National Nuclear Security Administration

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July 2012

DRAFT
SUPPLEMENT ANALYSIS
FOR THE
FINAL ENVIRONMENTAL IMPACT STATEMENT
FOR THE CONTINUED OPERATION OF THE
PANTEX PLANT AND ASSOCIATED STORAGE OF
NUCLEAR WEAPON COMPONENTS

U.S. Department of Energy
National Nuclear Security Administration
NNSA Production Office

ACRONYMS AND ABBREVIATIONS

CFR	*Code of Federal Regulations*
CREZ	Competitive Renewable Energy Zone
dBP	decibels peak sound pressure
DOE	U.S. Department of Energy
EA	environmental assessment
EIS	environmental impact statement
FM	farm-to-market (road)
FONSI	Finding of No Significant Impact
FR	*Federal Register*
FS	Firing Site
NEPA	*National Environmental Policy Act*
NNSA	National Nuclear Security Administration
PEIS	programmatic EIS
RCRA	*Resource Conservation and Recovery Act*
S&D PEIS	The *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement* (DOE/EIS-0229)
SA	supplement analysis
SSM PEIS	The *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (DOE/EIS-0236)
SWEIS	site-wide EIS
TSCA	*Toxic Substances Control Act*
TTU	Texas Tech University

CONVERSION FACTORS FOR MEASURES USED IN THIS SUPPLEMENT ANALYSIS

English to Metric		
Multiply	**By**	**To get**
Acres	0.4046873	Hectares
Square feet	0.092903	Square meters
Miles	1.6093	Kilometers
Feet	0.3048	Meters
Inches	2.54	Centimeters
Tons (short)	0.90718	Metric tons
Pounds	0.45359	Kilograms
Gallons	3.78533	Liters
Cubic yards	0.76456	Cubic meters
Metric to English		
Multiply	**By**	**To get**
Hectares	2.47104	Acres
Square meters	10.764	Square feet
Kilometers	0.62137	Miles
Meters	3.2808	Feet
Centimeters	0.3937	Inches
Metric tons	1.1023	Tons (short)
Kilograms	2.2046	Pounds
Liters	0.26418	Gallons
Cubic meters	1.3079	Cubic yards

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Appendix A: Projects Considered in this Supplement Analysis

1. INTRODUCTION

The U.S. Department of Energy's (DOE's) *National Environmental Policy Act* (42 U.S.C. 4321 *et seq*; NEPA) implementing procedures at Title 10 Code of Federal Regulations (CFR) 1021.330(d) require evaluation of a site-wide environmental impact statement (SWEIS) at least every five years through preparation of a supplement analysis (SA) as provided in 10 CFR 1021.314. This SA will enable DOE's National Nuclear Security Administration (NNSA) to determine whether the existing SWEIS remains adequate, if a new SWEIS is warranted, or if the existing SWEIS should be supplemented. DOE/NNSA has prepared this SA in accordance with these requirements.

In 2000, the NNSA was established as a separately organized agency within DOE, responsible for the management and security of the nation's nuclear weapons, including oversight of the Pantex Plant. Within this document, DOE's role is more specifically attributed to DOE/NNSA, or simply NNSA, unless the discussion deals with actions taken before 2000 or on a broader scale.

1.1 Background

The Pantex Plant is located in the Texas Panhandle, approximately 17 miles northeast of Amarillo, Texas. Figure 1-1 shows the location of the Pantex Plant and Figure 1-2 shows key onsite and offsite areas relevant to this SA. The Pantex Plant was originally built during the early days of World War II to produce conventional munitions, bombs, and artillery projectiles for the U.S. Army. After the war, the Plant was deactivated and remained vacant until 1949, when Texas Technological College [now Texas Tech University (TTU)] purchased the site for $1. In 1951, the main Plant and surrounding land were reclaimed under the recapture clause of the sales agreement with the Atomic Energy Commission (DOE's predecessor) and used for nuclear weapons assembly operations. Since that time, the four other plants in the United States with weapons assembly and modification missions were shut down, and nuclear weapons assembly and disassembly operations in the United States were transferred to, and occur at, the Pantex Plant (DOE 1996a, Section 1.2.1).

DOE issued the *Final Environmental Impact Statement for the Continued Operation of the Pantex Plant and Associated Storage of Nuclear Weapon Components* (DOE/EIS-0225) [referred to as the Pantex Site-Wide EIS (or Pantex SWEIS)] in November 1996 (DOE 1996a, all). The SWEIS assessed impacts on areas of the human and natural environment potentially affected by operations performed at the Pantex Plant. The SWEIS evaluated activities associated with ongoing operations, including onsite pit storage, transportation of pits to an alternate site for interim storage, and transportation of classified components between the Pantex Plant and other sites occurring over a period of approximately 10 years, from 1996 through 2006. The analysis assumed that production (the combined activities of assembly, disassembly, and modifications) would not exceed 2,000 weapons per year and assessed the impacts of activity levels required to produce 2,000, 1,000, and 500 weapons per year. These activity levels were considered a reasonable but conservative estimate of the work that could be required based on policy directives at that time (DOE 1996a, Section 2.2).

DOE published its Record of Decision in the *Federal Register* (FR) on January 27, 1997 (62 FR 3880), announcing its decision to implement the Preferred Alternative evaluated in the Pantex SWEIS by "(1) continuing nuclear weapon operations involving assembly and disassembly of nuclear weapons at the Pantex Plant; (2) implementing facility projects, including upgrades and construction consistent with conducting these operations; and (3) continuing to provide interim pit storage at the Pantex Plant and increasing the storage level from 12,000 to 20,000 pits."

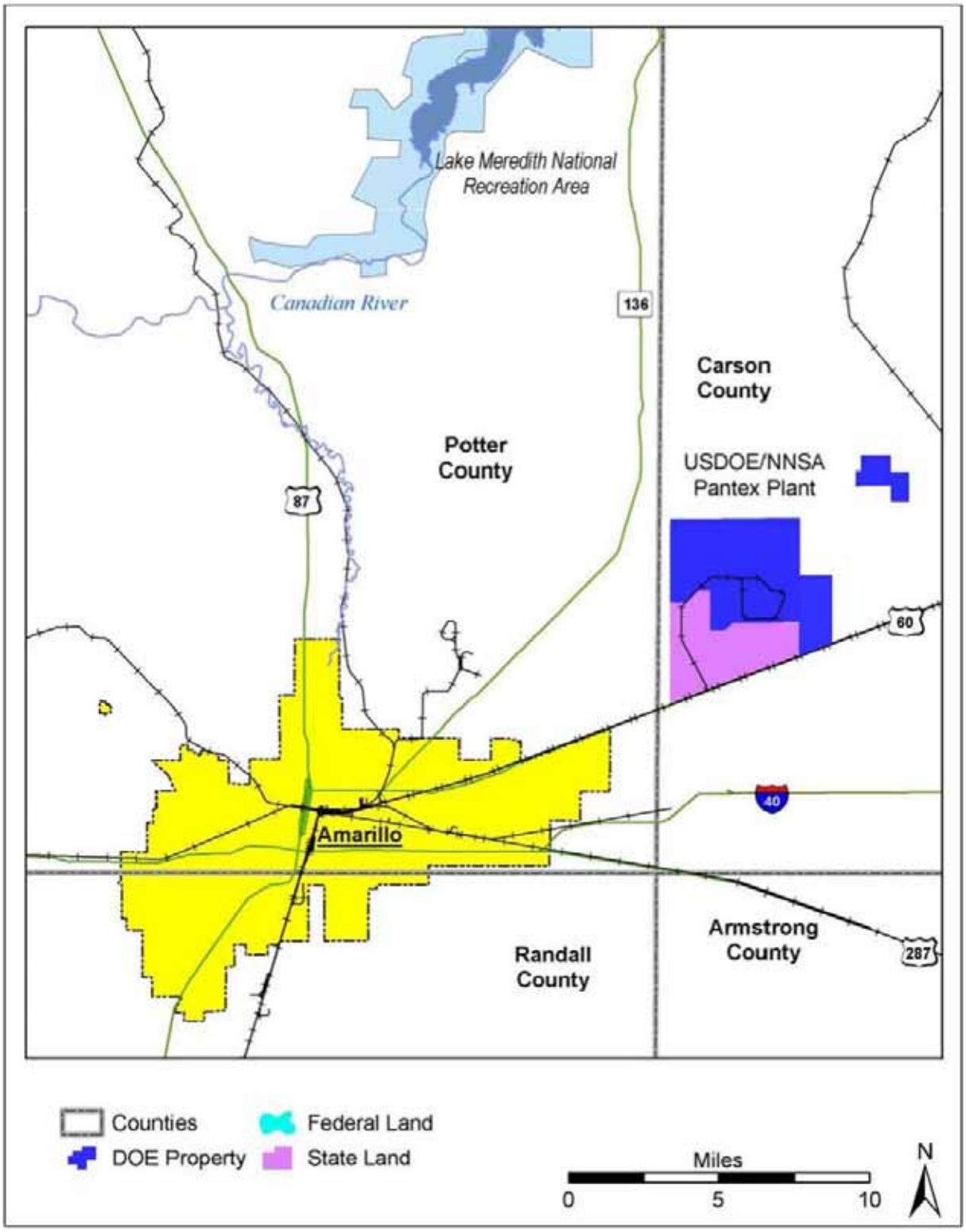

Figure 1-1. Pantex Plant Site Location (Source: NNSA 2008, Section 1.1)

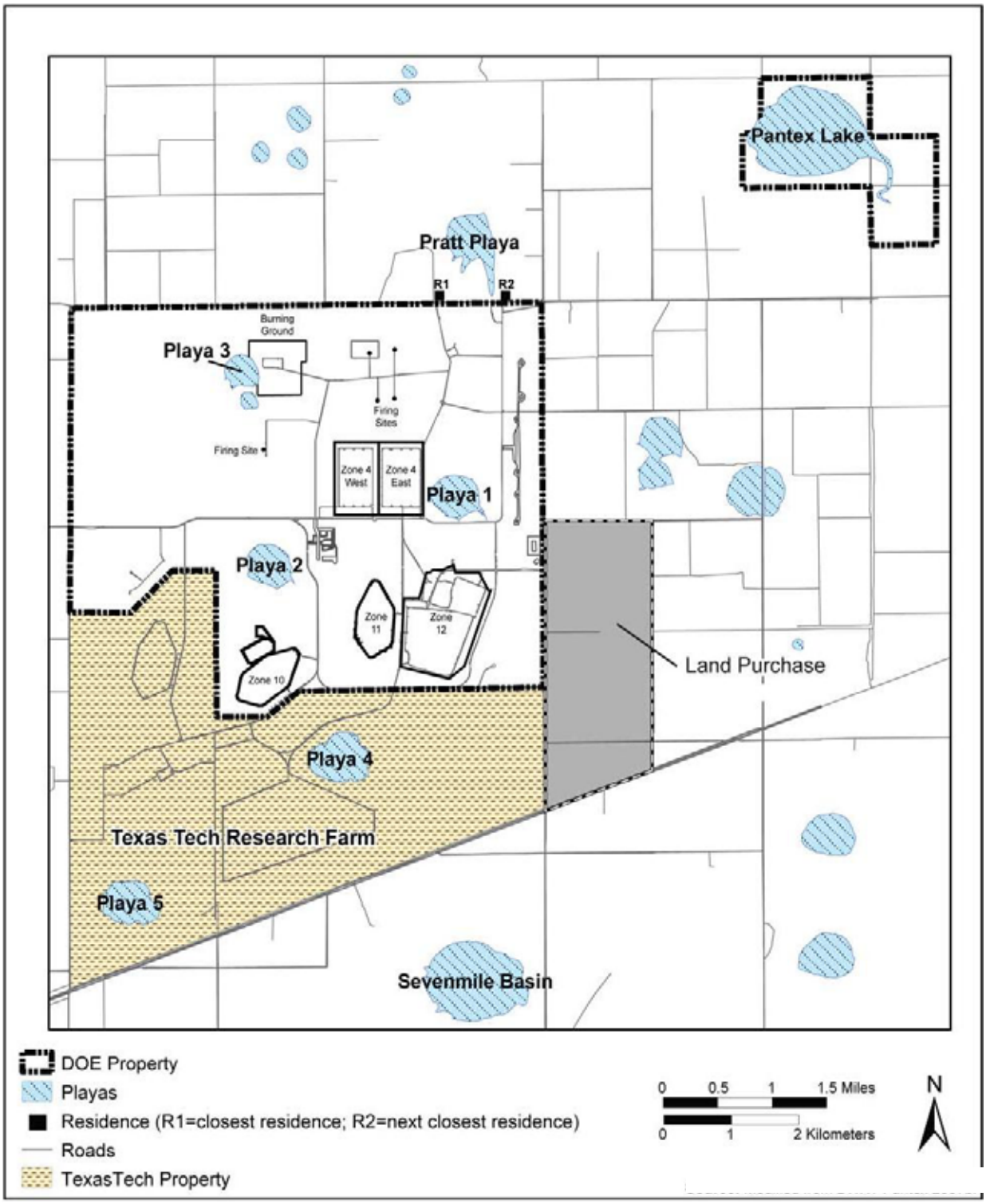

Figure 1-2. Location of Key Areas at the Pantex Plant (Source: NNSA 2008, Section 1.1)

1.2 Purpose of and Need for the Supplemental Analysis

In February 2003 and October 2008, DOE/NNSA issued the first and second five-year update SA for the Pantex SWEIS (2003 SA and 2008 SA, respectively) (NNSA 2003, 2008). The second five-year update of the SWEIS (that is, the 2008 SA), evaluated the impacts of Plant activities through 2007 and projected potential impacts from 2007 through 2011 (NNSA 2008). The analyses in the 2008 SA, as well as its 2003 predecessor, indicated that, for the time period evaluated, the identified and projected impacts for all resource areas, including cumulative impacts, were not substantially changed from those identified in the SWEIS and Record of Decision, nor did they represent significant, new circumstances or information relative to environmental concerns. Therefore, NNSA issued determinations that there was no need to supplement the SWEIS or to prepare a new SWEIS for the Pantex Plant. This SA document, the third five-year update, fulfills DOE/NNSA's requirement to review the SWEIS at least every five years as required by 10 CFR 1021.330(d). This SA accomplishes that requirement by comparing the information presented in the SWEIS with changes and proposed changes through 2016 in the environment and Pantex Plant mission, activities, programs, and impacts.

1.3 Changes Since Preparation of the SWEIS

This section describes the mission, programmatic, operational, and environmental changes and projects that have occurred since DOE issued the SWEIS in 1996, as well as those anticipated through 2016. These changes and projects provide the basis for the analyses in this SA.

1.3.1 Pantex Site Mission and Programmatic Changes

There are no major changes in the primary mission planned for the next five years. The primary mission of the Pantex Plant described in the Programmatic Information Document (BWXT Pantex 2006, Section 1.0) and the Site Environmental Report (B&W Pantex 2011, Section 1.2) is consistent with that identified in the SWEIS:

- Assemble nuclear weapons for the nation's stockpile;
- Disassemble nuclear weapons being retired from the stockpile;
- Evaluate, repair, and retrofit nuclear weapons in the stockpile;
- Provide interim storage for plutonium pits;
- Develop, fabricate, and test chemical explosives and explosive components for nuclear weapons; and
- Support DOE initiatives.

Individual operations conducted at the Pantex Plant to support these programmatic mission elements and analyzed within the scope of the SWEIS include assembly and disassembly of nuclear weapons, certain maintenance and modification activities regarding the nuclear weapons stockpile, stockpile evaluation, quality assurance testing of weapon components, and research and production of high explosives components for nuclear weapons. Related activities at Pantex Plant include quality assurance evaluations of weapons; research and development activities supporting nuclear weapons; demilitarization and sanitization of weapon parts, equipment, and related materials (although demilitarization is not currently performed at the Plant); waste management; environmental restoration; and onsite transportation (DOE 1996a, Section 1.2.2).

The SWEIS also identified areas of the Pantex Plant that support the mission. These areas, shown in Figure 1-2 of this SA, are:

- Zone 12, where assembly, disassembly, and surveillance operations are performed and nonnuclear components are staged;
- Zone 11, where high-explosives research and production occur and nonnuclear components are staged;
- Zone 4 West, where nuclear weapons and classified components are staged and pits are stored on an interim basis;
- Zone 4 East, where high explosives are stored and nonnuclear components are staged;
- The Burning Ground, where high-explosive material is thermally treated; and
- The firing sites, where testing and sanitization are conducted on high-explosive material and items containing energetic material.

Six proposed projects were at a sufficient stage of development in 1996 to be included in the SWEIS analysis: (1) the Hazardous Waste Treatment and Processing Facility, (2) the Pit Reuse Facility, (3) the Gas Analysis Laboratory, (4) the Materials Compatibility Assurance Facility, (5) the Nondestructive Evaluation Facility, and (6) the Metrology and Health Physics Calibration and Acceptance Facility. These projects were proposed for locations in or near Zones 11 and 12 to meet explosives, safety, seismic, or tornado criteria; streamline the efficiency of continued operations; maximize worker safety; reduce existing facility footprints; or meet regulatory requirements (NNSA 2008, Section 1.3.1). Appendix A, Table A-1 of this SA presents information about these projects, including their current status.

Appendix A, Table A-2 identifies selected projects initiated since issuance of the SWEIS. Appendix A, Table A-3 includes selected projects that are not yet underway, but are expected to be initiated through 2016 and that NNSA determined should be mentioned (either individually or collectively) and considered in this SA. Factors that influenced this determination include projected cost, NEPA coverage, and the potential for the project to result in a major change to the Pantex Plant footprint (for example, construction of new facilities or demolition of existing facilities). In some cases, a number of individually small but related projects were grouped. Projects involving replacement of similar equipment, such as electrical or fire safety system upgrades, or modifications to existing facilities or infrastructure but not major changes to the Plant footprint were not included in Appendix A, Tables A-2 or A-3. Smaller projects, such as Plant infrastructure improvement projects, are routinely implemented and normally do not result in significant environmental impacts. Such projects may be initiated after completion of the NEPA review in accordance with DOE NEPA implementing procedures at 10 CFR 1021.410 and the Pantex Plant Work Instruction 02.01.04.02.01, "Prepare National Environmental Policy Act Documents."

There are two additional actions that warrant mention in this SA, although they do not represent changes to the Pantex mission and are not described in the Appendix A tables. The first is a possible minor work change and the second is an upcoming change in management functions. They are described as follows:

- NNSA is considering a work change that would enable the Pantex Plant to perform re-qualification of the Canned Sub-Assembly weapon component rather than sending that component to the Y-12 Plant for re-qualification. Performing this work at the Pantex Plant would reduce the amount of transportation of weapons components between sites. The work also would be very similar to the pit re-qualification work currently performed at the Plant, and would fit well within the Plant's primary mission identified above. However, the work would require larger, specialized workstations due to the size of the component, and the Plant would have to establish contingency procedures to address expected conditions that may be encountered during the processes. It is currently anticipated that the work would not require construction of new facilities, and any modification of existing facilities would be relatively minor. Accordingly, this SA does not further address this possible work.

- NNSA is currently in the process of competing the management and operation contract for the Pantex Plant; that is, the contract currently held by Babcock and Wilcox Technical Services Pantex, LLC. In addition to Pantex operations, the new contract will incorporate the management and operations of the Y-12 National Security Complex at Oak Ridge, Tennessee, with an option for phase-in of Tritium Operations at the Savannah River Site in South Carolina. The new, combined contract is not intended to change the Pantex mission or the missions of the other sites; rather, a goal of the action is to more fully integrate NNSA's functions and improve operating efficiencies. As such, the new contract may foster future changes in how those existing missions are accomplished. However, the statement of work for the contract competition does not identify specific operational changes that would affect the evaluations in this SA. This SA, therefore, does not further address the upcoming contract change.

1.3.2 Operational Changes

Operational changes evaluated in this SA include changes in mission-related and non-mission-related activities at the Pantex Plant that may result in environmental impacts or may indicate variances in the parameters that were assumed in the SWEIS analyses. These changes mainly involve the weapons workload level and associated activities; explosives fabrication, detonation, and disposition activities (including sanitization); and the overall square footage of facilities. In addition, changes in staffing levels may result from changes in mission- and non-mission-related activities

1.3.3 Environmental Changes

Environmental changes pertain to changes in the environmental resources that provide the baseline for evaluating environmental impacts or to changes in the parameters and assumptions used for the environmental impacts analyses. This section summarizes information, primarily from the *Environmental Information Document in Support of National Environmental Policy Act Documents for the Pantex Plant* (BWXT Pantex 2007, all) or from the *Site Environmental Report Pantex Plant 2010* (B&W Pantex 2011, all), that demonstrates that the natural environment depicted in the SWEIS has not changed appreciably.

1.3.3.1 Land Resources

There have been minor, but notable, changes to land resources at the Pantex Plant. The Pantex Plant is in Carson County in the Texas Panhandle, north of U.S. Highway 60 and 17 miles northeast of downtown Amarillo. The Pantex Plant comprises 11,703 acres of land, including 9,100 acres in the main Plant area, 1,526 acres in four tracts purchased in the latter part of 2008 [adjacent to the main Plant area, but east of Farm-to-Market Road (FM) 2373], and 1,077 acres approximately 2.4 miles to the northeast, at Pantex Lake (B&W Pantex 2011, Section 1.1). In addition, NNSA leases 5,503 acres of land south of the main Plant area from TTU for use as a safety and buffer zone. Previously, the amount of leased land was 5,800 acres, but 297 acres were removed from the agreement with TTU in late 2009. Several soil types classified as prime farmland cover the majority of Pantex Plant. Only the 1,526 acres added in 2008 and the 297 acres of leased land removed in 2009 differ from the land resources evaluated in the SWEIS. The new parcel of land provides additional buffer for the main Plant area and is being used primarily for agriculture. It also provides a location for many of the planned Pantex wind turbines addressed later in this document.

1.3.3.2 Water Resources

Surface Water, Floodplains, and Playas. There have been minor changes to surface water, floodplains, and playas at the Pantex Plant since the SWEIS was issued. Surface waters, for the most part, discharge into onsite playas. Storm water from agricultural areas at the periphery of the Plant drains into both

onsite and offsite playas. From the various playas, water either evaporates or infiltrates the soil. Two principal subsurface water-bearing units exist beneath the Pantex Plant and adjacent areas: the Ogallala Aquifer and the underlying Dockum Group Aquifer. The vadose, or unsaturated, zone above the Ogallala Aquifer consists of as much as 460 feet of sediments that lie between the land surface and the Ogallala Aquifer. The Tulsa District of the U.S. Army Corps of Engineers delineated floodplains on the Pantex Plant site. Floodplain boundaries were delineated for Playas 1, 2, 3, and 4, Pantex Lake, and Pratt Lake (north of Pantex). According to the SWEIS, Playa 1 received continuous discharges from the Pantex Plant Wastewater Treatment Facility. Since issuance of the SWEIS, DOE/NNSA has obtained discharge permits and installed systems that allow treated water from the Wastewater Treatment Facility to be beneficially reused through discharge to an onsite subsurface irrigation system (B&W Pantex 2011, Section 2.6). Discharge of treated effluent to Playa 1 is still a permitted option, but is only used for backup. This has allowed the Playa 1 area to develop and be managed as a more natural environment. It also removes or reduces a primary source of focused recharge for the perched groundwater that underlies Playa 1.

