

CHAPTER 1
INTRODUCTION AND PURPOSE AND NEED

1.0 INTRODUCTION AND PURPOSE AND NEED¹

Chapter 1 of this *Final Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)* (DOE/EIS-0283-S2) describes the purpose and need for agency action, introduces the proposed action and alternatives, and summarizes the scoping process for this document. This chapter also describes the amounts of surplus plutonium addressed and the decisions that could be made following completion of this *SPD Supplemental EIS*.

1.1 Introduction

In keeping with U.S. nonproliferation policies and agreements with the Russian Federation to reduce the availability of material that is readily usable in nuclear weapons, the U.S. Department of Energy (DOE), including the semiautonomous National Nuclear Security Administration (NNSA), is engaged in a program to disposition U.S. surplus weapons-usable plutonium (referred to in this supplemental environmental impact statement as “surplus plutonium”). Surplus plutonium includes pit² and non-pit³ plutonium that is no longer needed for U.S. national security or programmatic purposes. The Agreement Between the Government of the United States of America and the Government of the Russian Federation Concerning the Management and Disposition of Plutonium Designated As No Longer Required for Defense Purposes and Related Cooperation (referred to as the “PMDA”) was first signed in 2000, and entered into force in 2011. The United States and the Russian Federation have agreed to each dispose of at least 34 metric tons (37.5 tons) of excess weapons-grade plutonium as fuel in nuclear reactors to produce electricity, or by any other method as may be agreed to by the Parties in writing. It is important that DOE move forward with the Plutonium Disposition Program to meet the U.S. obligations under the PMDA and *The Treaty on the Non-Proliferation of Nuclear Weapons (Nonproliferation Treaty)*, to demonstrate progress to the Russian government, to meet U.S. legislative requirements, and to reduce the quantity of surplus plutonium and the concomitant cost of secure storage. DOE has previously analyzed and made decisions on disposition paths for most of the plutonium the United States has declared surplus (see Section 1.5).

Weapons-usable plutonium is plutonium in forms that can be readily converted for use in nuclear weapons. Weapons-grade plutonium, as well as some forms of fuel-grade, and power-reactor-grade plutonium can be considered weapons-usable plutonium.

Surplus plutonium has no identified programmatic use and does not fall into one of the categories of national security reserves.

On March 28, 2007, DOE published a Notice of Intent (NOI) in the *Federal Register* (FR) (72 FR 14543) to prepare this *Surplus Plutonium Disposition Supplemental Environmental Impact Statement (SPD Supplemental EIS)*⁴ to evaluate the potential environmental impacts at the Savannah River Site (SRS) of alternative disposition pathways for surplus plutonium originally planned for immobilization in the Record of Decision (ROD) (65 FR 1608) for the *Surplus Plutonium Disposition Environmental Impact Statement (SPD EIS)* (DOE 1999b). The proposed actions and alternatives included construction and operation of a new vitrification capability in K-Area, processing in H-Canyon/HB-Line and the

¹ Vertical change bars in the margins of this Final SPD Supplemental EIS indicate revisions and new information added since the Draft SPD Supplemental EIS was issued in July 2012. Editorial changes are not marked.

² The plutonium was made by the United States in nuclear reactors for use in nuclear weapons. A pit is the central core of a primary assembly in a nuclear weapon and is typically composed of plutonium metal (mostly plutonium-239), enriched uranium, or both, and other materials. Most surplus pits are currently stored at the Pantex Plant (Pantex) near Amarillo, Texas.

³ Non-pit plutonium may exist in metal or oxide form, and may be combined with other materials that were used in the process of manufacturing plutonium for use in nuclear weapons or related research and development activities. Most surplus non-pit plutonium is currently stored at SRS near Aiken, South Carolina.

⁴ In the NOI (72 FR 14543), the title was given as the “Supplemental Environmental Impact Statement for Surplus Plutonium Disposition at the Savannah River Site.”

Defense Waste Processing Facility (DWPF), and fabricating mixed oxide (MOX) fuel in the Mixed Oxide Fuel Fabrication Facility (MFFF) currently under construction in F-Area at SRS.

On July 19, 2010, DOE issued an amended NOI (75 FR 41850) announcing its intent to modify the scope of this *SPD Supplemental EIS* and to conduct additional public scoping. Under the revised scope, DOE would refine the quantity and types of surplus plutonium, evaluate additional alternatives, and no longer consider in detail one of the alternatives identified in the 2007 NOI (i.e., ceramic can-in-canister immobilization). In addition, DOE had identified in the 2007 NOI a glass can-in-canister immobilization approach as its Preferred Alternative for the non-pit plutonium then under consideration; the 2010 amended NOI explained that DOE would evaluate a glass can-in-canister immobilization alternative in this *SPD Supplemental EIS*, but that DOE did not have a preferred alternative.

On January 12, 2012, DOE issued a second amended NOI (77 FR 1920) announcing its intent to further modify the scope of this *SPD Supplemental EIS* to evaluate additional options for pit disassembly and conversion of plutonium metal to oxide, including potential use of the Plutonium Facility (PF-4) at the Los Alamos National Laboratory (LANL), and to conduct additional public scoping. In addition, DOE identified the MOX Fuel Alternative as DOE's Preferred Alternative.

This *SPD Supplemental EIS* updates the previous DOE National Environmental Policy Act (NEPA) analyses (described in Appendix A, Section A.1) to consider options for pit disassembly and conversion of plutonium metal to oxide. It also analyzes the use of fuel fabricated from surplus plutonium in Tennessee Valley Authority (TVA) reactors and other domestic commercial nuclear power reactors⁵ to generate electricity. This *SPD Supplemental EIS* also evaluates alternatives for the disposition of 13.1 metric tons (14.4 tons) of surplus plutonium for which a disposition path is not assigned.

1.2 Purpose of and Need for Agency Action

DOE's purpose and need for action remains, as stated in the *SPD EIS* (DOE 1999b:1-3), to reduce the threat of nuclear weapons proliferation worldwide by conducting disposition of surplus plutonium in the United States in an environmentally safe and timely manner, ensuring that it can never again be readily used in nuclear weapons.

TVA is a cooperating agency on this *SPD Supplemental EIS* because it is considering the use of MOX fuel, produced as part of DOE's Surplus Plutonium Disposition Program, in its nuclear power reactors. TVA provides electrical power to the people of the Tennessee Valley region, including almost all of Tennessee and parts of Alabama, Mississippi, Kentucky, Virginia, North Carolina, and Georgia. TVA's Sequoyah and Browns Ferry Nuclear Plants, located near Soddy-Daisy, Tennessee and Athens, Alabama, respectively, currently are, and will continue to be, major assets among TVA's energy generation resources in meeting the demand for power in the region. Consistent with DOE's purpose and need, TVA's purpose for considering use of MOX fuel derived from DOE's Surplus Plutonium Disposition Program is the possible procurement of MOX fuel for use in these reactors.

Cooperating Agency

A cooperating agency participates in the preparation of an environmental impact statement because of its jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) (40 *Code of Federal Regulations* [CFR] 1501.6, 1508.5).

⁵ Other domestic commercial nuclear power reactors are evaluated in this *SPD Supplemental EIS* by way of analyzing a "generic reactor" reflecting characteristics of such reactors.

1.3 Proposed Action

DOE proposes to disposition 13.1 metric tons (14.4 tons) of surplus plutonium for which a disposition path is not assigned; to provide the appropriate capability to disassemble surplus pits and convert surplus plutonium to a form suitable for disposition; and to provide for the use of MOX fuel in TVA's and other domestic commercial nuclear power reactors.

Figure 1–1 shows the major Surplus Plutonium Disposition Program activities. Facilities that could be used to support plutonium disposition activities are located at, or would be constructed at: E-, F-, H-, K-, and S-Areas at SRS in South Carolina; at Technical Area 55 (TA-55) at LANL in New Mexico; at the Waste Isolation Pilot Plant (WIPP) in New Mexico; and at the Browns Ferry and Sequoyah Nuclear Plants and other domestic commercial nuclear power reactors that could irradiate MOX fuel. **Figures 1–2** and **1–3** show the locations of SRS and LANL and the applicable operations areas at these sites. **Figures 1–4, 1–5, and 1–6** show the locations of WIPP, the Browns Ferry Nuclear Plant, and the Sequoyah Nuclear Plant, respectively.

