations of air pollutants at the SRS boundary. Ambient air concentrations at SRS are in compliance with the applicable standards or guidelines, as discussed in

[38] Under the No-Action Alternative, only decommissioning (and perhaps demolition) would be required for the MFFF; decontamination would not be necessary because no radiological operations have been conducted in that facility and there is no contamination. If another purpose was identified in the future for the MFFF, a separate NEPA review would be conducted.

Chapter 3, Section 3.2.5. As a result, air pollutant concentrations generated from DD&D activities are expected to remain below the applicable NAAQS.

Potential impacts to ecological resources during DD&D operations could occur from changes in land use and human disturbance and noise. However, given the minimal ecological resources at F Area, impacts would not be notable. Infrastructure demands associated with DD&D are expected to be less than construction demands, and the SRS infrastructure has adequate supply to meet demand.

DD&D activities also would cause health and safety impacts to workers (occupational and radiological), as well as potential health impacts to the public through the release of radiological materials. DD&D planning would follow radiological protection guidelines to ensure that radiation doses to employees are kept below administrative guidelines and that airborne releases, which could impact the public, are kept to *de minimis* levels. Lessons learned from DD&D at other DOE sites would be applied to minimize impacts to workers and the public. Experience with other DD&D operations has shown that while occupational impacts to workers are expected, BMPs can reduce impacts. See Section 4.1.15 for examples.

While DD&D activities would also produce socioeconomic impacts, it would be speculative to quantify the number of jobs that would be created. See Section 4.1.15 for examples.

It is expected that most surface contamination would be easily removed and reduced to acceptable levels. Any wastes from such decontamination likely would be categorized as LLW. These wastes (e.g., clothing, gloves, equipment, rags, paper, filters, and plastic) likely would be disposed of on the SRS. There also would be TRU wastes, which would be sent to the WIPP facility for disposal. Under the No-Action Alternative, there would be no contamination and no radiological wastes at SRS.

The sand filter system would likely be left in place at the project's end of life and possibly grouted in place for decommissioning. However, given that decommissioning would not occur for approximately 50 years after SRPPF began operations, NNSA acknowledges that new technologies or standards could change that assumption/approach. If the sand filter system were grouted in place, NNSA would develop a performance assessment to (1) demonstrate achievement of long-term performance objectives and comply with applicable regulatory criteria, (2) protect worker and public health and safety, and (3) minimize potential impacts to the environment. Such a performance assessment could require implementation of measures to monitor, detect, and prevent contaminants from being released from the grouted sand filter system. Ultimate management of the sand filter would be part of the detailed DD&D plan, described above, that would be prepared at the project's end of life.

4.2.16 Design Features, Best Management Practices, and Mitigation Measures

As specified in DOE NEPA Implementing Procedures (DOE 2025a, Section 8.0), mitigation measures are those that avoid, minimize, or compensate for effects caused by a proposed action or alternatives as described in an environmental document or ROD and that have a nexus to those effects. Mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action;
- Minimizing effects by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

Pit production at SRS has the potential to affect one or more resource areas. If mitigation measures above and beyond those required by regulations are needed to reduce impacts, NNSA would describe mitigation commitments in the ROD and prepare a mitigation action plan that would explain how, before implementing the Proposed Action, certain measures would be planned and implemented to mitigate adverse environmental impacts. Because no potential adverse impacts were identified that would require additional mitigation measures beyond those required by regulation or achieved through design features or BMPs, NNSA does not expect to prepare a mitigation action plan at SRS for pit production.

A combination of design features and BMPs would be implemented to avoid or reduce potential environmental impacts that could result from implementing the Proposed Action. The SRPPF design includes many features (e.g., HEPA filtration, seismically qualified confinement structures) that would be critical to minimizing potential impacts to worker and public safety. BMPs are policies, practices, and measures that reduce the environmental impacts of proposed activities, functions, or processes.

Section 4.13 of the 2020 SRS Pit Production EIS (NNSA 2020b) provides examples of design features and potential BMPs. In general, activities associated with the Proposed Action would follow standard practices, such as BMPs for minimizing impacts on environmental resources as required by regulation, permit, or guidelines.

4.2.17 Unavoidable Adverse Impacts

This section identifies potential unavoidable adverse impacts that could occur under the alternatives at SRS and measures that could be taken to minimize or avoid these impacts. The residual adverse impacts of actions remaining after design features and BMPs are credited, if any, are considered to be unavoidable. In accordance with the NEPA statute and DOE NEPA Implementing Procedures, this section discusses any adverse environmental effects that cannot be avoided should the proposal be implemented.

Construction activities associated with the Proposed Action would disturb approximately 107 acres of land; 9.3 of which is previously disturbed. This land requirement represents less than 1 percent of the total site. Although construction activities would change the existing land use, the SRPPF would be compatible and consistent with the land use plans at SRS and would be compatible with the current land use designations.

The site for the SRPPF complex is located in a highly developed and previously disturbed industrial area; therefore, there would be no loss of habitat or impacts to biological, cultural, or archaeological resources. Construction impacts would be minor, and appropriate soil and erosion mitigation measures would minimize any adverse impacts. No federal- or state-threatened or endangered species and other species of special designation are expected to be impacted by the Proposed Action.

For both construction and operations, the use of water, fuel, and electricity is considered unavoidable. During construction and operations, use of these consumables would be a small percentage of the site-wide capacity at SRS.

Although there would be overall positive socioeconomic impacts associated with construction and operational workforces, an increase in vehicle traffic could affect the roads and transportation network surrounding SRS. Even though the employment increases would represent less than 1 percent of the total employment in the socioeconomic ROI, the resulting impacts on traffic and congestion resulting from socioeconomic growth, although minor, would be unavoidable.

During normal operations, a minimal amount of radioactive material and activation products could be released to the environment. However, any radiation dose received by a member of the public from emissions would be small and well below regulatory limits.

Operation of the SRPPF would generate a variety of wastes (including radioactive, hazardous, mixed, and sanitary) as an unavoidable result of normal operations. Although SRS uses pollution prevention and waste avoidance measures, generation of chemical and radioactive wastes would be unavoidable. SRS would continue to further reduce hazards and potential exposures through the continued success of pollution prevention and waste avoidance measures.

4.2.18 Relationship Between Short-Term Uses and Enhancement of Long-Term Productivity

Sections 4.2.1 through 4.2.15 discuss potential impacts that could occur at SRS under the Proposed Action. NNSA reviewed these potential impacts and determined that land use, ecological resources, water resources, air quality, and waste management warranted discussion regarding short-term uses of the environment and the maintenance and enhancement of long-term productivity. In accordance with the NEPA statute and DOE's NEPA Implementing Procedures, this section discusses the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity.

Land Use and Biological Resources

Construction of the SRPPF complex would disturb approximately 107 acres of land within the existing industrial landscapes of F Area; 9.3 of which is previously undisturbed pine forest. Once construction is complete, pit production activities would not adversely affect the long-term productivity of the land because the proposed operations of the complex would be compatible with historic nuclear weapons support at SRS. Losses of terrestrial habitat to accommodate the SRPPF are not expected due to the industrialized nature of the SRPPF site, and short-term disturbances of previously disturbed land is not expected to cause long-term reductions in the biological productivity of the SRS area as a whole. After the operational life of the SRPPF, NNSA would perform DD&D of the facilities (*see* Section 4.2.15) in accordance with applicable regulatory requirements and then close in place or restore the areas occupied by the facilities to brownfield sites that would be available for other industrial use. Appropriate reviews under appropriate processes would be conducted before initiation of DD&D actions. In all likelihood, the site for the SRPPF would be restored to a natural terrestrial habitat.

Water Resources

Groundwater would be used to meet process and sanitary wastewater needs over the short term (during construction and operations). After use and treatment, this water would be released through permitted outfalls into surface water streams; eventually recharging the groundwater or entering the Savannah River. The withdrawal, use, and treatment of water are not likely to affect the long-term productivity of water resources.

Air Resources

Air emissions associated with construction and operation of the SRPPF complex would add small amounts of radiological and nonradiological constituents to the SRS regional air environment. During the short term, these emissions are not expected to affect SRS compliance with radiation exposure or air quality standards. No significant residual environmental effects on long-term environmental productivity are expected.

Wastes

The management and disposal of LLW and solid wastes would require energy and space at TSD facilities at SRS and regional landfills. Land used for LLW and solid waste disposal would require a long-term commitment of terrestrial resources. The short-term use of these facilities to support pit production activities is not expected to change their planned closure dates, and therefore, should not result in an incremental change in the potential long-term productivity of these sites. Similarly, disposal of TRU waste at the WIPP facility would require the continued long-term commitment of that site to support national defense missions.

4.2.19 Irreversible and Irretrievable Resource Commitments

A commitment of resources is irreversible when its primary or secondary impacts limit the future options for a resource. For example, as a landfill receives waste, the primary impact is a limit on waste capacity. The secondary impact is a limit on future land use options. An irretrievable commitment refers to the use or consumption of a resource that is neither renewable nor recoverable for use by future generations. NNSA reviewed the impacts in Sections 4.2.1 through 4.2.15 and determined that land, energy, material, and water have the potential to be committed irreversibly or irretrievably under the Proposed Action.

Land

The land requirements in support of the Proposed Action at SRS would be minimal in relation to the existing land at the site and would represent an irreversible commitment of the land. Construction of the SRPPF would disturb approximately 107 acres of land within the existing industrial landscapes of F Area; 9.3 of which is currently undisturbed. The areas identified for the Proposed Action were previously committed to the MFFF project, whose mission was not dissimilar to the current proposed land commitment. Once the SRPPF complex is operational, the land would not be available for other uses. Once the project reaches its end of life, it is possible that the land would not be restored to its original condition or even to minimum cleanup standards. This land could be permanently unusable because the substrata would not be available for other potential intrusive uses such as mining, utility infrastructure, or foundations for other buildings. However, the surface area appearance and biological habitat lost during construction and operation of the SRPPF complex could be largely restored to pre-disturbed conditions.

Energy

The irretrievable commitment of resources during construction and operation of the SRPPF would include the consumption of fossil fuels used to generate heat and electricity. Energy would also be expended in the form of diesel fuel, gasoline, and oil for construction equipment and transportation vehicles. The amounts of irretrievable energy required to construct and operate the SRPPF are estimated in Section 4.2.11. In general, the irretrievable energy amounts would represent a fraction of the SRS site-wide capacity and current uses.

Materials

The irreversible and irretrievable commitment of material resources during the life of the SRPPF includes construction materials that cannot be recovered or recycled, materials that are rendered radioactive and cannot be decontaminated, and materials consumed or reduced to unrecoverable forms of waste. Materials used during construction would include wood, concrete, sand, gravel, plastics, steel, aluminum, and other metals. At this time, no unique construction material requirements have been identified—whether type or quantity. The construction resources, except for those that can be recovered and recycled with present technology, would be irretrievably lost. However, none of these identified construction resources is in short supply and all are readily available in the vicinity of SRS. The materials to be manufactured into new equipment that could not be recycled at the end of the project's useful life are considered irretrievable. While irretrievable, consumption of operating supplies, miscellaneous chemicals, and gases would not constitute a permanent drain on local sources or involve any material in critically short supply in the U.S. as a whole. Plans to recover and recycle as much of useful materials as practical would depend upon need. Each item would be considered individually at the time a recovery decision is required.

Water

Water is a scarce resource in many parts of the U.S. and must not be taken for granted. During construction and operations, groundwater use for the SRPPF complex would be a small percentage of the total current water use at SRS. There would be minimal impacts on surface water and groundwater resources. Nonhazardous facility wastewater, stormwater runoff, and other industrial waste streams would be managed and disposed of in compliance with the NPDES permit limits and requirements. There would be no direct release of contaminated effluents to groundwater or surface waters. To the extent water is recoverable, it has been designed into the facility planning process.

4.3 Complex-Wide Impacts of Multi-Site Pit Production

The concurrent production of pits at LANL and SRS has the potential to result in some environmental impacts that could be considered additive. Sections 4.1 and 4.2 identify the potential impacts, by resource area, that would be expected under the Multi-Site Alternative within the ROIs at LANL and SRS, respectively. Table 4.3-1 evaluates each resource area to determine if impacts could be considered additive under the Multi-Site Alternative. These resource areas are evaluated further.

Table 4.3-1 Potential Additive Impacts – Multi-Site Alternative

Resource Area	Potential for Additive Impacts Under the Multi-Site Alternative
Land use	Low potential. There would be land disturbance within the site boundary at both pit production locations. There are no proposed land disturbances outside of either site. Impacts associated with land disturbance and potential changes to land uses are limited to the specific ROI for each site. Impacts in this resource area are not additive under the Multi-Site Alternative.
Aesthetic and scenic resources	Low potential. Short-term, temporary visual impacts from construction would occur at LANL and SRS. Impacts would be limited to viewpoints within the site boundary or within a close distance from the site. Impacts in this resource area are not additive under the Multi-Site Alternative.
Geology and soils	Low potential. There would be disturbance of soils within the site boundary at both locations. There is no proposed development outside of either site. Minerals or other borrow materials would not be shared between sites. The USGS provides data on the seismicity of each site; however, they are totally independent and do not interact. Impacts in this resource area are not additive under the Multi-Site Alternative.
Water resources	Low potential. Potential impacts to water resources include effects to stormwater runoff, the potential for contamination of surface and/or groundwater and impacts to floodplains. Impacts would be localized and limited to adjacent surface water and groundwater under each pit production location and nearby offsite areas. Impacts in this resource area are not additive under the Multi-Site Alternative.
Air quality	Low potential. There would be very small radiological emissions at each pit production location, however, as shown in Sections 4.1.13 and 4.2.13, these radiological emissions would not make a notable contribution to health impacts even within their own region. Therefore, these radiological emissions would not be additive. There would also be nonradiological emissions at each pit production site; primarily from construction activities and transportation of waste and materials (*see* Section 4.3.1 for an evaluation of complex-wide transportation). The emissions of criteria pollutants would be below *de minimis* thresholds at each site and in different air quality control regions and therefore would not be additive. Greenhouse gas emissions would be negligible at each site and collectively. Overall, impacts in this resource area are not additive under the Multi-Site Alternative.
Noise	Low potential. Construction activities and additional traffic around both pit production locations 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 baseline noise environments. Impacts in this resource area are not additive under the Multi-Site Alternative.
Biological resources	Low potential. The potential impacts to biological resources at each pit production location are limited to the amount of onsite land disturbance, which is minimal. This PEIS evaluates potential impacts to sensitive species at each site and there are no species that would be affected at both sites under the Multi-Site Alternative. As a result, impacts in this resource area are not additive under the Multi-Site Alternative.