Groundwater. Perched groundwater is present beneath the Pantex Plant in a discontinuous zone approximately 200 to 300 feet below ground surface, where it rests upon a relatively low permeability zone, referred to as the fine-grained zone. The fine-grained zone consists of sand, silt, and clay, which slows vertical movement of water in the subsurface soil to the extent that it moves laterally (B&W Pantex 2011, Section 6.1). Perched groundwater is associated with natural recharge from several playas and historical industrial releases to the ditches draining Zones 11 and 12. Beneath the Pantex Plant, the groundwater initially flows outward in a radial manner away from the playa lakes, and then is influenced by the regional south-to-southeast gradient. The perched groundwater ranges in saturated thickness from less than 1 foot at the margins to more than 75 feet in the area of Playa 1. Perched groundwater beneath the Plant contains contaminants associated with historical industrial releases and is unsuitable for use without treatment. At the time DOE issued the SWEIS, evaluations for remedial actions, including a treatability study, had been conducted to begin cleaning up perched groundwater contaminants associated with Pantex Plant legacy releases. DOE/NNSA has since implemented a multi-pronged approach to remediate the perched groundwater, including the above noted elimination of industrial releases to onsite ditches through collection and processing at the Wastewater Treatment Facility, pump and treat systems, as well as *in situ* bioremediation actions.

The second water-bearing zone, the Ogallala Aquifer, also known as the High Plains Aquifer, is located below the fine-grained zone, primarily in the lower portion of the Ogallala Formation. (Because the High Plains Aquifer is in the Ogallala Formation in this part of the country, High Plains Aquifer and Ogallala Aquifer are used interchangeably in this SA.) The High Plains Aquifer is a primary drinking and irrigation water source for most of the High Plains. The groundwater surface of the High Plains Aquifer beneath the Plant is approximately 400 to 500 feet below ground surface; saturated thickness is approximately 1 to 100 feet in the southern regions of the Plant and approximately 250 to 400 feet in the northern regions. The primary flow direction of the High Plains Aquifer in the vicinity of the Plant is north to northeast due to the influence of the City of Amarillo's well field north of the Plant (B&W Pantex 2011, Section 6.1).

1.3.3.3 Air Quality

There have been no notable changes to the air quality at the Pantex Plant since DOE issued the SWEIS. Modeling results of concentrations for criteria and toxic pollutants using Plant emissions for ongoing operations indicated that none of the National Ambient Air Quality Standards would be exceeded at the Pantex Plant boundary. Concentrations of all of the toxic air pollutants were estimated to be below their respective Effect Screening Levels at the Plant boundary. Modeling performed in 2008 demonstrated that the activities modeled would not cause a condition of "air pollution" as defined in the *Texas Clean Air*

Act, Section 382.003(3) or violate the *Texas Clean Air Act*, Section 382.085 as codified in the Texas Health and Safety Code. Since DOE issued the SWEIS, the Plant's air quality permits have evolved to address any changes in emissions as well as changes in regulations; compliance with permit limits has been maintained. Similarly, based on projected emissions for continued operations during the period 2012 through 2016, concentrations at the Pantex Plant boundary are estimated to continue to remain within all National Ambient Air Quality Standards and Effect Screening Levels, and overall Plant emissions should continue to be within permit and regulatory limits.

1.3.3.4 Acoustics

There have been no changes to most acoustic sources within and around the Pantex Plant since DOE issued the SWEIS. Sources of environmental noise offsite consist of background sounds from vehicular traffic on U.S. Highway 60, farm-to-market roads, county roads, airport traffic, railroad traffic on a major east-to-west corridor with two tracks, and the operation of heavy equipment during agricultural activities. Sources of environmental noise onsite consist of background sounds from industrial processes, vehicular traffic, routine operations, alarms (fixed and on construction equipment), occasional high-explosives testing, firearms training for security police officers, ongoing construction and demolition of infrastructure, and the operation of heavy equipment during agricultural activities by TTU Research Farm personnel on lands managed for DOE/NNSA. Since DOE issued the SWEIS, the only notable change in acoustic sources within the Pantex Plant is that associated with the testing of high explosives. The frequency of such testing and the limits on the quantity of high explosives involved in a single test have increased since DOE issued the SWEIS. The potential effects from these testing increases are addressed in detail in this SA. This SA also describes the relatively minor sound related to the proposed operation of wind turbines within DOE/NNSA-owned and -leased land during the 2012 through 2016 timeframe.

1.3.3.5 Biotic Resources

Vegetation. The Pantex Plant is located within the Southern High Plains region. Vegetation is characterized as shortgrass prairie. The land ranges from unvegetated in the south-central industrial area of the Plant to a variety of shortgrass prairie species elsewhere on the site. The Pantex Plant and land leased from TTU incorporate three different land uses: cultivated ground, native grass or pastureland, and land enrolled in the U.S. Department of Agriculture Conservation Reserve Program. Cultivated ground consists of both dry land and irrigated properties. The dry land areas are typically planted with winter wheat or grain sorghum. Irrigated land may be planted with winter wheat, grain sorghum, corn, or alfalfa. The native grass areas primarily consist of blue grama (*Bouteloua gracilis*) and buffalograss (*Buchloe dactyloides*). Established cover on the Conservation Reserve Program land (only within the property leased from TTU) is blue grama, buffalograss, side oats grama (*Bouteloua curtipendula*) and, in at least one area, old world blue stem (*Bothriochloa ischaemum*). Although the Conservation Reserve Program is used in this SA and in the SWEIS to characterize vegetation in the Pantex Plant vicinity, land is accepted into the Program for specific contract periods, so participation changes over time or may stop altogether.

Habitat. There have been no changes in habitat at the Pantex Plant since DOE issued the SWEIS. Shortgrass prairie, consisting of buffalograss, blue grama, and western wheatgrass (*Agrophyron smithii*), in drainage ditches and low lying areas represents the primary habitat for species of concern in the area, for example, the Texas horned lizard (*Phrynosoma cornutum*), ferruginous hawk (*Buteo regalis*), western burrowing owl (*Athene cunicularia hypugaea*), and song birds. The recently acquired land on the east side of FM 2373 is cultivated land with a small percentage of shortgrass habitat.

Wildlife. There have been no notable changes to wildlife at the Pantex Plant since DOE issued the SWEIS. The all-time wildlife list for Pantex, as reported in 2010, includes 45 species of mammals, 197 species of birds, and 28 species of reptiles and amphibians (B&W Pantex 2011, Section 3.4). The

majority of these species is associated with the playas and surrounding upland areas. NNSA has instituted management initiatives to maintain biodiversity, including revegetation of formerly cultivated areas, especially around playas, and to manage prairie dogs as part of the shortgrass prairie ecosystem.

Threatened and Endangered Species. Since DOE issued the SWEIS, changes to threatened and endangered species at the Pantex Plant have been limited to changes in several species designations by the U.S. Fish and Wildlife Service and the Texas Parks and Wildlife Department. These changes in designation are described in subsequent sections of this SA. Black-tailed prairie dog (*Cynomys ludovicianus*) colonies are found in the area. They are considered a rare species by the State of Texas and attract or provide habitat for some special status species such as the ferruginous hawk, bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), and western burrowing owl.

The Texas horned lizard is the only threatened or endangered species that is a year-round resident of the area. The American and Arctic peregrine falcons (*Falco peregrinus anatum* and *Falco peregrinus tundrius*), as well as the bald eagle and whooping crane (*Grus americana*), are migratory and may be observed along the project route during the fall through spring migrational and wintering periods.

1.3.3.6 Socioeconomic Resources

As would be expected, the population in the region around the Pantex Plant has grown since DOE issued the SWEIS. Population data from the 2010 Census are now available at most tracking levels and were used to generate Figure 1-3, showing the population distribution at 5-mile intervals within 50 miles of the Plant. Figure 1-4 provides an expanded, or exploded, view of the first two circles (that is, the 5-mile and 10-mile radius circles). According to the 2010 Census, the total population within 50 miles of the Pantex Plant is 316,132 people. This is an increase of 18.4 percent over the corresponding population of 267,107 people described in the SWEIS (DOE 1996a, Section 4.14.2.1).

The employment levels at the Pantex Plant have not grown at the same rate as the region's population; in fact, the Plant's employment levels have remained relative steady. As a result, it is likely that socioeconomic indicators of the region, such as workforce, demands on services, and disposable income, have grown faster than the indicators for the Plant. Thus, the Plant's contribution represents a smaller percentage than at the time DOE issued the SWEIS. This may not be the case for all factors. For example, the average income of Pantex employees was greater than the average income in the region at the time DOE issued the SWEIS, and this is likely still the case. Thus, the Plant's contribution to the region's economy has not decreased as much as its contribution to the region's workforce numbers. However, it is unlikely that the Pantex Plant's impact on any socioeconomic indicator in the region has increased significantly.

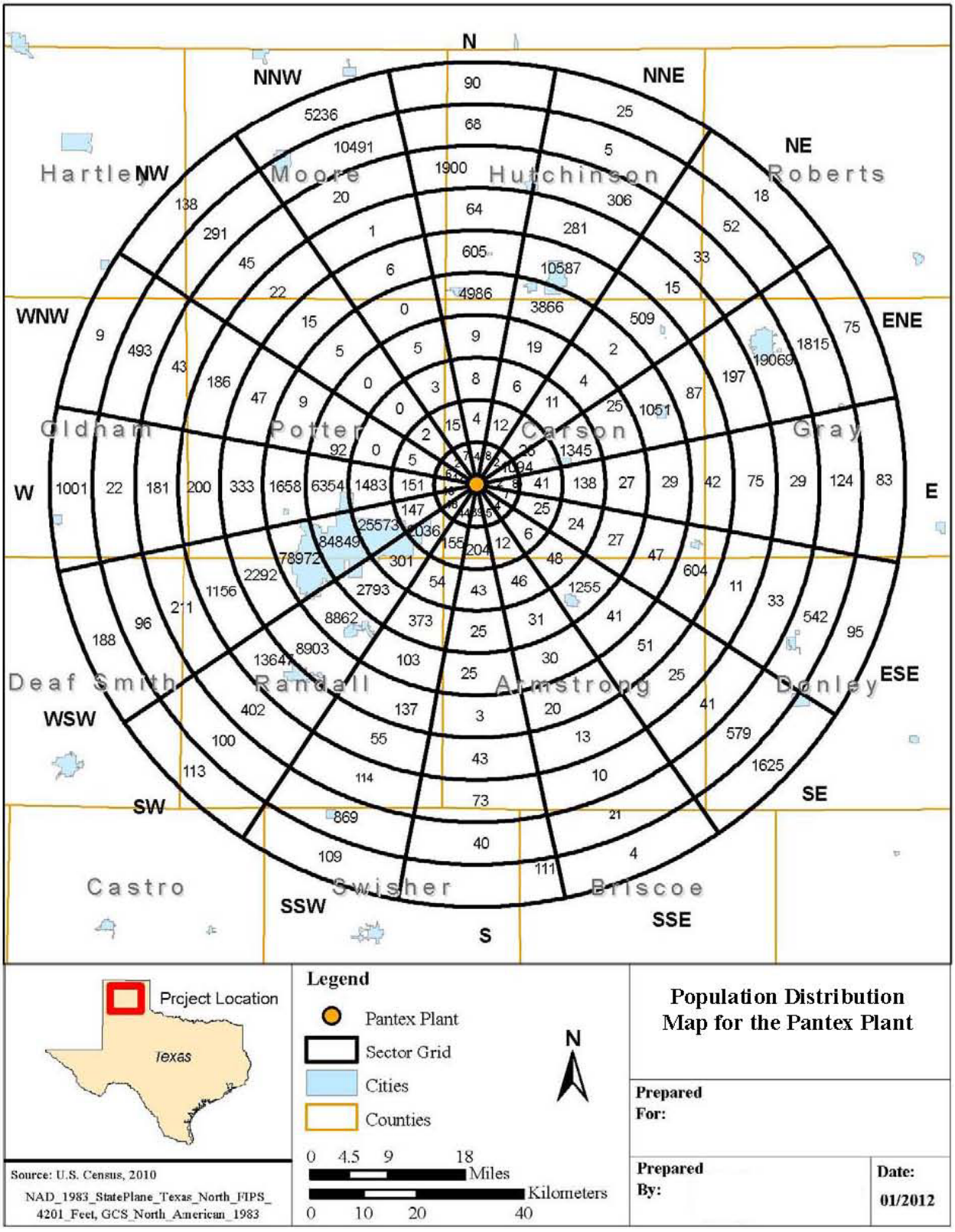

Figure 1-3. 2010 Population Distribution within 50 miles of the Pantex Plant

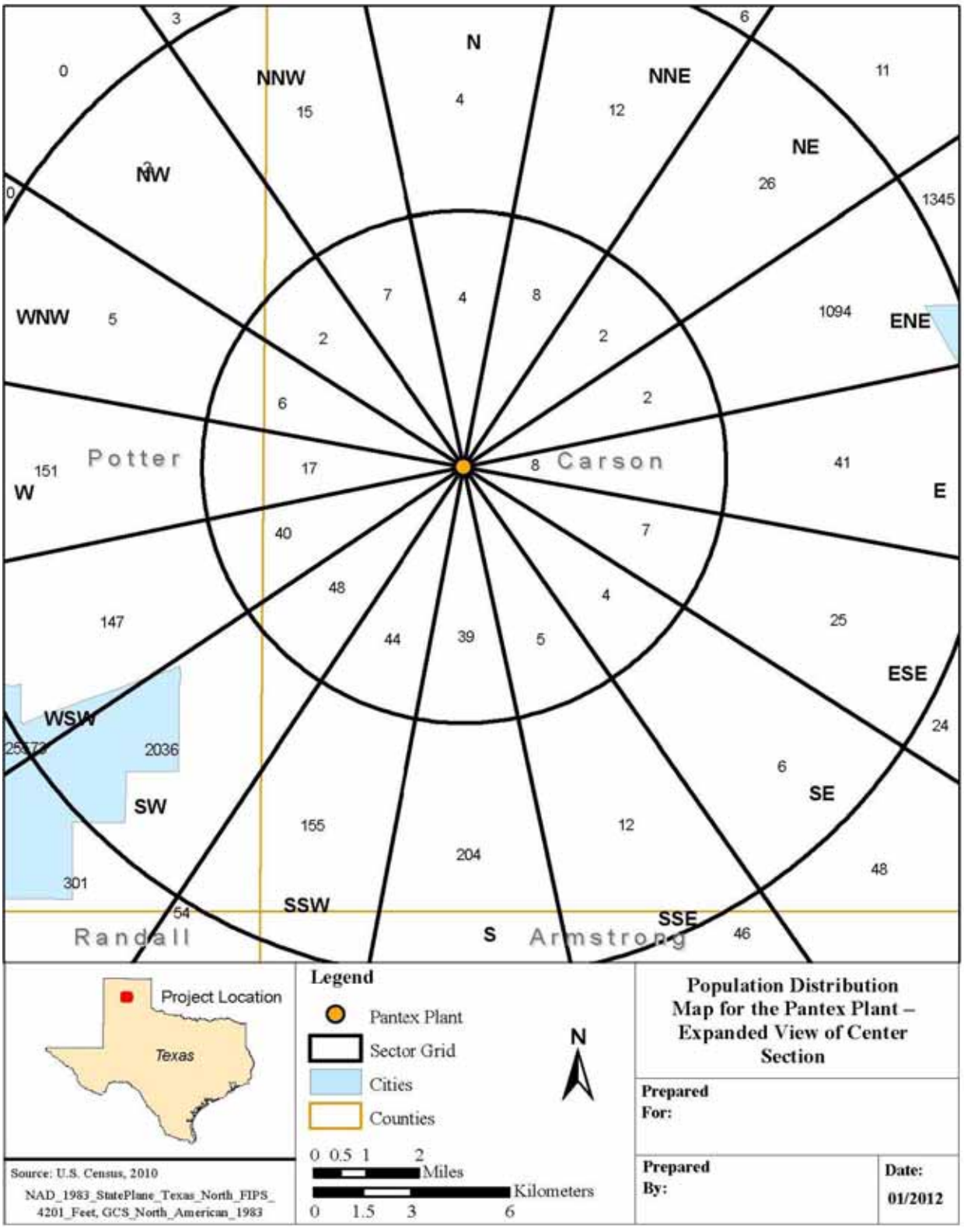

Figure 1-4. Expanded View of the Center of Figure 1-3 (2010 population distribution)

1.4 Operating Basis

The Pantex SWEIS assessed impacts of a Pantex Plant operating basis consisting of a maximum activity level of 2,000 weapons per year and an increase in the interim storage limit from 12,000 pits to 20,000 pits. The SWEIS also evaluated repackaging of pits from AL-R8 containers into AT-400A containers for onsite staging and ultimately offsite shipment (DOE 1996a, Section 3.1.1). In subsequent evaluations, NNSA determined that repackaging the pits in AL-R8 sealed insert containers (or AL-R8 SI containers) instead of the AT-400A containers would result in lower worker doses and could be done in a shorter timeframe (NNSA 2003, Section 1.4). These containers, however, are not certified shipping containers and some degree of repackaging will be necessary for pits transported offsite.

Table 1-1 provides a summary of the Pantex Plant's operating basis in terms of the number of weapons assembly/disassembly actions accomplished since DOE issued the SWEIS and planned for the near future. The 2003 SA identified the pit repackaging activities as a separate, scheduled function that was also representative of the Plant's operating basis. However, the backlog of repackaging actions was completed in the 2005/2006 timeframe, so those actions are not shown in the table. Changes in the number of pits in interim storage and pit packaging, or repackaging, actions are now a direct function of the weapons assembly/disassembly activity.

Table 1-1. Weapons Work Since the SWEIS was Issued and Planned Through 2016

Fiscal Year	Weapons Assembly/Disassembly[a] (units)	Fiscal Year	Weapons Assembly/Disassembly[a] (units)	Fiscal Year	Weapons Assembly/Disassembly[a] (units)
1996	1,976	2003	699	2010	766
1997	884	2004	430	2011	774
1998	1,422	2005	562	2012	708
1999	591	2006	828	2013	1,267
2000	636	2007	1,027	2014	1,391
2001	530	2008	1,152	2015	1,389
2002	985	2009	704	2016	1,258

Source: B&W Pantex 2012.

a. Includes dismantlement, evaluation, maintenance, rebuilds, limited life components, and repair units. The unit numbers are actuals for Fiscal Year (FY) 1996 through FY2011 and estimates for FY2012 through FY2016. The estimates (FY2012 through FY2016) were as of May 22, 2012, but they change frequently over time as planning factors change.

1.5 Intentional Destructive Acts

In the events following the terrorist attacks of September 11, 2001, NNSA implemented measures to minimize the risk and consequences of potential terrorist attacks on its facilities. The safeguards applied to protecting the Pantex Plant involve a dynamic process of enhancement to meet threats; these safeguards will evolve over time. It is not possible to predict whether intentional attacks will occur at any site, or the nature or types of such attacks. Nevertheless, NNSA has re-evaluated security scenarios involving malevolent, terroristic, or intentional destructive acts to assess potential vulnerabilities and identify improvements to security procedures and response measures (Brooks 2004, all). Security at its facilities is a critical priority for NNSA. Therefore, NNSA continues to identify and implement measures to defend and deter attacks. NNSA maintains a system of regulations, orders, programs, guidance, and training that form the basis for maintaining, updating, and testing site security to preclude and mitigate any postulated terrorist actions (Brooks 2004, all).

The conservative assumptions inherent in the accidents analyzed for the Pantex Plant assume initiation by natural events, equipment failure, or inadvertent worker actions. These same events could be caused by intentional malevolent acts by saboteurs or terrorists. For example, a criticality could be purposefully

created, or high explosives could be used to damage buildings in the same way that an earthquake could. The resulting radiological release and consequences to workers and the public would be similar, regardless of the nature of the initiating event.

The Pantex Plant's physical security protection strategy is based on a graded and layered approach supported by an armed Protective Force, which is trained to detect, deter, and neutralize adversary activities and is backed up by local, State, and Federal law enforcement agencies. Both staffed and automated access-control systems are used to limit entry into areas or facilities to authorized individuals. Automated access-control systems include controlled booths, turnstiles, doors, and gates. Escort requirements provide access controls for visitors. Barriers, electronic surveillance systems, and intrusion detection systems form a comprehensive site-wide network of monitored alarms. Various types of barriers channel, delay, or deny personnel access to classified matter, protected materials, and vital areas. Barriers direct the flow of vehicles and deter or prevent penetration by motorized vehicles where they could significantly increase the likelihood of a successful malevolent act. Tamper-protected surveillance, intrusion detection, and alarm systems designed to detect adversary action or anomalous behavior inside and outside the facilities are paired with assessment systems that evaluate the nature of the adversary action. Random patrols and visual observation are also used to deter and detect intrusions. Penetration-resistant, alarmed vaults and vault-type rooms are used to protect classified materials.

There is also a potential for attempted sabotage or terrorist attack during transport. The safety features of the transportation casks that provide containment, shielding, and thermal protection also protect against sabotage. Although it is not possible to predict the occurrence of sabotage or terrorism or the exact nature of such events if they were to occur, NNSA has examined several transportation accident scenarios that could result in the same types of consequences from such acts, such as those documented in the *Final Environmental Impact Statement on Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* (DOE 1996b, all). However, because the materials being considered for transport under this SA would have substantially less total radioactivity than those analyzed in the aforementioned EIS, the corresponding impacts resulting from such events would be much lower.

1.6 National Environmental Policy Act Activities

New projects and modifications to existing projects that have been initiated since DOE issued the SWEIS have been described and evaluated in environmental assessments (EAs), SAs, and NEPA review forms in accordance with Pantex Plant Work Instruction 02.01.04.02.01, "Prepare National Environmental Policy Act Documents." Appendix A, Tables A-1 and A-2 of this SA list the NEPA status for included projects. Appendix A, Table A-3 describes NEPA actions expected to be initiated from 2012 through 2016. In addition, NNSA has completed NEPA checklists, documents, or review forms for many smaller projects. Projects planned as of 2006 are listed in Appendix A of the Programmatic Information Document (BWXT Pantex 2006, all), and updated information is provided in the Pantex FY2012–FY2021 Ten-Year Site Plan (NNSA/B&W Pantex 2011a, all). NEPA reviews will be conducted prior to implementation of future projects, whether new construction, modifications, or demolitions, in accordance with DOE NEPA Implementing Procedures (10 CFR Part 1021) and Pantex Plant Work Instruction 02.01.04.02.01.