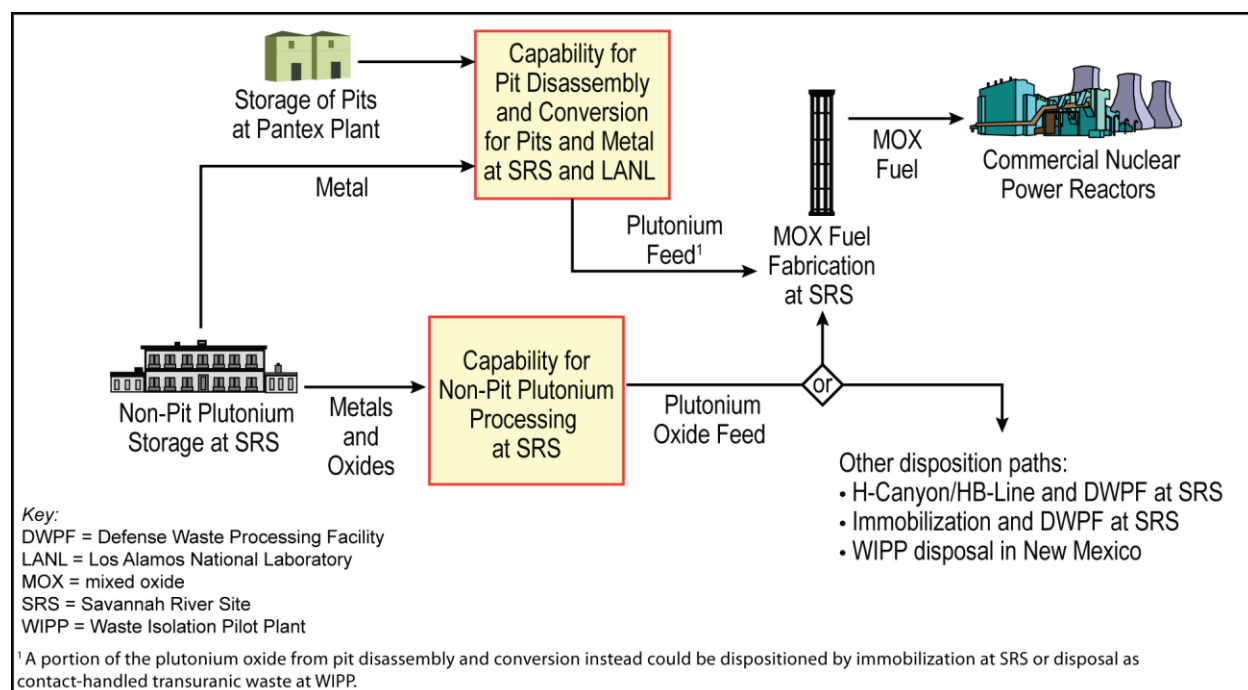


Figure 1–1 Surplus Plutonium Disposition Program Activities

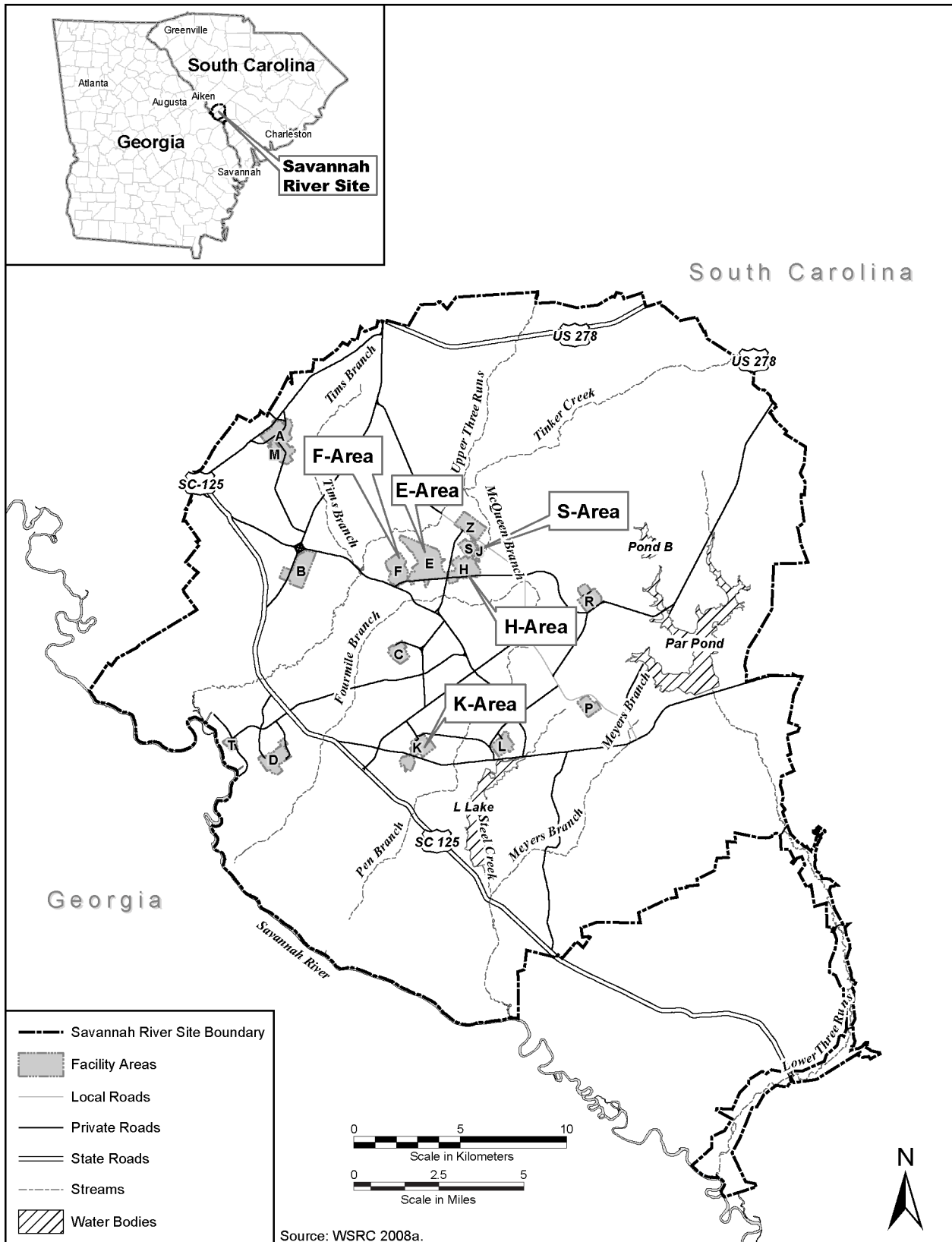