Resource Area	Potential for Additive Impacts Under the Multi-Site Alternative
Cultural resources	Low potential. 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 (27 acres) would be a subset of the projected amount of previously undisturbed land that could be affected by the Expanded Operations Alternative in the 2026 LANL SWEIS (806 acres). At SRS, no disturbance would occur on previously undisturbed land. While both sites include cultural resources associated with the Cold War era; however, none of these resources are being affected by the Proposed Action. Impacts in this resource area are not additive under the Multi-Site Alternative.
Socioeconomics	Low potential. There would be positive socioeconomic impacts (benefits) within the 4-county ROI in Georgia and South Carolina and within the 5-county ROI in New Mexico. The community services (e.g., medical, fire, police, schools) are not shared by the ROIs. While there would be overall positive socioeconomic benefits to the Nation as a whole, the specific impacts from pit production are not additive under the Multi-Site Alternative.
Traffic and Transportation	Moderate potential. There are two elements associated with the analysis of transportation in this PEIS; local traffic and health impacts associated with transportation of waste and nuclear materials. The local traffic impacts are limited to the ROI where the workforce reside. Therefore, those potential impacts are not additive. Transportation of waste and nuclear materials from both pit production sites would be traversing the same highways on the routes to the same locations for material transport (e.g., Pantex, LANL, NNSS, SRS) and for radiological waste (e.g., NNSS, WIPP facility). Therefore, these potential impacts are additive and are further addressed in Section 4.3.1.
Infrastructure	Low potential. Utility and fuel consumption at LANL and SRS have been shown to be well within their respective capacities within their respective ROIs. The sites do not obtain their water, electricity, or fuels from the same suppliers and therefore would not add any undue strain on the utility infrastructure beyond their ROI. Impacts in this resource area are not additive under the Multi-Site Alternative.
Waste and materials management	Moderate potential. Pit production at LANL and SRS both generate quantities of radioactive and hazardous wastes. These wastes are transported to a limited number of TSD facilities across the United States for treatment (as needed) and disposal. Therefore, these potential impacts are additive and are further addressed in Section 4.3.2.
Human health	Low potential. There are potential radiological and nonradiological human health impacts to workers and the public from facility operations associated with pit production at LANL and SRS. Impacts to the public are identified for the MEI and the population within 50 miles of the sites. Not only are these impacts very small (*see* Sections 4.1.13 and 4.2.13), but there is also no possibility that a member of the public would receive human health impacts from both sites concurrently. Each site would have its own workforce for pit production. While there would be information sharing and beneficial application of lessons learned between the sites, the same personnel would not be subject to the potential health risks at both sites. Therefore, human health impacts are not additive under the Multi-Site Alternative.

Resource Area	Potential for Additive Impacts Under the Multi-Site Alternative
Accidents and intentional destructive acts	Low potential. Potential impacts from accidents would be independent at each site. Although the types of potential accidents would be similar because many of the internal processes are similar, none of the accidents at one site would have a higher probability of occurrence nor result in greater radiological releases because of operations at the other site. The majority of the accident consequences are related to the MAR for each facility, which is independent of the operating status of the other pit production facility. Therefore, impacts related to accidents are not additive under the Multi-Site Alternative. As discussed in Sections 4.1.14 and 4.2.14, this PEIS evaluates the potential impacts of intentional destructive acts. For potential acts that are evaluated at LANL or SRS and, similar to accidents, the human health impacts of these types of events at the facilities would not be additive under the Multi-Site Alternative. The potential consequences of an intentional destructive act on a shipment of nuclear material are addressed in Section 4.3.1 with transportation impacts.

LANL = Los Alamos National Laboratory; MAR = material-at-risk; MEI = maximally exposed individual; NNSS = Nevada National Security Sites; PEIS = programmatic environmental impact statement; ROI = region of influence; SRS = Savannah River Site; SWEIS = site-wide environmental impact statement; TSD = treatment, storage, and disposal; USGS = U.S. Geological Survey; WIPP = Waste Isolation Pilot Plant

4.3.1 Transportation of Radiological Material

Section 4.1.10.1 presents the potential impacts resulting from transportation of wastes and nuclear materials (e.g., pits, pit-related materials, HEU) associated with production of up to 80 ppy at LANL. Similarly, Section 4.2.10.2 presents the potential impacts resulting from transportation of wastes and nuclear materials associated with production of up to 125 ppy at SRS. Under the Multi-Site Alternative, the highest potential impacts would occur in the event that each site was producing the maximum number of pits concurrently (i.e., 80 ppy at LANL and 125 ppy at SRS). Under this maximum production capacity, the potential transportation impacts would be considered additive, although the combined set of impacts would be on a much larger total population. Like the discussions presented in Sections 4.1 and 4.2, this section is likewise separated by incident-free transportation impacts and accident risk.

Incident Free

The estimated annual collective radiation dose to transportation crews from all offsite transportation activities under the maximum production capacity from both sites would total 62.8 person-rem annually from all waste and secure shipments at the maximum pit production rate. The estimated annual doses to the general population along these routes would be 22.8 person-rem annually from all shipments. Accordingly, incident-free transportation of all materials would result in an annualized total of 0.038 excess LCFs among all transportation workers and 0.014 annualized excess LCFs in all affected public populations.

Impacts of Accidents During Transportation

The potential consequences of the bounding accident are independent of the number of shipments or the origin or destination. Therefore, the consequences are the same as presented in Section 4.1.10.1. Under the maximum production capacity associated with the Multi-Site Alternative, the total estimated annualized transportation accident risk (calculated by summing the individual annual accident probabilities times their associated unmitigated consequences) for all projected accidents involving radioactive shipments to and from both sites, regardless of type, was determined to be $4.9x10^{-5}$ LCF to the general population. This can be directly compared to the estimated nonradiological accident risk (traffic accidents) of 0.086 fatalities per year from shipments of the same materials.

4.3.2 Waste Management

Section 4.1.12.1 presents the estimated volumes of radioactive and hazardous waste generated from production of up to 80 ppy at LANL. Similarly, Section 4.2.12.2 presents the estimated volumes of radioactive, including hazardous waste, generated from production of up to 125 ppy at SRS. Sanitary and nonhazardous solid waste would be disposed of locally and, like other resource areas that are limited to only local impacts, would not be additive. Therefore, this section focuses on the treatment (as necessary) and disposal of radioactive and mixed waste that would be necessary under the maximum production capacity under the Multi-Site Alternative.

Table 4.3.2-1 provides the combined estimates of the projected range of waste quantities generated at each site from pit production.

Table 4.3.2-1 Combined Estimates of Radioactive Waste Quantities

Waste Type	LANL (30–80 ppy)	SRS (50–125 ppy)	Combined Total (80–205 ppy)
LLW (m^3/yr)	3,029–7,627	4,650–9,400	7,679–17,027
MLLW (m^3/yr)	102–262	8–15	120–277
TRU waste (m^3/yr)	280–634	459–765	739–1,399
Hazardous waste (MT/yr)	169–451	16–40	185–491

LLW = low-level radioactive waste; m^3/yr = cubic meters per year; MLLW = mixed low-level radioactive waste; MT/yr = metric tons per year; ppy = pits per year; TRU = transuranic

For LLW, as discussed in Section 4.2.12.2, NNSA expects that the majority of LLW generated at SRS would be disposed of on site in E Area and therefore not be cumulative with the wastes generated at LANL. The disposal of the LANL LLW is managed through a combination of NNSS and available licensed and permitted LLW disposal facilities (e.g., WCS in Andrews County, Texas and Energy*Solutions* in Clive, Utah). The ability of these facilities to accommodate the LANL LLW is described in Section 5.11.1.1 of the 2026 LANL SWEIS (NNSA 2026a).

For MLLW, both LANL and SRS manage their MLLW by sending it to a licensed and permitted TSDs for treatment and disposal. The disposal of the LANL MLLW is managed through a combination of NNSS and available licensed and permitted MLLW disposal facilities (e.g., WCS in Andrews County, Texas and Energy*Solutions* in Clive, Utah). The ability of these facilities to accommodate the LANL LLW is described in Section 5.11.1.1 of the 2026 LANL SWEIS (NNSA 2026a). SRS's potential contribution to the annual volume of MLLW is less than 10 percent and there is adequate capacity in licensed and permitted TSDs to manage these volumes without impact.

The only authorized disposal site for TRU waste is the WIPP facility in Carlsbad, New Mexico. The WIPP Land Withdrawal Act (LWA) includes provisions that allow no more than 175,564 cubic meters of total TRU waste volume and 5.1 million curies of remote-handled TRU waste to be disposed of at the WIPP facility. As of December 2022, about 41 percent of the total TRU waste volume capacity limit authorized in the WIPP LWA has been disposed of in eight disposal panels. Under the maximum production capacity, up to 1,399 cubic meters of TRU waste could be generated per year.

The TRU waste inventory estimates from DOE sites that would send TRU waste to WIPP change frequently due to retrieval, treatment, characterization, and shipping activities. Consequently, TRU waste inventory estimates are collected annually from generator/storage sites and the DOE prepares an ATWIR. The ATWIR provides updated TRU waste inventory estimates and is used for strategic planning. The DOE Carlsbad Field Office uses the ATWIR to provide input into supporting documents (e.g., WIPP Documented Safety Analysis, NEPA evaluations), performance assessments, and the evaluation of changes associated with the WIPP facility. The latest ATWIR was published in January 2026 and reflects a data cutoff date of December 31, 2024 (DOE 2026a). Per that report, the WIPP facility emplaced almost 2,780 cubic meters of TRU waste in 2024. The report also indicates that, based on current projections for TRU waste volumes (some sites [e.g. SRS] reporting projections out to 2083), the total estimated volume is slightly under the LWA limit (175,000 cubic meters).[39] Although there would be increases in waste amounts and shipments to the WIPP facility, adverse impacts to the WIPP facility operational capabilities are not expected. Potential cumulative impacts from TRU waste disposal at WIPP are evaluated in Section 5.4.3.2.

[39] "Slightly" if the potential wastes evaluated in the ATWIR receive approvals of changes to current regulatory or legal restrictions preventing WIPP from disposing of about 21,500 cubic meters. Current projects of WIPP-bound waste are about 153,000 cubic meters inclusive of estimates for the volume of pit production wastes provided by LANL and SRS.

5.0 CUMULATIVE IMPACTS

5.1 Introduction

In accordance with DOE NEPA Implementing Procedures (DOE 2025a), DOE is responsible under NEPA for analyzing reasonably foreseeable environmental effects (42 U.S.C. 4332(C)(i)) of the Proposed Action and alternatives. This PEIS evaluates those reasonably foreseeable environmental effects that have a reasonably close causal relationship to the production of plutonium pits at LANL and SRS. The reasonably foreseeable impacts of implementing the Proposed Action are presented in Chapter 4. Neither the NEPA statute nor DOE's NEPA Implementing Procedures require a separate evaluation of cumulative or indirect effects; however, neither prohibit such analysis.

Both the 2026 LANL SWEIS (NNSA 2026a) and the 2020 SRS Pit Production EIS (NNSA 2020b) analyzed cumulative impacts and addressed the combination of the incremental impacts of plutonium pit production with other past, present, and reasonably foreseeable future actions at each site. Those analyses are summarized, updated, and incorporated by reference into this chapter.

5.2 Methodology and Assumptions

The following approach was used to estimate cumulative impacts for both the 2026 LANL SWEIS (NNSA 2026a) and SRS Pit Production EIS (NNSA 2020b):

- In general, potential cumulative effects (impacts) were determined by considering the baseline affected environment, the Proposed Action, and other current and reasonably foreseeable future actions. The affected environment (*see* Section 3.1 for LANL and Section 3.2 for SRS) includes the impacts of past and present projects and serves as the baseline for this cumulative effects analysis. For example, SRS has 515 waste units subject to the Federal Facilities Agreement. These cleanup actions began prior to signature of the Agreement in 1993 and will continue for years to come. The annual average parameters presented in Chapter 3 for affected resources (e.g., waste volumes, worker radiation exposure) reflect these ongoing activities.
- Current and reasonably foreseeable actions include projects and activities that could result in impacts to resources, ecosystems, or human communities within the defined ROI (defined in Sections 3.1 and 3.2 of this PEIS). These actions are described separately for each site.
- Cumulative effects were assessed by combining the impacts of the Proposed Action with the effects of other past, present, and reasonably foreseeable future actions in the ROI. Many of these actions occur at different times and locations and the potential impacts may not be truly additive. For example, actions affecting air quality occur at different times and locations across the ROI; therefore, it is unlikely that the impacts would be completely additive. The effects were combined irrespective of the time and location of the impact to envelope any uncertainties in the projected activities and their effects. This approach produced a conservative estimation of cumulative impacts for the activities considered.
- A cumulative effects analysis is only conducted for those resource areas with the potential for substantial cumulative impacts. Based on an analysis of the impacts presented in Chapter 4 of this PEIS, the resource areas identified for cumulative effects analysis are socioeconomics, transportation, infrastructure (electricity availability and water use), waste management (i.e., radioactive waste), and human health (normal operations). These are the same resource areas evaluated in the 2020 SRS Pit Production EIS. The 2026 LANL SWEIS evaluated all resource areas; however, the proposed action in the SWEIS was continuation of operations at the Laboratory, which had a broader potential to result in notable impacts for all resource areas.

5.3 Reasonably Foreseeable Actions

The following sections summarize the reasonably foreseeable actions evaluated in the 2026 LANL SWEIS (Section 5.3.1) and the 2020 SRS Pit Production EIS (Section 5.3.2) and updates the actions' status or any additional actions, as warranted.

5.3.1 Los Alamos National Laboratory

Section 6.3 of the 2026 LANL SWEIS presents a table of projects and other actions (external to DOE/NNSA's actions at LANL) that were considered in the cumulative impacts analysis (NNSA 2026a). The list of projects focused on activities proposed by other landowners in the ROI that could have effects when added to those of the continuing operation of the Laboratory and DOE's ongoing remediation of the LANL site. Examples of these activities include road improvements, Los Alamos County proposals for public utilities and housing, and neighboring operations of other federal agencies (e.g., Bandelier National Monument, Santa Fe National Forest, Valles Caldera).

The most notable reasonably foreseeable actions that have the potential to be cumulative with pit production activities are those proposed in the 2026 LANL SWEIS under the Expanded Operations Alternative, which was selected in the ROD based on the LANL SWEIS (NNSA 2026b).