1.6.1 NEPA Actions Related to Pantex Plant

Draft Environmental Impact Statement for the Proposed Consolidation of Nuclear Operations Related to the Production of Radioisotope Power Systems (DOE/EIS-0373D). This Draft EIS evaluates the environmental impacts of the proposed action and alternatives for consolidating radioisotope power system nuclear operations at a single site to reduce the security threat in a cost-effective manner, improve program flexibility, and reduce interstate transport of special nuclear material. Under the

proposed action, milliwatt radioisotope thermoelectric generator heat sources removed from nuclear weapons and currently stored at the Pantex Plant would be transported to the Idaho National Laboratory for storage and processing. The potential impacts of this transportation activity are evaluated in the Draft EIS. The Final EIS has not been issued and is currently on hold (DOE 2012, p. 19). Since there is no decision at this time, this SA does not include potential impacts of this proposed activity. Should the proposed action be implemented in the future, impacts at the Pantex Plant would be very minor. The radioisotope thermoelectric generator heat sources are small (typically about 0.75 inch in diameter and height), and DOE estimates that moving the units from both the Pantex Plant and Los Alamos National Laboratory would require a total of 28 shipments, occurring over 14 years (DOE 2005, Appendix D). There would be a correspondingly small decrease in the amount of nuclear material in storage at the Pantex Plant.

Final Complex Transformation Supplemental Programmatic Environmental Impact Statement (DOE/EIS 0236-S4). In October 2008, NNSA issued the *Final Complex Transformation Supplemental Programmatic Environmental Impact Statement* (Complex Transformation SEIS). The Complex Transformation SEIS evaluates future missions of DOE's Stockpile Stewardship and Management Program and the nuclear weapons complex. Under the preferred alternative, the Pantex Plant would remain the assembly/disassembly/high-explosives production and manufacturing center, and nondestructive surveillance operations would be consolidated at the Plant. In addition, the Pantex Plant would remain the high-explosives production and machining center and would conduct experiments with up to 48 pounds of high explosives. NNSA issued its Record of Decision on December 19, 2008, for programmatic alternatives, stating that assembly and disassembly of nuclear weapons and high-explosives production and manufacturing will remain at the Pantex Plant in Texas (73 FR 77644). In another Record of Decision, also issued on December 19, 2008 (for project-specific alternatives rather than programmatic alternatives), NNSA decided to transfer the major environmental test facilities functions currently performed in two buildings at Lawrence Livermore National Laboratory to Pantex (73 FR 77656). The Record of Decision stated that this would require removal of equipment from Lawrence Livermore…

> "and the installation at Pantex of a measurement tower, a sealed source storage pit, and a five-ton bridge crane. This installation would require modification to only one building at Pantex; no new construction would be required. These changes would result in the addition of two jobs at Pantex. Operations would not be expected to generate additional waste other than normal office refuse, and waste associated with occasional use of solvent and cleaning fluids, and would not use additional water other than the sanitary and personal usage of the two additional employees."

Because these decisions leave Pantex Plant's primary operations unchanged, this SA does not further address the Complex Transformation SEIS. An increase in the quantity limit for the size of high-explosives testing, however, is addressed in some detail in the SA discussion of acoustic effects.

Environmental Assessment for the Proposed High Explosive Pressing Facility (DOE/EA-1613). In June 2008, NNSA issued this EA to analyze the environmental consequences of a construction project at the Pantex Plant. The proposed action is to construct a new facility that would consolidate the Pantex Plant's current high-explosive pressing activities at one facility. The approximately 30-acre area required for construction would include a soil stockpiling area, an area for construction vehicles to enter and exit, an area for additional construction equipment, a laydown area, a permanent access road, a construction fence, a temporary concrete batch plant, and the proposed pressing facility. Based on the information and analyses in the EA, NNSA determined that the proposed action was not a major Federal action significantly affecting the quality of the human environment, within the meaning of NEPA, and that an EIS was not required. NNSA issued a Finding of No Significant Impact (FONSI) for the project and construction of the high-explosive pressing facility is currently underway, with facility operations

expected to begin in 2015, if construction is not delayed. As a result, this SA includes effects of this facility as one of the changes taking place between 2012 and 2016.

Environmental Assessment for the Proposed Pantex Renewable Energy Project (DOE/EA-1696). In July 2010, NNSA issued this EA to analyze a proposed action to design, construct, operate, maintain, and decommission a wind generator farm and its associated distribution infrastructure on Pantex Federal property, or on adjacent land leased from TTU. The EA describes the proposed action as being completed in three phases. Phase 1 consists of installing 4 to 7 wind turbines, Phase 2 adds 20 to 23 wind turbines, and Phase 3 involves installation of another 8 to 9 units, bringing the combined average generating capacity to approximately 40 megawatts. Phase 2 actions include a substation and a control building Based on the analysis in the EA, NNSA issued a FONSI. At the present time, Pantex is undertaking Phase 1 of the overall project, with no firm plans on when the subsequent phases might be implemented. However, in order to be conservative, this SA includes all three phases of the proposed project as actions that could be taken between 2012 and 2016.

2. COMPARISON OF IMPACTS

2.1 Introduction

Figure 2-1 illustrates the impact assessment process NNSA used in this SA. As this figure indicates, NNSA conducted an initial screening review of new, modified, or proposed projects and missions; new regulations; and updated environmental and operating basis information. This review identified whether associated levels of activity or potential for impact on a particular resource area, either individually or collectively, warranted additional analysis. No further analysis was conducted for those resource areas where it was evident from the initial screening that associated impacts would be minimal and within the impacts identified in the Pantex SWEIS.

Other resource areas required further analysis to determine (1) whether potential impacts on the areas were outside the envelope of environmental consequences established in the SWEIS, and (2) if so, whether the impacts could be considered significant within the context of NEPA (40 CFR 1508.27), which would require preparation of a new or supplemental EIS. This SA used a "sliding-scale" approach, such that analyses for the resource areas are in proportion to their significance.

The *Pantex FY2012–FY2021 Ten-Year Site Plan* (NNSA/B&W Pantex 2011a, all) and updates provided by Pantex (B&W Pantex 2012, all) describe ongoing, planned, and proposed activities. NNSA reviewed these sources, as well as information provided in the 2008 SA (NNSA 2008, all) and other NNSA and Pantex Plant documents, to identify potential new missions and specific project activities for analysis in this SA.

Table 2-1 presents a comparison of changes in environmental impacts that have occurred in the 15 years (November 1996 through December 2011) since the SWEIS was issued and those that are expected to occur during the following five-year interval (2012 through 2016). These changes include those resulting from the activities described in Section 1.3 and the projects listed in Appendix A, Tables A-1, A-2, and A-3 of this SA.

The columns in Table 2-1 present Pantex SWEIS values for the 2,000-weapons level of the Preferred Alternative, current values, and projected future values (2012 through 2016) of selected impact indicators for each resource area. For each resource area, the last row in the table provides a brief comparison of the impacts to those evaluated in the SWEIS. Section 2.2 provides more detailed analyses for those resource areas that required further analysis to determine the significance of identified impacts relative to the impacts identified in the SWEIS.

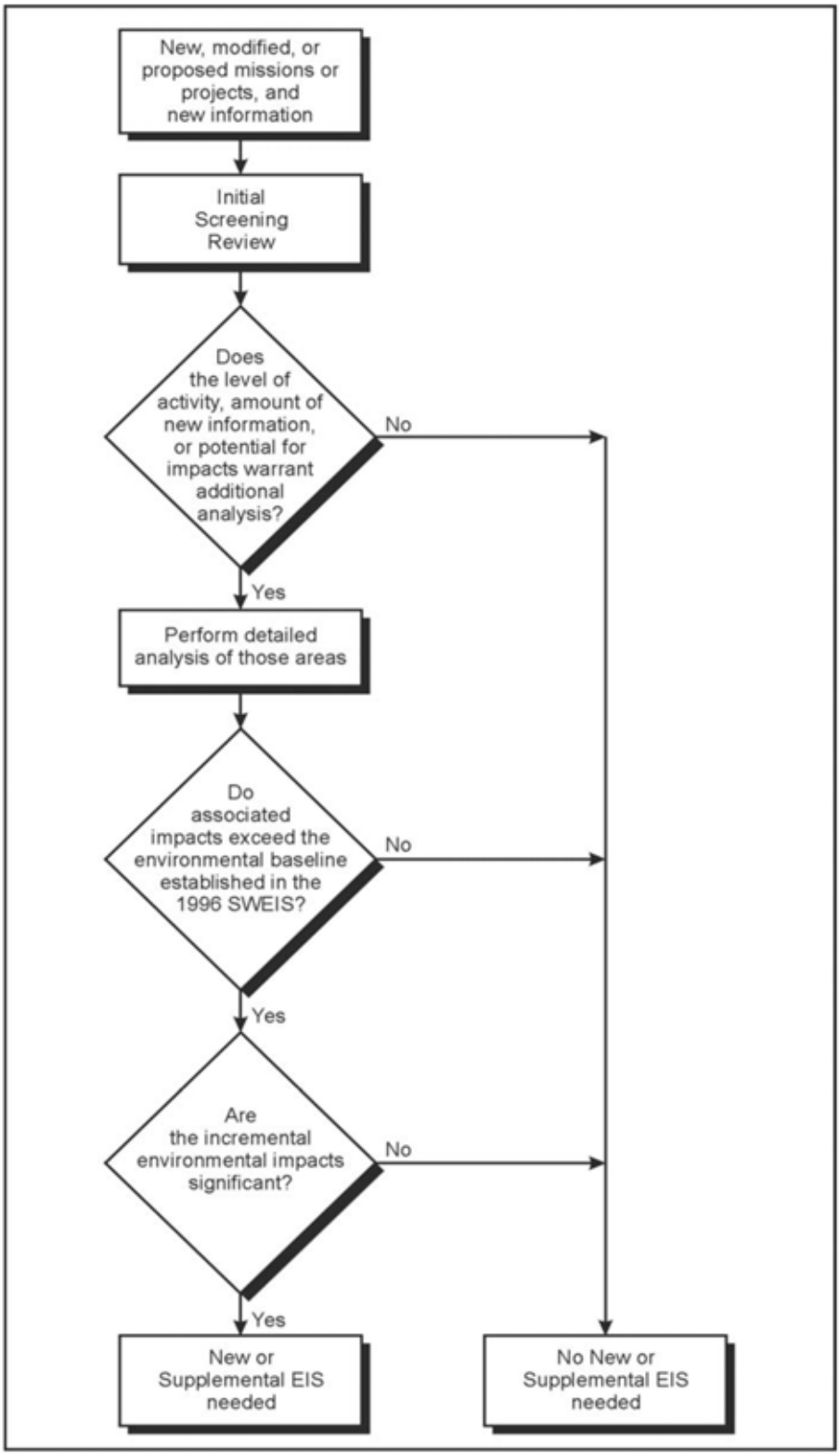

Figure 2-1. Impact Assessment Process Used in this Supplement Analysis

Table 2-1. Summary Comparison of Impact Indicators

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Facilities Infrastructure			
Total floor space, square feet	3,083,960	3,114,600[a]	3,245,600[a]
Roads, miles	47	56[b]	No plans for new roads[b]
Comparison to the SWEIS: The net increase in floor space (owned and leased) over the next five years is expected to exceed the projection in the SWEIS by about 5.2 percent. The current length of paved roads within the Plant represents an increase of about 19 percent over the amount considered in the SWEIS. Although not shown above, projects in the next five years could involve up to 4 miles of new, limited-use access roads on DOE/NNSA-owned land in order to access proposed wind turbine sites (NNSA 2010a, Section 2.2).			
Utilities Infrastructure			
Electricity, megawatt-hours per year	90,400	71,672[b]	66,500[b]
Steam, million pounds per year	398	262[b]	271[b]
Natural gas, million cubic feet per year	573	358[b]	314[b]
Water (from the Ogallala Aquifer), million gallons per year	267	107[b]	105[b]
Wastewater treatment (influent), million gallons per year	171	48[b]	50[b]
Wastewater discharge (treated wastewater and treated perched groundwater) million gallons per year	171 (same as influent above)	222[b]	350[b]
Comparison to the SWEIS: Impacts on utility infrastructure would continue to be bounded by the analyses presented in the SWEIS. The Pantex Plant is actively working toward goals of reducing energy use and water consumption and, as a result, future projections are generally based on downward-sloping trends. Values shown in the five-year projection column are the annual rates targeted for 2016. The exception is wastewater discharge, which is greater than was evaluated in the SWEIS because it now includes water produced from the Environmental Restoration Program's two pump and treat systems that pump water from the perched aquifer below the Plant (and is the reason for the wastewater discharge quantities being greater than the water production quantities). This source of wastewater was not part of the SWEIS evaluation and represents a significant contributor to the wastewater discharged by the Plant. For example in 2010, water from the pump and treat systems contributed about three-quarters of the water discharged to the Plant's subsurface irrigation system (B&W Pantex 2011, Section 8.2; NNSA/B&W Pantex 2011b, Section 2.1). The current wastewater discharge value takes into account evaporative losses while the treated wastewater is in holding ponds prior to irrigation; no attempt was made to forecast evaporative losses for the future discharge. Future electrical demand will be offset to some extent by the planned construction of Pantex wind turbine generators. If all three phases of the Pantex Renewable Energy Project are implemented, average electricity production from the wind turbines would more than offset the entire Pantex electrical demand (NNSA 2010a, Section 3.2.4).			
Land Resources			
Main Plant area, acres	9,100	10,630[c]	10,630[c]
		acres, percent of main Plant area	
Operations	The SWEIS does not include a breakdown by land use category	2,620[b] 25	2,640[b] 25
Cultivated		4,259[b] 40	4,239[b] 40
Rangeland / grass land		3,627[b] 34	3,627[b] 34
Other[d]		124 1	124 1
Comparison to the SWEIS: Current values include 1,526 acres of cultivated land on the east side of FM 2373 that were obtained by Pantex in 2008 and not addressed in the SWEIS. Although the SWEIS did not provide a detailed land use breakdown, it describes Plant activities occurring on about 2,000 acres and agricultural activities on about 6,400 acres. The current land uses within the main Plant area are, therefore, similar to those described in the SWEIS. Changes in land use that have occurred or are planned over the next five years would not fundamentally change land use at the Pantex Plant and impacts on land resources would not be substantially different than presented in the SWEIS.			

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Visual Resources			
Landscape appearance	Pantex Plant appears as a cluster of low buildings on a flat landscape.[e]	Negligible changes	New buildings near public roads and wind turbines on DOE/NNSA-owned or –leased property bordering U.S. Highway 60 and FM 2373.
Comparison to the SWEIS: This resource was not evaluated in the SWEIS. At present, the viewscape has not changed substantially from when the SWEIS was prepared, but planned projects would involve visual effects of temporary construction and permanent buildings in areas nearer to public roads than most existing facilities, and most notably, the phased construction of up to 39 wind turbines in current cropland and range-land adjacent to U.S. Highway 60 and FM 2373. The primary project involved, the Pantex Renewable Energy Project, has been evaluated in an EA (NNSA 2010a, all) and NNSA has concluded that it would not significantly affect visual resources.			
Geology and Soils			
Temporary soil disturbance from construction, square feet	342,300	6,164,700	Included in current values
Comparison to the SWEIS: The analysis presented in the SWEIS continues to bound the potential for geologic hazards to affect existing or proposed facilities at the Pantex Plant. Since 1995, there have been no earthquakes of magnitude 4 or greater within the Texas Panhandle and no earthquakes of magnitude 5 or greater within 200 miles of the Pantex Plant (USGS 2012, all). As was done in the SWEIS, the current value for land disturbance is for construction of projects that may occur within a five- to six-year window starting at the present time. The amount of land disturbance that may occur is much greater than evaluated in the SWEIS, but a vast majority (about 98 percent) of the disturbance would be attributed to the Pantex Renewable Energy Project and includes the access roads and electrical connection lines that would be needed to support construction of up to 39 wind turbines. NNSA has already evaluated the energy project in an EA (NNSA 2010a, all) and concluded that it would not significantly affect the quality of the human environment. Without the energy project, land disturbance estimates would be about 127,700 square feet, which is well below the amount evaluated in the SWEIS. All land-disturbing activities would include application of best management practices to minimize soil erosion, including measures to limit the amount of time soils are exposed until revegetated or otherwise covered.			
Water Resources*, millions of gallons per year*			
Volume of treated wastewater discharged to Playa 1 (SWEIS) or to irrigation (current and future)	171	222[b]	350[b]
Volume of groundwater pumped from Ogallala Aquifer	267	107[b]	105[b]
Comparison to the SWEIS: Impacts on water resources would continue to be bounded by the analyses presented in the SWEIS. The Pantex Plant is actively working toward goals of reduced water consumption and, as a result, future projections are based on a downward-sloping trend. The water value shown in the five-year projection column is the annual rate targeted for 2016. Wastewater treated is greater than was evaluated in the SWEIS because it now includes water produced from the Environmental Restoration Program's two pump and treat systems that pump water from the perched aquifer below the Pantex Plant (and is the reason for the wastewater quantities being greater than the water production quantities). This source of wastewater was not part of the SWEIS evaluation. In 2010, water from the pump and treat systems contributed about three-quarters of the treated water discharged by the Plant (BWXT Pantex 2011, Section 8.2; NNSA/BWXT Pantex 2011b, Section 2.1). Treated water from the Wastewater Treatment Facility and the pump and treat systems is now beneficially reused through a permitted discharge to a subsurface irrigation system on Pantex property with a backup permitted surface discharge to Playa 1 (the wastewater disposal method described in the SWEIS).			

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Water Resources – Environmental Restoration Program			
Volume of groundwater pumped from perched aquifer, millions of gallons per year	N/A	191[b]	300[b]
Environmental Restoration Program Actions	• Groundwater characterization effort • Contaminated soil removal efforts • Groundwater pump and treat system treatability study • Soil vapor extraction • 144 solid waste management units identified for evaluation	• Playa 1 pump and treat system[f] • Southeast pump and treat system[f] • Zone 11 *in-situ* bioremediation[f] • Southeast *in-situ* bioremediation[f] • Burning grounds soil vapor extraction[f] • Soil remedial actions – 254 solid waste management units identified and evaluated[f] • Monitoring, inspection, and maintenance of completed remedial actions[f]	Continuation of current actions Possible new actions:[b] • Expansion of Zone 11 *in-situ* bioremediation with more wells and even a pump and treat system • Storage pond and piping to improve beneficial use of treated groundwater • Additional extraction wells for southeast pump and treat system • Additional monitoring wells
Comparison to SWEIS: The Environmental Restoration Program has evolved and expanded since the SWEIS was issued. The Selected Remedy is focused on cleanup of perched groundwater underlying the site as the best approach to protecting the regional High Plains Aquifer. Construction, operation, and maintenance of the Selected Remedy was accomplished through CERCLA, which incorporated RCRA requirements via the criteria of State Acceptance that was later manifested in issuance of modified Compliance Plan No. 50284 by the Texas Commission on Environmental Quality. Future actions are expected to include measures to optimize ongoing remedial actions. Impacts of Program actions have been evaluated independently as part of the interagency agreement required through compliance with CERCLA. This has included public and stakeholder involvement, and the overall objective has always been to lessen the potential for adverse impacts to human health and the environment. Accordingly, the potential for adverse impacts is not greater than described in the SWEIS. The current quantity of water pumped from the perched aquifer is greater than the corresponding contribution to the subsurface irrigation system due to evaporative losses in holding ponds prior to irrigation.			
Air Quality			
Construction emissions	Less than 3.3 tons per year in PM_{10} in peak construction year	Not estimated, but peak year expected to be greater than reported in the SWEIS due to increased land disturbance; however, emissions would still be temporary and minimized to the extent practicable	Included as part of "Current Value" forecast (as was done in SWEIS)
Stationary source operation emissions, tons per year	CO – 22.37 NO_x – 87.02 PM_{10} – 9.30 SO_2 – 0.0001 VOC – 3.09 HAPs – 22.40 Lead – 0.20	2010 Emissions[c]: CO – 6.14; NO_x – 33.79; PM_{10} – 1.72; SO_2 – 0.88; VOC – 4.54; HAPs – 3.64; Lead – in HAPs Current PTE Limit[g]: 28.53; 93.08; 19.14; 5.14; 33.03; 20.6	CO – 6.14 NO_x – 33.79 PM_{10} – 1.72 SO_2 – 0.88 VOC – 4.54 HAPs – 3.64 Lead – in HAPs

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Emissions from firing sites	Also included in above operation emissions (tons per year) CO – 0.10 NO_2 – 0.0043 PM_{10} – 0.0012	Emissions may increase, but would remain within the following permit limits (pounds per hour)[h]: CO – 716.00 NO_x – 50.10 PM_{10} – 97.60 VOC – 131.00 SO_x – 8.36 HAP – 76.80 NH_3 – 1.00 HCl – 24.00 HCN – 1.00 HF – 23.70 N_2O – 1.00 Plus total tons per year from firing sites are included in PTE limits (above) for entire Plant.	Emission limits for firing sites are expected to stay as described for current conditions.
Greenhouse gas emissions in carbon dioxide equivalent tons per year[i] Scope 1 and 2 Scope 3	Not evaluated, but Plant energy intensity has been reduced by 27% since 2003[i]	 82,000 26,500	 72,800 24,300
Comparison to SWEIS: The impacts on air quality would not be substantially different from the analyses presented in the SWEIS and would be less for certain air pollutants. Firing site emissions are higher than evaluated in the SWEIS, but must meet pound per hour limits set by the Plant's air permit. Also, the total tons per year from the firing sites must be included in the air permit's annual limit as well as the annual Potential to Emit certification. With respect to greenhouse gas emissions, Scope 1 (direct) emissions and Scope 2 (indirect resulting from purchased electricity) emissions are reported separately from Scope 3 (other indirect) emissions because of the reduced control NNSA has over Scope 3 emissions. Greenhouse gas emissions were not evaluated in the SWEIS, but it is reasonable to assume they are less now as a result of energy intensity reductions already made at the Pantex Plant.			
Acoustics (Sound)			
Construction and non-firing site operations	Negligible offsite impacts	Negligible offsite impacts	Negligible offsite impacts, includes planned wind turbines
Firing site operations Detonations per year	60 (in 1994)	≈ 3,200 (in 2006)	Estimates not available
Normal maximum net explosive weight, pounds	55 at all firing sites	154 at FS-4 and FS-10 308 at FS-21 and FS-22	154 at FS-4 and FS-10 308 at FS-21 and FS-22
Peak sound level decibels at closest residence (feet) by firing site	FS-4: 141.1 (3,166) FS-10: 139.1 (4,003) FS-21: 130.4 (10,839) FS-22: 136.2 (5,566)	FS-4: 135.5 (3,166)[j] FS-10: 132.6 (4,003)[j] FS-21: 122.6 (10,839)[j] FS-22: 130.8 (5,566)[j]	FS-4: 135.5 (3,166)[j] FS-10: 132.6 (4,003)[j] FS-21: 122.6 (10,839)[j] FS-22: 130.8 (5,566)[j]
C-weighted day-night average noise levels (in C-weighted decibels)	Not evaluated	< 62[j]	< 62[j]
Comparison to the SWEIS: The current number of firing site detonations is greater than described in the SWEIS, but peak sound levels at the closest residence have remained similar. The difference in peak sound levels from the SWEIS to present is attributed to the current use of a more elaborate sound propagation model that incorporates attenuation factors not considered in the SWEIS model. The SWEIS peak values are also based on a 6.9 mile per hour wind blowing from the firing site toward the sound receptor, increasing the sound effect. The 2008 SA (NNSA 2008, Section 2.2.4) included an evaluation of increasing maximum net explosive weights to 70 kilograms (154 pounds) for FS-4 and FS-10, and to 140 kilograms (308 pounds) for FS-21 and FS-22. This increase in operational limits has now gone into effect. Evaluation of the increased limits indicates that peak sound levels at the nearest residence would remain below 140 decibels and the firing sites would be operated such that the C-weighted day-night average noise levels would remain below 62 C-weighted decibels at the nearest residence. Land use guidelines indicate locations with C-weighted day-night average noise levels below 62 C-weighted decibels are usually suitable for all types of land use activities.			