Figure 1-2 Savannah River Site Location and Operations Areas

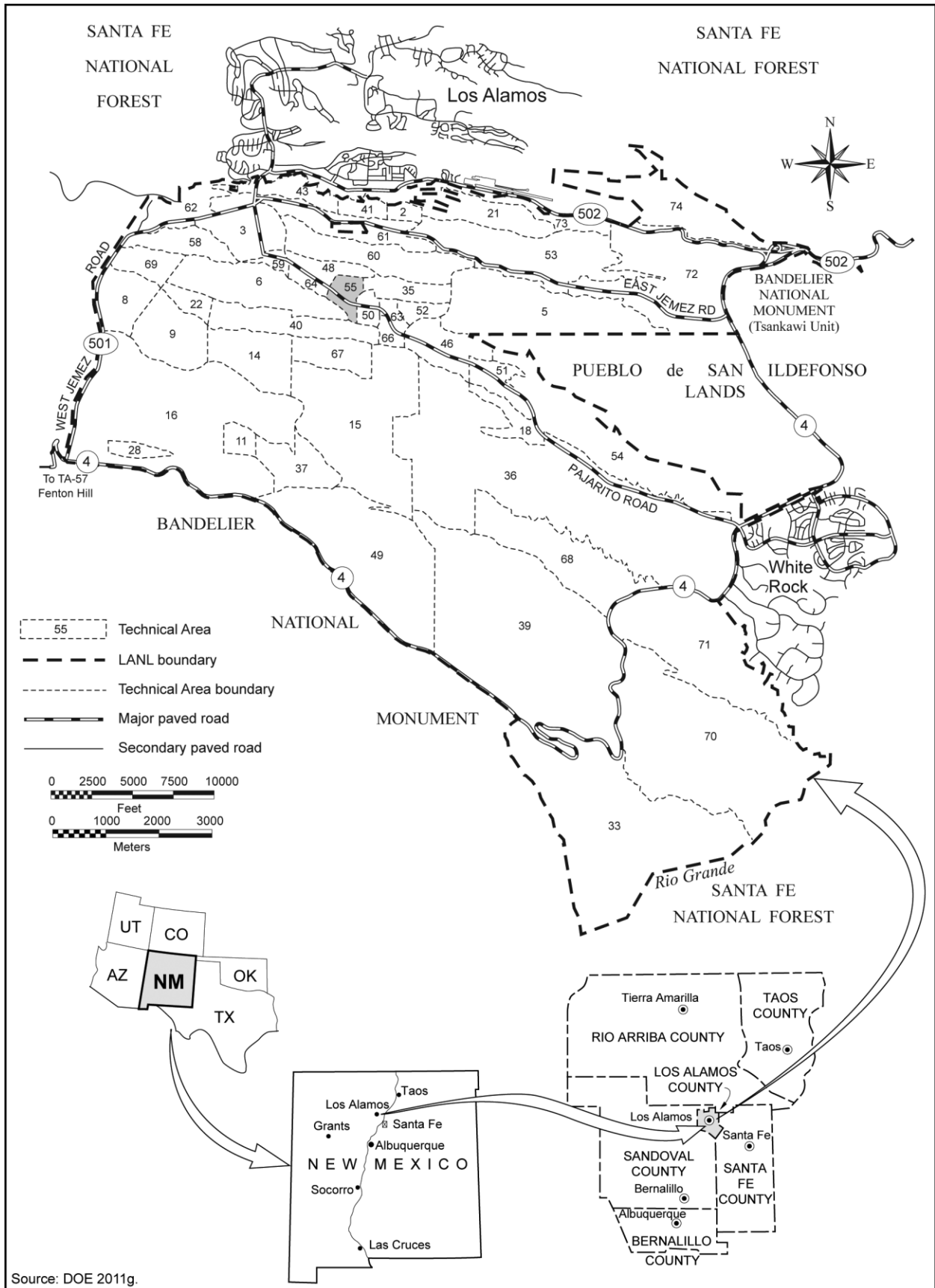
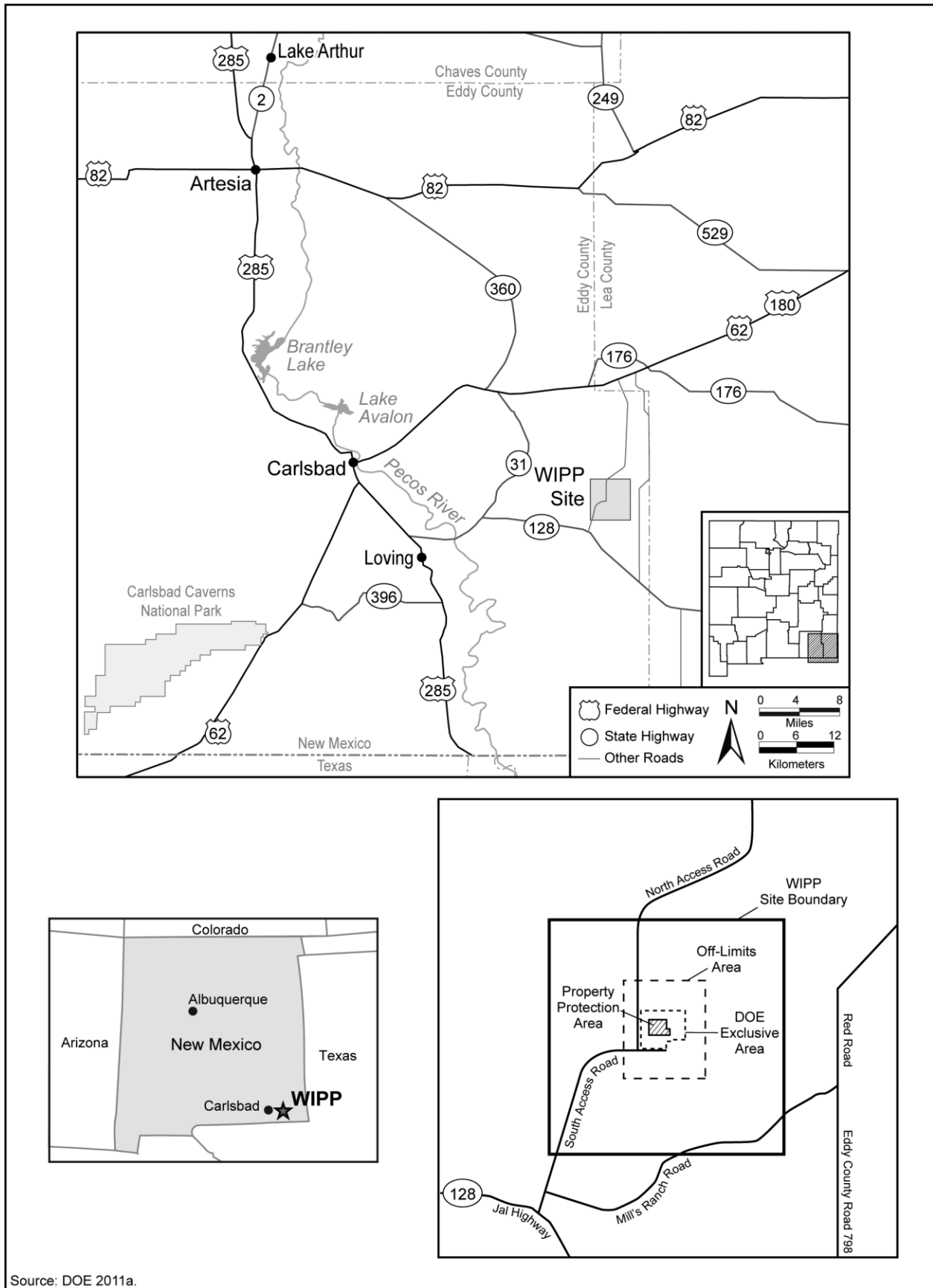
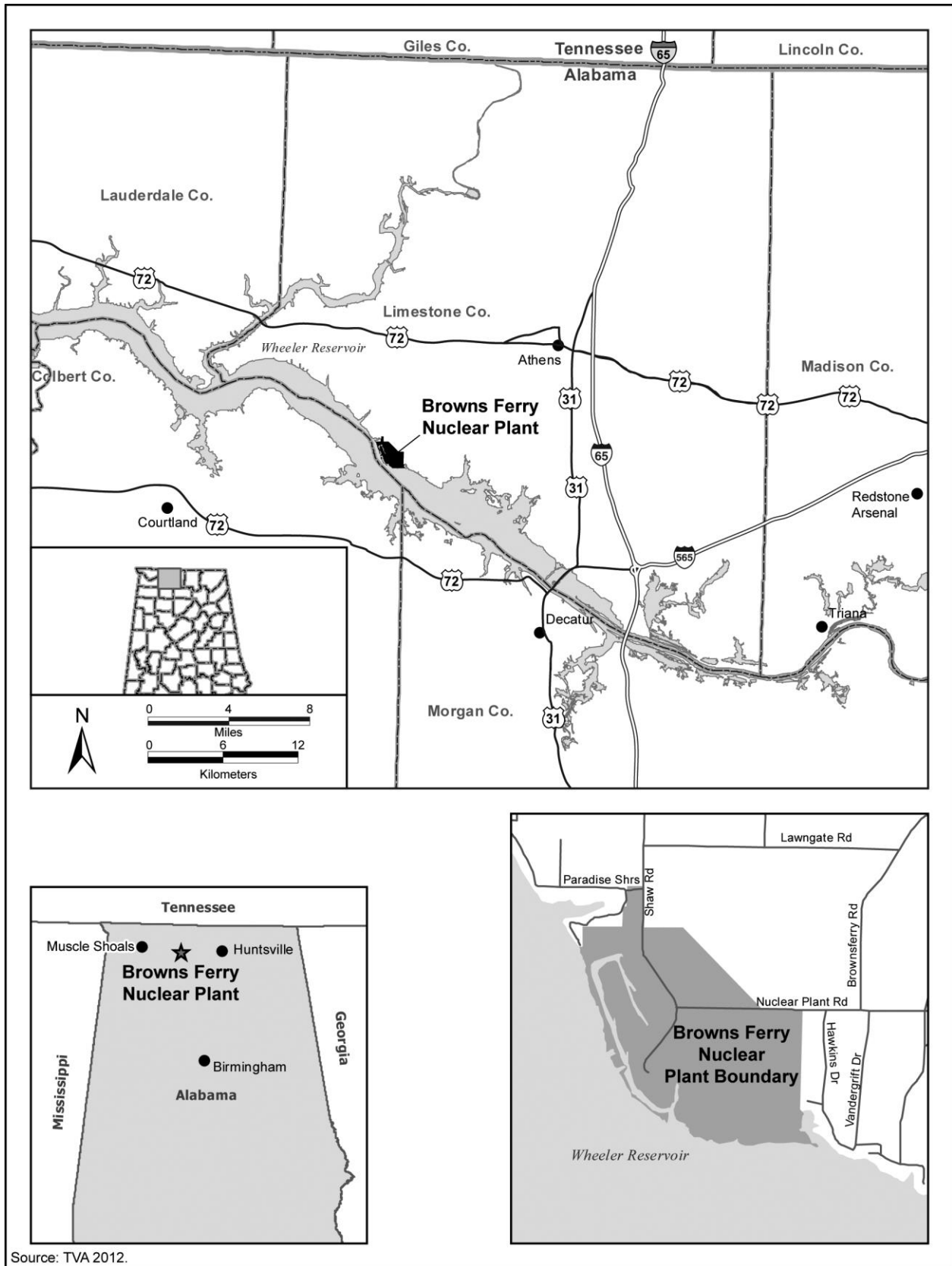