Table 5.3.1-1 identifies the projects evaluated in this PEIS for potential cumulative impacts with plutonium pit production at LANL. The actions considered include those that could result in cumulative effects to the resource areas identified in Section 5.2 (i.e., socioeconomics, transportation, infrastructure, waste management, and human health).

Table 5.3.1-1 Projects Considered in the LANL Cumulative Impacts Analysis

Project Name	Summary of Project
LANL SWEIS Expanded Operations Alternative	This alternative involves implementing all projects evaluated for the No-Action Alternative, Modernized Operations Alternative, and Expanded Operations Alternative in the LANL SWEIS over a 15-year period. In total, this represents construction of about 129 acres of new facilities; 371 acres for utilities, infrastructure, roads, and parking; up to 795 acres of solar photovoltaic arrays; and about 138 acres of temporary construction laydown areas. Each of the resource areas evaluated in this PEIS summarizes the impacts on that resource from the 2026 LANL SWEIS (NNSA 2026a).
Continued operation of Sandia National Laboratories, Albuquerque, New Mexico	SNL/NM have been operating in Albuquerque, New Mexico, since 1948. SNL/NM is located about 60 miles south of LANL on Kirtland Air Force Base. SNL/NM's primary mission is to function as a nuclear weapons research, development, and engineering laboratory. The ROIs for LANL and SNL overlap for select resource areas (NNSA 1999; SNL 2023).
Camp May Water Pipeline Project	Installation of a water pipeline, four pump stations, and a new water tank adjacent to the existing Pajarito 4 Tank on West Road to support the Pajarito Ski Hill. The majority of the pipeline and three pump stations would be located on USFS land. A short segment of the pipeline is on Los Alamos County land. The new tank, fourth pump, and a short segment of the pipeline would be on DOE land. The USFS prepared an EA in 2021 (USDA 2021).
NM-30 Improvements	Project for physical, operational, and safety improvements to reduce congestion and delays on NM-30 between NM-502 and US 84/285 in Española, New Mexico (NMDOT 2023).

Project Name	Summary of Project
Los Alamos County – Public Utility Development	Los Alamos County has several utility projects currently under construction or development that would be within the ROI for this PEIS and could have cumulative impacts. Examples of these projects include (LAC 2024): • Bayo Booster Station – Construct a new 833,000-gallon non-potable water storage tank to expand from the current 182,000 gallons to 1,015,000 gallons. The expanded non-potable water system would capture flows normally discharged to the environment and increase the amount of non-potable water that can be conveyed for irrigation. • White Rock Wastewater Treatment Plant – Replace the wastewater treatment plant in White Rock with a new water resource recovery plant. • DP Road Infrastructure Phase II – Roadway and Utility Infrastructure – Install a new low-pressure sewer collection system to provide sewer service to the existing customers on DP Road and to serve new development that will occur on the vacant parcels. DOE had previously conveyed these parcels to the county. • Foxtail Flats solar power and battery storage – Los Alamos County has entered into agreements to build 170 MW of solar power and 80 MW of battery storage. The facilities will be located in the Four Corners region, northwest of Farmington, New Mexico (134 miles northwest of LANL). Construction of the facilities will occur between 2024 and 2026 and power will be available to the LAPP by 2026.
Los Alamos County – Housing Development	Los Alamos County has several housing projects currently under construction or development that would be within the LANL ROI and could have cumulative impacts. Some of these projects have been completed as of the end of 2025 but are kept in the analysis since the affected environment baseline is 2023. Examples of the planned housing projects include LAC (2024): • Arbolada Subdivision – Develop and construct 85 homes on North Mesa in Los Alamos. The site is approximately 1.5 miles northeast of the LANL site boundary. • Bluffs Senior Apartments – Construct multi-family, affordable, senior apartments on DP Road in Los Alamos. The 64-unit complex is located on land DOE conveyed to the county. • Canada Bonita Apartments – Develop and construct 160 apartment units on Canyon Road, approximately 0.75 mile north of the LANL site boundary. • Mirador Mixed-Use Development – Develop and construct 57 units of multi-family housing in White Rock on land DOE conveyed to the county. • Ponderosa Estates Subdivision – Develop 49 residential housing lots about two miles north of the LANL site. • The Hill Apartments – Develop and construct 144 multi-family rental units along Trinity Drive in Los Alamos.

DOE = U.S. Department of Energy; EA = Environmental Assessment; LANL = Los Alamos National Laboratory; LAPP = Los Alamos Power Pool; MW = megawatts; PEIS = Programmatic Environmental Impact Statement; ROI = region of influence; SNL/NM = Sandia National Laboratories/New Mexico; SWEIS = Site-wide Environmental Impact Statement; USFS = U.S. Forest Service

5.3.2 Savannah River Site

Section 5.2 of the 2020 SRS Pit Production EIS presents reasonably foreseeable future actions that were considered in the cumulative impacts analysis. The list of projects focused on activities proposed by other landowners in the ROI that could have effects when added to those of proposed pit production at SRS. Several of the projects that were initially identified in the 2020 SRS Pit

Production EIS were dismissed from further analysis in 2020 and are therefore not included in this PEIS.

The most notable reasonably foreseeable actions that have the potential to be cumulative with pit production activities at SRS include the continuing operations of SRS and the remediation of land at SRS. These activities were also included in the 2020 analysis.

Table 5.3.2-1 identifies the projects evaluated in this PEIS for potential cumulative impacts with plutonium pit production at SRS. The actions considered include those that could result in cumulative effects to the resource areas identified in Section 5.2 (i.e., socioeconomics, transportation, infrastructure, waste management, and human health).

Table 5.3.2-1 Projects Considered in the SRS Cumulative Impacts Analysis

Project Name	Summary of Project
Surplus Plutonium Disposition	NNSA reviewed potential impacts of surplus plutonium disposition in the 2015 *Surplus Plutonium Disposition Supplemental EIS* (NNSA 2015). Under the chosen alternative in the ROD (85 FR 70601, November 5, 2020), the non-pit plutonium will be prepared for disposal in facilities at HB-Line or K Area at SRS for disposal at WIPP. The non-pit plutonium containers will be opened in an existing glovebox or newly constructed glovebox capability in HB- Line or K Area. Plutonium metal will be converted to oxide. Plutonium oxide will be repackaged into suitable containers, mixed/blended with inert material, and loaded into pipe overpack containers or criticality control overpacks. Preparation of facilities in K Area and dilution (or downblending) of plutonium have been underway at SRS since the ROD. In 2023, NNSA published a new SPDP EIS (NNSA 2024b) that evaluated the proposal to use the dilute-and-dispose technique for disposition of 34 MT of surplus plutonium. In Executive Order 14302, *Reinvigorating the Nuclear Industrial Base*, the president has directed DOE to establish a program to dispose of surplus plutonium by processing and making it available to industry for advanced nuclear technologies. This order also halts the surplus plutonium dilute and dispose program, except to fulfill legal obligations to the state of South Carolina. DOE-NE has established a Surplus Plutonium Utilization Program (SPUP) to support deploying advanced nuclear reactor technologies. The SPUP has issued an RFA which enables DOE-NE to formally solicit applications for surplus plutonium utilization from industry. Based on feedback from the SPUP RFA, DOE will establish a process for companies to access surplus plutonium for advanced reactor fuel. Requirements for future processing of surplus plutonium are dependent on input received from industry under the SPUP RFA. At present, any impacts associated with dilute and dispose operations at SRS will be substantially less than those estimated in the SPDP EIS. With success of the SPUP to supply materials for industry use, and other national security priorities, it is feasible that less than 10% of the 34 MT inventory of surplus plutonium would be dispositioned to WIPP using the dilute and dispose approach. To bound impacts of any future dilute and dispose activities, DOE/NNSA has included the impacts of disposing of 34 MT of surplus plutonium using the dilute and dispose process. DOE/NNSA has taken these estimates from SPDP EIS (NNSA 2024b). This approach ensures that DOE/NNSA does not underestimate impacts if the SPUP goals for utilization of identified surplus plutonium material are not realized.

Project Name	Summary of Project
Artificial Intelligence (AI) Data Center	In December 2025, NNSA published a Request for Proposal (RFP) to industry to potentially develop one or more AI data centers on SRS property. In the RFP, NNSA identified 10 potential tracts of land that could be leased to the awardee to support a data center and/or power generation. NNSA received several proposals and as of the publication of this Draft PEIS, an award has not been announced. Although the 10 potential sites (ranging from 81 to 570 acres) represent about 3,100 acres, the RFP specifies that no more than approximately 450 acres would be leased. NNSA's award is expected in 2026 and at that time, the following details will be clearer: acreage developed (including necessary infrastructure), power requirements (including onsite power during initial startup and project-specific power generation), and water demand (expected withdrawals from either the Savannah River or groundwater). Construction would be labor intensive (estimated at 250 workers) and operations would be expected to require less than 20 full-time staff (NNSA 2026c).
Uranium Recovery Operations in H-Canyon	In 2022, DOE issued an amended ROD to process 29.2 MT of DOE spent fuel through H-Canyon, without uranium recovery, and send the dissolved material to the Defense Waste Processing Facility for eventual disposal as HLW (DOE 2022a). On January 21, 2026, DOE rescinded that decision and, instead, announced that H-Canyon would recover the uranium from the DOE spent fuel; consistent with the decision on the SRS Spent Nuclear Fuel Management EIS (DOE 2026b, 2000). The differences between the updated decision and that from 2000 include: (1) processing 16.2 MT of aluminum clad fuel instead of the original 29.2 MT (the remaining 13 MT of heavy metal SNF would remain in wet storage pending a future processing decision); (2) H-Canyon will recover highly enriched uranium from spent fuel stored at SRS and downblend it to high-assay low-enriched uranium (HALEU) to fuel advanced nuclear reactors (the end product from H-Canyon would be 20-percent enriched HALEU instead of the original 4.5-percent low-enriched uranium); and (3) transportation of HALEU to an advanced reactor fuel fabricator instead of low-enriched uranium to the Tennessee Valley Authority for commercial use. The action is planned to start in 2028 and proceed for 13 years.
Versatile Test Reactor (VTR)	The 2020 SRS Pit Production EIS discussed information based on a Draft EIS for the VTR. In a ROD (87 FR 47400, August 3, 2022) based on the Final VTR EIS (DOE 2022b), DOE decided to construct and operate a VTR and the associated facilities for post-irradiation examination of test and experimental fuels and materials at INL. The VTR will operate as a national user facility, providing a fast neutron-spectrum test capability for the testing and development of advanced nuclear technologies. SRS was considered in the VTR EIS as a potential location for producing VTR driver fuel. In the ROD, DOE deferred decisions about VTR driver fuel production. DOE has not decided whether to establish VTR driver fuel production capabilities at INL, SRS, or a combination of the two sites. Consistent with the analysis in the 2020 SRS Pit Production EIS, this action is not considered as reasonably foreseeable and is not evaluated further in this cumulative impacts analysis.
Tritium Finishing Facility	The TFF project would replace key capabilities in H Area Old Manufacturing. The H Area Old Manufacturing supports an extensive array of mission-critical capabilities, such as the pre-loading process, inert loading, reservoir acceptance, assembly of reservoir components, packaging, storage, shipping, and metallurgical analysis. These capabilities directly support shipments of Gas Transfer Systems and Limited Life Component Exchanges to the DoD/DOW. The TFF complex, to be

Project Name	Summary of Project
	located in the northeast Tritium Area, includes two new buildings: Building 1 would be a HC-2 nuclear facility and Building 2 would be a below HC-3 radiological facility. The project also includes renovations of existing Building 249-H and a portion of existing Building 234-7H, removal of three warehouses, replacement of one warehouse, and upgrades to utilities and infrastructure to support these facilities. This project was evaluated in the TFF EA (NNSA 2021b). As of 2025, one warehouse has been removed, the replacement warehouse constructed, and early site preparation work has begun. Operation of the new TFF is scheduled to begin in 2035.[40]
Georgia Power's Plant Vogtle	Plant Vogtle is a commercial nuclear power plant near Waynesboro, Georgia, located approximately 13 miles south-southwest of the SRPPF complex. All four reactor units are operating. When the SRS Pit Production EIS was published in 2020, Units 3 and 4 were under construction. Unit 3 began operation in July 2023, and Unit 4 began operation in April 2024. Considering that construction is complete, the only reasonably foreseeable action associated with Plant Vogtle is continued operation.

AI = artificial intelligence; DoD = U.S. Department of Defense; DOE-NE = U.S. Department of Energy Office of Nuclear Energy; DOW – Department of War; EA = Environmental Assessment; EIS = Environmental Impact Statement; FR = Federal Register; HALEU = high-assay low-enriched uranium; HC = Hazard Category; INL = Idaho National Laboratory; MT = metric ton; NNSA = National Nuclear Security Administration; RFA = Requestion for Application; ROD = record of decision; SRUP = Surplus Plutonium Utilization Program; SRPPF = Savannah River Plutonium Processing Facility; SRS = Savannah River Site; TFF = Tritium Finishing Facility; VTR = Versatile Test Reactor; WIPP = Waste Isolation Pilot Plant

5.4 Cumulative Effects by Resource Area

The following sections present the potential cumulative effects of the reasonably foreseeable future actions when combined with the potential impacts from pit production at LANL (Sections 5.4.1), SRS (Section 5.4.2), and those that could occur nationally from pit production under the maximum production capacity in the Multi-Site Alternative (Section 5.4.3), which includes an assessment of the cumulative impacts of radiological transportation and TRU waste disposal at the WIPP facility. As discussed in Section 5.2, analysis of cumulative effects is addressed for socioeconomics, transportation, infrastructure, waste management, and human health.

5.4.1 Los Alamos National Laboratory

5.4.1.1 Socioeconomics

The socioeconomic analysis presented in Section 4.1.9 identifies the potential impacts from changes in employment and economic activity due to construction of new facilities and the production of 30–80 ppy at LANL. As defined in Section 3.1.9, the ROI is a five-county area surrounding LANL, where about 93 percent of LANL employees and their families reside.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, the ROI would benefit from generally positive socioeconomic impacts. Table 4.1.9-2 provides the potential impacts associated with production of up to 80 ppy at LANL.