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Biotic Resources			
Wildlife habitat within the main Plant area, acres			
Operations area	The SWEIS does not include a breakdown by land use category.	2,620[b]	2,640
Cultivation		4,259[b]	4,239
Rangeland / grass land		3,430[b,k]	3,430
Wetlands		197 [b,k]	197
Threatened and Endangered Species (Federal/State)			
Plants			
Of concern or rare	0/0	1/1	1/1
Animals			
Endangered	4/5	2/2	2/2
Threatened	1/3	1/6	1/6
Candidate or proposed	2/Not designated	2/Not designated	2/Not designated
Of concern or rare	15/Not designated	Not designated/15	Not designated/15
Comparison to the SWEIS: The impacts on biotic resources would not be substantially different from the analyses presented in the SWEIS. Current wildlife habitat is similar to that at the time of the SWEIS and changes in the next five years are expected to be very minor. With respect to sensitive species, Texas identifies 24 endangered, threatened, candidate, or rare species as occurring or potentially occurring in Carson or Potter Counties. Significant changes since the SWEIS include: addition of the Mexican mud-plantain as a rare plant in the area; Federal delisting of the American peregrine falcon, arctic peregrine falcon, and bald eagle; Federal removal of the swift fox and mountain plover from the candidate list and addition of the lesser prairie-chicken; and State redesignation of the bald eagle and American peregrine falcon from endangered to threatened. Changes of the numbers of species in each category are unrelated to operation of the Pantex Plant.			
***Cultural Resources**, as applicable "total sites identified/number of sites potentially eligible for NRHP listing"*			
Prehistoric Archaeology[l,m]	Negligible impacts – 57 sites identified; NRHP eligibility not determined. Negligible impacts – 1 bison bone site identified	57/2 – 2 of 57 sites potentially eligible for NRHP. No impact from ongoing activities. Minor impacts – 2 findings: Bison bones excavated and placed in an exhibit at the Plant. Peccary bones excavated from construction site and cataloged (11/2011). Bones could not be protected *in-situ* at either site.	No impact – Per PA/CRMP, the 2 potentially eligible sites will be preserved *in-situ* and monitored. No impacts expected.
Pre-World War II[l]	Negligible impacts – 12 historic sites identified; NRHP eligibility not determined.	12/0 – None of 12 is eligible for NRHP status. No impact from ongoing activities.	No impacts expected – No NRHP-eligible sites present.
World War II[l]	Negligible impacts – Standing structures, foundations, and ruins of era surveyed; NRHP eligibility not determined	118/0 – None of the remaining 118 structures are eligible for NRHP status due to their being highly modified. Plant's records of era are NRHP-eligible.	No impacts expected – No NRHP-eligible sites present. Records of era will be preserved.
Cold War[l]	Impacts expected to be negligible – Surveys for this period not yet conducted.	661/178 – Of the 661 buildings considered, 178 were determined to be NRHP-eligible.	Minor impacts – NRHP-eligible buildings to be managed in accordance with PA/CRMP.
American Indian[l]	No impact – No American Indian sites, traditional cultural properties, or mortuary remains identified in the Plant area.	No impact – No sites identified.	No impacts expected.

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Comparison to the SWEIS: Impacts on cultural resources would not be substantially different from the analyses present in the SWEIS. Additional surveys have been performed and many properties have been determined to be eligible for the NRHP. The Programmatic Agreement/Cultural Resource Management Plan (PA/CRMP) finalized in 2004 among DOE/NNSA, BWXT Pantex, the SHPO, and the ACHP, identifies the Pantex Plant's important cultural resources and defines how they will be protected. The newly acquired 1,526 acres of land on the east side of FM 2373 was not addressed in either the SWEIS or the PA/CRMP. However, this new land has been cultivated for many years, is not within one-quarter mile of playas or their major drainages, and based on the prehistoric archaeological site location model documented in the PA/CRMP; it is land with very low probability of site occurrence.			
Socioeconomic Resources			
Total Pantex Plant employees	3,800 workers	4,041 workers[b]	3,840 workers[b]
M&O contractor only	3,310 workers	3,451 workers[b]	3,250 workers[b]
Region of influence population – 50-mile radius data for SWEIS is from Section 4.14 Human Health	4 counties (1995) 209,762 people 50-mile radius (1995) 267,107 people	4 counties (2010) 249,881 people[n] 14-county ROI (2010) 358,053 people[n] 50-mile radius (2010) 316,132 people[n]	4 counties (2016) 264,532 people[o] 14-county ROI (2016) 373,074 people[o]
Comparison to the SWEIS: The impacts on socioeconomic resources would not be substantially different from the analyses presented in the SWEIS. The Pantex Plant M&O contractor employment level of 3,451 full-time equivalent workers at the start of 2012 is slightly higher than evaluated in the SWEIS, but it is expected to dip slightly below SWEIS levels in the next five years. Total Plant staffing excludes construction subcontractors (numbering 494 at the start of 2012), and for 2012 through 2016, DOE/NNSA assumes that staffing levels other than M&O will remain the same. The region of influence is now considered to be the 14 counties having significant land within a 50-mile radius around the Plant, rather than the 4 counties (Armstrong, Carson, Potter, and Randall) the SWEIS considered. Because staffing remains close to levels evaluated in the SWEIS and population in the region of influence continues to grow, the overall socioeconomic impacts of the Pantex Plant may be decreasing as associated percentages decrease.			
***Waste Management**, cubic yards per year*			
Low-level radioactive	326	74.9[c]	Waste generation in the next five years is expected to remain similar to current levels, except more mixed waste is expected.[b]
Low-level mixed	239.6	0.10[c]	
Hazardous and universal	251.5	714.9[c]	
Nonhazardous industrial	1,815.5	9,267.0[c]	
TSCA	Small	106.9[c]	
Medical	Small	≈19.2[p]	
Comparison to the SWEIS: Hazardous waste and nonhazardous waste are produced at higher rates than evaluated in the SWEIS, but disposal paths are well established and their availability is expected to continue in the future. The upcoming production schedule could result in a mixed waste generation rate higher than at present, but this rate should remain below the levels evaluated in the SWEIS.			
Onsite Transportation			
Annual weapons transports	Approximately 50 workers would be involved in these activities. This weapons level would have an estimated worker exposure of 61 person-rem and a group excess cancer fatality risk for a 10-year exposure of 0.024. Onsite transportation would not impact the public.	Approximately 50 workers would be involved in these activities. This weapons level would have an estimated worker exposure of 24 person-rem and a group excess cancer fatality risk for a 10-year exposure of 0.014 (based on new dose-to-risk conversion factor of 0.0006 per person-rem). Onsite transportation would not impact the public.	Approximately 50 workers would be involved in these activities. This weapons level would have an estimated worker exposure of 37 person-rem and a group excess cancer fatality risk for a 10-year exposure of 0.022 (based on new dose-to-risk conversion factor of 0.0006 per person-rem). Onsite transportation would not impact the public.
Comparison to the SWEIS: Onsite transportation impacts would continue to be bounded by the analyses presented in the SWEIS.			

Table 2-1. Summary Comparison of Impact Indicators (continued)

Resource Area	Impacts Indicators from the SWEIS (Based on 2,000-Weapons Level)	Impacts Indicators in this SA	
		Current Values	5-Year Future Projection (2012 through 2016)
Human Health			
Annual dose to maximally exposed offsite individual, millirem	5.8×10^{-5}	2.96×10^{-9} to 9.68×10^{-3} (1996 to 2011)	1.67×10^{-5}
Annual dose to the general population, person-rem	1.33×10^{-4}	2.56×10^{-8} to 1.14×10^{-2} (1996 to 2011)	5.09×10^{-6}
Average worker dose, rem	0.10	0.095	0.095
Comparison to the SWEIS: Impacts on human health are expected to remain very small. Because activities over the next five years are expected to be similar to past activities, doses to the public are expected to remain very small and similar to or less than indicated in the SWEIS. The historical measured and projected worker doses are essentially the same as indicated in the SWEIS.			
Facility Accidents			
Accident scenarios	11 accident scenarios	Accident scenarios have remained the same as the SWEIS, except that the frequency for 3 of the accident scenarios has increased.	Accident scenarios have remained the same as the SWEIS, except that the frequency for 3 of the accident scenarios has increased.
Population within a 50-mile radius	267,107 people	316,132 people	Not available (expected to increase slightly based on projections for 14-county area)
Distance to maximally exposed offsite individual	Varies by onsite release location.	Varies by onsite release location.	Varies by onsite release location.
Dose to latent cancer fatality conversion factor	0.0004 for workers 0.0005 for public	0.0006 for both	0.0006 for both
Comparison to the SWEIS: The consequences and risks from facility accidents remain very small and would not be substantially different from those presented in the SWEIS.			
Environmental Justice			
Minority Population (year) 4-county ROI 50-mile radius ROI 14-county ROI	 39,794 people (1990) 55,982 people (1990)	 50,500 people (2010)[n] Not available 71,750 people (2010)[n]	Projection estimate[q] 52,900 people (2016) Not available 74,600 people (2016)
Low-Income Population 4-county ROI 50-mile radius ROI 14-county ROI	 30,253 people (1990) 42,219 people (1990)	 39,400 people (2010)[n] Not available 55,400 people (2010)[n]	Projection estimate[q] 39,900 people (2016) Not available 56,300 people (2016)
Comparison to the SWEIS: Since the SWEIS was issued, minority and low-income populations increased at slightly higher rates than did the total population. In the case of minorities, State projections indicate this trend will continue into the near future. The projected human health risks from normal operations and facility accidents over the next five years are expected to remain small, so no disproportionate, adverse impacts are expected on minority or low-income populations.			

a. Source: NNSA/B&W Pantex 2011a, Attachment E.
b. Source: B&W Pantex 2012.
c. Source: B&W Pantex 2011, Sections 1.1 (land), 2.2.8.4 (air), and 2.10.1 (waste).
d. Note: The main Plant area of 9,100 acres shown in the SWEIS and included in the current area is the legal description that extends to the center of all public roadways surrounding the original main Plant. The land use categories do not extend into those surrounding public roadways and the "Other" designation is the difference between the total of the land use categories and the main Plant area total.
e. This description is based on DOE 1996c, Section 3.5.1.
f. Source: NNSA/B&W Pantex 2011b, Section 1.2.
g. Source: NNSA 2010c, all.
h. Source: TCEQ 2011, all.
i. Source: NNSA/B&W Pantex 2011c, Section II, SSPP Goal 1.1.
j. Source: SAIC 2008, all.
k. Source: B&W Pantex 2010a, Section 1.
l. Source: NNSA/BWXT Pantex 2004, all.

Table 2-1. Summary Comparison of Impact Indicators (continued)

m. Source: PantexNews 2011, all.
n. Source: USCB 2010, all. Note: Minority and low-income population numbers are rounded to be consistent with the Census Bureau's QuickFacts data, which are presented in percentages with three significant figures.
o. Source: Texas SDC 2009, all. Note: This source provides population projections developed by the State of Texas for the span of 2000 through 2040 and starts with 2000 Census figures. The State's projections include five different scenarios based on five different migration assumptions; other elements of the projections are the same for each scenario. The individual county projections making up the 2016 populations presented in this table used whichever scenario best predicted the 2010 Census population for that county and added the net increase (or decrease) projected for that county (and scenario) over 2010 through 2016 to the county's actual 2010 Census population.
p. Source: BWXT Pantex 2007, Section 14.5.8.
q Note: Projections for the 2016 minority and low-income figures are based on rates reported in the SWEIS and for current data. For minority figures, the SWEIS and 2010 Census data indicate rates varying between 19 and 21 percent of the total population; 20 percent of the projected total population was used here. For low-income figures, the SWEIS and census data indicate rates varying between 14.4 and 15.8 percent of the total population; 15.1 percent of the projected population was used here.

ACHP = Advisory Council on Historic Preservation; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; CO = carbon monoxide; HAP = hazardous air pollutant; HCl = hydrochloric acid; HCN = hydrogen cyanide; HF = hydrogen fluoride; M&O = management and operations; N_2O = nitrous oxide; NH_3 = ammonia; NRHP = National Register of Historic Places; NO_x = nitrogen oxides; PA/CRMP = Programmatic Agreement/Cultural Resource Management Plan; PM_{10} = particulate matter with an aerodynamic diameter of 10 micrometers or less; PTE = potential to emit; RCRA = Resource Conservation and Recovery Act; ROI = region of influence; SHPO = State Historic Preservation Officer; SO_2 = sulfur dioxide; VOC = volatile organic compound.

2.2 Comparison of Impacts

This section provides more detailed analyses for those resource areas requiring further analysis to determine the significance of identified impacts relative to the impacts identified in the SWEIS.

2.2.1 Facilities Infrastructure

The Pantex SWEIS described the facilities infrastructure as consisting of 476 buildings housing major mission operations and containing 2,483,020 square feet of floor space; an additional 144 structures for support operations containing 429,780 square feet; and 6 planned new buildings with a combined floor space of 171,160 square feet (DOE 1996a, Sections 4.3.1.1 and 3.1.1). Thus, the SWEIS evaluated a facility infrastructure of 626 buildings with a combined floor space of 3,083,960 square feet. The SWEIS noted that most of these buildings were constructed prior to 1966 and would be considered for shutdown after consolidation of functions into newer buildings. The SWEIS also noted there were 47 miles of roads within the Pantex Plant boundary (DOE 1996a, Section 4.3.1.2).

Of the six new facilities addressed in the SWEIS, only the Hazardous Waste Treatment and Processing Facility and the Pit Reuse Facility were constructed, totaling 33,500 square feet of floor space. As a result, it might be reasoned that the SWEIS evaluated an overestimated amount of facility floor space (by some 137,700 square feet). However, since DOE issued the SWEIS, specifically in the 2006 and 2007 timeframe, NNSA instituted a program to validate the number and floor space of all buildings at the Pantex Plant. As a result of that effort, the number of buildings of record at that time was decreased slightly (from 641 to 638), and the total floor area was increased by about 160,000 square feet. Based on these adjustments to facility floor space within the Plant, the total value considered in the SWEIS (that is, 3,083,960 square feet) is still reasonable for comparisons with current and planned values for facility floor space.

In 2011, the facility infrastructure at Pantex comprised 3,114,626 square feet of DOE/NNSA-owned and -leased floor space [NNSA/B&W Pantex 2011a, Attachment E-4(b)]. This represents an increase of about 1 percent of the building area evaluated in the SWEIS. Similar to what was described in the

SWEIS, this SA looks at projects considered reasonably foreseeable at the present time. In this case, the SA looks at the activities that are in the current five-year planning window and that could involve changes to the facilities footprint for the Pantex Plant. These projects are summarized in Table 2-2. Several of the activities identified in this planning window are not currently funded and can only be considered tentative at this time. Facilities and actions planned for years further beyond the present are even less certain and, as was done in the SWEIS, are generally considered inappropriate for the current evaluation. At the end of 2016, if all actions are implemented, they would put the Pantex Plant's facility infrastructure at about 3,245,600 square feet of DOE/NNSA-owned and -leased facility floor space. This would represent an increase of 5.2 percent over the amount of floor space evaluated in the SWEIS.

The project with the largest effect on the infrastructure footprint is the Pantex Renewable Energy Project, which could place up to 39 wind turbines within DOE/NNSA-owned and -leased property. The data in Table 2-2 conservatively assume all three phases of the project would be constructed in the next five years. At the current time, action has only started on Phase 1 of the project, which involves the construction of just four to seven wind turbines and not the substation or the control building. Therefore, the footprint and land disturbance values presented in the table would be notably lower if this project does not move into the subsequent phases during the next five years.

Table 2-2. Potential Footprint Changes and New Land Disturbance in the Five-Year Planning Window

Planned Project	Completed Footprint, square feet	New Land Disturbance (temporary + footprint), square feet
Projects from the 10-Year Site Plan[a]		
New construction		
Electrical Equipment Building	320	640[b]
Zone 11 HPFL Tank and Pump Facility	1,012	2,024[b]
Zone 12 HPFL Tank and Pump Facility	1,012	2,024[b]
HE Freezer Building	330	660[b]
Physical Training and Intermediate Use of Force Facility	7,450	14,900[b]
HE Pressing Facility	53,712	107,424[b]
Facility disposition (footprint reductions)	*-24,331*	
Other Projects		
Pantex Renewable Energy Project (all 3 phases)[c,d]		6,037,000
Roads	874,000	
Substation	69,700	
Control building	21,800	
Totals (rounded) Footprint for new structures and buildings Footprint for new roadways (or 8 miles) New land disturbance	 131,000 874,000	 6,164,700

a. Source: NNSA/B&W Pantex 2011a, Attachments E-1, E-2, and E-4(a).
b. As was done in the SWEIS (DOE 1996a, Table 4.5.2.2-1), total temporary land disturbance is estimated at 2 times the footprint of the new building.
c. Source: NNSA 2010a, Section 3.2.1.
d. The Pantex Renewable Energy Project also includes 1.44 acres for wind turbine foundations and 2.1 acres for the interconnect equipment, but these are not included in the table as they would not be considered floor space. Soil disturbance associated with these components of the project are, however, included in the total project land disturbance presented in the table.

HPFL = high pressure fire loop.

Much of the planned increase in the Pantex Plant's facility footprint during the five-year period of 2012 through 2016 is part of the modernization cycle, resulting in fluctuations in overall facility floor space. Primary objectives, however, of NNSA's planning include actions to consolidate functions and operations and modernize infrastructure, including reutilization of existing facilities, in such a manner that the Plant's operating footprint and costs are minimized.

Based on Pantex Plant's databases, the facility has approximately 56 miles of paved roads and approximately 10 miles of unpaved roads. This length of paved roads represents an increase of about 19 percent over the 47 miles described in the SWEIS (DOE 1996a, Section 4.3.1.2). NNSA has no specific plans for changes to roads in the next five years, but it is expected that some projects, particularly the Pantex Renewable Energy Project, will, at a minimum, involve the construction of new, limited-use access roads. As indicated in Table 2-2, DOE/NNSA estimates that under all three phases of the Renewable Energy Project there would be about 8 miles of these new access roads. Approximately one-half of the access roads would be on DOE/NNSA-owned land, the other half would be on DOE/NNSA-leased land.

Also shown in Table 2-2 are the amounts of new land disturbance that would be associated with the identified projects. These values support information presented in Table 2-1.

2.2.2 Visual Resources

The SWEIS did not address visual resources; however, the appearance of the Pantex Plant and its surroundings was described in another DOE EIS (DOE 1996c, all) that was published the same year. That EIS described the area as cultivated cropland and rangeland, which is typical of the High Plains region of Texas. The industrial land uses within the Plant are surrounded by cropland and rangeland that blend into the offsite viewscape. The Plant's interior is not accessible to the public, but is generally visible from surrounding roads and low-density rural housing areas. The elevated, cylindrical water towers are the Plant's most visible feature (DOE 1996c, Section 3.5.1).

The aforementioned DOE EIS also described the most sensitive viewpoint for the Pantex Plant as the intersection of U.S. Highway 60 and Texas FM 2373, approximately 1.5 miles southeast of Pantex facilities (DOE 1996c, Section 3.5.1). Highway 60 is part of the Texas Plains Trail, a scenic road that designates the Pantex Plant as a point of interest. From this viewpoint, the Plant facilities are described as low clusters of buildings on a flat horizon. The Plant operations area is visible from Interstate 40, located farther to the south, with the closest viewpoint at a distance of about 6 miles.

The current viewscape is basically the same as it was in the mid-1990s when the SWEIS was prepared. Several new structures have been constructed and older buildings have been demolished. However, new facilities are similar in size and appearance to existing facilities, and neither construction nor demolition has changed the overall appearance of the Pantex Plant.

During the next five years, however, NNSA is planning a project that could affect visual resources of the Pantex Plant. Referred to as the Pantex Renewable Energy Project, it would involve the phased construction of as many as 39 wind turbine generators within DOE/NNSA-owned or -leased property, with an ultimate combined electrical generating capacity of about 40 megawatts. Planned locations for these turbines, which could each extend vertically as high as 426 feet (the tip of the blade at its highest extent) above ground level, would be within the newly acquired land to the east of FM 2373 and on DOE/NNSA-leased land that borders U.S. Highway 60 on the south side of the Plant. NNSA prepared an EA for the Pantex Renewable Energy Project and, after making the Draft EA available for public and agency review and comment, issued a Final EA and FONSI in July 2010. The Final EA identifies potential visual effects from construction activities, access roads, control building, new substation and

interconnect, and aboveground electrical lines, but recognizes that the most dominant visual impact would be from the wind turbines themselves (NNSA 2010a, Section 3.2.5). The EA also noted there were 61 wind turbines already in place on land to the north of the Pantex Plant, so the new project would not present a totally new viewscape to the region. NNSA concluded that the Pantex Renewable Energy Project would not constitute a major Federal action that would significantly affect visual resources or other aspects of the human environment (NNSA 2010b, all).

2.2.3 Acoustics (Sound)

The SWEIS described traffic as the primary source of noise at the Pantex Plant boundary and at residences near roads. A sound measure used in the SWEIS is the energy equivalent sound level, which is the steady state sound level that would contain the same acoustic energy as the time-varying sound levels during the same time interval (a time-weighted average). At the boundary and at residences near roads, the SWEIS describes the equivalent sound level as varying from 38 to 58 A-weighted decibels, with onsite equivalent sound levels ranging only slightly higher, from 40 to 60 A-weighted decibels. The SWEIS also described offsite noise impacts in terms of the day-night average sound level, which is also an average sound level but with a 10 A-weighted decibel penalty added to sounds made during the sensitive nighttime hours (10 p.m. to 7 a.m.). Offsite day-night average sound level values from normal operations are less than 65 A-weighted decibels and are therefore compatible with residential land uses according to guidelines established by the Federal Aviation Administration and the Federal Interagency Committee on Urban Noise. Based on these sound levels, the SWEIS concluded that noise impacts on nearby noise-sensitive areas (residences) from the usual noise sources at the Pantex Plant are negligible (DOE 1996a, Section 4.8.2.1). The SWEIS further concluded that construction activities would result in small increases in noise levels for offsite areas, but would still result in overall day-night average sound levels below 65 A-weighted decibels during ongoing construction activities.

The SWEIS also recognized that low frequency, impulse, or airblast noises such as those generated from the Plant's testing of high explosives result in higher decibel levels when measured on a C-weighted scale or in terms of peak overpressure decibels than on an A-weighted scale. Accordingly, the preceding conclusions based on criteria for A-weighted decibels may not adequately characterize potential impacts from those operations. In order to address sound levels from high-explosive detonations, the SWEIS used a sound propagation model developed for airblast sources to predict peak overpressure decibels at various distances from two different sized detonations (net explosive weights of 55 and 25 pounds). The model evaluations included effects from three different wind speeds to show how sound levels could carry farther distances under certain atmospheric conditions. The SWEIS concluded that the high-explosive detonations could be audible out to distances of 3 to 6 miles. Since the 1996 levels of detonations had not generated significant noise impacts, continued operations would not be expected to generate such impacts.