Figure 1–3 Los Alamos National Laboratory Location and Technical Areas



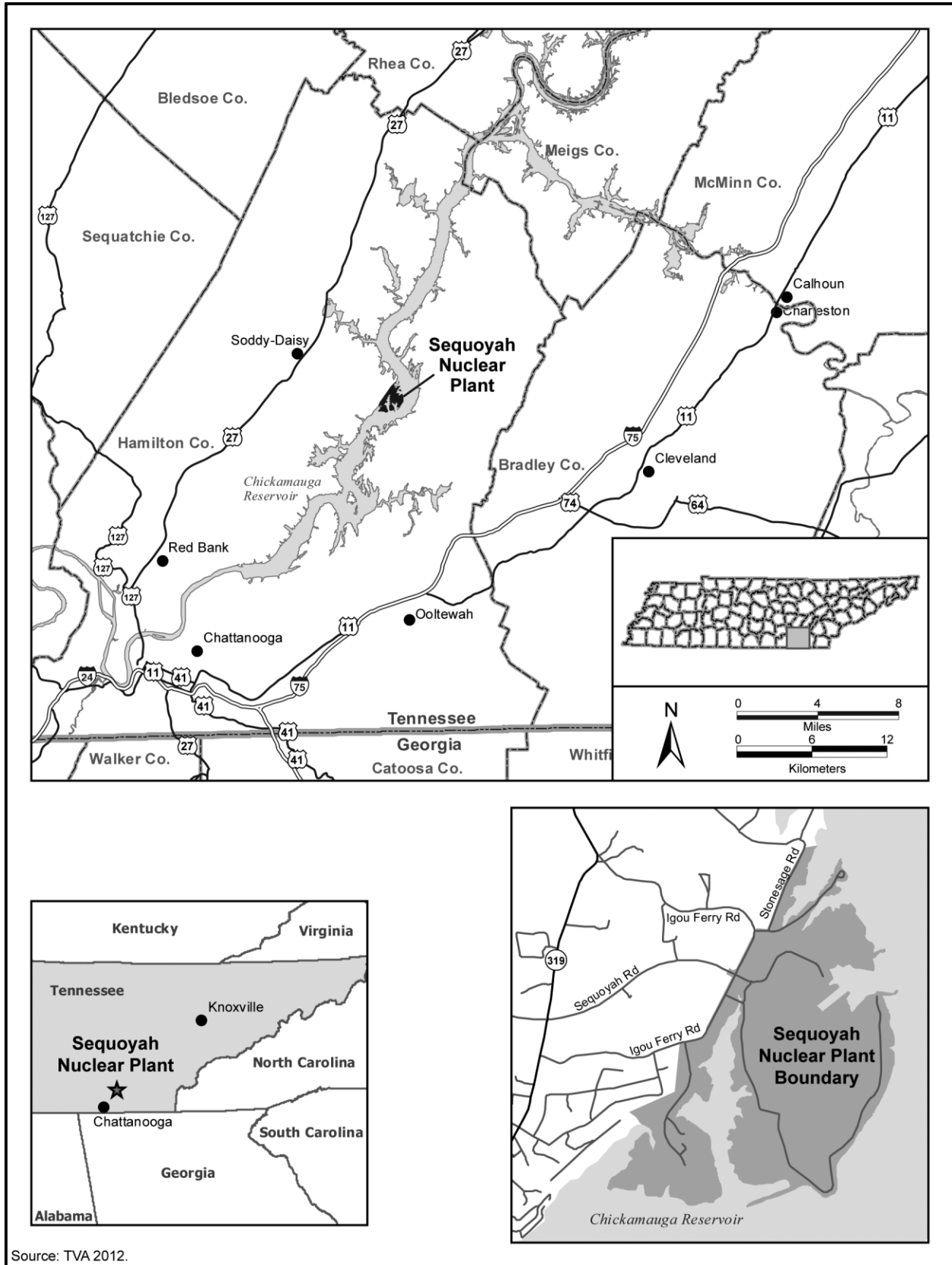
Source: DOE 2011a.

Figure 1-4 Waste Isolation Pilot Plant Location



Source: TVA 2012.

Figure 1-5 Browns Ferry Nuclear Plant Location



Source: TVA 2012.

Figure 1-6 Sequoyah Nuclear Plant Location

1.4 Alternatives Evaluated

In addition to a No Action Alternative, in this *SPD Supplemental EIS* DOE evaluates four action alternatives. The alternatives are based on four options for disposition of 13.1 metric tons (14.4 tons) of surplus plutonium for which a disposition path is not assigned, and include from one to four applicable options for pit disassembly and conversion.⁶ The alternatives are briefly described below (Chapter 2, Section 2.3, describes the alternatives in more detail):

- *No Action Alternative* – continued storage of 7.1 metric tons (7.8 tons) of pit plutonium at the Pantex Plant (Pantex), and 6 metric tons (6.6 tons) of non-pit plutonium at SRS
- *Immobilization to DWPF Alternative* – glass can-in-canister immobilization for both surplus non-pit and disassembled and converted pit plutonium and subsequent filling of the canister with high-level radioactive waste (HLW) at DWPF
- *MOX Fuel Alternative* – fabrication of the disassembled and converted pit plutonium and much of the non-pit plutonium into MOX fuel at MFFF for use in domestic commercial nuclear power reactors to generate electricity and potential disposition of the surplus non-pit plutonium that is not suitable for MFFF as contact-handled transuranic (CH-TRU) waste at WIPP, a deep geologic repository in southeastern New Mexico
- *H-Canyon/HB-Line to DWPF Alternative* – processing the surplus non-pit plutonium in the existing H-Canyon/HB-Line at SRS and subsequent disposal with HLW (i.e., vitrification in the existing DWPF), and fabrication of the pit plutonium into MOX fuel at MFFF
- *WIPP Alternative* – disposal of both surplus non-pit and disassembled and converted pit plutonium as CH-TRU waste at WIPP

For brevity, the pit disassembly and conversion and plutonium disposition options are not described here, but are described in Chapter 2, Sections 2.1 and 2.2, respectively. Under all alternatives, DOE would also disposition as MOX fuel 34 metric tons (37.5 tons) of surplus plutonium in accordance with previous decisions. The 34 metric tons (37.5 tons) of plutonium would be fabricated into MOX fuel at MFFF, as described in Section 2.2.2, for use in domestic commercial nuclear power reactors.