Site-Wide Operations at LANL. Under the Expanded Operations Alternative evaluated in the 2026 LANL SWEIS, pit production would be a subset of the total impacts presented in the SWEIS (NNSA

[40] https://www.srs.gov/general/news/factsheets/srs_overview.pdf

2026a, Table 5.9-5). The comparison of the impacts related to jobs (direct and indirect) and earnings (direct and indirect) are presented in Table 5.4.1.1-1. These annual impacts for pit production and the SWEIS are both evaluated during steady-state operations (estimated in late 2030's)

Table 5.4.1.1-1 Potential Cumulative Socioeconomic Impacts at LANL

Resource Metric	Baseline (2023)	Pit Production at LANL (80 ppy)	SWEIS Expanded Operations Alternative
Direct jobs at LANL (persons)	16,620	18,703	20,169
Indirect jobs from LANL (persons)	10,208	11,487	11,887
Total Direct and Indirect employment	26,828	30,190	32,056
Total ROI labor force (persons)	503,747	532,758	543,205
Earnings from direct jobs at LANL (millions of dollars)	$2,259.8	$2,543.0	$2,649.3
Earnings from indirect jobs from LANL in ROI (millions of dollars)	$1,388.0	$1,562.0	$1,593.4
Anticipated value added from LANL (millions of dollars)	$3,495.4	$3,933.5	$4,084.9

LANL = Los Alamos National Laboratory; ppy = pits per year; ROI = region of influence; SWEIS = Site-wide Environmental Impact Statement
Source: Table 4.1.9-2 and NNSA 2026a, Table 5.9-5

Other Actions. Because the national laboratories at LANL and Sandia National Laboratories/New Mexico (SNL/NM) are within 60 miles of each other, they can both draw from the same pool of potential employees and both contribute to the socioeconomic conditions of the surrounding ROI. The LANL five-county ROI includes Bernalillo County, which contains SNL/NM. According to SNL (2023), there were 12,580 employees at SNL/NM in 2022. Most of the SNL/NM employees reside in Bernalillo County, while only about 6 percent of the LANL workforce reside in Bernalillo County. Impacts to employment and economic activity include direct, indirect, and induced economic impacts that could potentially result from project activities. As project-related direct expenditures are made in the ROI, these dollars begin to circulate in the economy. As funds are expended to pay employees and to buy goods and services, the recipients then make purchases, causing successive rounds of local spending, until the original expenditures eventually exit the ROI. Overall, both national laboratories have been located in their respective communities for over 70 years, provide generally positive socioeconomic benefits to the ROI, and do not have projected changes that would significantly stress the housing or public services of the ROI.

The utility and housing development in Los Alamos County is being implemented in direct response to the housing and infrastructure needs in the county. The Los Alamos Housing Program, a component of the Economic Development Division of Los Alamos County, is responsible for developing and implementing programs and projects to maintain and increase housing opportunities for all segments of the Los Alamos community. This includes contracting with service providers that oversee operations of affordable housing homeownership, rental, and rehabilitation programs. The Housing Division works to ensure compliance with state and federal regulations and updates to county Housing Programs' policies and procedures on an ongoing basis. The county also works with the Planning Division to produce short-term rental policy and feasibility studies with the Los Alamos Public Schools for housing on school-owned land on North Mesa. The North Mesa Housing Study identified specific housing needs and potential options for additional development to provide up to 360 additional housing units. The Los Alamos townsite and White Rock are considering the development of high-density, mixed-use housing units in the town center areas that would include a transit center to the LANL site. The plans include up to 363 housing units in White Rock and 2,591 units in Los Alamos (NNSA 2026a).

5.4.1.2 Transportation

The transportation analysis presented in Section 4.1.10 presents the potential impacts on traffic and transportation for the alternatives at LANL, including shipping nuclear material and waste under both incident-free and accident conditions. Supporting analysis is provided in Appendix E of this PEIS. The following paragraphs discuss potential cumulative effects on local transportation at LANL. National transportation and the potential health impacts of shipping nuclear materials and waste are presented in Section 5.4.3.1.

No-Action Alternative and Site-Wide Operations at LANL. Up to 2,083 additional pit-production workers would commute to LANL under the range of alternatives evaluated in this PEIS. This would be a subset of the workforce additions analyzed in the 2026 LANL SWEIS, which evaluated increases in workforce of as much as 3,549 from the 2023 baseline for the Expanded Operations Alternative (NNSA 2026a). The analysis found that the incremental annual increases in traffic due to this employment growth would not change the LOS's on roads in the immediate vicinity of LANL, nearly all of which are deemed to presently operate between LOS "C" and LOS "D" (as discussed in Chapter 3, Section 3.1.10), which is above the LOS "E" designation that is used to denote a major deficiency condition in traffic flow. Within the LANL site boundary, any resulting traffic increases due to the presence of more pit-production-related staff would be expected to pose small-to-moderate impacts on the site's existing road network. The potential addition of up to 2,083 pit-production workers would represent about a 12-percent increase over the present-day number of workers site-wide at LANL.

Other Actions. The 2026 LANL SWEIS (NNSA 2026a, Section 4.9.2) identified that population growth in the ROI is expected to increase by about 0.7 percent annually. This includes the projected housing projects listed above in Table 5.3.1-1. During the development of the LANL SWEIS, NNSA considered this population growth when determining potential traffic impacts for cumulative impacts. None of the other actions in Table 5.3.1-1 would have notable impacts on local transportation.

5.4.1.3 Infrastructure

The infrastructure analysis presented in Section 4.1.11 presents potential impacts to infrastructure at LANL for the alternatives. Important metrics include the quantities of water and electricity consumed, and an analysis of the current infrastructure to meet projected demands.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, the projected consumption of water and electricity would be within the capacities of the associated infrastructure. Table 4.1.11-1 provides the potential impacts associated with production of up to 80 ppy at LANL.

Site-Wide Operations at LANL. Under the Expanded Operations Alternative evaluated in the 2026 LANL SWEIS, pit production would be a subset of the total impacts presented in the SWEIS (NNSA 2026a, Table 5.10-1). The comparison of the impacts related to water consumption and electricity power consumption and peak demand are presented in Table 5.4.1.3-1. In the table, the site-wide baseline reflects the conditions as of 2023; the pit production column reflects the additional demand associated with pit production, and the SWEIS column represents the total projected demand at LANL by 2038 from all proposed activities in the 2026 LANL SWEIS (including pit production). As reported in the 2026 LANL SWEIS, all infrastructure demands for the alternatives are expected to be within the existing or projected capacity (i.e., assuming the implementation of the EPCU project).

Table 5.4.1.3-1 Potential Cumulative Infrastructure Impacts at LANL

Resource Parameter	Site-Wide Baseline (2023)	Pit Production at LANL (80 ppy) (by 2035)	SWEIS Expanded Operations Alternative (by end of 2038)[a]	Capacity
Domestic water (MGY)	271.5	30	504	542
Electricity – power consumption (MkW-hr/yr)	440	5.94	810 average; 1,174 peak	651[b]
Electricity–peak load (MW)	70	1.9	110 average; 171 peak	116[b]

EPCU = Electric Power Capacity Upgrade; MGY = million gallons per year; LLNL = Los Alamos National Laboratory; MkW-hr/yr = million kilowatt-hours per year; MW = megawatt; ppy = pits per year; SWEIS = Site-wide Environmental Impact Statement

a Assumes steady state 30 ppy pit production.

b Capacity for electrical consumption will increase from 651 to 1,440 MkW-hr/yr and import capacity will increase from 116 MW to 200 MW upon completion of the EPCU project.

Other Actions. Due to the relative distance between LANL and SNL/NM, continued operations of the two national laboratories would be unlikely to have cumulative infrastructure impacts.

Los Alamos County is considering recommendations for overall management of natural resources including water consumption. Examples of higher priority recommendations related to water and wastewater include: (1) develop and adopt a comprehensive water conservation and watershed stewardship plan to maintain and enhance the quality and quantity of the county's water supply and (2) develop and implement a plan to capture stormwater runoff and reduce contamination through green infrastructure approaches. Implementation of these recommendations would reduce potential impacts to this infrastructure resource.

Water rights for Los Alamos County total 5,541 acre-feet (1,804 million gallons) per year and are made up of a combined right of groundwater and surface water. Between the late 1960s and 2015, total water consumption in Los Alamos County had ranged between 4,000 and 5,000 acre-feet per year with maximum annual consumption above 5,000 acre-feet on two occasions (LAC 2015). As outlined in Table 5.4.1.3-2, current water usage for Los Alamos County is about 4,200 acre-feet annually, of which LANL consumes about 24 percent. The Expanded Operations Alternative from the 2026 LANL SWEIS would increase LANL's water consumption by 714 acre-feet by 2038.

Table 5.4.1.3-2 Water Rights and Projected Water Use for Los Alamos County

Location	Water Rights	Current Use	Projected Water Use
Los Alamos County (acre-feet/year)	3,879	3,387	3,590[a]
LANL (acre-feet/year)	1,662	834[b]	1,548
TOTALS (acre-feet/year)	**5,541**	**4,221**	**5,138**

LANL = Los Alamos National Laboratory
a Estimate based on population of 20,000.
b Existing baseline of 271.5 million gallons per year equals 834 acre-feet per year for water consumption; 1 acre-foot equals 325,581 gallons.
Source: NNSA 2026a, Section 6.4.10

As shown in Table 5.4.1.3-2, projected water consumption would be approximately 5,138 acre-feet, which would remain about 7 percent below the water rights of 5,541 acre-feet. Ongoing water conservation efforts are in place both in Los Alamos County and at LANL and include water reuse projects, leak detection and repair, water meter replacements, and public outreach. Sustainable water use practices will be paramount in the coming years due to potential impacts from increasingly erratic and damaging weather patterns and increasing social demand.

DOE/NNSA, LANL, and Los Alamos County commit their electricity generation, transmission, and distribution resources to a pool in a long-term contract among the parties via the LAPP. The LAPP supplies Los Alamos County and LANL with electricity through hydroelectric, coal, and natural gas power generators from across the western U.S. Historically, LANL has used approximately 80 percent of the energy from the LAPP. As shown in Table 5.4.1.3-3, LAPP's electrical consumption is projected to increase over the next 15 years due mostly to LANL's proposed energy requirements under the Expanded Operations Alternative evaluated in the 2026 LANL SWEIS. The LAPP would need to increase the contracted amounts of imported electricity from its providers. Los Alamos County and LANL are increasingly seeking opportunities to add renewable energy to their supply portfolio through the coordination of Los Alamos County Department of Public Utilities and the Los Alamos County Council, such as adopting goals and federal mandates on LANL to increase renewable energy use. As such, future imported electricity demand would be partially offset by increasing renewable energy projects within Los Alamos County and LANL. As noted in the 2026 LANL SWEIS, DOE is planning to implement solar photovoltaic arrays (up to about 169 MW), which would assist in offsetting this increase.

Table 5.4.1.3-3 Baseline and Projected Electrical Energy Consumption (MkW-hr/yr) for the LAPP

Category	LANL Total	County Total	LAPP Total
Baseline electrical consumption[a]	440	120	560
Projected electrical consumption	810[b]	132[c]	942

LAPP = Los Alamos Power Pool; LANL = Los Alamos National Laboratory; MkW-hr/yr = mega kilowatt-hours per year
a Average annual electrical energy consumption from 2017–2023.
b Projected electrical consumption for the Expanded Operations Alternative from Section 5.10.3.
c Projected electrical consumption based on 10 percent increase to baseline.
Source: NNSA 2026a, Table 6.4-2

In 2026, Los Alamos County expects to begin receiving energy into the LAPP from the Foxtail Flats solar and battery storage project near Farmington, New Mexico. According to LAC (2024), the project will produce 170 MW per hour, which is more than enough to supply the daytime load for the LAPP. The county plans to sell 50 MW per hour under a separate power purchase agreement. Therefore, this project will add 120 MW per hour to the LAPP. The battery storage system will also be located near the solar project and will help supply the night load to LAPP and be used to store excess generated solar power above the required load. This project will help the county manage cost-efficient use of the various power generations.

5.4.1.4 Waste Management

The analysis presented in Section 4.1.12 presents the potential impacts on waste management for the alternatives and addresses potential radiological waste volumes generated for production of 30 and 80 ppy.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, operations at LANL would generate radioactive waste including LLW, MLLW, and TRU waste. Tables 4.1.12-1, -2, and -3 provide the potential radioactive waste volumes (for LLW, MLLW, and TRU waste, respectively) associated with production of up to 80 ppy at LANL. Section 5.4.3 evaluates the potential national waste management impacts, primarily focusing on the available capacity of waste disposal facilities.

Site-Wide Operations at LANL. Under the Expanded Operations Alternative evaluated in the 2026 LANL SWEIS, pit production would be a subset of the total impacts presented in the SWEIS (NNSA 2026a, Table 5.11-16). The comparison of the relative waste volumes between pit production and site-wide operations is presented in Table 5.4.1.4-1.

Other Actions. The cumulative impacts analysis for radiological waste disposal includes contributions from both LANL and SNL/NM since the laboratories dispose of their radiological waste at the same locations. The individual contributions by SNL/NM to specific waste volumes are relatively small in comparison. As reported in the LANL SWEIS, the annual contribution to waste volumes from SNL/NM operations (as compared to LANL) was less than 1 percent, about 9 percent, and less than 1 percent for LLW, MLLW, and TRU waste, respectively. None of the other actions in Table 5.3.1-1 would involve radioactive waste generation.

Table 5.4.1.4-1 Waste Management Cumulative Impacts at LANL

Resource Parameter	Site-Wide Baseline	Pit Production at LANL (30 ppy)	Pit Production at LANL (80 ppy)	SWEIS Expanded Operations Alternative
Total LLW generated (m^3/yr)	4,985	3,029	7,627	16,276
Total MLLW generated (m^3/yr)	640	102	262	653
Total TRU waste generated (m^3/yr)	388	280	634	849

LANL = Los Alamos National Laboratory; LLW = low-level radioactive waste; m^3/yr = cubic meters per year; MLLW = mixed low-level radioactive waste; ppy = pits per year; TRU = transuranic

5.4.1.5 Human Health

The analysis presented in Section 4.1.13 presents the potential impacts on human health (workers and the offsite public) for the alternatives and addresses potential impacts for production of 30 and

80 ppy. Key metrics for the cumulative impacts analysis include radiological doses and potential LCFs to the public and workers from normal operations.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, Section 4.1.13.1 illustrates that the potential offsite doses to the MEI and the collective population from normal operations would be the same as the current baseline. In other words, the incremental increase in potential offsite doses from pit production would be less than 1 percent of the current annual reported dose to the MEI and collective population.

Table 4.1.13-3 presents the annual radiological impacts to workers for the production of 30 and 80 ppy.