The sound levels predicted in the SWEIS for a detonation of 55 pounds of high explosives are shown in Table 2-3. Also shown in the table are corresponding sound levels that would occur at the nearest residence, were that detonation to occur at each of the firing sites. NNSA calculated this second set of sound levels using a simple, conservative sound propagation equation and the sound level predicted in the SWEIS for a distance of 3,608 feet.

With a couple of exceptions that warrant additional discussion, Plant operations and the sounds generated by operations are basically the same as those evaluated in the SWEIS and are expected to remain the same over the next five years. As a result, the conclusion of the SWEIS that normal Pantex Plant operations have negligible noise impacts is still applicable. Further, the SWEIS's conclusion that there would be only minor impacts from the small, short-term noise increases associated with construction projects would be applicable to the scope of current and future construction projects.

The possible exceptions to these conclusions are the Pantex Plant's ongoing firing site operations involving detonations of high explosives and the planned construction of groups of wind turbines within Plant property. The firing site operations deserve additional discussion because the characteristics of those operations have changed between the time of the SWEIS and the present. The project that would add wind turbines to the Plant is addressed briefly at the end of this section because the operating turbines would generate different sounds and at different locations than normal Plant operations would.

Table 2-3. Sound Levels Predicted in the SWEIS and Corresponding Sound Levels at the Nearest Residence by Firing Site

Sound levels from SWEIS for a 24.9 kilogram (55 pound) HE detonation[a]		Sound levels at distances from firing sites to closest residence as derived from the SWEIS values[b]	
Distance from source, feet (meters)	**Predicted sound level, decibels (dB)**	**Distance from firing sites to nearest residence, feet (meters)[b]**	**Predicted Sound Level, decibels (dB)[c]**
3,608 (1,100)	140	FS-4: 3,166 (965)	141.1
7,218 (2,200)	133	FS-10: 4,003 (1,220)	139.1
14,436 (4,400)	128	FS-21: 10,839 (3,304)	130.4
		FS-22: 5,566 (1,697)	136.2

a. Source: DOE 1996a, Section 4.8.1.3, Table 4.8.1.3-1. The SWEIS presented predicted sound levels in terms of three different wind speeds. The values shown above are associated with the lowest speed. HE = high explosive.
b. Source: SAIC 2008, Section 1.1.
c. Sound levels at the distances from the firing sites to the nearest residence were calculated starting with the sound level predicted in the SWEIS for a distance of 3,608 feet and using the following simple sound propagation equation:

$$L_{p2} = L_{p1} - 20 \times \log (d_2 / d_1)$$

Where: d_2 = distance from source to receptor at location 2
d_1 = distance from source to location 1
L_{p2} = sound at d_2
L_{p1} = sound at d_1.

2.2.3.1 Firing Site Operations

According to the SWEIS, the Pantex Plant's open-air explosives testing at firing sites typically detonates 60 charges during a year (specifically in 1994) with high-explosive weights varying from 5 to 47 pounds and a maximum weight of 55 pounds (DOE 1996a, Section 4.8.1.3). By 2006, the high-explosives testing involved approximately 3,200 detonation events during the year with a combined net explosive weight of approximately 550 pounds (that is, an average of less than 0.18 pound per event) (SAIC 2008, Section 1.1) and individual event weights up to 47 pounds (BWXT Pantex 2007, Section 11.2.1.3).

Over the past five years, the Pantex Plant has increased the maximum limit for the size of its explosive charges to provide for more operational flexibility and the capability to perform a wider range of tests. The 2008 SA (NNSA 2008, Section 2.2.4) addressed this increase in the limit of individual charge sizes, and this SA summarizes that evaluation because it represents a notable change from actions described in the SWEIS.

Currently, Pantex has four designated firing sites (FS) 4, 10, 21, and 22. It is anticipated that FS-4 will be closed within the next five years. Figure 1-2 (in Section 1 of this SA) is a site map that identifies the location of key areas of the Pantex Plant, including the firing sites and the two closest residences (R1 and R2 in the figure). The acoustic analysis performed to assess the noise impacts associated with the increased charge limits proposed explosives charges of 70 kilograms (154 pounds) net explosive weight for FS-4 and FS-10, and 140 kilograms (308 pounds) net explosive weight for FS-21 and FS-22 (SAIC 2008, all). The acoustic analysis used the Noise Assessment Prediction System model to assess acoustic impacts for both individual events and the effect of multiple events over the course of a year under normal atmospheric conditions. This analysis identified the controlling offsite receptor as a single residence

located northeast of the firing sites. Table 2-3 (above) shows the distances from each of the firing sites to the closest residence.

Sound level impacts may be characterized by both societal and physiological effects. A peak sound pressure level of 130 decibels peak sound pressure (dBP) is associated with the generation of structural vibration audible to a residential occupant. A level of 140 dBP is where potential effects move from transient annoyance into the realm of safety, and hearing protection may be appropriate (SAIC 2008, Section 6.2). Table 2-4 depicts the quantity of net explosive weight that would be needed for detonation at each of the Pantex Plant firing sites to result in 130 dBP and 140 dBP levels at the closest residence under normal atmospheric conditions. The higher net explosive weight quantities are associated with FS-21 and FS-22 because those sites are farther from the residence than FS-4 and FS-10.

Table 2-4. Detonations Resulting in 130 and 140 dBP Peak Sound Levels at the Closest Residence

Firing Site	Size detonation, in pounds net explosive weight, resulting in 130 dBP	Size detonation, in pounds net explosive weight, resulting in 140 dBP
FS-4	28	651
FS-10	70	1,619
FS-21	3,238	74,601
FS-22	247	5,696

a. Source: SAIC 2008, Section 6.2.

Unlike the peak sound pressure level metric, which considers a single event lasting less than 1 second, the C-weighted day-night noise level considers the effect of multiple noise events over the course of a year. C-weighted sound levels or decibels more accurately assess the perceived loudness of each event, reflecting human sensitivity to low-frequency (that is, low hertz) impulse noise events, and the C-weighted day-night noise level value is a means to account for the cumulative effect of noise in a community based on level and prevalence of annoyance. A day-night noise level of 62 C-weighted decibels is the average daily sound level at which 15 percent of residents are likely to be "highly annoyed" by multiple noise events like explosive detonations or gunnery, and it is recommended that residential land use at or above this level be evaluated for treatment with acoustical insulation (FICUN 1980, Section 1; DOD 2007, Section 14-4).

Table 2-5 identifies the calculated (single-event) peak sound pressure levels (using the Noise Assessment Prediction System model) and the maximum number of detonations that could occur without exceeding the day-night noise level limit of 62 C-weighted decibels using the increased net explosive weight limit for each firing site. The indicated peak sound pressure levels are calculated for favorable weather conditions: light winds without temperature inversion. The allowable shots per year that correspond to a day-night noise level limit of 62 C-weighted decibels assume that distribution of the total annual acoustic energy emitted from the four firing sites would be 10 percent each for FS-4 and FS-10 and 40 percent each for FS-21 and FS-22. It should be noted that detonations of maximum size at all the firing sites

Table 2-5. Prospective Sound Levels at the Closest Residence with CDNL 62 Activity Limits

Firing Site	Net Explosive Weight, pounds (kilograms)	Percent of Acoustic Energy	Single-Event Sound Level (dBP)	CDNL 62 dBC Limit (shots/year)
FS-4	154 (70)	10	135.5	45
FS-10	154 (70)	10	132.6	87
FS-21	308 (140)	40	122.6	3,473
FS-22	308 (140)	40	130.8	529

a. Source: SAIC 2008, Section 6.2.
CDNL = C-weighted day-night average noise level; dBC = C-weighted decibel; dBP = P-weighted decibel.

except FS-21 would generate sound levels in excess of 130 dBP at the closest residence, a level that may elicit some complaints. However, Pantex Plant procedures require telephone notification of potentially affected offsite residents, as well as the use of warning sirens and lights prior to detonations greater than 1 pound. FS-21, farther from the residence than the other firing sites, would generate only 122.6 dBP at the closest residence, the threshold at which moderate complaints are possible but unlikely. Detonations of maximum size at all of the firing sites would generate sound levels below 130 dBP at the second closest residence (SAIC 2008, Section 7.2) shown in Figure 1-2 as R2.

The last column of Table 2-5 identifies the number of maximum weight shots that may be fired each year at each firing site without exceeding the day-night noise level limit of 62 C-weighted decibels at the closest residence based on the distribution of emitted acoustic energy specified in the table. In other words, if the sounds emitted from all four firing sites over the course of a year are added together, the combined effect would not exceed the 62 C-weighted decibel criterion at that residence. A total of 4,134 tests a year may be conducted without exceeding the limit at the closest residence. This represents 29 percent more tests at much higher charge weights than the 3,200 detonation events involving a total quantity of approximately 550 pounds net explosive weight performed at the Pantex Plant in 2006. The goal of staying below a day-night noise level of 62 C-weighted decibels is achieved under conditions where all shots are at the maximum proposed weight or less. Lighter charges would use less capacity, but a higher number of lower-weight charges should not be substituted for the weights assessed without additional analysis—the relationships between the number of blast events, charge weight, and sound level are logarithmic. Simple trading of weights for shots is arithmetic, and therefore, would not provide the correct result (SAIC 2008, Section 7.2).

Figure 2-2 depicts the relationship between the size of explosive charges detonated at the Pantex Plant firing sites and the estimated sound levels at the closest residence. The figure illustrates that large increases in net explosive weight result in only small increases in sound level once a threshold value exceeds about 25 pounds net explosive weight.

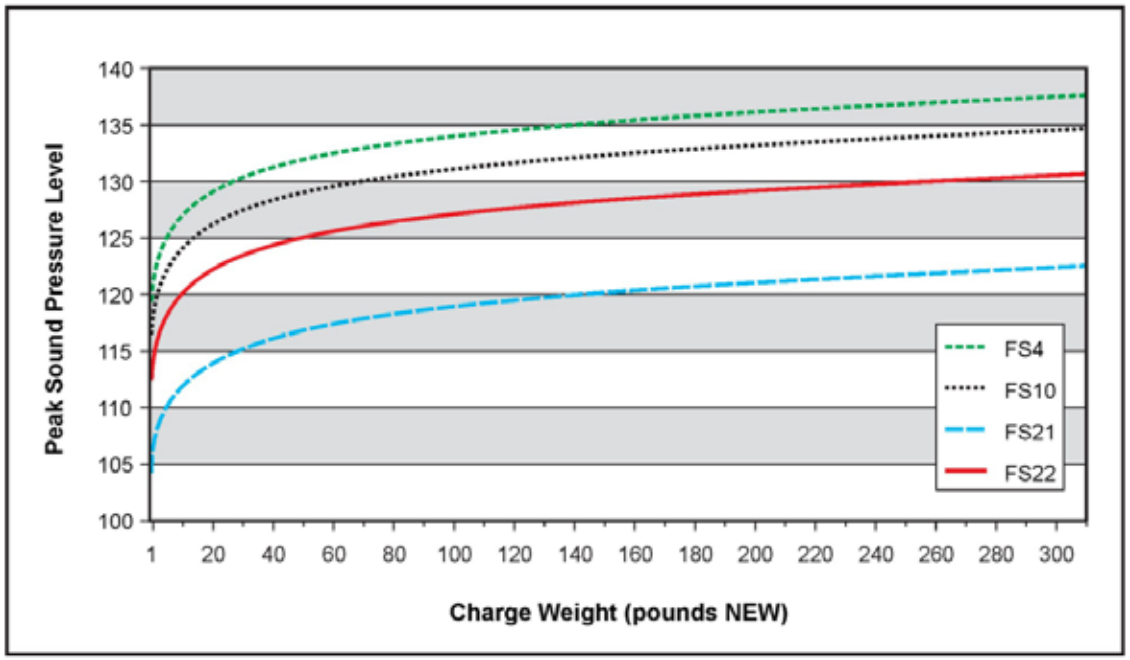

Figure 2-2. Noise Level at the Closest Residence as a Function of Charge Weight
(Source: SAIC 2008, Section 7.1)

The preceding noise levels and shot capacities reflect activities conducted during the normal to favorable weather conditions that prevail over 90 percent of the time during daylight hours (explosives are not detonated in open air at night at the Pantex Plant). Unusual wind and temperature could result in conditions that could affect the predicted noise levels. Wind blowing directly from a firing site toward a residence would tend to increase predicted sound levels; wind blowing away from the residence would decrease predicted sound levels. To a lesser degree, temperature inversions (air temperature rising with altitude) would also tend to increase predicted sound levels at the residence. In combination (wind and temperature inversion), predicted levels could be increased as much as 7 to 10 dBP at the nearest residence and there would be the potential for levels to exceed 140 dBP on rare occasions (SAIC 2008, Section 7.4).

Since the Occupational Safety and Health Administration prescribes hearing protection for workplace exposures at or above 140 dBP, detonations that could cause a peak sound pressure of this level should be avoided. Pantex Plant facility procedures require that current local meteorological data be used to evaluate conditions prior to commencing detonations. With respect to meteorological conditions, one of the following two conservative actions could be taken to ensure that detonation sound levels at the closest residence would be within acceptable levels:

1. If both temperature inversion and adverse wind direction are indicated, limit shots for FS-4, FS-10, and FS-22 to no more than 40 percent of the maximum proposed weight (no restrictions are required for FS-21), or

2. If wind speeds are less than 25 miles per hour and there is no temperature inversion, detonations up to the proposed limits may be conducted regardless of wind direction (SAIC 2008, Section 7.4).

The acoustic analysis described in the preceding paragraphs provides the basis for the size and number of detonations performed under the Pantex Plant's high-explosive testing activities. Testing needs vary over time but are managed in accordance with the individual discharge limits set in the acoustic analysis and to keep the annual C-weighted day-night noise level at the nearest residence below 62 C-weighted decibels.

2.2.3.2 Wind Turbine Operations

As was described above in the discussion of visual resources (Section 2.2.2), NNSA's Pantex Renewable Energy Project would involve the phased construction of as many as 39 wind turbine generators within DOE/NNSA-owned or -leased property. Planned locations for these turbines, which could each extend vertically as high as 426 feet (the tip of the blade at its highest extent) above ground level, would be within the newly acquired land to the east of FM 2373 and on DOE/NNSA-leased land that borders U.S. Highway 60 on the south side of the Pantex Plant.

The EA NNSA completed for that project (also described in Section 2.2.2) concluded there would be no significant noise impacts from the project because the operating wind turbines would be within the same 40 to 60 A-weighted decibel range as the average onsite sound levels (NNSA 2010a, Section 3.2.6). As additional support for this conclusion, independent research shows that the sound from modern operating wind turbines generally is between 40 and 50 A-weighted decibels at distances of 1,000 to 2,000 feet (Colby et al. 2009, Section 3.1.2). Based on a June 2010 aerial view of the Pantex area, a single, offsite residence south of U.S. Highway 60 is within 2,000 feet of a proposed wind turbine location. Since the proposed project would involve a row of wind turbines on the north side of U.S. Highway 60, sound levels at that residence could be from more than a single wind turbine. The sound level from two equidistant sources of the same magnitude is 3 decibels higher than for only one of the sources. Even if sound from three wind turbines overlapped at equal magnitude, the increase would be less than 5 decibels.

Accordingly, noise levels at the single closest residence could be on the order of 45 to 55 A-weighted decibels. With a penalty of 10 A-weighted decibels for nighttime operations, day-night average noise values would still be in the range of 55 to 65 A-weighted decibels or less. As described previously, a day-night average noise level less than 65 A-weighted decibels is generally considered appropriate for any land use, including residential. While there would be one residence exposed to wind turbine sound levels in this range, most of the scattered residences in the area of the Pantex Plant would be much farther away, and sound levels would be lower than these conservative estimates.

2.2.4 Biotic Resources

The Pantex SWEIS described the affected environment (that is, the Pantex Plant) in terms of vegetation and wildlife, with special attention given to the aquatic and wetlands resources associated with the playa areas of the Plant. The site of the Pantex Plant in the Southern High Plains is characterized as shortgrass prairie with a couple of specific dominant grass species, as well as several less abundant species. The SWEIS noted that in addition to the built-up operations areas within the Plant, much of the native shortgrass prairie had been converted for agricultural purposes. The SWEIS also identified the Federally or State-protected and sensitive species of birds, mammals, and reptiles that occur or potentially occur within the Plant area. The bald eagle was identified as the only Federally protected species known to inhabit the area for extended periods of time. The Texas horned lizard and the white-faced ibis were identified as State-protected species that reside within the Plant area for at least portions of the year. (The Texas horned lizard has been verified to be a year-round inhabitant.)

The SWEIS concluded there would be minimal impacts to biotic resources as a result of continued Plant operations because there would be no additional disturbance. The SWEIS recognized the potential for effects on protected or sensitive species as a result of associated noise, human activity, and equipment operations, but noted that animal and plant surveys had not shown any decline in the number of species present. The SWEIS also concluded that existing natural resource programs within the Pantex Plant were attempting to manage portions of the property, particularly the playas, for the benefit of native and migratory wildlife species. Thus, continued Plant operations would include beneficial impacts.

Current Pantex Plant operations are basically the same as those that were evaluated in the SWEIS. There have been changes in the level of detail available to characterize biotic resources and, in the case of protected and sensitive species, there have been changes in the status of specific species. Some of these changes are addressed further in the subsequent portions of this section. There have also been changes in the direction and emphasis of some resource management plans, such as providing added focus on shortgrass prairie along with playa wetlands as the principal wildlife habitats. However, the objective of maintaining and enhancing habitat for native and migratory wildlife species has not changed. With regard to future actions, NNSA's Pantex Renewable Energy Project would involve construction of numerous wind turbines within the Plant area and have the potential to affect wildlife, so it is also briefly discussed in this SA.

2.2.4.1 Wildlife Habitat

With regard to wildlife and land use categories, the Pantex Plant tracks and reports in more detail than was presented in the SWEIS. The Plant identifies two primary habitat types: shortgrass prairie and playa wetlands. Land use types associated with these or secondary habitat types include the following (B&W Pantex 2010a, Executive Summary):

- Playas and other depressional areas (important wet or dry);
- Shortgrass prairie, variance by soil type, depth and slope;
- Shortgrass prairie, playa management unit grazing and fire rotation;

- Shortgrass prairie, other conservative grazing systems or no grazing;
- Shortgrass prairie, prairie dog colonies;
- Shortgrass prairie, two-track interfaces;
- Shortgrass prairie, mowed;
- Taller, mixed prairie generally influenced by past disturbances and invasion of Old World bluestem;
- Cultivated crops, variance by crop type;
- Tree and shrub rows;
- Odd areas with weedy/grassy cover (fence lines, ditches, mounds);
- Odd areas with bare ground (disturbed sites, security fence lines); and
- Structures (buildings, equipment yards, fences, ruins, bat boxes, trash and caliche pits, stacked power poles, and railroad ties).

Table 2-6 shows how NNSA has grouped and categorized these habitat and land types to identify the associated land area. Figures 2-3 and 2-4 provide graphical views of the areas for these land types for the main Pantex Plant and Pantex Lake, respectively. Table 2-6 also shows the expected minor changes to the size of the groupings based on planned construction over the next five years.

Table 2-6. Wildlife Habitat Categories within the Pantex Plant and Pantex Lake[a]

Category	Current Area, acres[a]		Planned Changes, acres[b]		2016 Area Estimate, acres	
	Plant	Lake	Plant	Lake	Plant	Lake
Operations areas	2,620	0	+15		2,635	0
Cultivated land	4,259	138	-15		4,253	138
Rangeland/grass land	3,430	585			3,430	585
Wetlands	197	337			197	337
Totals	10,506	1,060	0	0	10,506	1,060

a. Sources: B&W Pantex 2012, Land Use Map; B&W Pantex 2010a, Section 1. Land category acreages from B&W Pantex 2012 were altered by adding wetland acreage from B&W Pantex 2010a and subtracting that acreage from the "rangeland/grass land" category.

b. Sources: NNSA 2010b, Table 3-1; NNSA/B&W Pantex 2011a, Attachment E-2. Planned changes include 14.7 acres of currently cultivated land for permanent use by wind turbine construction.

Generally speaking, land areas associated with these habitat groupings, particularly the "cultivated land" and "rangeland/grass land" categories, change by small amounts over time. The current values should be similar to conditions at the time the SWEIS was issued, with the exception that the Table 2-6 numbers for the main Pantex Plant include the 1,526 acres of recently acquired land on the east side of FM 2373. This new property resulted in additional land in the grasslands and cultivation categories. Because of their significance in providing habitat for resident and migrating wildlife, the playas and areas of shortgrass prairie within the DOE/NNSA-owned property of the Pantex Plant and Pantex Lake have been focal areas for biotic resource programs. In addition to the 197 acres of wetlands (Table 2-6) associated with Playas 1, 2, and 3 within the Pantex Plant, the associated playa management units include 216 acres of revegetated lands and 473 acres of shortgrass prairie upland (B&W Pantex 2010a, Section 1). Within the Pantex Lake playa management unit, the rangeland habitat includes 100 acres of revegetated area and 485 acres of shortgrass prairie upland as well as 337 acres of wetland. These management units are fenced and managed as restricted activity areas. Since DOE issued the SWEIS, Playa 1 is no longer being used for the discharge of treated wastewater, except in unusual conditions; the treated discharge is instead being used for irrigation. As a result, Playa 1 rapidly reverted to a more natural, ephemeral, and productive playa, providing natural seed and invertebrate food sources (B&W Pantex 2010a, Section 4.1).