1.5 Disposition Paths for Surplus Plutonium

To date, the United States has declared as excess to U.S. defense needs a total of 61.5 metric tons (67.8 tons) of plutonium. This quantity includes both pit and non-pit plutonium. Based on a series of NEPA reviews (described in Appendix A, Section A.1), DOE has determined disposition paths for most of this surplus plutonium.

1.5.1 Plutonium with Identified Disposition Paths

Figure 1–7 summarizes the various plutonium disposition paths decided to date for 45.3 metric tons (49.9 tons) of surplus plutonium.

In the 2000 ROD (65 FR 1608) and 2003 amended ROD (68 FR 20134) for the *SPD EIS*, DOE decided to convert 34 metric tons (37.5 tons) of surplus plutonium into MOX fuel at an MFFF currently being constructed at SRS. DOE’s prior decisions with respect to the disposition path for the 34 metric tons (37.5 tons) of surplus plutonium are not addressed in this *SPD Supplemental EIS*. In 2012, DOE issued an interim action determination relative to this *SPD Supplemental EIS* to prepare 2.4 metric tons (2.6 tons) of plutonium metal and oxide as feed material for MFFF using H-Canyon/HB-Line (DOE 2012j). This material is a subset of the 6.5 metric tons (7.2 tons) of non-pit metal and oxides that DOE decided to prepare as MOX fuel in 2003 (68 FR 20134).

⁶ In the 2000 ROD (65 FR 1608) for the *SPD EIS*, DOE decided to construct and operate a Pit Disassembly and Conversion Facility at SRS. However, as described in DOE’s amended NOIs issued in 2010 (75 FR 41850) and 2012 (77 FR 1920), DOE is revisiting this decision.

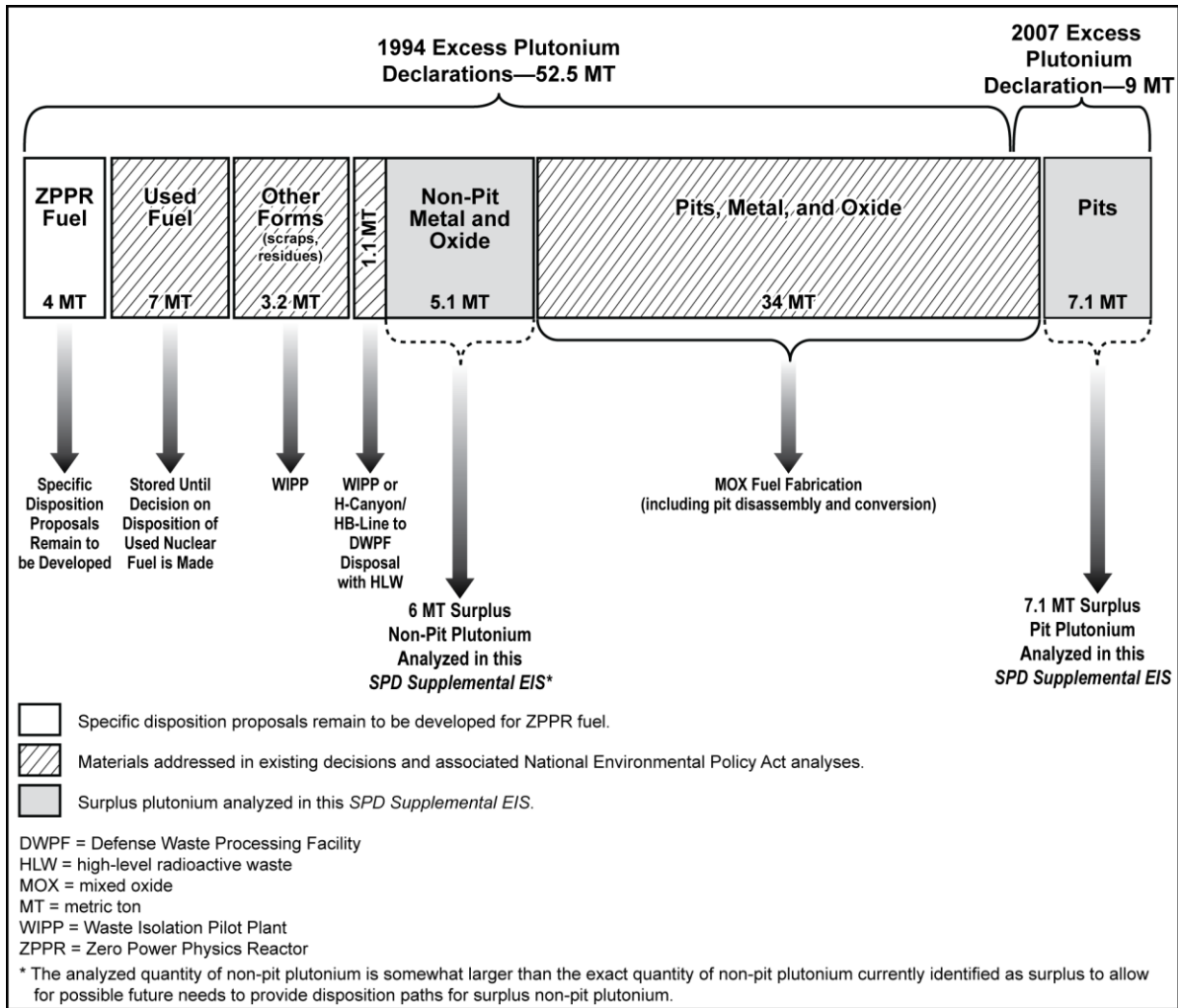


Figure 1-7 Disposition Paths for Surplus Plutonium

Seven metric tons (7.7 tons) of surplus plutonium are contained in used reactor fuel (used fuel is also known as spent fuel) and are, therefore, already in a proliferation-resistant form. Following appropriate NEPA reviews as described in Appendix A, Section A.1, DOE has already disposed of 3.2 metric tons (3.5 tons) of surplus plutonium scrap and residues at WIPP as transuranic (TRU) waste. In 2008 and 2009, DOE completed interim action determinations concluding that 0.6 metric tons (0.66 tons) of surplus non-pit plutonium could be disposed of through H-Canyon/HB-Line and DWPF (DOE 2008g, 2009b); in 2011, DOE amended this determination to add WIPP as a disposal alternative for about 85 kilograms (187 pounds) of these 0.6 metric tons (0.66 tons) (DOE 2011c). Also in 2011, DOE decided to use H-Canyon/HB-Line to prepare 0.5 metric tons (0.55 tons) of surplus plutonium for disposal at WIPP (DOE 2011f); DOE amended this determination in 2013 to also allow preparation in the K-Area Complex (DOE 2013g). Thus, DOE has determined that a total of 1.1 metric tons (1.2 tons) of surplus plutonium could be dispositioned through H-Canyon/HB-Line and the K-Area Complex to DWPF and WIPP.