Site-Wide Operations at LANL. Under the Expanded Operations Alternative evaluated in the 2026 LANL SWEIS, pit production would generally be a subset of the total impacts presented in the SWEIS (NNSA 2026a, Table 5.7-9). The comparison of the radiological impacts to workers is presented in Table 5.4.1.5-1. As noted in the table, the 2026 LANL SWEIS uses production of 30 ppy as the baseline assumption, but, as acknowledged in the SWEIS, there would be changes to the SWEIS No-Action Alternative (which included production of 30 ppy with surge to 80 ppy) values that include an increases of 975 radiological workers, 105 millirem to the average pit production worker dose, 74 millirem increase to the site-wide average worker dose, and 559 person-rem to the collective site-wide worker dose (NNSA 2026a, Table 5.7-2).

Other Actions. Due to the relative distance between LANL and SNL/NM, continued operations of the two national laboratories would be unlikely to have cumulative impacts to human health. This conclusion is supported in the 2026 LANL SWEIS (Section 6.4.7), which demonstrates that the additional contribution from SNL/NM activities above the projected LANL population dose would be 0.3 percent. None of the other actions in Table 5.3.1-1 would involve radiological health impacts.

Table 5.4.1.5-1 Annual Radiological Impacts to Workers – Pit Production and Site-Wide Operations

Resource Parameter	Baseline (existing environment)	Pit Production at LANL (30 ppy)	Pit Production at LANL (80 ppy)	SWEIS Expanded Operations Alternative (30 ppy)
Number of radiological workers who receive a measurable dose (TA-55)	585	1,028	2,003	4,940
Average annual dose to radiological worker (mrem)	79.7	360	465	141
Average annual radiological worker risk (LCFs)[a]	4.8×10^{-5}	2.2×10^{-4}	2.8×10^{-4}	8.5×10^{-5}
Collective annual dose to radiological workers (person-rem)	46.6	370	931	695.7
Total Annual Radiological Worker Risk (LCFs)[a]	0.028	0.22	0.56	0.42

LANL = Los Alamos National Laboratory; LCF = latent cancer fatality; mrem = millirem; ppy = pits per year; SWEIS = Site-wide Environmental Impact Statement; TA – technical area

a Based on the dose-to-risk conversion factor of 0.0006 LCF per rem or person-rem (DOE 2003).

5.4.2 Savannah River Site

5.4.2.1 Socioeconomics

The socioeconomic analysis presented in Section 4.2.9 identifies the potential impacts from changes in employment and economic activity due to construction of new facilities and the production of 50–125 ppy at SRS. As defined in Section 3.2.9, the ROI is a four-county area on the South Carolina-Georgia border around SRS where about 85 percent of site employees and their families reside.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, the ROI would benefit from generally positive socioeconomic impacts. Table 4.2.9-3 provides the potential impacts associated with production of up to 125 ppy at SRS. A summary of these impacts, similar to that for LANL in Section 5.4.1.1 is presented in Table 5.4.2.1-1.

Other Actions. As noted in Section 5.3.2, the surplus plutonium disposition mission at SRS is underway. Even though additional staffing and level of effort were originally projected and evaluated in NNSA (2024b), these increases are considered unlikely because of the halt of the disposition program. Therefore, surplus plutonium disposition would not notably contribute to cumulative impacts for socioeconomics.

Table 5.4.2.1-1 Potential Cumulative Socioeconomic Impacts at SRS

Resource Metric	Baseline (2023)	Pit Production at SRS (125 ppy)
Direct jobs at SRS (persons)	12,691	15,531
Indirect jobs from SRS (persons)	7,772	9,511
Total Direct and Indirect employment	20,464	25,042
Total ROI labor force (persons)	240,178	248,857
Earnings from direct jobs at SRS (millions of dollars)	$1,671.6	$2,045.7
Earnings from indirect jobs from SRS in ROI (millions of dollars)	$1,023.7	$1,252.8
Anticipated value added from SRS (millions of dollars)	$2,703.1	$3,308.0

ppy = pits per year; ROI = region of influence; SRS = Savannah River Site
Source: Table 4.2.9-3

Per the *Environmental Assessment for the Tritium Finishing Facility at the Savannah River Site* (TFF EA), the peak construction workforce would be about 170 and the number of operational workers, including security personnel, would not change from that currently employed at the current tritium facilities that would be replaced (NNSA 2021b).

The artificial intelligence (AI) data center has the potential to add about 250 construction workers to the SRS demand over the next few years; however, operations would have a smaller long-term effect. This could be in addition to the peak year of SRPPF construction. Depending on the timing of the SRPPF and data center construction, the cumulative impacts could either result in a stressed demand for workers (if the peaks were concurrent) or there would be a suitable supply of workers (if the project peaks were offset). In either case, the project would increase the beneficial socioeconomic impacts for the ROI.

The H-Canyon recovery operations would not have a measurable cumulative impact on socioeconomics in the ROI.

As discussed in Table 5.3.2-1, the new units at Plant Vogtle both began operations after publication of the 2020 SRS Pit Production EIS. Regionally, the operations workforce for Plant Vogtle is smaller than the construction workforce that was evaluated in 2020 and is reflected in the socioeconomic baseline data in Section 3.2.9. As such, this ongoing action would not further contribute to cumulative socioeconomic impacts.

5.4.2.2 Transportation

The transportation analysis in Section 4.2.10 presents the potential impacts on traffic and transportation for the alternatives at SRS, including shipping nuclear material and wastes under both incident-free and accident conditions. Supporting analysis is provided in Appendix E of this PEIS. The following paragraphs discuss potential cumulative effects on local transportation at SRS. National transportation and the potential health impacts of shipping nuclear materials and waste are presented in Section 5.4.3.

No-Action Alternative and Site-Wide Operations at SRS. Up to 2,840 additional workers would commute to SRS under the range of pit production alternatives evaluated in this PEIS. The 2020 SRS Pit Production EIS evaluated impacts from traffic associated with pit production at SRS and acknowledged that SRPPF operations would generate commuter traffic (NNSA 2020b). However, this commuter traffic would represent less than 1 percent of the total employment in the ROI and would not adversely affect the LOS of local roads. More specifically, the roads in Aiken, Barnwell, and Allendale counties in South Carolina that have the highest levels of traffic would continue to operate at LOS "A," and roads in Augusta-Richmond County, Georgia, would continue to operate at currently designated LOS levels.

Other Actions. As discussed in Section 5.4.2.2 under socioeconomics, neither the halted surplus plutonium mission, construction and operation of TFF, nor Plant Vogtle's recent transition from construction to operations constitute a notable change in the workforce in the region.

Like the discussion above for socioeconomics, the AI data center would contribute to short-term traffic impacts during construction; however, the true effect on traffic would depend on the location of the data center, which will not be known until NNSA awards a contract and lease. Of the 10 potential sites, half are well south of F Area (NNSA 2026c). Cumulative traffic impacts would be larger if one of the sites nearest F Area was selected.

H-Canyon uranium recovery operations would not impact traffic, but it would include transportation of radiological materials from SRS. The amended ROD reported that shipment of HALEU from SRS could result in per-shipment impacts of approximately 2×10^{-5} LCF risk to the population and 1×10^{-5} LCF risk to the crew. Accident risks would be approximately 2×10^{-9} LCF per shipment. DOE estimates approximately 12 shipments per year over the 13-year life of the action. The total risk of these shipments will be approximately 3×10^{-3} LCF risk to the population and 2×10^{-3} LCF risk to the crew. Accident risks would be approximately 3×10^{-7} LCF (DOE 2026b). These health and safety risks are small and would not measurably contribute to cumulative impacts.

5.4.2.3 Infrastructure

The infrastructure analysis in Section 4.2.11 presents potential impacts to infrastructure at SRS for the alternatives. Important metrics include the quantities of water and electricity consumed, and an analysis of the current infrastructure to meet projected demands.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, the projected consumption of water and electricity would be within the capacities of the associated infrastructure at SRS. Table 4.2.11-1 provides the potential impacts associated with production of up to 125 ppy at SRS. At maximum pit production capacity, the infrastructure demands are all a small contribution to the total site-wide capacity (<7 percent). The total site-wide water demand is about 36 percent of capacity, and the total power demand is only about 10 percent of capacity.

Other Actions. For the same reasons as described in Section 5.4.2.1, surplus plutonium disposition is unlikely to increase infrastructure demands beyond those included in the current baseline. Additionally, the construction and operation of TFF is not a large consumer of water or power (NNSA 2021b). As noted in Table 5.3.2-1, when the 2020 SRS Pit Production EIS was published, only two of the Plant Vogtle units were generating electricity. Since that time, Units 3 and 4, which together generate about 2,234 MW, have started operation and are providing baseload power to the grid.

Implementation of the AI data center would have the potential for contributing to infrastructure demands; however, the degree to which it would contribute will not be known until after a DOE award. For water consumption, DOE/NNSA currently has a permit (until 2042) with SCDES to withdraw 575,000 gallons per minute from the Savannah River across three geographic locations. SRS currently only withdraws about 7,500 gallons per minute (1.3 percent of the permitted amount). If the awardee opts for groundwater withdrawal, the project would need a new permit from SCDES and would need to use advanced cooling systems with higher water efficiency (NNSA 2026c).

H-Canyon operations would not impact water consumption. Considering the above discussions, regardless of the awardee and their selection for water supply, future water withdrawals (from surface or groundwater) would be within permitted limits.

5.4.2.4 Waste Management

The analysis in Section 4.2.12 presents the potential impacts on waste management for the alternatives and addresses potential radiological waste volumes generated for production of 50, 80, and 125 ppy at SRS.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, operations at SRS would generate radioactive waste, including LLW, MLLW, and TRU waste. Tables 4.2.12-1, -2, and -3 provide the potential radioactive waste volumes (for LLW, MLLW, and TRU waste, respectively) associated with production of up to 125 ppy at SRS. A summary of these waste volumes, similar to that for LANL in Section 5.4.1.4, is presented in Table 5.4.2.4-1. Section 5.4.3 evaluates the potential national waste management impacts; primarily focusing on the available capacity of waste disposal facilities.

Other Actions. The primary increases in radioactive waste associated with other actions would come from plutonium disposition. As discussed in Section 5.3.2, the volume of surplus plutonium that is now planned for downblending at SRS and disposal at WIPP is likely to change since issuance of the SPDP EIS, which estimated that the total volume to be disposed at the WIPP facility would be about 1,500 cubic meters (NNSA 2024b). Based on the projections in the 2025 ATWIR, disposal of surplus plutonium waste was expected to be about 1,713 cubic meters (DOE 2026a). Depending on the outcome of the future reprocessing of surplus plutonium, this disposal volume could decrease substantially.

Table 5.4.2.4-1 Potential Waste Management Cumulative Impacts at SRS

Resource Parameter	Site-Wide Baseline	Pit Production at SRS (50 ppy)	Pit Production at SRS (80 ppy)	Pit Production at SRS (125 ppy)	Plant Vogtle
Total LLW generated (m^3/yr)	4,681	4,650	6,550	9,400	40–70
Total MLLW generated (m^3/yr)	4.2	7.6	11.5	15	5
Total TRU waste generated (m^3/yr)	128	459	673	765	0

LLW = low-level radioactive waste; m^3/yr = cubic meters per year; MLLW = mixed low-level radioactive waste; ppy = pits per year; SRS = Savannah River Site: TRU = transuranic

According to the TFF EA (NNSA 2021b), the TFF was designed as a clean facility. Its operation is expected to produce no LLW, hazardous waste, or MLLW. Work in the TFF will be performed in glovebox settings and LLW, such as personal protective equipment, would typically not be generated during normal operations.

Existing operations and F Area cleanup at SRS would be expected to generate radioactive waste at the same annual average as presented in Section 3.2.12. DOE/NNSA acknowledges that some years would be higher than the annual average. Additionally, as facilities are determined to be excess during the 50-year analytical period, there would be an increase in radioactive waste due to DD&D. However, those volumes and the specific timing associated with the DD&D are speculative and not evaluated in this cumulative effects analysis.

According to the recent amended ROD for the H-Canyon uranium recovery operations, the action would produce similar waste streams and annual volumes as evaluated in the SRS Spent Nuclear Fuel EIS (DOE 2020). This also would be less than the waste generated under the 2022 decision to dispose of the processed spent fuel without uranium recovery (DOE 2022a). Therefore, this action would result in an overall reduction of site-wide radioactive waste generation (not including pit production).

According to the information provided by the LLW Forum and NRC, the average commercial power plant unit generates about 10-20 cubic meters of Class A LLW per year. Plant Vogtle is a member of a LLW compact and sends its LLW to EnergySolutions' Clive, Utah facility. As a 4-unit power plant, the plant will send an average of 40-80 cubic meters of LLW to Utah each year. This volume would add less than 1 percent to the expected LLW generation from SRS pit production.

5.4.2.5 Human Health

The analysis in Section 4.2.13 presents the potential impacts on human health (workers and the offsite public) for the alternatives and addresses potential impacts for production of 50, 80, and 125 ppy. Key metrics for the cumulative impacts analysis include radiological doses and potential LCFs to the public and workers from normal operations.

No-Action Alternative and Action Alternatives. Under the various alternatives evaluated in this PEIS, Section 4.2.13.1 illustrates that the potential offsite doses to the MEI and the collective population from normal operations would be the same as the current baseline. In other words, the incremental increase in potential offsite doses from pit production would be less than 1 percent of the current annual reported dose to the offsite MEI and collective population. The potential cumulative health impacts in the region to the MEI and population within 50 miles of SRS, are presented in Table 5.4.2.5-1.

Table 4.2.13-2 presents the annual radiological impacts to workers at SRS for the production of 50, 80, and 125 ppy.

Other Actions. As noted in Section 5.3.2, the continuity of the surplus plutonium mission in K Area is uncertain, however, for conservatism, the estimated population and worker doses from NNSA (2024b), which included disposition of up to 34 metric tons of surplus plutonium, are included in Table 5.4.2.5-1. As reported in Section 4.2.13.4, NNSA is considering an operational efficiency to repurpose facilities and equipment that were planned for plutonium disposition to support pit production. In this scenario, the potential worker exposures are captured as impacts associated with the Proposed Action.