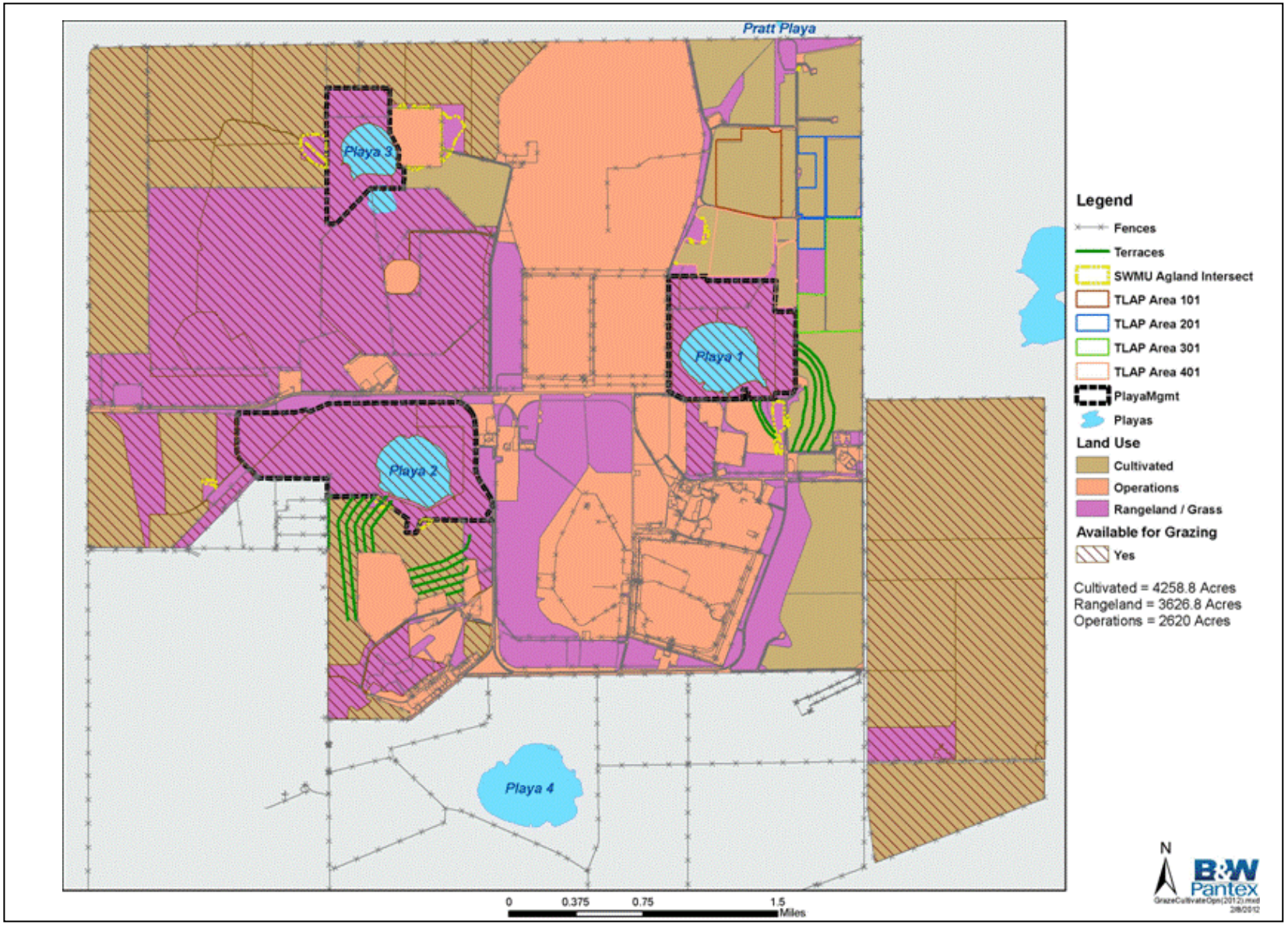

Figure 2-3. Pantex Plant Land Area and Wildlife Habitat (Source: B&W Pantex 2012)

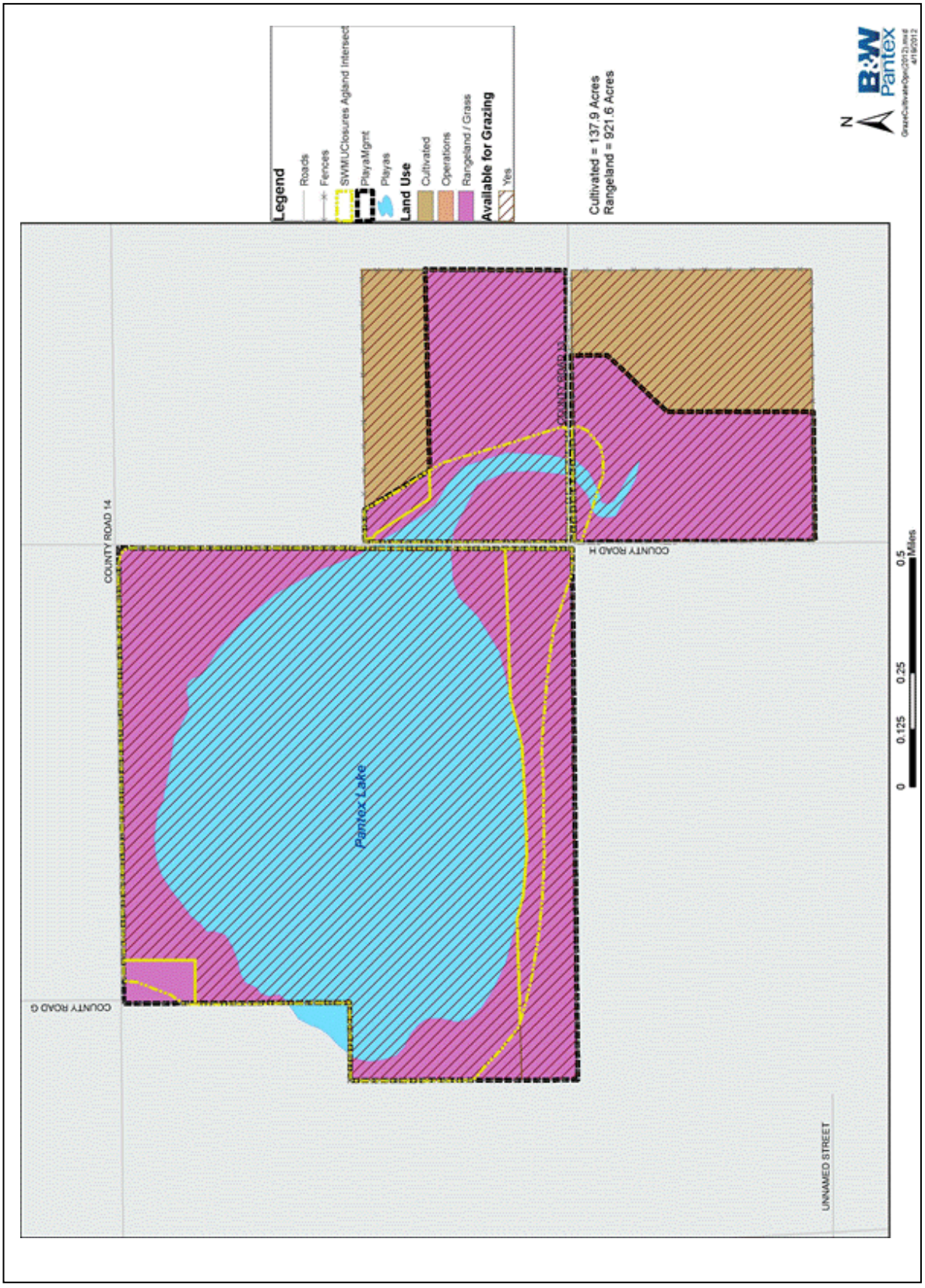

Figure 2-4. Pantex Lake Land Area and Wildlife Habitat (Source: B&W Pantex 2012)

Over the next five years, there will continue to be minor fluctuations to the amount of land area associated with most of the categories shown in Table 2-6. As shown in the table, new construction, particularly construction such as the proposed wind turbines that would be outside of the normal operations areas, would have small effects on the amount of grasslands and cultivation areas. However, the wetlands and the associated grasslands that make up the playa management units as well as the shortgrass prairie areas in other parts of the Pantex Plant represent key areas of wildlife habitat and would be expected to remain at their current size.

2.2.4.2 Protected and Sensitive Species

Table 2-7 identifies bird, mammal, reptile, and plant species that occur or could potentially occur at the Pantex Plant and that are currently protected or considered sensitive by the Federal government or the State of Texas. Included for comparison are the species of concern specifically identified in the SWEIS.

Table 2-7. Species of Interest Occurring or Potentially Occurring at the Pantex Plant

Common Name	Scientific Name	Status from SWEIS[a]		Current Status[b]	
		Federal	State	Federal	State
Birds					
American peregrine falcon[d]	*Falco peregrinus anatum*	E	E	DL	T
Arctic peregrine falcon	*Falco peregrinus tundris*	E (S/A)	T	DL	SAT
Baird's sparrow	*Ammodramus bairdii*	SOC	NL	NL	R
Bald eagle[c,d]	*Haliaeetus leucocephalus*	T	E	DL	T
Black tern[c,d]	*Chlidonias niger*	SOC	NL		
Ferruginous hawk[c,d]	*Buteo regalis*	SOC	NL	NL	R
Interior least tern	*Sterna antillarum athalassos*	E	E	E	E
Lesser prairie-chicken	*Tympanuchus pallidicinctus*			C	R
Loggerhead shrike[c,d]	*Lanius ludovicianus*	SOC	NL		
Migrant loggerhead shrike	*Lanius ludovicanus migrans*	SOC	NL		
Mountain plover[d]	*Charadrius montanus*	C	NL	NL	R
Prairie falcon[d]	*Falco mexicanus*			NL	R
Snowy plover	*Charadrius alexandrinus*			NL	R
Western burrowing owl[c,d]	*Athene cunicularia hypugea*	SOC	NL	NL	R
Western snowy plover	*Charadrius alexandrinus nivosus*			NL	R
White-faced ibis[c,d]	*Plegadis chihi*	SOC	T	NL	T
Whooping crane[c,d]	*Grus americana*	E	E	E	E
Mammals					
Big free-tailed bat	*Nyctinomops macrotis*			NL	R
Black bear	*Ursus americanus*			SAT	T
Black-tailed prairie dog[d]	*Cynomys ludovicianus*			NL	R
Cave myotis	*Myotis velifer*	SOC	NL	NL	R
Longlegged myotis	*Myotis volans*	SOC	NL		
Occult little brown myotis	*Myotis lucifugus occultus*	SOC	NL		
Pale Townsend's big-eared bat	*Corynorhinus townsendii pallescens*			NL	R
Plains spotted skunk	*Spilogale putorius interrupta*	SOC	NL	NL	R
Swift fox[c]	*Vulpes velox*	C	NL	NL	R
Western small footed myotis	*Myotis ciliolabrum*	SOC	NL	NL	R
Yuma myotis	*Myotis yumanensis*	SOC	NL		
Reptiles					
Smooth green snake	*Opheodrys vernalis*	NL	E		
Texas garter snake	*Thamnophis sirtalis annectens*	SOC	NL		
Texas horned lizard[c,d]	*Phrynosoma cornutum*	SOC	T	NL	T
Plants					
Mexican mud-plantain	*Heteranthera mexicana*			NL	R

2-7. Species of Interest Occurring or Potentially Occurring at the Pantex Plant (continued)

Legend

Species not appearing in the SWEIS or, as applicable, not currently listed or of concern to the State for Carson and Potter Counties.

Status Codes:
- C – Candidate for listing
- DL – Delisted
- E – Endangered
- NL – Not listed
- PT – Proposed threatened
- R – Rare
- S/A – Protected under the similarity of appearances provision of the *Endangered Species Act* (16 U.S.C. 1531)
- SAT – Threatened due to similarity of appearance
- SOC – Species of concern
- T – Threatened

a. Source: DOE 1996a, Section 4.9.1.1.
b. Source: Federal listings – USFWS 2011; State listings – TPWD 2011, species occurring on either the Carson or Potter County lists. Note: The white-faced ibis did not occur on the species of concern lists for either county, but since it is still considered "Threatened" by the State of Texas and is on the list of observed birds within Pantex, it is included in the table.
c. Species identified in the Pantex SWEIS as being observed within the Pantex Plant (DOE 1996a, Section 4.9.1.1).
d. Species whose presence at the Pantex Plant was verified in 2010 (B&W Pantex 2011, Section 2.4) or in the case of birds, are on the All-Time Bird List for Pantex (B&W Pantex 2010a, Appendix C).

The "current status" information is obtained primarily from "The Rare, Threatened, and Endangered Species of Texas by County" database maintained by the Texas Parks and Wildlife Department. The table includes listings from the database for both Carson and Potter Counties. The State database also lists the status of Federally protected species. DOE/NNSA verified this information against data posted by the Southwest Region of the U.S. Fish and Wildlife Service. Because Table 2-7 is basically derived from two separate listings of species (those identified in the SWEIS and those from the State's database), there are instances in which a species did not occur on both lists, indicated in the table by shading.

The Pantex SWEIS identified species of Federal interest with a specific listing status (for example, threatened, endangered, or candidate) or as "species of concern." For each State entry, the SWEIS included a specific listing status or the species was identified as "not listed." With regard to the current status in Table 2-7, the status categories have somewhat reversed. The Southwest Region of the U.S. Fish and Wildlife Service indicated it does not keep a formal list of "species of concern," so no attempt was made to place species in that grouping, and the table entry is "not listed." The State data, on the other hand, includes species that do not have a formal State listing, but are considered "rare."

As can be seen in Table 2-7, there are several instances where the listing status for a species has changed since DOE issued the SWEIS. Primary examples are the bald eagle and peregrine falcon. In both instances, the species have been delisted from Federal status and downgraded from endangered to threatened on the State list. It should be noted, however, that the bald eagle is still protected under the *Migratory Bird Treaty Act* (16 U.S.C. 703-7012) and the *Bald and Golden Eagle Protection Act* (16 U.S.C. 668-668d). As another example, the lesser prairie-chicken was not identified as a species of concern in the SWEIS, but is now a candidate species for Federal listing. Changes in the numbers of species in the different categories are unrelated to the operation of the Pantex Plant, and current operations of the Plant are having no different effect on protected or sensitive species than was identified in the SWEIS. What could affect wildlife in the next five years are the plans to construct wind turbines on Plant property. This topic is addressed separately below.

2.2.4.3 Wind Turbine Operations

As was described above in the discussion of visual resources (Section 2.2.2), NNSA's Pantex Renewable Energy Project would involve the phased construction of as many as 39 wind turbine generators within DOE/NNSA-owned or -leased property. Planned locations for these turbines, which could each extend vertically as high as 426 feet (the tip of the blade at its highest extent) above ground level, would be

within the newly acquired land to the east of FM 2373 and on DOE/NNSA-leased land that borders U.S. Highway 60 on the south side of the Pantex Plant.

The EA already completed by NNSA on this project (also described in Section 2.2.2), addresses the potential for short-term impacts during construction (NNSA 2010a, Section 3.2.3). The EA also addresses potential effects to Texas horned lizards and black-tailed prairie dog colonies along with measures that would be taken to minimize any adverse effects. The fact that most construction activities would occur within cultivated land would also tend to minimize impacts to most species of concern.

The EA recognizes that operation of wind turbines could adversely impact some wildlife, particularly birds and bats, which could be subject to strike mortality as they feed and traverse over the wind farm areas. There is also evidence that bats may be susceptible to trauma from the rapid pressure changes that occur in close proximity to the rotating wind turbine blades. The playas in the Pantex area are noted as features that might attract migratory waterfowl, shorebirds, and raptors (NNSA 2010a, Section 3.2.3).

Pursuant to guidelines issued by the U.S. Fish and Wildlife Service to avoid and minimize wildlife impacts from wind turbines, NNSA awarded a contract to West Texas A&M University to investigate potential impacts based on data from other wind turbine operations and to conduct preconstruction monitoring in the project area (NNSA 2010a, Section 3.2.3). This work also entails monitoring of impacts after the wind turbines become operational. The Pantex Plant's resource management plans will incorporate information obtained from the University's studies and monitoring, as appropriate, to implement measures to minimize potential impacts from the wind turbines (B&W Pantex 2010a, Section 5.4.8).

The EA describes coordination actions already implemented between NNSA and the U.S. Fish and Wildlife Service, and between NNSA and the Texas Parks and Wildlife Department. These coordination efforts confirmed the need for the planned studies and monitoring. They also provided information with regard to species of concern and recommendations for actions to minimize impacts to wildlife. As applicable, NNSA will implement actions to minimize impacts and will continue to coordinate actions and results with these wildlife agencies. This would include coordination with the Fish and Wildlife Service if any incidence of take were to occur as part of the project.

NNSA concluded that the Pantex Renewable Energy Project would not constitute a major Federal action that would significantly affect biotic resources or other aspects of the human environment (NNSA 2010b, all). According to the FONSI released with the Final EA, NNSA actions to minimize impacts to biological resources would include locating the wind turbines as far from playas as possible, burying electrical distribution lines within the wind farm area and designing any other power lines with effective measures to reduce the potential for avian mortality, and possibly taking actions such as reducing turbine speeds at night to avoid impacts to bat species and nocturnal avian species (NNSA 2010b, all).

2.2.5 Waste Management

The primary waste-generating operations at the Pantex Plant are related to the production of high explosives and the ongoing assembly and dismantlement of nuclear weapons, the same primary waste-generating activities the Pantex SWEIS identified. Wastes are also generated from support operations, including maintenance, administration, and construction activities; medical services; laboratory operations; and environmental monitoring and restoration activities. Types of waste generated at the Pantex Plant, along with their typical generating activities, makeup, and disposition pathways are summarized below:

- Low-level radioactive waste is generated by weapons-related and weapons-support activities and typically includes compactable materials such as wipes, personal protective equipment, filters, and similar materials, as well as non-compactable materials such as high-efficiency particulate air filters and various packing materials. Low-level radioactive waste is transported to a central collection area before being sent offsite for disposal, primarily at the Nevada National Security Site (formerly the Nevada Test Site), but it may also be shipped to commercial disposal facilities with case-by-case approval of NNSA (BWXT Pantex 2007, Section 14.7.4). Before being sent offsite, some low-level waste may be treated onsite through processes such as sorting, repackaging, and compacting.

- Low-level radioactive mixed waste, which qualifies as hazardous waste pursuant to the *Resource Conservation and Recovery Act* (42 U.S.C. 6901 *et seq*; RCRA) and radioactive waste, is managed in accordance with the most recent update to the Pantex Plant Site Treatment Plan/Compliance Plan, Title 30 of the Texas Administrative Code, and the Pantex Hazardous Waste Permit No. 50284. Mixed waste is generated by weapons-related and weapons-support activities and typically consists of inorganic debris contaminated with solvents or heavy metals as well as low levels of radionuclides. Mixed wastes are sent offsite for treatment and then disposed of at an appropriate permitted disposal facility. Some mixed waste may be treated onsite through processes such as macro-encapsulation, neutralization, precipitation, evaporation, amalgamation, and stabilization (BWXT Pantex 2007, Section 14.7.3) before being sent offsite.

- Hazardous wastes are generated from weapons-related and weapons-support activities and from high-explosives manufacturing and testing activities, as well as from numerous support operations and environmental restoration activities. Typical hazardous waste includes explosives-contaminated solids, spent organic solvents, and solids contaminated with spent organic solvents and/or metals. NNSA processes explosive waste and materials contaminated with explosives onsite through thermal treatment at the Burning Ground. Other hazardous waste may be treated onsite through processes such as sorting, repackaging, and compacting. Residues from these processes, as well as other hazardous wastes, are shipped to commercial facilities permitted for the final treatment, disposal, or recycling of the specific wastes.

- Universal wastes, which are hazardous wastes subject to alternative management standards per Texas Administrative Code, include batteries, pesticides, fluorescent lamps, paint, and paint-related wastes. These wastes come primarily from routine Plant processes, including maintenance activities, and are shipped offsite for final treatment, disposal, or recycling.

- Nonhazardous industrial waste is managed in accordance with Title 30 of the Texas Administrative Code, Chapter 335 and is divided into three classes:

  – Class 1 wastes do not meet the definition of RCRA hazardous waste, but do exceed State-specified levels for hazardous contaminants or meet State-specific criteria for being ignitable or corrosive. Class 1 waste includes wastes subject to the *Toxic Substances Control Act* (15 U.S.C. 2601; TSCA) such as asbestos and polychlorinated biphenyls with a concentration greater than 50 parts per million. These wastes are tracked separately as TSCA wastes.

  – Class 2 wastes are defined by the State of Texas as nonhazardous industrial wastes that are not Class 1 or Class 3 wastes. Pantex routinely tracks a category of waste designated as sanitary waste, which is described as office trash and cafeteria waste. Because such waste is produced incidental to the operation of an industrial facility (the Pantex Plant), it qualifies as a Class 2 nonhazardous industrial waste under the State regulations.

– Class 3 wastes are inert, essentially insoluble, and pose no threat to human health and/or the environment. Examples of Class 3 wastes include bricks, concrete, glass, dirt, and certain plastics and rubber items that are not readily degradable. Because of the difficulty in proving absolutely that a waste meets the Class 3 criteria, the Pantex Plant made the decision in 1996 to conservatively classify all potentially Class 3 waste as Class 2 waste (BWXT Pantex 2007, Section 14.5.7).

Class 1 wastes are managed in a manner similar to hazardous waste and are shipped to offsite treatment and/or disposal facilities. Class 2 wastes that are liquids are shipped to commercial facilities for treatment and disposal; Class 2 wastes that are consistent with municipal solid waste (such as the sanitary waste) are disposed of at authorized offsite landfills. Some Class 2 waste that is generally characterized as construction debris (and might otherwise qualify as Class 3 waste) is disposed of in an onsite Class 2 nonhazardous waste landfill (B&W Pantex 2011, Section 2.10.1). This construction debris-type of Class 2 waste is the only category of nonhazardous industrial waste that is disposed of onsite; all other nonhazardous waste is recycled or disposed of offsite. A notable portion of the Pantex Plant's nonhazardous industrial waste comes from environmental restoration, deactivation and decommissioning, and construction activities; that is, from activities that might be considered outside primary Plant operations. Excluding the sanitary wastes, these outside activities generated an average of almost 50 percent of the nonhazardous waste from 2007 through 2010 (B&W Pantex 2008, 2009, 2010b, 2011, Section 2.10.1 of each).

- TSCA wastes include asbestos, asbestos-containing material, and material containing or contaminated with polychlorinated biphenyls. Construction projects and deactivation and decommissioning of excess facilities are the primary activities that generate TSCA wastes. All TSCA wastes are shipped offsite for final treatment and disposal.

- The Pantex Medical Department generates medical wastes from various healthcare activities and includes urine cups, medical gloves, cotton balls, blood samples, contaminated sharps (e.g., needles, blades), and contaminated bandage materials. Title 30 of the Texas Administrative Code, Chapter 330 defines this waste as a special waste, and it is managed through a commercial vendor who picks up the waste and transports it to a permitted commercial facility. Because of the relatively small quantity of medical waste generated within the Pantex Plant, values are not reported in the Plant's annual site environmental reports.

Table 2-8 shows the SWEIS projections for annual waste generation for the 2,000-weapons level, including wastes from the Environmental Restoration Program. The SWEIS estimates that pit storage activities would generate additional low-level radioactive waste, low-level radioactive mixed waste, hazardous waste, and nonhazardous waste, but each in quantities less than 1.3 cubic yards per year, so waste management activities would not be affected. Also shown in the table are actual quantities of waste generated each year from 2007 through 2010. The SWEIS describes the amount of medical, polychlorinated biphenyl, and asbestos waste streams as small at the Pantex Plant and, as a result, does not provide actual or estimated generation rates and does not address potential impacts further. The Pantex Plant normally does not generate transuranic or mixed transuranic wastes and currently is not generating high-level radioactive wastes (DOE 1996a, Section 4.13.1.1).