1.5.2 Plutonium with No Identified Disposition Path

Figure 1-7 shows the DOE inventory of surplus plutonium including those quantities for which a disposition path is not assigned. Of this material, DOE previously set aside for programmatic use 4 metric tons (4.4 tons) of surplus plutonium in the form of Zero Power Physics Reactor fuel at its Idaho National Laboratory. DOE no longer has that particular programmatic use for the material. DOE is

considering using a portion (about 0.4 metric tons [0.44 tons]) of the material for a different programmatic use. While the bulk of the Zero Power Physics Reactor fuel currently stored at the Idaho National Laboratory has been declared excess, specific disposition proposals remain to be developed.

Therefore, DOE currently proposes to make decisions regarding the disposition of 13.1 metric tons (14.4 tons) of surplus plutonium (i.e., 7.1 metric tons [7.8 tons] of pit plutonium⁷ and 6 metric tons [6.6 tons] of non-pit plutonium⁸). The 6 metric tons (6.6 tons) of non-pit plutonium include a limited quantity of additional plutonium (0.9 metric tons [1.0 ton]), to allow for the possibility that DOE may, in the future, identify additional quantities of surplus plutonium that could be processed for disposition through the facilities and capabilities analyzed in this *SPD Supplemental EIS*. For example, future sources of additional surplus plutonium could include additional plutonium quantities recovered from foreign locations through NNSA's Global Threat Reduction Initiative⁹ or future quantities of plutonium declared excess to U.S. defense needs.

1.6 Public Involvement

The NEPA process, for this *SPD Supplemental EIS*, included opportunities for public involvement during the scoping period and the public comment period for the *Draft SPD Supplemental EIS*. Section 1.6.1 summarizes the scoping process and Section 1.6.2 summarizes the public comment period for the *Draft SPD Supplemental EIS*. Although scoping is optional for a supplemental environmental impact statement under DOE's NEPA implementing procedures (10 *Code of Federal Regulations* [CFR] 1021.314(d)), DOE invited public participation during three distinct scoping periods for the preparation of this *SPD Supplemental EIS*. A public comment period on a draft supplemental environmental impact statement is required by 40 CFR 1503.1 and 10 CFR 1021.314(d).

1.6.1 Scoping Process

DOE first opened the scoping process for this *SPD Supplemental EIS* in 2007 (72 FR 14543). Between 2007 and 2012, DOE provided three specific scoping periods during which DOE held public scoping meetings and actively solicited scoping comments from Federal agencies, state and local governmental entities, American Indian tribal governments, and members of the public (2007 [72 FR 14543]; 2010 [75 FR 41850]; and 2012 [77 FR 1920]). The public scoping periods extended from March 28 through May 29, 2007; July 19 through September 17, 2010; and January 12 through March 12, 2012. The dates and locations of the scoping meetings are listed below.

<i>Date</i>	<i>Scoping Meeting Location</i>
April 17, 2007	Aiken, South Carolina
April 19, 2007	Columbia, South Carolina
August 3, 2010	Tanner, Alabama
August 5, 2010	Chattanooga, Tennessee
August 17, 2010	North Augusta, South Carolina
August 24, 2010	Carlsbad, New Mexico
August 26, 2010	Santa Fe, New Mexico
February 2, 2012	Pojoaque, New Mexico

⁷ The 34 metric tons (37.5 tons) previously identified for MOX fuel fabrication included an allowance of 1.9 metric tons (2.1 tons) for future declarations. DOE later determined, as shown in Figure 1-7, that 1.9 metric tons (2.1 tons) from the 9 metric tons (9.9 tons) of pit plutonium in the 2007 declaration qualified for inclusion within the 34 metric tons (37.5 tons) identified for MOX fabrication, leaving 7.1 metric tons (7.8 tons) of pit plutonium to be dispositioned.

⁸ The analyzed quantity of non-pit plutonium is somewhat larger than the exact quantity of non-pit plutonium currently identified as surplus (6 metric tons [6.6 tons] compared to 5.1 metric tons [5.6 tons]) to allow for possible future needs to provide disposition paths for surplus non-pit plutonium. The 5.1 metric tons (5.6 tons) of currently identified surplus non-pit plutonium includes 0.7 metric tons (0.77 tons) of unirradiated Fast Flux Test Facility fuel.

⁹ As analyzed in the Environmental Assessment for the U.S. Receipt and Storage of Gap Material Plutonium and Finding of No Significant Impact (DOE 2010f).

Commentors were encouraged to submit scoping comments via the U.S. mail, email, a toll-free telephone number, and a toll-free fax line. All scoping comments received by DOE were considered in preparing the *Draft SPD Supplemental EIS*. A summary of the comments received during the public scoping periods is presented in Appendix L.

1.6.2 Public Comment Period on the *Draft SPD Supplemental EIS*

On July 27, 2012, the U.S. Environmental Protection Agency (EPA) and DOE published notices in the *Federal Register* announcing the availability of the *Draft SPD Supplemental EIS* (77 FR 44234 and 77 FR 44222). A 60-day comment period, from July 27 to September 25, 2012, was announced to provide time for interested parties to review and comment on the *Draft SPD Supplemental EIS*. In response to public requests, DOE extended the public comment period by 15 days, through October 10, 2012, and held an additional public hearing (77 FR 54908). During the public comment period, DOE held seven public hearings to provide interested members of the public with opportunities to learn more about the content of the *Draft SPD Supplemental EIS* from exhibits, factsheets, and other materials; to hear DOE representatives present the results of the *Draft SPD Supplemental EIS* analyses; to ask questions; and to provide oral or written comments. TVA representatives attended the public hearings in Chattanooga, Tennessee and Tanner, Alabama. The dates and locations of the public hearings are listed below.

<i>Date</i>	<i>Public Hearing Location</i>
August 21, 2012	Los Alamos, New Mexico
August 23, 2012	Santa Fe, New Mexico
August 28, 2012	Carlsbad, New Mexico
September 4, 2012	North Augusta, South Carolina
September 11, 2012	Chattanooga, Tennessee
September 13, 2012	Tanner, Alabama
September 18, 2012	Española, New Mexico

In addition, Federal agencies, state and local governmental entities, American Indian tribal governments, and members of the public were encouraged to submit comments via the U.S. mail, email, a toll-free telephone number, and a toll-free fax line. All comments received by DOE, including late comments, were considered in preparing this *Final SPD Supplemental EIS*.

DOE received 432 comment documents containing about 1,050 comments during the public comment period. Topics of interest from the comments received during the public comment period on the *Draft SPD Supplemental EIS* are presented in Section 2 of the Comment Response Document (Volume 3). Responses to individual comments are provided in Section 3 of the Comment Response Document.

1.7 Scope of this *SPD Supplemental EIS*

In this *SPD Supplemental EIS*, DOE considers four action alternatives for the disposition of 13.1 metric tons (14.4 tons) of surplus plutonium and four options for pit disassembly and conversion of 34.6 metric tons (38.1 tons) (rounded to 35 metric tons [38.6 tons] in this *SPD Supplemental EIS*).¹⁰ The alternatives involve DOE facilities at LANL, SRS, and WIPP. DOE also analyzes the potential environmental impacts of using MOX fuel in TVA’s Browns Ferry and Sequoyah Nuclear Plants, as well as in one or

¹⁰ As described earlier, in two RODs for the SPD EIS (65 FR 1608 and 68 FR 20134), DOE decided to fabricate 34 metric tons (37.5 tons) of surplus plutonium into MOX fuel at an MFFF being constructed at SRS. DOE’s prior decisions with respect to the disposition path for the 34 metric tons (37.5 tons) of surplus plutonium are not addressed in this SPD Supplemental EIS. However, because DOE is revisiting its decision to construct and operate a PDCF at SRS, the pit disassembly and conversion options analyzed in this SPD Supplemental EIS will apply to the 27.5 metric tons (30.3 tons) of plutonium metal that DOE has decided to fabricate into MOX fuel, as well as the 7.1 metric tons (7.8 tons) of pit plutonium for which disposition is under consideration in this SPD Supplemental EIS.

more generic reactors. **Figure 1–8** shows the locations of major facilities that could be affected by activities analyzed in this *SPD Supplemental EIS*.¹¹