Table 5.4.2.5-1 Potential Human Health Cumulative Impacts at SRS

Activity	Population within 50 miles		Offsite MEI	
	Dose (person-rem per year)	Annual LCF Risk[a]	Dose (mrem per year)	Annual LCF Risk[a]
Past, Present, and Reasonably Foreseeable Future Actions				
Existing site activities (baseline)[b]	3.5	2.1×10^{-3}	0.26	1.6×10^{-7}
Other DOE actions evaluated in the SPDP EIS (NNSA 2024b)	18	0.01	0.31	2.0×10^{-7}
SPDP EIS preferred alternative	0.97	0.0006	0.010	6.0×10^{-9}
Subtotal – Baseline Plus Other DOE Actions	***22.5***	***0.014***	***0.58***	***3.5×10^{-7}***
Pit Production (125 ppy)[c]	5.2×10^{-5}	3.1×10^{-8}	0.023	1.5×10^{-8}
Total for Savannah River Site	***22.5***	***0.014***	***0.6***	***3.6×10^{-7}***
Plant Vogtle[d]	1.8	1.0×10^{-3}	0.3	1.8×10^{-7}
Total for Region	***24.3***	***0.015***	***(e)***	***(e)***

DOE = U.S. Department of Energy; LCF = latent cancer fatality; MEI = maximally exposed individual; mrem = millirem; ppy = pits per year; SPDP EIS = Surplus Plutonium Disposition Program Final Environmental Impact Statement; SRS = Savannah River Site

a LCFs are calculated using a conversion of 0.0006 LCF per rem or person-rem (DOE 2003). The annual LCFs for the analyzed population represent the number of LCFs calculated by multiplying the listed doses by the risk conversion factor; no population LCFs are expected from any individual activity or from all combined activities. The annual MEI LCF risk represents the calculated risk of an LCF to an individual.

b From Chapter 3, Section 3.2.13, of this PEIS.

c From Chapter 4, Section 4.2.13, of this PEIS.

d Contribution from Plant Vogtle to population (NNSA 2015, Table 4-38) and to MEI (Southern Nuclear 2025, Table 3).

e The same individual would not be the MEI for all activities at SRS and Plant Vogtle; therefore, MEI impacts for SRS and Plant Vogtle have not been summed.

Once the TFF becomes operational, potential worker doses would be minimal and the small amounts of tritium that would be released would not measurably add to doses to members of the offsite public (NNSA 2021b).

The worker and public exposure from ongoing cleanup activities at SRS is included in the reported annual average presented in Section 3.2.13. The contribution from these activities to future worker and public dose estimates would be expected to continue at the same annual average. DOE/NNSA acknowledges that some years would be higher than the annual average. Additionally, as facilities are refurbished or determined to be excess during the 50-year analytical period, there would be an increase in worker exposure due to refurbishment activities or DD&D. However, worker doses would continue to be maintained within the 500-millirem-per-year SRS administrative control level (*see* Section 3.2.13.2).

Health impacts to workers and the offsite public from ongoing operations of H-Canyon are included in the site-wide SRS baseline presented in Section 3.2.13 and Appendix C, Section C.2.13. Recovery of uranium from these operations would not result in a notable change to these ongoing impacts.

5.4.3 Complex-Wide Cumulative Effects

Similar to Section 4.3, the maximum production capacity under the Multi-Site Alternative could result in cumulative impacts that would be outside of the ROIs for LANL and SRS. Based on the screening evaluation in Table 4.3-1, the national impacts would be focused primarily in transportation of radiological materials and waste management (primarily radioactive waste disposal).

5.4.3.1 Transportation

The transportation analysis in Section 4.3.1 presents the potential human health impacts to transportation crews and the public from shipping nuclear materials and waste associated with pit production at LANL and SRS under the Multi-Site Alternative.

The assessment of cumulative impacts includes other nation-wide facilities, and their present and reasonably foreseeable future actions involving radioactive material transport, and focuses on radiological impacts from offsite transportation throughout the U.S. that would result in potential radiation exposure to the general population. This would be in addition to those impacts evaluated for the alternatives in this PEIS. Cumulative radiological impacts from transportation are measured using the collective dose to the general population and workers because dose can be directly related to LCFs using a dose-conversion factor.

Table 5.4.3-1 compiles the potential impacts on transport workers and the general population from future transportation activities considered in this PEIS with the cumulative impacts estimates from past, present, and reasonably foreseeable future DOE actions; past, present, and reasonably foreseeable future non-DOE actions and general radioactive material transport. In many instances, the estimated projections in Table 5.4.3-1 are conservative because the projects may not be implemented as analyzed in the referenced NEPA documents (e.g., the Surplus Plutonium Disposition Program, as described in Section 5.3.2).

Table 5.4.3-1 Potential Cumulative Radiological Transportation Impacts

Action	Crew Dose (person-rem)	Latent Cancer Fatalities	Population Dose (person-rem)	Latent Cancer Fatalities
Past, Present, and Reasonably Foreseeable Future DOE Actions as identified in the SPDP EIS (NNSA 2024b)				
Historical (UNF to SRS) – (1953–1993)	49	0.03	25	0.02
Past, present, and reasonably foreseeable future DOE actions[a]	36,550–37,430	21.9–22.5	38,810–39,890	23.3–23.9
Additional Reasonably Foreseeable Future DOE Actions not included in NNSA (2024b)				
LANL SWEIS (2024–2038)[b]	1,209	0.73	175	0.11
VTR at INL[c]	1,824	1.13	1,674	1.06
Total DOE Actions	**39,632–40,512**	**23.8–24.3**	**40,684–41,764**	**24.4–25.1**
Past, Present, and Reasonably Foreseeable Future Non-DOE Actions				
Enrichment facility in Lea County[d]	1,500	0.90	450	0.27
Eagle Rock enrichment facility[e]	3,350	2.01	60,000	36
GE Global laser enrichment[f]	242	0.15	419	0.25
American Centrifuge plant[g]	285	0.17	390	0.23
General radioactive material transport (1943–2073)[h]	380,000	228	340,000	204
Total Non-DOE Actions	**385,400**	**231**	**401,300**	**241**
SUBTOTALS	**425,500**	**255**	**443,000**	**266**
Pit Production PEIS *Multi-Site Alternative* (to 2077)	3,140	1.88	1,140	0.68
TOTAL IMPACTS (up to 2077)	**428,600**	**257**	**444,100**	**267**

DOE = U.S. Department of Energy; INL = Idaho National Laboratory; LANL = Los Alamos National Laboratory; NNSA = National Nuclear Security Administration; NRC = U.S. Nuclear Regulatory Commission; PEIS = Programmatic Environmental Impact Statement; SPDP EIS = Surplus Plutonium Disposition Program Final Environmental Impact Statement; SRS = Savannah River Site; SWEIS = Site-Wide Environmental Impact Statement; UNF = used nuclear fuel; VTR = Versatile Test Reactor

a Shipments from the SRS Pit Production EIS removed from this total.

b Source: NNSA 2026a.

c Source: DOE 2022b. INL VTR location selected in ROD; assumed max transportation for driver fuel production.

d Source: NRC 2005b. The values presented are for 30 years of operation.

e Source: NRC 2011, Table 4-12.

f Source: NRC 2012, Table 4-14.

g Source: NRC 2006.

h General radioactive material transportation is not related to a particular action; for example, shipments of radiopharmaceuticals to nuclear medicine laboratories and shipments of commercial low-level radioactive waste to commercial disposal facilities (DOE 2015).

5.4.3.2 Waste Management

The analysis in Section 4.3.2 presents the potential combined volumes of radioactive wastes associated with pit production at LANL and SRS under the Multi-Site Alternative. These radioactive wastes would require disposal at an approved disposal facility. Sections 5.4.1.4 and 5.4.2.4 evaluate the cumulative effects of waste management at LANL and SRS, respectively. Therefore, this section focuses on the potential disposal facilities for each radioactive waste type.

Low-Level Radioactive Waste

Per NNSA (2026a), LLW generated at LANL is disposed of at a combination of NNSS and commercial, licensed TSD facilities. Approximately 11 percent of the LLW was sent to NNSS in 2023, 47 percent to WCS in Texas, 32 percent to the Energy*Solutions* facility in Utah, and the remaining 10 percent was sent to commercial TSD facilities in Washington and Florida. As stated in Section 3.2.13, LLW at SRS is typically disposed of on site in E Area.

The 2020 SRS Pit Production EIS evaluated potential cumulative impacts of onsite LLW disposal and acknowledged that the volume of LLW that would be generated from pit production activities, coupled with the long lifespan planned for the SRPPF, would represent an increase above current LLW management planning levels (NNSA 2020b). The existing LLW disposal area (within E Area) would have to be expanded at some point if it were to accommodate the SRPPF LLW. SRS has already identified acreage on the north side of the disposal area for potential expansion, and there may be other locations within SRS that could be developed for LLW disposal given the need and sufficient lead time. However, onsite disposal of SRPPF LLW would be contingent upon the waste meeting the disposal facility's waste acceptance criteria and adherence to the associated performance assessment.

As shown in Table 4.3.2-1, pit production under the Multi-Site Alternative would generate from 7,679 (80 ppy) to 17,027 (205 ppy) cubic meters of LLW annually, more than half of which would be expected to be disposed of on site at SRS. Over the past 3 years, NNSS received an average of about 16,400 cubic meters of LLW per year for disposal (NNSS 2022, 2023, 2024). In a ROD based on the 2013 SWEIS for NNSS (NNSA 2013), NNSA decided to expand waste management capacity at NNSS to 48 million cubic feet (1,359,000 cubic meters) over a 10-year period (79 FR 78423; December 30, 2014). As of 2022, NNSA had disposed of 221,688 cubic meters (16 percent of the planned disposal) (NNSA 2024 SA). The NNSS SWEIS also stated that disposal services are expected to continue at the Area 5 Radioactive Waste Management Complex for as long as the DOE complex requires them (NNSA 2013, Section 4.1.11.1.1.2). Similarly, as shown in Table 4.3.2-1, pit production under the Multi-Site Alternative would generate from 110 (80 ppy) to 277 (205 ppy) cubic meters of MLLW annually.

WCS is licensed to dispose of LLW and MLLW in the WCS Federal Waste Facility by the Texas Commission on Environmental Quality. The current license for the WCS Federal Waste Facility contains a total volume limit of 300,000 cubic yards (~230,000 cubic meters) and total activity limit (total decay corrected radioactivity) of 5,500,000 curies for containerized Class A, Class B, and Class C LLW, collectively. As of December 2024, approximately 97 percent of the current license limit remains available (WCS 2024).

Energy*Solutions* (Clive Disposal Facility) is licensed by the Utah Department of Environmental Quality, to receive Class A LLW and MLLW. The current license contains a volume limit for the mixed waste landfill cell of 1,354,092 cubic yards (over 1 million cubic meters) with no radioactivity limit.

Considering the availability of disposal options for the LLW and MLLW generated from pit production under the Multi-Site Alternative, LLW and MLLW would continue to be managed through a combination of NNSS and commercial LLW and MLLW disposal facilities.

Transuranic Waste

As described in Section 4.3.2, the WIPP facility is the only permanent disposal option for TRU waste, and it currently receives TRU waste from LANL and SRS, as well as other DOE sites. The LWA volume limit for the WIPP facility is 175,564 cubic meters.

The TRU waste inventory estimates from DOE sites that would send TRU waste to WIPP change frequently due to retrieval, treatment, characterization, and shipping activities. Consequently, TRU waste inventory estimates are collected annually from generator/storage sites, and the DOE prepares an ATWIR, which provides updated TRU waste inventory estimates and is used for strategic planning. The DOE Carlsbad Field Office uses the ATWIR to provide input into supporting documents (e.g., WIPP Documented Safety Analysis, NEPA evaluations), performance assessments, and the evaluation of changes associated with the WIPP facility. The latest ATWIR was published in January 2026 and reflects a data cutoff date of December 31, 2024 (DOE 2026a). Per that report, the WIPP facility emplaced about 2,780 cubic meters of TRU waste in 2024. The report also indicates that, based on current projections for TRU waste volumes (some sites [e.g., SRS] reporting projections out to 2083), the total estimated volume is slightly under the LWA limit (175,000 cubic meters). Although there would be increases in waste amounts and shipments to the WIPP facility, adverse impacts to the WIPP facility operational capabilities are not expected.

In the 2025 ATWIR, the current projections of TRU waste from LANL and SRS include more than 42,800 cubic meters through 2083, which includes TRU waste expected from dilute-and-dispose surplus plutonium disposition as well as pit production operations (*see* Section 5.3.2). Per the SPDP EIS (NNSA 2024b), more than 2,000 cubic meters of TRU waste was projected to be disposed of at WIPP (which includes diluted plutonium-oxide and job control waste).

TRU waste volume estimates, such as those provided in NEPA documents, cannot be used to determine compliance with the WIPP LWA total TRU waste disposal volume capacity limit. The TRU waste estimates in the ATWIR change annually. Determining compliance with the WIPP LWA disposal capacity limit is via proven and audited procedures and processes implemented for the WIPP facility by the Carlsbad Field Office. The Carlsbad Field Office monitors and tracks the actual TRU waste volume emplaced at the WIPP facility to ensure compliance with the WIPP LWA and will take action as appropriate in a timely manner to ensure the needs of the DOE Complex are met.

To provide a perspective for potential evolution over the 50-year analytical period, this PEIS considers the following:

- NNSA projects that LANL would generate about 280 cubic meters of TRU waste during the production of 30 ppy. LANL production capacity could surge above 30 ppy for periods; however, that rate cannot be sustained for long periods without down time for maintenance and equipment replacement. If NNSA averages 30 ppy for 50 years, about 14,000 cubic meters of TRU waste could be generated.
- NNSA projects that SRS would generate about 459 cubic meters of TRU waste during production of 50 ppy. This level of operation would not likely begin until about 2034. If the

SRPPF operates continuously for over 40 years at average production rate of 50 ppy, about 19,000 cubic meters of TRU waste could be generated.

- In the future, the realized rates of pit production at each site could vary. NNSA could rely on one site for increased production more than the other. There could also be periods where annual production rates would be higher than the mandated 80 ppy total and other years where production would notably be less than 80 ppy.
- For other waste management activities within the DOE/NNSA Complex, sites have taken advantage of TRU waste compaction or other waste processing technologies to reduce waste volumes prior to shipment to the WIPP facility for disposal. The TRU waste volume estimates provided in this PEIS do not account for potential compaction or other volume reduction. One example facility is the supercompactor at the Advanced Mixed Waste Treatment Project in Idaho. The current RCRA permit for the supercompactor indicates that the average size reduction is about 80 percent (Idaho 2025). If generated waste was compacted to a size reduction of 80 percent, based on volumetric constraints alone, five times as much waste could be disposed of at the WIPP facility. Any future compaction would have to take into account the allowable radionuclide loading concentrations for TRU waste packages and to ensure that the WIPP waste acceptance criteria would still be met prior to shipping compacted waste to the WIPP facility for disposal.