As can be seen in Table 2-8, recent generation rates for low-level radioactive waste and mixed waste have been notably lower than those projected in the SWEIS, and generation rates for hazardous waste and nonhazardous industrial waste have been higher, particularly those for nonhazardous waste. The waste generation rates shown in the table for 2007 through 2010 are similar to those reported for the period of 2003 through 2006 with the exception of an unusually high hazardous waste generation rate in 2003, an

Table 2-8. Comparison of 2007 to 2010 Waste Generation Rates in Cubic Yards with the SWEIS

Waste Type	2,000-Weapons Level and Environmental Restoration Annual Waste Generation from the SWEIS[a,b]	Waste Generation[c]				Change in 2010 Waste Generation Versus the SWEIS
		2007	2008	2009	2010	
Low-level radioactive waste	326	42.8	44.5	28.3	74.9	-77.0 percent
Low-level mixed waste	239.6	0.4	0.10	0.18	0.10	-99.96 percent
Hazardous waste	251.5	734.9	538.7	662.6	708.1	181.5 percent[d]
Universal waste[d]	Not considered	26.6	21.3	8.1	6.8	Not applicable
Nonhazardous industrial waste[e]	1,815.6	9,323.8	31,915	12,024	9,267.0	410.4 percent
TSCA waste	"Small"	32.7	150.7	84.1	106.9	Not applicable
Medical waste[f]	"Small"	≈19.2	≈19.2	≈19.2	≈19.2	Not applicable

a. Source: DOE 1996a, Tables 4.13.1.2-2 and 4.13.1.2-3. The SWEIS waste generation projections include a 10-percent margin to provide conservative estimates and do not include polychlorinated biphenyl, asbestos, or medical waste.
b. The SWEIS's projection of waste from environmental restoration activities were very minor, consisting only of 0.9 and 94.8 cubic yards of hazardous and nonhazardous waste, respectively, for the year 2000. The SWEIS assumed these levels of hazardous and nonhazardous waste, which were identified as liquids, would continue beyond 2000.
c. Source: B&W Pantex 2011, Table 2.6, for wastes other than medical wastes.
d. In 2001, Pantex began managing some hazardous waste under the Universal Waste Rules. If the Universal waste generated in 2010 was added to the hazardous waste generated in that year, the change compared to the SWEIS would increase to 184.2 percent.
e. The nonhazardous waste values shown in the table include the sanitary waste category that is tracked separately in the Pantex annual site environmental reports. Sanitary waste is described in the annual reports as consisting of office trash and cafeteria waste, but is also described as Class 2 nonhazardous waste. During the period from 2007 to 2010, annual sanitary waste generation ranged from about 1,360 to 1,920 cubic yards.
f. Source: BWXT Pantex 2007, Section 14.5.8. The value identified as a typical annual generation rate in the referenced document is assumed to be a reasonable estimate for the quantities generated in 2007 through 2010.

≈ = approximately.
TSCA = Toxic Substance Control Act.

unusually high nonhazardous industrial waste generation rate in 2008, and generally higher TSCA waste generation rates in 2003 through 2005. Waste stream categories with generation rates higher than forecast in the SWEIS and the TSCA wastes are categories identified as receiving notable contributions from environmental restoration, deactivation and decommissioning, and construction activities. The high quantity of nonhazardous industrial waste generated in 2008 was attributed to the amount of deactivation and decommissioning of excess facilities and construction that occurred that year (B&W Pantex 2009, Section 2.10.1). Waste generation rates identified in the SWEIS include relatively small contributions from environmental restoration activities (Table 2-8, footnote b), but make no mention of contributions from deactivation, decommissioning, and construction activities. With regard to the large difference in the generation rates of nonhazardous industrial waste, it is also significant to note that the SWEIS specifically excluded from its estimates Class 3 construction debris (DOE 1996a, Section 4.13.1.2), which is now reported as Class 2 waste and managed at the onsite landfill.

The following are brief discussions, by waste category, of the potential for current impacts compared with those identified in the SWEIS.

2.2.5.1 Low-Level Radioactive Waste

The Pantex SWEIS described a low-level radioactive waste storage capacity of at least 648 cubic yards, an annual generation rate of 326 cubic yards, and an average offsite shipping rate of 432 cubic yards.

Accordingly, the SWEIS predicted no problems in managing low-level waste so long as offsite disposal options did not cease. The SWEIS further indicated that if offsite shipments ceased, additional storage facilities would be added onsite to avoid impacting principal Plant operations. The Pantex Plant sends most of its low-level waste to the Nevada National Security Site for disposal; other waste, such as environmental cleanup soil, is sent to commercial facilities for disposal in compliance with environmental regulations. The Plant stores low-level wastes in onsite storage facilities until it can be sent for onsite or offsite treatment, if required, and eventual offsite disposal. The Plant has experienced no difficulties in temporarily storing the current amount of low-level waste onsite within existing facility capacities. Current low-level waste generation rates are notably (77 percent) lower than those estimated in the SWEIS (Table 2-8), and the Pantex Plant is routinely investigating options for disposal of low-level waste streams at other commercial facilities to ensure there are always disposal options available.

2.2.5.2 Low-Level Radioactive Mixed Waste

When the SWEIS was issued, disposition of mixed waste at the Pantex Plant was a concern. The SWEIS predicted that at the 2,000-weapons level, additional storage capacity would be required by 2004 if no offsite disposal were provided. In 1996, the Pantex Plant had just finalized its Site Treatment Plan for mixed waste as required by RCRA and the *Federal Facility Compliance Act* (Pub. L 102-386). Implementation of this plan, including subsequent updates and new milestones, resulted in a substantial reduction in the mixed waste inventory at Pantex. Specifically, the SWEIS reported 191 cubic yards of mixed waste in storage in September 1995. By the end of September 2006, the amount of stored mixed waste was 0.29 cubic yard. In addition, as shown in Table 2-8, the current quantities of mixed waste produced at the Pantex Plant are significantly (more than 99 percent) lower than were projected at the time of the SWEIS. NNSA estimates that generation of mixed waste in the next five years will increase over the amounts generated in 2007 through 2010 because of an increased production schedule (B&W Pantex 2012). However, generation rates are expected to remain well below those identified in the SWEIS. Mixed waste streams are stored onsite in facilities authorized according to the Plant's hazardous waste permit until the waste can be sent for onsite or offsite treatment, if required, and eventual offsite disposal; mixed waste currently generated at Pantex has identified disposal paths (BWXT 2007, Section 14.5.2).

2.2.5.3 Hazardous and Universal Waste

The SWEIS describes hazardous waste being managed in compliance with RCRA regulations from the point of generation to storage and disposal (DOE 1996a, Section 4.13.1.2). Although the quantity of hazardous waste the Pantex Plant currently generates is greater than forecasted in the SWEIS (Table 2-8), continued compliance with regulatory requirements and availability of commercial facilities for treatment and disposal of hazardous waste have minimized the potential for environmental problems. Hazardous waste from construction, deactivation and decommissioning, and environmental restoration activities have contributed to variability in waste generation rates from year to year and to the differences from the SWEIS estimates. These types of activities generated an average of approximately 14 percent of the hazardous waste from 2007 through 2010, and in the highest year (2010) were responsible for more than 36 percent of the hazardous waste production (B&W Pantex 2008, 2009, 2010b, 2011, Section 2.10.1 of each).

2.2.5.4 Nonhazardous Industrial Waste

The SWEIS estimated minimal impacts on nonhazardous waste management because the amount of nonhazardous waste projected would be below past generation rates. Although the quantities of nonhazardous industrial waste currently generated at the Pantex Plant are notably higher than estimated in the SWEIS (for possible reasons already described herein), management of such waste is still being

performed in accordance with environmental regulations, with minimal impacts to the environment and to available waste management options. Before being sent offsite for treatment and disposal, Class 1 nonhazardous waste is stored and managed onsite in a manner similar to low-level radioactive waste and hazardous waste, including containers that are in good condition and compatible with the waste, protected storage areas, secondary containment for liquids, and routine inspections (BWXT Pantex 2007, Section 14.6.2).

With regard to Class 2 wastes, liquids are shipped to commercial facilities for treatment and disposal, construction debris is disposed of onsite and should pose minimal impacts, and wastes with the characteristics of standard municipal waste are sent to an offsite landfill. The Pantex Plant's contribution to the local region's municipal solid waste generation is minor. For example, the closest large landfills to the Plant are the Amarillo Landfill and the Allied (formerly BFI) Southwest Landfill in Canyon (Randall County), Texas, which are both Type 1 standard landfills permitted for disposal of municipal solid waste (PRPC 2002, p. 12). The 638 tons of Pantex waste sent for offsite landfill disposal in 2000 (BWXT Pantex 2007, Section 14.5.6) represents less than 0.2 percent of the roughly 411,000 tons disposed of in these two landfills in the same year (PRPC 2002, p. 12).

2.2.5.5 TSCA and Medical Waste

As noted previously, the SWEIS provided little information on the impacts of managing TSCA and medical waste because they were considered small, minor waste streams. However, it can be stated that current management of these wastes is no different than described in the SWEIS; that is, these wastes are transported offsite for treatment and disposal at commercial facilities with appropriate permits to manage the applicable waste. The Pantex Plant has identified no significant issues in finding and utilizing appropriate offsite services for these wastes.

In summary, current waste generation rates at the Pantex Plant are somewhat different than were evaluated in the SWEIS. However, the waste streams that include radioactive contaminants (that is, low-level radioactive and mixed wastes), which generally have fewer commercial options for disposal, are now generated at notably lower rates. Possibly of more importance, there are currently well established disposition paths for all Pantex waste streams, and that is expected to continue into the foreseeable future.

3. CUMULATIVE IMPACTS

Council on Environmental Quality regulations (40 CFR 1508.7) define cumulative impacts as "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time." This section reviews the cumulative impacts analysis presented in the SWEIS relative to subsequent programmatic decisions and the updated resource area impacts identified in this SA.

3.1 Cumulative Impacts Analysis in the SWEIS

The cumulative impacts analysis in the SWEIS considered the impacts of continued Pantex Plant operations at the 2,000-weapons level and the storage of 20,000 pits when added to the impacts at the Pantex Plant from the activities proposed in the following:

- The *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE/EIS-0236),
- The *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic Environmental Impact Statement* (S&D PEIS) (DOE/EIS-0229), and
- The *Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (Waste Management PEIS) (DOE/EIS-0200).

Each of these programmatic documents addresses activities that were planned or underway at the Pantex Plant when the SWEIS was issued. As the following discussion indicates, the cumulative impacts from these activities are expected to remain within the bounds of the cumulative impacts analysis presented in the SWEIS.

3.1.1 SSM PEIS

The Pantex SWEIS considered the potential impacts associated with three SSM PEIS alternatives involving the Pantex Plant: No Action, Downsize Existing Capability, and Relocate Capability. The SWEIS indicated there would be no significant cumulative impacts associated with downsizing Pantex Plant capabilities (DOE 1996a, Section 4.21), which was the alternative subsequently selected in the SSM PEIS Record of Decision (61 FR 68014, December 26, 1996). The SSM PEIS evolved into the Complex Transformation SEIS (DOE/EIS-0236-S4) described in Section 1.6.1 of this SA. Per the earlier discussion, the two Records of Decision issued on December 19, 2008, for the Complex Transformation SEIS described NNSA decisions that would have only minor effects on the Pantex Plant and, accordingly, no cumulative impacts would be expected.

3.1.2 S&D PEIS

The Pantex SWEIS considered the potential siting, construction, and operation of new collocated fissile material (plutonium and highly enriched uranium) storage and plutonium disposition facilities (pit disassembly/conversion facility, plutonium conversion facility, mixed oxide fuel fabrication facility, and light water reactor) at the Pantex Plant as bounding (most adverse impacts) alternatives associated with potential S&D PEIS activities. The SWEIS identified potential contributions to cumulative impacts from

activities analyzed in the S&D PEIS for the following resource areas: Plant facilities and infrastructure, land resources, water resources, air quality, biotic resources, cultural resources, socioeconomic resources, and waste management.

The S&D PEIS Record of Decision (62 FR 3014, December 10, 2008) selected the Pantex Plant as the site for consolidated storage of plutonium pits, but did not select the Plant for any other facilities or activities. Likewise, the Record of Decision for the tiered *Surplus Plutonium Disposition Environmental Impact Statement* (DOE/EIS-0283) (65 FR 1608, January 11, 2000) did not select the Pantex Plant for any other surplus plutonium disposition facilities or activities. Therefore, the potential cumulative impacts associated with S&D PEIS activities at the Pantex Plant would be expected to be less than those presented in the SWEIS analysis.

Subsequent to the original S&D PEIS, there were four supplement analyses (DOE/EIS-0229-SA-01, -02, -03, and -04 in 1998, 2002, 2003, and 2007, respectively), which were followed by amended Records of Decision. The amended Records of Decision for the first, third, and fourth supplement analyses (63 FR 43386, August 13, 1998; 68 FR 64611, November 14, 2003; and 72 FR 51807, September 11, 2007, respectively) all dealt solely with decisions on the management of non-pit weapons-reusable plutonium, primarily addressing when and what materials would be shipped and where they would be stored within the Savannah River Site. These decisions did not involve activities at the Pantex Plant. The amended Record of Decision for the second supplement analysis, (67 FR 19432, April 19, 2002), addressed plans for extended storage of non-pit weapons-usable plutonium at the Savannah River Site, but also described DOE's decision to continue storing pits indefinitely in both Zone 4 and Zone 12 of the Pantex Plant. The decision to continue storing pits at the Pantex Plant was in lieu of relocating all pits to upgraded facilities in Zone 12 as was described in the original S&D PEIS Record of Decision. Through subsequent evaluations, NNSA determined that storage capacity in Zone 4 would eventually be required so the cost savings associated with closure of Zone 4 would not be achieved. These subsequent decisions did not significantly affect actions at the Pantex Plant and do not have cumulative impact implications.

3.1.3 Waste Management PEIS

The Pantex SWEIS identified that the most adverse impact at the Pantex Plant from proposed Waste Management PEIS activities would occur in association with the Decentralized Alternative and would result from the need to construct low-level waste and low-level mixed waste treatment and disposal facilities at the Plant. The SWEIS analyzed the impacts of this bounding case (DOE 1996a, Section 4.21). NNSA ultimately decided on a combination of decentralized and regionalized alternatives, as reflected in the Waste Management PEIS Record of Decision (65 FR 10061, February 25, 2000). The potential impacts of this decision fall within the conditions evaluated in the SWEIS. Other Records of Decision issued for the Waste Management PEIS (63 FR 3629, January 23, 1998; 63 FR 41810, August 5, 1998; and 64 FR 46661, August 26, 1999) addressed management decisions for transuranic waste, non-wastewater hazardous waste, and high-level radioactive waste, and did not change ongoing waste management practices at the Pantex Plant. Subsequent to the original Waste Management PEIS, DOE prepared three supplement analyses (DOE/EIS-0200-SA-01, -02, and -03 in 2000, 2005, and 2008, respectively) as well as several Record of Decision revisions and a Record of Decision amendment that have all dealt with the management of transuranic waste. Transuranic waste is not normally produced at the Pantex Plant, and these subsequent waste management decisions have no cumulative impact implications.

3.2 New Activities Considered for Cumulative Impacts

NNSA contacted the Panhandle Regional Planning Commission with regard to the identification of any reasonably foreseeable future projects in the area of the Pantex Plant that might result in cumulative

impacts. The Planning Commission identified the CenterPort Business Park under development by the Amarillo Economic Development Corporation, the Public Utility Commission of Texas's Competitive Renewable Energy Zone Project, and the High Majestic Wind II Project under development by NextEra Energy Resources. These three projects are briefly described below.

3.2.1 CenterPort Business Park

The CenterPort Business Park, located on the east side of Amarillo, is owned, controlled, and under development by the Amarillo Economic Development Corporation (AEDC 2012a, all). Figure 3-1 shows the location of the 440-acre business park in relation to the Pantex Plant. The business park is about 8 miles to the southwest of the nearest part of the main Pantex Plant and about 6 miles southwest of the nearest DOE/NNSA-leased land. Western portions of the business park have already been developed and the Amarillo Economic Development Corporation is planning to make improvements on other portions of the property in the immediate future. These plans include road work, involving about 0.5 mile of new road and improving about 0.6 mile of existing road, as well as improvements to the existing drainage system for the Park (AEDC 2012b, all). A primary purpose for this property is to attract new businesses to the area. As such, additional construction might occur in the near future if new businesses choose to locate there. However, only the road and drainage improvement are currently identified as reasonably foreseeable actions for the immediate future.

Figure 3-1. Location of the CenterPort Business Park in Relation to the Pantex Plant

3.2.2 Competitive Renewable Energy Zone Project

Senate Bill 20 (2005) directed the Public Utility Commission of Texas to designate "competitive renewable energy zones," for areas suitable for the generation of wind power and to define the required electrical transmission system upgrades necessary to deliver wind-generated energy to Texas consumers (PUCT 2012a, all). A primary objective of this project is to provide the capability to move wind-generated electricity from the more remote parts of north and west-central Texas to the heavily populated areas of Texas such as Austin, Dallas-Fort Worth, and San Antonio. Figure 3-2 shows the transmission lines and substations proposed for the Texas Panhandle region under the Competitive Renewable Energy Zone (CREZ) Project.

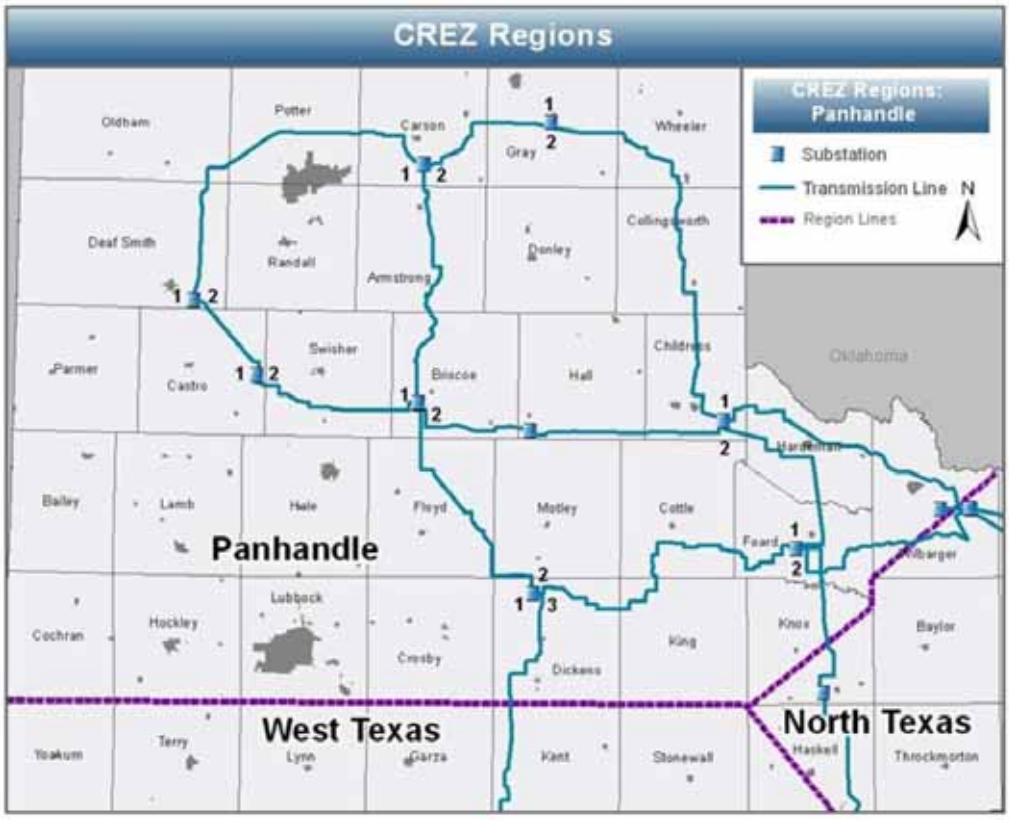

Figure 3-2. Transmission Lines and Substations Proposed for the Texas Panhandle Region
(Source: PUCT 2012b, all)

The Public Utility Commission of Texas designated Sharyland Utilities to construct approximately 300 miles of new transmission lines and four substations under the Competitive Renewable Energy Zone project, including the loop around the Amarillo area in Figure 3-2 (Sharyland 2012a, all). Sharyland expects the transmission lines to be constructed within right-of-ways of a nominal width of 175 feet, but notes that some locations may require more or less width depending on the specific terrain and type of structure to be used. Sharyland also has indicated that lines would normally be suspended from steel lattice structures (towers) of approximately 125 feet in height (Sharyland 2012b, all). Construction on some of the Sharyland transmission line segments and substations has already begun, most construction is to be complete by mid-2013, and the entire loop is scheduled to be in service by the end of September 2013 (PUCT 2012b, all). Figure 3-3 shows the approved route for the transmission line segment that will run closest to the Pantex Plant. The figure also shows the location of the nearest substation, which Sharyland has labeled as a collection station.

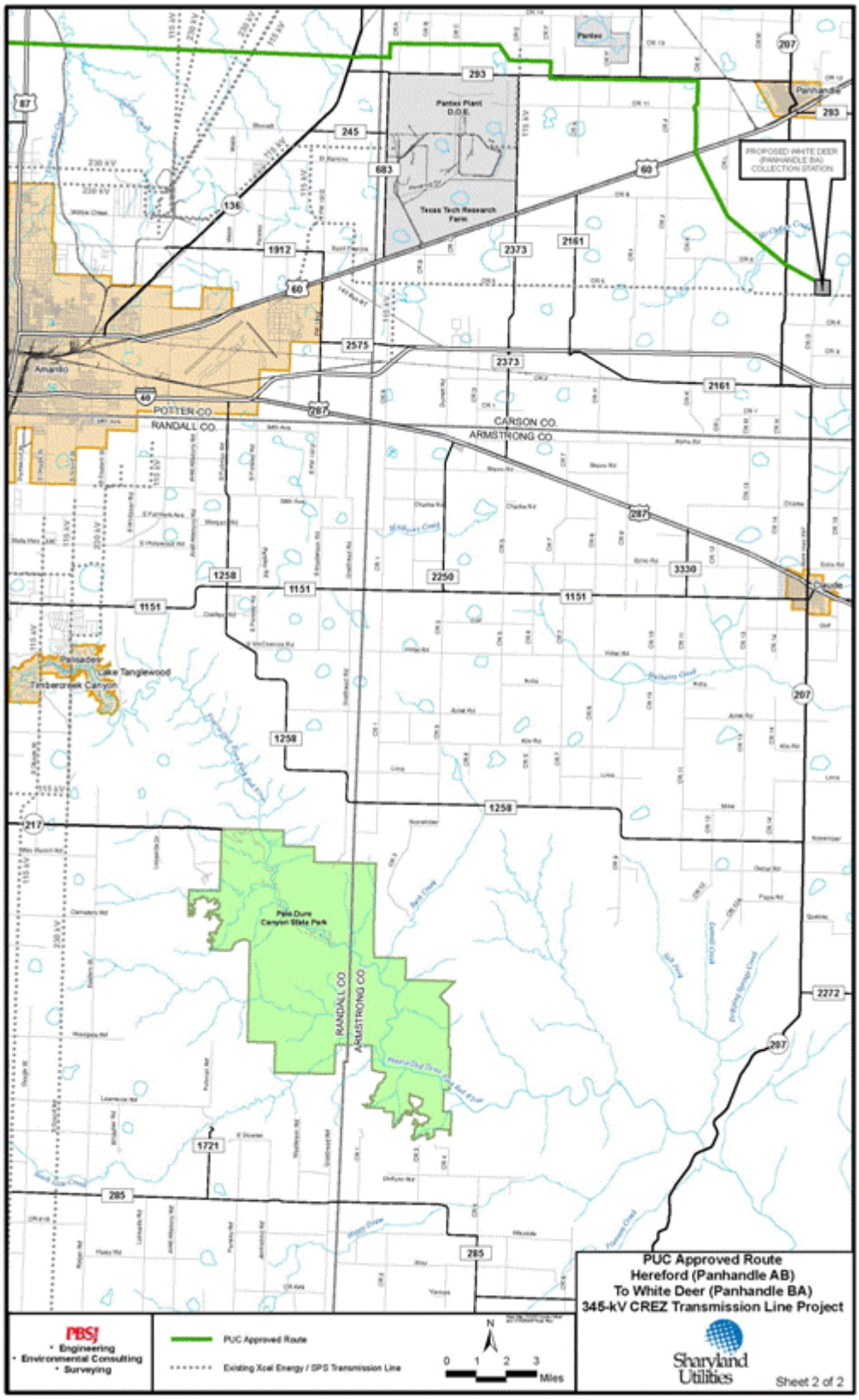

Figure 3-3. Approved Route for the Transmission Line Segment Closest to the Pantex Plant
(Source: Sharyland 2012c, all)

3.2.3 High Majestic Wind II Project

NextEra Energy Resources has started a project, High Majestic Wind II, to build 51 wind turbines on land north of the Pantex Plant. The new turbines will have a total capacity rating of about 80 megawatts. The project site comprises approximately 5,000 acres of agricultural land leased by NextEra, located on the Potter-Carson County border between FM Roads 293 and 1342 (Figure 3-4). All but two of the wind turbines are planned to be in Carson County. At the time of this SA's preparation, NextEra hoped to have wind turbines of the High Majestic Wind II Project operational by September 2012 (Amarillo Globe-News 2012, all). NextEra is already under contract to provide electricity from the new wind turbine farm to the Southwestern Electric Power Company (SWEPCO 2012, all).