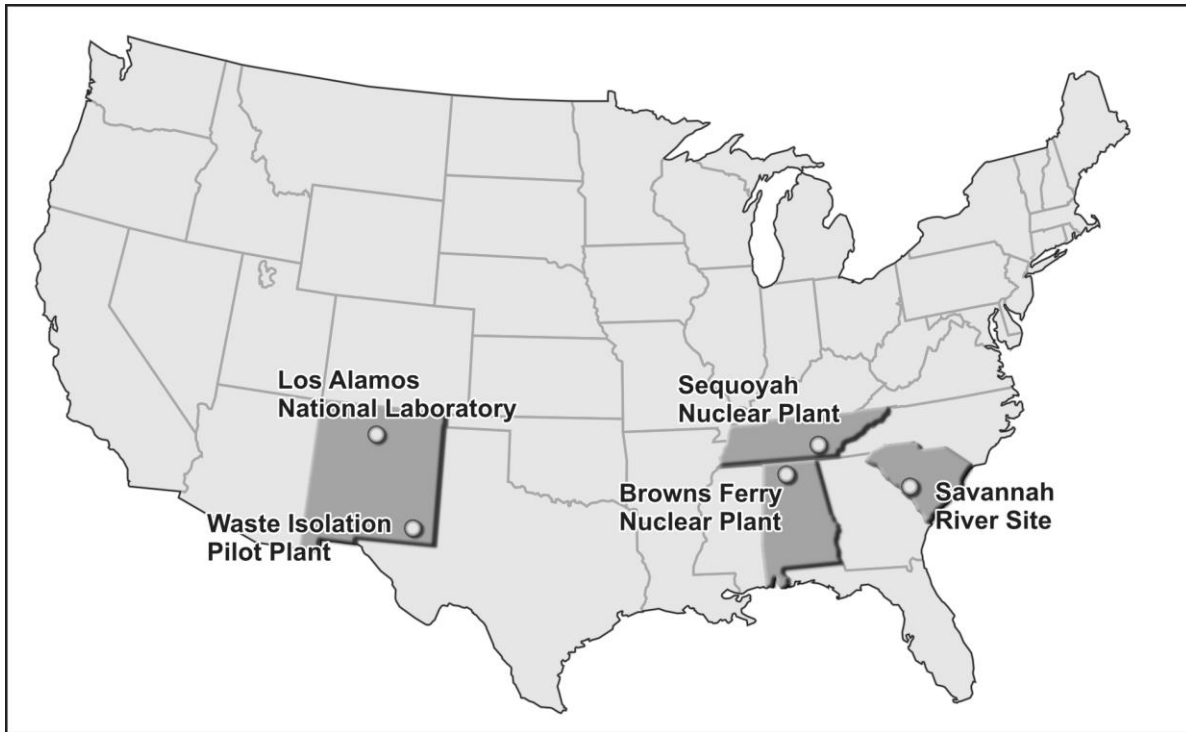


Figure 1–8 Locations of Major Facilities Evaluated in this *SPD Supplemental EIS*

Potential impacts from transporting surplus plutonium to WIPP are addressed in Chapter 4, Section 4.1.5, and Appendix E. The impacts from TRU waste disposal at WIPP are analyzed in the *Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement* (DOE 1997b) and briefly described in Appendix A, Section A.2, of this *SPD Supplemental EIS*.

The 7.1 metric tons (7.8 tons) of surplus pit plutonium addressed in this *SPD Supplemental EIS* are currently stored at Pantex near Amarillo, Texas. Potential impacts from transporting pits from Pantex to SRS and LANL are addressed in Chapter 4, Section 4.1.5, and Appendix E. The impacts from continued storage of pits at Pantex are analyzed in the *Final Supplemental Analysis for the Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapons Components* (DOE 2012i) and are briefly described in Appendix A, Section A.2, of this *SPD Supplemental EIS*.

This supplement to the *SPD EIS* (DOE 1999b) incorporates Appendix F, “Impact Assessment Methodology,” from the *SPD EIS* by reference. Rather than repeat the details of this appendix, Chapter 4 of this *SPD Supplemental EIS* refers to Appendix F and describes only variations from the impact assessment methodology applied in the *SPD EIS*.

¹¹ Because generic reactors that may use MOX fuel could be located anywhere in the United States, they are not shown on Figure 1–8.

1.8 Changes from the Draft SPD Supplemental EIS

In preparing this *Final SPD Supplemental EIS*, DOE made revisions to the *Draft SPD Supplemental EIS* in response to comments received from other Federal agencies, state and local government entities, American Indian tribes, and the public. DOE also changed this *Final SPD Supplemental EIS* to provide more environmental baseline information, including additional analyses, as well as to correct inaccuracies, make editorial corrections, and clarify text. In addition, DOE updated information due to events or notifications made in other documents since the *Draft SPD Supplemental EIS* was provided for public comment in July 2012. The following summarizes the more important changes made to this *Final SPD Supplemental EIS*.

Public Comment Period and Comments Received on the Draft SPD Supplemental EIS

A new Section 1.6.2 was added to Chapter 1 to describe the public comment period on the *Draft SPD Supplemental EIS*. A Comment Response Document (CRD) was added to this *Final SPD Supplemental EIS*. The CRD presents the comment letters, including the campaign letters,¹² as well as the public hearing transcripts and DOE's responses to the comments.

Changes Made for this Final SPD Supplemental EIS

A new Section 1.8 was added to Chapter 1 to list the changes made to the *Draft SPD Supplemental EIS* in preparing this *Final SPD Supplemental EIS*.

WIPP Alternative

In the *Draft SPD Supplemental EIS*, the WIPP Alternative evaluated disposition of 6 metric tons (6.6 tons) of surplus non-pit plutonium as CH-TRU waste at WIPP and disposition of 7.1 metric tons (7.8 tons) of surplus pit plutonium as MOX fuel. Based on public comments on the *Draft SPD Supplemental EIS*, updated estimates of unsubscribed CH-TRU waste capacity at WIPP (DOE 2012e), and the availability of a higher capacity disposal container (i.e., criticality control overpacks), the WIPP Alternative was revised to include analysis of the potential disposal of all 13.1 metric tons (14.4 tons) of surplus pit and non-pit plutonium as CH-TRU waste at WIPP. All of this surplus plutonium could be prepared at H-Canyon/HB-Line and the K-Area Complex at SRS for potential disposal at WIPP, or 7.1 metric tons (7.8 tons) of pit plutonium could be prepared at LANL for potential disposal at WIPP should higher levels of pit disassembly and conversion take place at LANL as proposed under the PF-4 and MFFF; and PF-4, H-Canyon/HB-Line, and MFFF pit disassembly and conversion options. Changes to this *Final SPD Supplemental EIS* include a description of the revised WIPP Alternative in Chapter 2 and the Summary, and analyses of the impacts of the revised alternative in Chapter 4 and Appendices E and G.

Alternatives Considered but Dismissed from Detailed Study

Chapter 2, Section 2.4, of this *Final SPD Supplemental EIS*, was revised to discuss additional options and alternatives, including some recommended by the public, that were considered but dismissed from detailed study.

Preferred Alternative

Chapter 2, Section 2.5, was revised to change the Preferred Alternative. In the *Draft SPD Supplemental EIS*, the MOX Fuel Alternative was DOE's Preferred Alternative for surplus plutonium disposition. DOE's preferred option for disposition of surplus non-pit plutonium that is not suitable for MOX fuel fabrication was disposal at WIPP. DOE's preferred option for pit disassembly and conversion of surplus

¹² A letter was considered to be part of a campaign if a significant number of letters were received with the same text in the body of the letter.

plutonium metal, regardless of its origins, was to use some combination of facilities at TA-55 at LANL and K-Area, H-Canyon/HB-Line, and MFFF at SRS, rather than to construct a new stand-alone facility.