Ultimately, as pit production proceeds, whether at a single or multiple production sites, NNSA and DOE-EM would monitor annual projections for future TRU waste generation related to pit production and complex wide, respectively. DOE/NNSA would take proactive measures to stay within the existing LWA limits established at the current WIPP facility. If, in the future, DOE determined that additional regulatory actions for TRU waste disposal would be required, additional NEPA review would be performed.

6.0 STATUTORY REQUIREMENTS AND ENVIRONMENTAL STANDARDS

Activities at LANL or SRS must be performed in a manner that ensures the protection of public health and safety and the environment through compliance with all applicable federal, state, and local laws, regulations, and other requirements. This chapter identifies the statutory requirements and environmental standards that are applicable to the activities included in the alternatives addressed in this PEIS. These requirements and standards originate from several sources. Federal and state statutes define broad environmental and safety programs and provide authorization to agencies to carry out the mandated programs. More specific requirements are established through regulations at both the federal and state level. Federal agencies, such as DOE/NNSA, receive additional direction in complying with executive policy through Executive Orders. In addition, DOE/NNSA has established regulations and management directives (DOE Orders) that are applicable to DOE/NNSA activities, facilities, and contractors. Regulations often include requirements for permits and consultations, which provide an in-depth, facility-specific review of the activities proposed. Statutes, regulations, Executive Orders, and DOE Orders are discussed in Section 6.1. Other regulatory activities and environmental permits are discussed in Sections 6.2 and 6.3, respectively.

6.1 Statutes, Regulations, Executive Orders, and DOE Orders

Multiple federal agencies regulate specific aspects of activities that would be conducted at LANL or SRS. The EPA regulates air emissions, hazardous waste management, water quality, and emergency management. In many cases, the EPA delegates all or part of its environmental protection authorities to states, including New Mexico and South Carolina, but retains oversight authority. For example, air emissions in New Mexico are regulated by NMED and those in South Carolina by SCDES.

DOE/NNSA imposes its own standards on many aspects of activities that would be conducted at the pit production facilities through regulations, orders, and contract requirements related to facility design and operations, radioactive waste management, and health and safety, including radiation protection. USDOT regulates commercial transportation of hazardous and radioactive materials.

Table 6.1-1 provides a listing of environmental laws, regulations, and other requirements, including, but not limited to, those that are potentially applicable to activities associated with pit production.

Table 6.1-1 Major Federal and State Environmental Laws, Regulations, Orders, and Guidance

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
General			
Atomic Energy Act of 1954, as amended	42 U.S.C. § 2011 et seq.	DOE	Requires NNSA to follow its own standards and procedures to ensure the safe operation of its facilities. The Act assigns responsibility to DOE for providing nuclear weapons to support U.S. national security strategy.
NEPA	42 U.S.C. §§ 4321–4336(e)	CEQ	Establishes requirements for environmental documents. Statutory requirements for preparation of EISs and EAs apply to all major federal actions that could significantly affect the environment. NNSA shall comply with NEPA implementing procedures in accordance with 10 CFR Part 1021.
DOE NEPA Regulations	10 CFR Part 1021 (July 3, 2025; 90 FR 29676)	DOE	Formalizes DOE’s policy to follow NEPA and apply the NEPA review process early in the planning stages for DOE proposals. DOE has published NEPA Implementing Procedures (DOE 2025a) that provide supplemental guidance to 10 CFR Part 1021.
DOE NEPA Implementing Procedures	DOE 2025a	DOE	DOE NEPA implementing procedures prior to June 30, 2025, were contained within 10 CFR Part 1021. After that date. Procedures were published in DOE (2025a), which are designed to inform agency decision makers during the decision making process. These procedures comply with the requirements of NEPA (42 U.S.C. §§ 4321–4336(e)).
EO 11514, “Protection and Enhancement of Environmental Quality”	35 FR 4247 (March 5, 1970)	CEQ	Requires federal agencies to demonstrate leadership in achieving the environmental quality goals of NEPA; provides for DOE consultation with appropriate federal, state, and local agencies in carrying out their activities as they affect the environment.
EO 13045, “Protection of Children from Environmental Health Risks and Safety Risks”	62 FR 19885 (April 23, 1997)	EPA	Requires each federal agency to identify and assess any environmental health risks and safety risks that may disproportionately affect children and ensure that its policies, programs, activities, and standards address these disproportionate risks.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
Ecology			
Fish and Wildlife Coordination Act	16 U.S.C. § 661 et seq.	USFWS	Requires consultation on the possible effects on wildlife if there is construction, modification, or control of bodies of water in excess of 10 acres in surface area.
Protection of Bald and Golden Eagles	16 U.S.C. § 668 et seq.	USFWS	Requires consultations to determine if any protected birds are found to inhabit the area. If so, DOE must obtain a permit prior to moving any nests due to mission requirements.
Migratory Bird Treaty	16 U.S.C. § 703 et seq.	USFWS	Requires consultation to determine if there are any impacts on migratory bird populations due to mission requirements. If so, DOE will develop mitigation measures to avoid adverse effects.
Endangered Species	16 U.S.C. § 1531 et seq.	USFWS	Requires consultation to identify endangered or threatened species and their habitats, assess DOE impacts thereon, obtain necessary biological opinions, and, if necessary, develop mitigation measures to reduce or eliminate adverse effects of construction or operation.
EO 13112, "Invasive Species, as amended by EO 13751"	81 FR 88609 (Dec. 5, 2016) amending 64 FR 6183 (February 3, 1999)	Department of Interior, National Invasive Species Council	Establishes the National Invasive Species Council. It requires federal agencies to act to prevent the introduction of invasive species and provide for their control; to implement restoration with native species; and to minimize actions that could spread invasive species. EO 13751 amended EO 13112 and included an updated definition of invasive species, which is "a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health."
EO 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds"	77 FR 60381 (October 3, 2012)	USFWS	Requires federal agencies to avoid or minimize the adverse impact of their actions on migratory birds and to assure that environmental analyses under NEPA evaluate the effects of proposed federal actions on such species. A Memorandum of Understanding between DOE and USFWS implements the Executive Order, targeting the conservation and management of migratory birds and their habitats.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
Air Quality and Noise			
Clean Air Act	42 U.S.C. § 7401 et seq.	EPA (NMED, SCDES)	Protects and enhances the Nation's air quality. Requires federal agencies to comply with air quality regulations. NMED is the state agency charged with coordinating efforts to attain and maintain ambient air quality standards in New Mexico. The NMED Air Quality Bureau has authority over air quality in all areas of New Mexico except in Bernalillo County and on tribal lands. SCDES is the state agency charged with coordinating efforts to attain and maintain ambient air quality standards in South Carolina. The SCDES Bureau of Air Quality has authority over air quality in the state.
National Ambient Air Quality Standards	40 CFR Part 50	EPA	Requires EPA to set NAAQS for pollutants considered harmful to public health and the environment. The *Clean Air Act* establishes two types of Standards. Primary standards set limits to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.
National Emission Standards for Hazardous Air Pollutants	40 CFR Part 61	EPA	Regulates emissions of hazardous air pollutants, including radionuclides and asbestos that could be released during operation, demolition, or renovation of DOE facilities.
Noise Control Act	42 U.S.C. § 4901 et seq.	EPA	Protects the health and safety of the public from excessive noise levels. Requires federal agencies to comply with federal, state, and local noise abatement requirements.
Water			
Clean Water Act	33 U.S.C. § 1251 et seq.	EPA	Requires EPA- or state-issued permits and compliance with provisions of permits regarding discharge of effluents to surface waters.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
Safety of Public Water Systems	42 U.S.C. § 300f	EPA	Sets national standards for contaminant levels in public drinking water systems, regulates the use of underground injection wells, and prescribes standards for groundwater aquifers that are a sole source of drinking water. The Act applies to federal facilities that own or operate a public water system. A public water system is defined as a system for the provision of piped water for human consumption that has at least 15 service connections or regularly serves at least 25 individuals. The Laboratory provides drinking water to its employees and is required to monitor drinking water quality for organic and inorganic compounds, radionuclides, metals, turbidity, and total coliform bacteria.
NPDES Stormwater Permit	33 U.S.C. § 1342	NMED, SCDES	Requires operators of construction sites, industrial facilities, and municipal separate storm sewer systems to obtain authorization to discharge stormwater under an appropriate NPDES permit for construction, industrial, or municipal operations. Federal facilities have been defined by regulation to be a municipal separate storm sewer system. NPDES permitting is implemented by NMED in New Mexico and the SCDES Bureau of Water in South Carolina.
Dredged or Fill Material (Section 404 of the *Clean Water Act*)/*Rivers and Harbors Appropriations Act of 1899*	33 U.S.C. § 1344 33 U.S.C. § 401 et seq.	USACE	Requires permits to authorize the discharge of dredged or fill material into navigable waters or wetlands and to authorize certain structures or work in or affecting navigable waters.
Floodplain Management	EO 11988 10 CFR Part 1022	DOE	Addresses concerns over the potential loss of the natural and beneficial functions of the Nation's floodplains as well as the increased cost to federal, state, and local governments from flooding disasters that are worsened by unwise development of the floodplain.
Protection of Wetlands	EO 11990 10 CFR Part 1022	DOE	Requires federal agencies to avoid any short- or long-term adverse impacts on wetlands wherever there is a practicable alternative. Each agency must also provide opportunities for early public review of any plans or proposals for new construction in wetlands.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
Cultural and Paleontological			
National Historic Preservation Act of 1966	54 U.S.C. § 300101 et seq. 36 CFR Part 800	ACHP	Protects historic properties. Section 106 of this Act requires consultation with the State Historic Preservation Officer and other consulting parties prior to any federal funding, permit, or action that could affect properties eligible for listing on the National Register of Historic Properties. Additional provisions of the Act provide direction to federal agencies on the protection and management of cultural resources located on federally managed lands.
National Register of Historic Places	54 U.S.C. § 302101 et seq. 36 CFR Part 60	NPS	Sets forth the procedural requirements for listing properties on the National Register of Historic Places.
American Indian Religious Freedom Act of 1978	42 U.S.C. § 1996	Office of the President	Reaffirms American Indian religious freedom under the First Amendment and sets U.S. policy to protect and preserve the inherent and constitutional right of American Indians to believe, express, and exercise their traditional religions. The Act requires that federal actions avoid interfering with access to sacred locations and traditional resources that are integral to the practice of religions.
Native American Graves Protection and Repatriation Act of 1990	25 U.S.C. § 3001 et seq. 43 CFR Part 10	NPS	Protects American Indian burial remains, funerary objects, sacred objects, and objects of cultural patrimony (cultural items) found on federal or tribal land.
Archaeological Resources Protection Act of 1979	16 U.S.C. §§ 470aa–mm 32 CFR Part 229	Federal agencies	Makes it a federal offense to excavate, remove, damage, alter, or otherwise deface archaeological resources on federal lands without authorization. Permits allowing for professional archaeological excavations can be granted by the land-managing agency.
EO 13007 "Indian Sacred Sites"	61 FR 26771 (May 29, 1996)	Office of the President	Directs federal agencies, to the extent practicable, as permitted by law, and not clearly inconsistent with essential agency functions, to: (1) accommodate access to and ceremonial use of American Indian sacred sites by their religious practitioners, and (2) avoid adversely affecting the physical integrity of such sacred sites. Where appropriate, agencies are to maintain the confidentiality of sacred sites.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
EO 11593	36 FR 8921 (May 15, 1971)	Office of the President	Directs federal agencies to administer cultural properties under their control in a spirit of stewardship and to direct their policies, plans, and programs such that cultural resources are preserved and maintained.
Antiquities Act of 1906	16 U.S.C. §§ 431–433	Federal agencies	Establishes a penalty for the unlawful appropriation, excavation, or injury to any "historic or prehistoric ruin or monument, or any object of antiquity" that is situated on federal lands or federally controlled lands. Paleontological resources that have significant research potential are protected under this law.
DOE O 144.1A - DOE Requirements for Consultation and Engagement with Federally Recognized Indian Tribes and Alaska Native Claims Settlement Act Corporations	O144.1A	DOE	Communicates Departmental, Headquarters program, field site, laboratory, and contractor responsibilities and requirements for consultation and engagement with federally recognized Indian Tribes that arise from DOE Policy on Consultation and Engagement with Federally Recognized Indian Tribes and Alaska Native Claims Settlement Act Corporations (DOE Policy 144.1; Tribal Consultation Policy). This Order expands and clarifies Departmental policy on consultation with Indian Tribes and Alaska Native Claims Settlement Act Corporations and acknowledges the provisions for conducting consultation in compliance with applicable statutes.
Worker Health and Safety			
Occupational Safety and Health Act of 1970	29 U.S.C. § 651 et seq.	OSHA	Ensures worker and workplace safety, including a workplace free from recognized hazards, such as exposure to toxic chemicals, excessive noise levels, and mechanical dangers.
Occupational Safety and Health Standards	29 CFR Part 1910 29 CFR Part 1926	OSHA	Protects workers from hazards encountered in the workplace (Part 1910) and at the construction site (Part 1926).
Worker Safety and Health Program	10 CFR Part 851	DOE	Defines controls and monitoring of hazardous materials to ensure that workers are not being exposed to health hazards, such as toxic chemicals, excessive noise, and ergonomic stressors.
Chronic Beryllium Disease Prevention Program	10 CFR Part 850	DOE	Aims to reduce the number of workers currently exposed to beryllium in the course of their work at DOE facilities managed by DOE or its contractors, minimize the levels of, and potential for, exposure to beryllium, and establish medical surveillance requirements to ensure early detection of the disease.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
Chemical Accident Prevention Provisions	40 CFR Part 68	EPA	Provides the list of regulated substances and thresholds and the requirements for owners or operators of stationary sources concerning the prevention of accidental releases.
Occupational Radiation Protection	10 CFR Part 835	DOE	Defines radiation protection standards, limits, and program requirements for protecting workers from ionizing radiation resulting from DOE activities.
Traffic and Transportation			
Hazardous Materials Transportation Act	49 U.S.C. § 5101 et seq.	USDOT	Provides the USDOT with authority to protect against the risks associated with transportation of hazardous materials, including radioactive materials, in commerce.
Packaging and Transportation of Radioactive Material	10 CFR Part 71	NRC	Provides detailed requirements for packaging design and package certification testing. Complete documentation of design and safety analysis and the results of required certification tests are submitted to NRC to certify the package for use.
Hazardous Materials Regulations	49 CFR Parts 171–185, 385, 397	USDOT	Establishes USDOT requirements for classification, packaging, hazard communication, incident reporting, handling, and transportation of hazardous materials; hazardous materials safety permits; and driving and parking rules.
Hazardous Waste and Materials Management			
Toxic Substances Control Act	15 U.S.C. § 2601 et seq.	EPA	Addresses the production, import, use, and disposal of specific chemicals, including PCBs. The Laboratory is responsible for recordkeeping and reporting the import or export of small quantities of chemicals used for LANL research activities and the disposal of PCB-containing substances. PCB-containing substances include: (1) dielectric fluids, (2) solvents, (3) oils, (4) waste oils, (5) heat-transfer fluids, (6) hydraulic fluids, (7) slurries, (8) soil, and (9) materials contaminated by spills.
Emergency Planning and Community Right-To-Know Act of 1986	42 U.S.C. § 11001 et seq.	EPA	Requires the development of emergency response plans and reporting requirements for chemical spills and other emergency releases and imposes right-to-know reporting requirements covering storage and use of chemicals that are reported in toxic chemical release forms.
Federal Facility Compliance Act of 1992	42 U.S.C. § 6961	NMED, SCDES	Requires federal facilities that generate or store mixed radioactive and hazardous wastes to submit a site treatment plan that includes a schedule for developing capacities and technologies to treat all mixed waste.