In this *Final SPD Supplemental EIS*, DOE has no Preferred Alternative for the disposition of the 13.1 metric tons (14.4 tons) of surplus plutonium that is the subject of this *SPD Supplemental EIS*. Also, DOE has no Preferred Alternative regarding the sites or facilities to be used to prepare surplus plutonium metal for disposition (i.e., pit disassembly and conversion capability). Consistent with the requirements of NEPA, once a Preferred Alternative is identified, DOE will announce its preference in a *Federal Register* notice. DOE would publish a ROD no sooner than 30 days after its announcement of a Preferred Alternative.

TVA does not have a preferred alternative at this time regarding whether to pursue irradiation of MOX fuel in TVA reactors and which reactors might be used for this purpose.

Secure Transportation Asset Program

Chapter 2, Section 2.1.3, and Appendix E were revised to clarify transportation activities that would be conducted under NNSA's Secure Transportation Asset Program. Under this program, NNSA would transport plutonium material between DOE sites and MOX fuel from SRS to domestic commercial nuclear power reactors.

Incorporation of Updated Environmental Information

Chapter 3, Sections 3.1 and 3.2, were revised to reflect updated environmental data from the *Savannah River Site Environmental Report for 2011* (SRNS 2012b) and the *Los Alamos National Laboratory Environmental Report 2011* (LANL 2012a).

Transuranic Waste

Chapter 4, Section 4.1.4, and Appendix E, Section E.5.1, were revised to clarify that all TRU waste generated under the alternatives for surplus plutonium disposition would be CH-TRU and mixed CH-TRU waste (analyzed collectively).

WIPP Unsubscribed Waste Quantity

Chapter 4, Sections 4.1.4 and 4.5.3.6.3, were updated to include revised CH-TRU waste projections for SRS and LANL and unsubscribed CH-TRU waste capacity data that were presented in the *Annual Transuranic Waste Inventory Report – 2012* (DOE 2012e).

Environmental Justice

The environmental justice analysis in Chapter 4, Section 4.1.6, was revised to include a dose assessment similar to that for the maximally exposed individual¹³ member of the public. Radiological impacts were calculated for hypothetical individuals living at the Pueblo de San Ildefonso and Santa Clara Pueblo boundaries who would be most affected by emissions from PF-4 at LANL. In addition, the discussion of impacts from a special pathways dose analysis (impacts on a subsistence consumer) that was performed for the *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE 2008f) was expanded and moved to the cumulative impacts section of Chapter 4 (Section 4.5.3.8.2).

¹³ The maximally exposed individual is a hypothetical member of the public at a location of public access that would result in the highest exposure; for purposes of evaluation in this SPD Supplemental EIS, the offsite maximally exposed individual was considered to be at the site boundary, or in the case of reactor accidents, at the exclusion area boundary.

Climate Change in the Southwest

Chapter 4, Section 4.5.4.2, was revised to include a summary of the possible impacts of climate change in the southwestern United States.

Human Health Impact Measures and Assessment Methods

Appendix C, Section C.1, was revised to include a more detailed discussion of human health impact measurement and assessment methods. Additional information was provided regarding the basis for the risk factor of 0.0006 latent cancer fatalities (LCFs) per person-rem (for the population) or rem (for an individual) and the scientific basis for its use.

Elimination of MFFF Accident

The ion exchange exotherm accident (explosion) was removed from the range of accidents evaluated for the MFFF. The accident was included in the *Draft SPD Supplemental EIS* as it had been in the original *SPD EIS*. It was deleted from this *Final SPD Supplemental EIS* because the design for MFFF, as evaluated in the EIS supporting licensing (NRC 2005a) and as described in Chapter 2 and Appendix B, does not include an ion exchange column as was envisioned for this accident. The analysis in this *SPD Supplemental EIS* continues to include an explosion accident in a sintering furnace at the MFFF. This is considered the limiting design-basis accident¹⁴ associated with this facility.

Seismic Safety Analysis of PF-4

Appendix D, Section D.1.5.2.11, was updated to discuss additional concerns regarding the seismic analysis of PF-4 at LANL raised by the Defense Nuclear Facilities Safety Board (DNFSB) after the *Draft SPD Supplemental EIS* was completed in the summer of 2012. The letters from DNFSB and DOE's responses through the end of October 2013 are discussed in this *Final SPD Supplemental EIS*. The analyses in this *Final SPD Supplemental EIS* were also revised to include scenarios consistent with the 2013 addendum to the documented safety analysis for PF-4 (LANL 2013a) and the *SPD Supplemental EIS* scenarios that take credit for factors that would normally help lessen the impacts of such accidents should they occur (see Appendix D for further information on these scenarios).

Emergency Response Actions in the Event of a Transportation Accident

Section E.4 was added to Appendix E to describe the emergency response actions that would occur in the event of a transportation accident. First responders and/or state and Federal responders would initiate actions in accordance with the U.S. Department of Transportation *Emergency Response Guidebook* (DOT 2012a) to isolate the incident and perform any actions necessary to protect human health and the environment (e.g., evacuations, sheltering, or other measures to reduce or prevent impacts to the public).

Dunnage as a Contributor to Uncertainty in Determining Waste Shipments to WIPP

Appendix E, Section E.14.2, was revised to include dunnage (secured space not occupied by waste or waste containers) as a contributor to uncertainty when determining the number of waste shipments to WIPP. Dunnage is only used to complete a payload assembly (e.g., a 7-pack of 55-gallon drums, a second standard waste box) when a limit is reached (e.g., fissile gram equivalent, weight, wattage). There is no "typical" dunnage usage for shipments to WIPP, even within a single waste stream.

U.S. MOX Fuel Use Experience and Testing

Appendix J, Section J.2, was revised to provide additional information on U.S. MOX fuel use and testing in pressurized water reactors and boiling water reactors.

¹⁴ As used here, the limiting design-basis accident means the individual facility accident analyzed in this SPD Supplemental EIS that would have the largest potential impact on the surrounding population, with the exception of accidents involving earthquakes. Accidents involving earthquakes are addressed separately (see Appendix D).

Environmental Documentation Review

Since the publication of the *Draft SPD Supplemental EIS* in July 2012, additional environmental documentation has become available. As such, there was a possibility that some environmental data, upon which the impact analyses rely, may have changed, potentially affecting the analyses and comparison of alternatives. Changes from the *Draft SPD Supplemental EIS* are discussed above and include updates to waste management, environmental justice, human health, and transportation. No other changes to the affected environment or analyses as presented in the *Draft SPD Supplemental EIS* were necessary. The documents reviewed are listed below.

- *2012 Los Alamos National Laboratory Environmental Report* (LANL 2013b).
- *Savannah River Site Environmental Report for 2012* (SRNS 2013).
- *Annual Transuranic Waste Inventory Report – 2013* (DOE 2013k).
- *DOE 2011 Occupational Radiation Exposure* (DOE 2012k).
- *DOE 2012 Occupational Radiation Exposure* (DOE 2013l).
- *Fiscal Year 2012 Site-Wide Environmental Impact Statement Mitigation Action Plan Annual Report, December 2012* (LANL 2012e).
- *Fiscal Year 2013 Mitigation Action Plan Annual Report for the 2008 Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory* (LANL 2013c).

1.9 Decisions to be Supported by this SPD Supplemental EIS

Consistent with the requirements of NEPA, DOE may issue a ROD announcing its decision no sooner than 30 days after its announcement of a Preferred Alternative in the *Federal Register*. DOE could decide, based on cost, schedule, technical viability, worker and public safety, potential environmental impacts, security, and the ability to carry out international agreements, which pit disassembly and conversion option to implement and which option to implement for disposition of the 13.1 metric tons (14.4 tons) of surplus plutonium.

As stated in the 2010 amended NOI (75 FR 41850) and reaffirmed in the 2012 amended NOI (77 FR 1920), DOE and TVA are evaluating use of MOX fuel in up to five TVA reactors at the Browns Ferry and Sequoyah Nuclear Plants. TVA, as a cooperating agency, may adopt this *Final SPD Supplemental EIS* after independently reviewing the EIS and determining that its comments and suggestions have been satisfied (40 CFR 1506.3(c)).