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
RCRA/Hazardous and Solid Waste Amendments of 1984	42 U.S.C. § 6901 et seq./ P.L. 98-616	EPA, NMED, and SCDES	RCRA regulates wastes from generation to disposal. Hazardous wastes include all solid wastes that are (1) listed as hazardous by the EPA (listed wastes); (2) ignitable, corrosive, reactive, or toxic (characteristic wastes); or (3) batteries, pesticides, lamp bulbs, or contain mercury. Mixed radioactive waste (also called mixed waste) is listed as hazardous, and characteristic hazardous waste is commingled with radioactive waste. Under RCRA, facilities that treat, store, or dispose of hazardous wastes, including mixed radioactive wastes, must obtain a permit from their regulatory authority.
Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level, and Transuranic Radioactive Wastes	40 CFR Part 191	DOE	Indicates the standard for radiation doses received by members of the public from the management (except for transportation) and storage of UNF, HLW, and TRU waste.
Low-Level Radioactive Waste Policy Act of 1980	42 U.S.C. § 2021 et seq.	DOE	Specifies that the Federal Government is responsible for the disposal of certain LLW, including LLW owned or generated by DOE.
Licensing Requirements for Land Disposal of Radioactive Waste	10 CFR Part 61	NRC	Establishes the procedures, criteria, terms, and conditions upon which NRC issues licenses for land disposal of LLW containing byproduct, source, and special nuclear material. These regulations do not apply to HLW or DOE-managed LLW, but do apply to LLW managed in commercial facilities, regardless of the generator. The regulations also apply to LLW, such as MLLW, that is also regulated under other statutory authorities.
Radioactive Waste Management	DOE Order 435.1	DOE	Aims to ensure that all DOE/NNSA radioactive waste is managed in a manner that is protective of worker and public health and safety and the environment. The Order is implemented through DOE Manual 435.1, “Radioactive Waste Management Manual,” which addresses the management of DOE HLW, TRU waste, LLW, and the radioactive component of MLLW. The purpose of the manual is to catalog those procedural requirements and existing practices that ensure that

Statutes, Regulation, Orders, or Guidance	Citation	Responsible Agency	DOE/NNSA Responsibilities
			DOE elements and contractors continue to manage DOE's radioactive waste to the requirements in the Order.
Byproduct Material	10 CFR Part 962	DOE	Applies only to radioactive waste substances owned or produced by DOE at facilities owned or operated by or for DOE under the *Atomic Energy Act of 1954*. This part does not apply to substances that are not owned or produced by DOE.
WIPP Land Withdrawal Act, as amended	P.L. 102-579	DOE	Withdrew land from the public domain for the purpose of creating and operating the WIPP facility in New Mexico as the national disposal site for defense TRU waste. The Act also defined the characteristics and amount of waste that will be disposed of at the facility. Amendments to the Act exempt waste to be disposed of at WIPP from the RCRA land disposal restrictions.

ACHP = Advisory Council on Historic Preservation; CEQ = Council on Environmental Quality; CFR = Code of Federal Regulations; et seq. = and what follows; DOE = U.S. Department of Energy; EA = Environmental Assessment; EIS = Environmental Impact Statement; EO = Executive Order; EPA = U.S. Environmental Protection Agency; FR = Federal Register; LLW = low-level radioactive waste; MLLW = mixed LLW; NA = not applicable; NEPA = National Environmental Policy Act; NMED = New Mexico Environment Department; HLW = high-level radioactive waste; NNSA = National Nuclear Security Administration; NPDES = National Pollutant Discharge Elimination System; NAAQS = National Ambient Air Quality Standards; NPS = National Park Service; NRC = U.S. Nuclear Regulatory Commission; OSHA = Occupational Safety and Health Administration; PCBs = polychlorinated biphenyls; P.L. = Public Law; RCRA = Resource Conservation and Recovery Act; SCDES = South Carolina Department of Environmental Services; TRU = transuranic; UNF = used nuclear fuel; U.S. = United States; U.S.C. = United States Code; USACE = U.S. Army Corps of Engineers; USDOT = U.S. Department of Transportation; USFWS = U.S. Fish and Wildlife Service; WIPP = Waste Isolation Pilot Plant

6.2 Regulatory Activities

Activities associated with implementation of the alternatives would be conducted in accordance with a variety of applicable regulations, orders, and guidance. Below is a brief discussion of the regulations and DOE Orders that would apply to pit production activities at LANL and/or SRS.

With respect to design requirements, the major DOE design criteria are found in DOE Order 6430.1A (1989), "General Design Criteria," and its successive Orders 420.1C, Change 3 (2019), "Facility Safety," and 430.1C, "Real Property Asset Management," which delineate applicable regulatory and industrial codes and standards for both conventional facilities designed to industrial standards and "special facilities," defined as nonreactor nuclear facilities and explosive facilities. Nuclear facilities would also comply with all the requirements of 10 CFR Part 830, "Nuclear Safety Management." 10 CFR Part 830 provides both quality assurance and safety requirements for the design and operations of the facilities, as documented in the required facility safety analysis. Prior to operation, the facilities would undergo cold and hot startup testing and an operational readiness review in accordance with the requirements of DOE Order 425.1D, Change 2 (2019), "Verification of Readiness to Start Up or Restart Nuclear Facilities." Prior to startup, NNSA would prepare a safety evaluation report to evaluate the proposed safety basis and controls for the new facilities and would obtain approval of the NNSA Administrator or designee prior to startup.

Nuclear facilities must comply with 10 CFR Part 820, "Procedural Rules for DOE Nuclear Facilities," and other applicable regulations and standards related to worker and public health and safety and environmental protection, including radiation protection standards (10 CFR Part 835, "Occupational Radiation Protection," and 10 CFR Part 851, "Worker Safety and Health Program"). Occupational Safety and Health Administration regulations governing industrial safety aspects of chemical risks to workers would apply. Also, radiological exposure levels to members of the public would apply, as regulated under DOE O 458.1, "Radiation Protection of the Public and the Environment," 40 CFR Part 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities," for radionuclide emissions to air. The protection of the environment from chemical risks is regulated by EPA and NMED or SCDES at the state level.

Federal or state regulations implementing the CAA and *Clean Water Act* also would be applicable. In addition, DOE requirements affecting site interfaces and infrastructure would also be applicable. These regulations are implemented through permits, mainly through NMED and SCDES. Prior to any new facility operations, an evaluation would be required to determine whether emissions and activities require modification of existing permits and the acquisition of additional air and water permits.

Radioactive wastes are managed in accordance with DOE Order 435.1 and Manual 435.1-1. TRU waste would be generated routinely as a result of operations and internal reconfiguration of PF-4 at LANL, but would be regularly shipped off site to WIPP for disposal. Before any TRU waste could be sent to WIPP for disposal, DOE/NNSA would prepare or modify waste certification plans, quality assurance plans, and TRU waste authorized methods for payload control, as applicable. Methods of compliance with each requirement and associated criteria to be implemented at LANL and/or SRS shall be described or specifically referenced and shall include procedural and administrative controls consistent with the Carlsbad Field Office *Quality Assurance Program Document* (DOE 2017b). DOE/NNSA would be required to submit these program documents to the Carlsbad Field Office for review and approval prior to their implementation (DOE 2017b). DOE/NNSA would then certify that each container of TRU waste intended for transport to WIPP meets the most current waste acceptance criteria (DOE 2016c).

Pit production operations (and PF-4 refurbishment at LANL) would produce solid LLW. Offsite disposal of LLW at NNSS (or a commercial facility such as WCS or Energy*Solutions*) would be contingent upon waste meeting the disposal facility's waste acceptance criteria and adherence to the associated performance assessment. These requirements also apply to onsite disposal of LLW at SRS. The disposal facility's performance assessment sets limits based on the type and amount of radionuclides and still meet the worker and public health and safety performance standards and other applicable regulatory criteria for the disposal facility.

6.3 Permits and Compliance Orders

The various pit production activities at either site require a variety of permits or are performed in accordance with compliance orders. Many of these activities would be conducted within existing structures in developed areas of LANL or SRS, would use existing infrastructure, and would operate under existing permits. There could be a need for new permits or modifications to existing permits, particularly if pit production were to be implemented at SRS. Prior to implementation, required environmental permits would be obtained in accordance with federal, state, and local requirements. Table 6.3-1 provides a summary of active permits and compliance orders (relevant to pit production activities at LANL) as of 2023. For current information on active permits for both sites, refer to https://www.energy.gov/ehss/annual-site-environmental-reports-aser-links.

The following is a brief discussion of some permits expected to be evaluated for modification or generation of a new permit at SRS. Hazardous waste management activities at SRS are regulated under RCRA Part A/Part B permits. In the case of TRU waste being shipped to the WIPP facility for disposal, the waste would need to meet the waste acceptance criteria, waste analysis plan, and WIPP permit requirements. SRS also complies with over 400 environmental permits covering air quality, water quality and wetlands, hazardous waste, sanitary waste, and underground storage tanks. The Savannah River Site Environmental Report for 2023 contains a compilation of permits for the site (SRNS 2024). Drinking water at SRS is regulated by SCDES under the State and Federal Safe Drinking Water Acts (SC Code § 44-55-10 et seq., and 42 U.S.C. § 300f et seq.). Permits for domestic water supplies cover 17 separate systems across SRS; new permits would be required for tie-ins to the existing domestic water supplies for modifications or new construction that may be required for the SRPPF. Wastewater discharges at SRS are regulated by four permits under the NPDES Program, a *Clean Water Act* program administered by SCDES under authority delegated by EPA. Wastewaters (i.e., stormwater, sanitary wastewaters, cooling water, and production effluents) from existing facilities are covered under permits already in place. During construction of the proposed SRPPF complex, stormwater would be managed under the SRS general stormwater permit. A Notice of Intent and stormwater pollution prevention plan would address facility-specific stormwater measures. Sanitary and industrial wastewater treatment and disposal are regulated under several permits for facilities across SRS. For sanitary wastewaters, the facilities and associated buildings would tie into existing SRS systems; permits could be required for both the construction and operations phases for these tie-ins. Air emissions from SRS facilities, including both radioactive and nonradioactive criteria and toxic air pollutant emissions, are regulated under the SRS air quality operating permit (SCDHEC 2021), issued under CAA Title V, and administered by SCDES. Changes resulting from SRPPF activities could necessitate modifications to the Title V permit. Permit revisions would be made as required as the project proceeds to construction and then to operations.

Table 6.3-1 Active Permits and Compliance Orders at LANL, 2023

Permit Name	Activity	Issuing and Revision Dates	Expiration Date	Lead Agency
LANL Hazardous Waste Facility Permit	A permit regulating management of hazardous wastes at the Laboratory, including storage and treatment. This permit also has standards for closure of indoor and outdoor areas used for hazardous waste storage or treatment.	Renewed November 2010	December 2020 (Administratively continued until new permit is effective)	NMED
Federal Facilities Compliance Order [for Mixed Wastes]	An order requiring the Laboratory to submit an annual update to its Site Treatment Plan for treating all mixed hazardous and radiological wastes (mixed waste).	• Issued October 4, 1995 • Amended May 20, 1997	None	NMED
Clean Air Act, Title V Operating Permit	A permit regulating air emissions from Laboratory operations (i.e., emissions from the power plant, asphalt batch plant, permanent generators). These emissions are subject to operating, monitoring, and recordkeeping requirements.	• Issued August 7, 2009 • Reissued October 17, 2018	February 27, 2020 (administratively continued until new permit is effective)	NMED
NPDES General Permit for Discharges of Storm Water from Construction Sites	A general permit (not LANL-specific) authorizing the discharge of pollutants during construction activities under specific conditions. Conditions include water quality requirements, inspection requirements, erosion and sediment controls, notices of intent to discharge, preparation of stormwater pollution prevention plans, and other conditions.	Effective February 16, 2022	February 16, 2027	EPA

Permit Name	Activity	Issuing and Revision Dates	Expiration Date	Lead Agency
NPDES Multi-Sector General Permit for Storm Water Discharges Associated with Industrial Activity	A general permit (not LANL-specific) authorizing facilities with some industrial activities to discharge stormwater and some non-storm-water runoff. The permit provides specific conditions for the authorization, including pollutant limits to meet water quality standards, inspection requirements, compliance with biological and cultural resource protection laws, and other conditions.	The 2021 Multi-Sector General Permit was issued on February 19, 2021 (86 FR 10269) and became effective on March 1, 2021	February 28, 2026	EPA
Groundwater Discharge Permit DP-1132	A permit authorizing discharges to groundwater from the Laboratory's Radioactive Liquid Waste Treatment Facility to three discharge locations: NPDES Outfall 051, mechanical evaporator system, or solar evaporative tank system.	May 5, 2022	May 4, 2027	NMED
Groundwater Discharge Permit DP-857	A permit that authorizes discharges to groundwater from the Sanitary Wastewater System plant, the Sanitary Effluent Reclamation Facility, and use of the Sigma Mesa Evaporation Basins.	Renewed September 25, 2024	September 1, 2029	NMED

EPA = U.S. Environmental Protection Agency; FR = Federal Register; LANL = Los Alamos National Laboratory; NMED = New Mexico Environment Department; NPDES = National Pollutant Discharge Elimination System

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