NextEra Energy Resources currently owns and operates 53 wind turbines, also with a combined capacity rating of about 80 megawatts, in the immediate area of the Pantex Plant. NextEra purchased this group of turbines, designated the Majestic Wind Energy Center, in 2009 (NextEra 2012, all) from its builders Babcock and Brown (RedOrbit 2008, all).

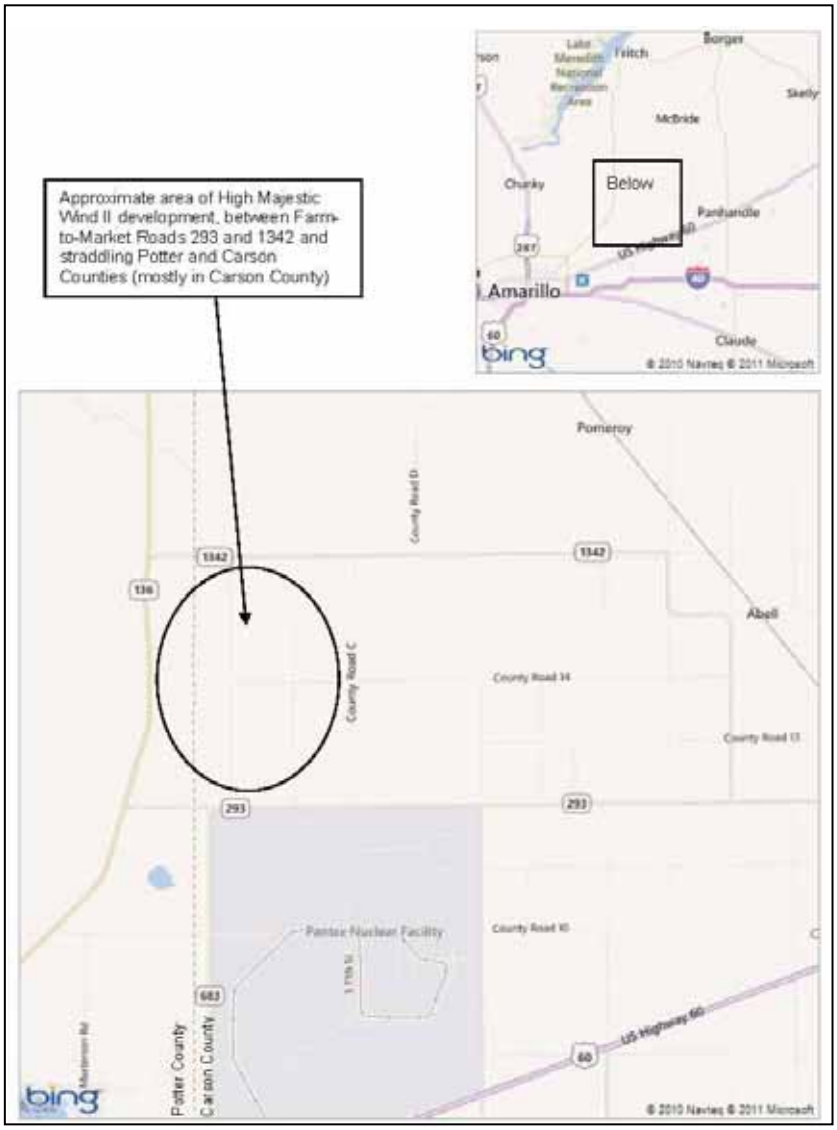

Figure 3-4. Approximate Location of the High Majestic Wind II Project

3.2.4 Summary of New Activities

Table 3-1 provides a summary of the environmental impacts expected from the reasonably foreseeable future actions that could be cumulative with those of the Pantex Plant operations. Although the new projects include a specific wind farm action, the applicable impacts in the table should also be considered general effects of additional wind power generation in the region that would reasonably be expected to occur once the Competitive Renewable Energy Zone transmission lines and substations were in place.

Table 3-1. Summary of Environmental Impacts Expected from Reasonably Foreseeable Future Actions

Resource Area	Potential Impacts by Activity		
	CenterPort Business Park	**CREZ Project**	**Wind Power Generation**
Utilities	Improvements should not affect existing utilities other than improving drainage	Positive impact on electricity grid	Positive impact on electricity grid
Land Resources	No impact, land is already dedicated for use as a business park	Land use would change permanently at transmission tower and substation locations – agricultural lands likely most effected, but change would be relatively minor	Land use would change permanently at wind turbine foundations and access roads – agricultural lands likely most affected, but change would be relatively minor
Visual Resources	No impact, land is already under development	Potentially adverse impacts from transmission line towers that would be visible from long distances	Potentially adverse impacts from wind turbines that would be visible from long distances, although many people do not object to the appearance of wind turbines – also, wind turbines are already present in the general area
Geology and Soils	Minor, temporary soil disturbance during construction, but relatively flat landscape minimizes potential for erosion	Minor, temporary soil disturbance during construction, but relatively flat landscape minimizes potential for erosion	Minor, temporary soil disturbance during construction, but relatively flat landscape minimizes potential for erosion
Water Resources	Minor, water would be used during construction for compaction and dust control	Minor, water would be used during construction for compaction and dust control	Minor, water would be used during construction for compaction and dust control
Air Quality	Temporary dust and equipment emissions during construction	Temporary dust and equipment emissions during construction	Temporary dust and equipment emissions during construction Positive impact, operating wind turbines offset emissions generated from other power sources
Acoustics	Temporary noise from construction actions	Temporary noise from construction actions	Temporary noise from construction actions Noise from operating wind turbines could affect nearby residents, but most likely sites would be areas of low population density

Table 3-1. Summary of Environmental Impacts Expected from Reasonably Foreseeable Future Actions (continued)

Resource Area	Potential Impacts by Activity		
	CenterPort Business Park	CREZ Project	Wind Power Generation
Biotic Resources	No impact, land is already under development	Potential loss of habitat, but most effects are expected to be in agricultural lands Potential strike hazards to birds and bats, but design expected to minimize to the extent practicable	Potential loss of habitat, but most effects are expected to be in agricultural lands Potential strike hazards to birds and bats, but developers expected to implement mitigation measures to the extent practicable
Cultural Resources	No impact, land is already under development	Unknown, but Sharyland indicates an environmental assessment was done on the approved route so no significant impacts would be expected	Unknown, but wind turbine locations would likely be in areas already cleared and developed for other uses, primarily agricultural
Waste Management	Minor, waste from construction	Minor, waste from construction	Minor, waste from construction
Transportation	Temporary increases in traffic associated with construction activities Increased usage/development of the business park would increase routine traffic on U.S. Highway 60 and the State Loop 335	Temporary increases in traffic associated with construction activities – as a linear project, traffic during construction of the transmission line would be spread over a large area	Temporary increases in traffic associated with construction activities – construction areas would likely be over a large area
Human Health	No impacts expected other than normal safety concerns during construction	No impacts expected other than normal safety concerns during construction	No impacts expected other than normal safety concerns during construction
Facility Accidents	Not applicable	Not applicable	Not applicable
Environmental Justice	No impact, land is already under development	Unknown, but Sharyland indicates an environmental assessment was done on the approved route so no significant impacts would be expected	Unknown, but wind turbine locations would likely be in areas already cleared and developed for other uses, primarily agricultural, so they would be away from populous areas

CREZ = Competitive Renewable Energy Zone.

3.3 Cumulative Impacts

This SA evaluates potential impacts associated with new information, new and proposed projects, and modifications to existing projects within the Pantex Plant since DOE issued the SWEIS in 1996. As described in Section 2 of this SA, these analyses demonstrate that minor or no additional impacts are expected for the various resource areas.

No new missions have been identified for the Pantex Plant. The number of new facilities that could possibly be constructed from 2012 through 2016 is similar to the number of new facilities evaluated in the SWEIS, and the associated increase to the Plant's facility footprint would be slightly lower than was

evaluated in the SWEIS. There would also be demolition of excess facilities and, where appropriate, NNSA is pursuing refurbishment of existing facilities rather than new construction. The testing of high explosives has increased in frequency and magnitude since the SWEIS was issued. The primary adverse impact from this increase is the noise level increase experienced by nearby residences. However, sound levels at the nearest residences are being maintained within normally acceptable levels and the number of close residences is small. The proposed construction of as many as 39 wind turbines on DOE/NNSA-owned and -leased land would change the visual impact of the Pantex Plant and present the potential for bird and bat fatalities from collisions.

As described in Section 3.2, activities identified in the region around the Pantex Plant would generally result in short-term construction impacts, and completion of the Competitive Renewable Energy Zone Project likely would foster the construction of additional wind turbines in the general area over the longer term. Pantex Plant construction activities and construction activities in the surrounding area could have cumulative impacts related to increases in traffic, sources of particulate air emissions from land disturbance and other emissions from heavy equipment, noise, and water demand for soil compaction and dust control. In addition to being relatively short-term, these construction effects would be spread over a large area. Visual resources of the area could be greatly affected at the completion of the projects as a result of the wind turbines and electrical transmission lines and towers. There are already offsite wind turbines located to the east and northeast of the Pantex Plant, and more being constructed to the north of the Plant. If the completion of the transmission lines promotes the construction of additional wind turbines as intended, the Pantex wind turbines could become a very minor portion of the overall cumulative impacts. Along with the wind turbines, however, comes the reduction in air emissions, including greenhouse gases, which would otherwise be produced from the more traditional power generation sources. Further, it is a matter of personal preference whether the visual impacts would be considered adverse. Some individuals find the sight of wind turbines and the benefits they represent to be pleasant, or at least not adverse.

The cumulative impacts analysis in the SWEIS considered worse-case, bounding scenarios for several broad-reaching programmatic actions DOE considered at that time. Since many of the associated activities never took place (for example, relocating the Plant's capability, and construction and operation of plutonium disposition facilities), the analysis overestimated the cumulative impacts for activities at the Pantex Plant. Although some current and projected (2012 through 2016) impacts exceed the levels estimated in the SWEIS on an individual basis, the cumulative impacts analysis in the SWEIS remains valid and bounding.

4. CONCLUSION

The Pantex SWEIS evaluated the potential impacts of continued operation of the Pantex Plant between 1996 and 2006. This SA compares current conditions with those characterized and projected in the SWEIS during this period and evaluates potential impacts between 2012 and 2016 to determine whether the impacts identified in the SWEIS remain valid.

DOE regulations (10 CFR 1021.314) require a supplemental EIS be issued when "there are substantial changes to the proposal" or there are "significant new circumstances or information relevant to environmental concerns." In accordance with DOE regulations, this SA provides sufficient information to assist DOE/NNSA in determining whether the existing SWEIS should be supplemented, a new SWEIS be prepared, or no further NEPA documentation is required.

These analyses indicate that for the period evaluated in this SA (1996 through 2016), most identified and projected impacts, including cumulative impacts, have been and would continue to be within the bounds of those identified in the SWEIS. Those few impacts that exceed the bounds of the SWEIS do not result in substantial changes from the Pantex Plant SWEIS or Record of Decision, nor do they present significant new circumstances or information relative to environmental concerns. In addition, there have been no changes to Pantex Plant operations or mission, and only very small changes to the environment. Therefore, there is no need either to supplement the SWEIS or to prepare a new SWEIS.

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APPENDIX A:

Projects Considered in this Supplement Analysis

Table A-1. Projects Evaluated in the SWEIS[a]

Title of Project/Activity	Project/NEPA Status	Discussion
Hazardous Waste Treatment and Processing Facility	Construction completed in 1999. Startup completed in 2001.	This project was initiated in 1992 and was included as one of the six specific projects addressed in the SWEIS (DOE 1996a).
Special Nuclear Material Component Requalification Facility	Modified project completed in 2005. NEPA review approved in May 2002; amended in August, November, and December 2003 (BWXT Pantex 2002a, 2003a, 2003b, 2003c).	This project's predecessor (the Pit Reuse Facility) was one of the six specific projects addressed in the SWEIS and involved modification to an existing building and addition of 5,000 square feet of new space. A new project called the Special Nuclear Material Component Requalification Facility did not require construction of new space, but did require modification of approximately 15,000 square feet of existing space.
Nondestructive Evaluation Facility	Construction was expected during 2008 to 2012, but is currently not funded. Construction is supported by the CWG to start in FY2021.	This project combines three of the six specific projects addressed in the SWEIS (the Gas Analysis Laboratory, the Nondestructive Evaluation Facility, and the Materials Compatibility Assurance Facility) into a single 40,000-square-foot facility in Zone 12 South. Because of the implementation schedule, this SA does not consider this project.
Meteorology/Maintenance Relocation/Consolidation	Original project has been modified and renamed several times. There is currently no schedule for implementation of any components.	This project has been divided into multiple projects, none of which is currently funded. Therefore, this SA does not consider this project.

Sources: NNSA/B&W Pantex 2011; NNSA 2008a.

a. These projects were originally addressed under the specific facility and construction upgrades included in the SWEIS Proposed Action.

CWG = Construction Working Group; FY = fiscal year.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS

Title of Project/Activity	Project/NEPA Status	Discussion
Wastewater Treatment Facility Upgrade	This project is complete. Use and possession occurred in 2002. DOE issued an EA in April 1999 (DOE 1999a). The associated FONSI was issued in May 1999 (DOE 1999b). An additional 100 acres of subsurface irrigation system was covered under the *Environmental Assessment for Proposed Perched Groundwater Corrective Measures* (DOE/EA-1579) May 2007; the associated FONSI was issued on June 15, 2007 (NNSA 2007a, 2007b). Use and possession of the additional 100-acre tract occurred in June 2012.	The existing Wastewater Treatment Facility was upgraded by construction and operation of two new lagoons on 8 acres of land and adding an interconnected drip irrigation system to beneficially irrigate approximately 300 acres of agricultural land on the Pantex Plant site. The subsurface irrigation system has been expanded to include an additional 100-acre tract of agricultural land. The purpose of this irrigation system is to increase the beneficial use of treated wastewater and treated perched aquifer groundwater for growing crops.
Pit Repackaging in the AL-R8 Sealed Insert Container	This project is complete. An SA determination was signed in August 1998 (DOE 1998).	The SWEIS evaluated storage of pits using the AT-400A container. An SA was completed to evaluate the potential impacts of using the AL-R8 Sealed Insert container, and the pits were repackaged accordingly.
Stockpile Management Restructuring Initiative	Three activities (two of which are complete and the third cancelled) were included under the Stockpile Management Restructuring Initiative: • 35 Account Relocation–Construction was completed in 2002. • Mass Properties Equipment–Installation was completed in 2003. Use and possession occurred in 2004. • Relocation of High-Explosive Formulation–Activities was cancelled. Activities were categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B, Section 1.31.	35 Account Relocation–35 account activities, warehousing of supplies for weapons production, were relocated and consolidated. Mass Properties Equipment Installation–Outdated equipment using vacuum tube technology no longer supported by the manufacturer was replaced with equipment using solid-state technology. Relocation of High-Explosive Formulation Activities–This cancelled project would have relocated high-explosive operations currently performed in World War II-vintage buildings to a newer, blast-resistant building designed to support High Explosive Class I and II operations.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS (continued)

Title of Project/Activity	Project/NEPA Status	Discussion
Environmental, Safety and Health Analytical Laboratory	This project is complete. Use and possession occurred in August 2002. The original EA was approved in July 1995 (DOE 1995). The modified project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B, Section B3.6.	The EA evaluated a new 16,400-square-foot facility prior to issuance of the SWEIS. As a result, DOE constructed an 8,300-square-foot addition to an existing analytical laboratory building.
Continued Storage of Pits in Zone 4	An amended Record of Decision was issued on April 19, 2002 (67 FR 19432).	The amended Record of Decision for the *Storage and Disposition of Weapons-Usable Fissile Materials Final Programmatic EIS* and *Surplus Plutonium Disposition EIS* states DOE's decision to continue storing pits indefinitely in Zones 4 and 12.
Stage Right Automated Guided Vehicle Pit Storage System	This project was originally evaluated in the *Final Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (DOE 1996b). The revised project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B. The last NEPA Review (for Phase III) was approved in April 2005.	The revised project provides an automated system for storage and retrieval of weapons pallets in Zones 4 and 12. The project was implemented in three phases, all of which are completed. Of note is Phase III, which extended automated guide vehicle operation into two additional rooms in Building 12-116.
Relocation of Weapons Evaluation Test Laboratory Facility	This project is complete. Use and possession occurred in 2005. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B, Section B3.6.	This project includes construction and operation of a new 30,000-square-foot facility south of Zone 11 and relocation of existing equipment. Sandia National Laboratories operates this facility.
Production Cells Upgrade	This project is complete. Use and possession occurred in 2007. Activities were evaluated under *Routine Administrative and Operating Activities Planned at Pantex Plant for FY2001 and FY2002*, which was approved in August 2000.	Modifications include installation of task exhaust, contaminated waste isolation, and dehumidifiers.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS (continued)

Title of Project/Activity	Project/NEPA Status	Discussion
Nuclear Weapons Complex Roofing Program Support	This project started in 2002 and is expected to continue as long as funding is provided. NEPA reviews have been and will continue to be completed to provide NEPA coverage. Activities are evaluated under *Routine Administrative and Operating Activities Planned at Pantex Plant* (for the current fiscal year).	The project involves the replacement or repair of roofs on buildings in all areas of the Pantex Plant, based on priority needs.
Records Storage Facility	This project was completed in 2006. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in August 2003.	A new 9,837-square-foot Records Storage Facility was constructed in Zone 12.
Technical Support Facility – Replacement of Office Buildings	Use and possession occurred in 2006. This project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in September 2004.	NNSA constructed a single-story office building, approximately 13,000 square feet in size, a parking area, and sidewalk in Zone 12. This new office building replaced Buildings 12-97 and 9-002. Building 9-002 was demolished in FY2006; Building 12-97 was demolished in FY2007.
Gas Main and Distribution System Upgrade	This project has been completed**.** An EA was issued in August 2005, and the associated FONSI was issued in September 2005 (NNSA 2005a, 2005b).	This project involved installation of a new gas distribution system and associated components, and upgrades to existing portions of the system on and off the Pantex Plant site.
New Administration Building – Replacement of Office Buildings	This project was completed in 2006. This project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in August 2003.	NNSA constructed a freestanding, two-story office building approximately 20,000 square feet in size in Zone 12 to house Pantex personnel.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS (continued)

Title of Project/Activity	Project/NEPA Status	Discussion
Tester Design Facility	This project was completed in 2006. Use and possession occurred in 2007. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review for construction was approved in September 2004. NNSA completed the NEPA review for demolition of Building 12-9A in January 2007 and the demolition of Building 12-9 was completed in July 2007. Activities were evaluated for both demolition projects under *Deactivation and Decommissioning Projects Planned for FY2007 through FY2010* (NNSA 2007c), approved January 2007.	NNSA constructed a single-story, metal office building for Tester Design to collocate existing tester design activities and personnel located in Buildings 12-9, 12-9A, and 12-102 in a single facility. The approximately 14,000-square-foot office building was constructed in conjunction with the new Technical Support Facility. In addition to office space, this building includes warehousing and a test hood. NNSA demolished Buildings 12-9 and 12-9A in 2008.
Process Container Storage Facility	The project was completed in 2005. This project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in August 2004.	This project involved construction of a new warehouse on the concrete slab of demolished warehouse Building 11-9. NNSA instead erected the Process Container Storage Facility, a 16,000-square-foot prefabricated, half-cylinder structure.
Security Infrastructure Projects	Use and possession of the Security Operations Facility occurred in 2008. Use and possession of the Security Locker Facility occurred in 2008. Use and possession of the Security Training Facility occurred in 2010. This project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in April 2006.	The increased size of the Pantex protective force required upgrading, expansion, or replacement of several facilities. Related projects include: • The Security Operations Facility (formerly called the Protective Force Muster Room/Armory and Training Facility) provides a muster room, an armory, and offices in a Zone 12 facility approximately 11,000 square feet in size. • The Security Locker Facility is a 12,780-square-foot locker room facility adjacent to the Security Operations Facility. • A new Training and Firearms Cleaning Facility in Zone 16 North is approximately 12,780 square feet in size.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS (continued)

Title of Project/Activity	Project/NEPA Status	Discussion
Building Demolition Projects	Buildings were demolished each year from FY2002 through FY2011. NEPA evaluations were completed as appropriate for individual projects.	This project involved demolition to remove approximately 250,424 square feet of aging facilities that are no longer useful. Demolition also counts toward maintaining the total facility footprint.
Playa 1 Perched Aquifer Dewatering Corrective Measures Construction	Use and possession occurred in December 2008. NEPA coverage for this project was under the *Environmental Assessment for Proposed Perched Groundwater Corrective Measures* (DOE/EA-1579) May 2007; the associated FONSI was issued on June 15, 2007 (NNSA 2007a, 2007b).	This project involved the design, construction, and operation of a pump and treat system that is used to dewater a large portion of the perched aquifer, thereby providing long-term stabilization of the contaminant plume by removing the hydraulic head.
Installation and Use of Microwave Furnace to Melt/Disfigure Scrap Weapon Components	NNSA installed the microwave furnace and completed performance testing in June 2011. It is fully functional. NEPA coverage was provided by the Pantex SWEIS; the Record of Decision (62 FR 3880) was signed January 1997.	This furnace allows for the destruction and sanitization (removal of classified attributes) of scrap weapon components and reclaiming of warehouse space (necessary for current weapon dismantlement programs).
Installation of a Mixed Oxidant Generator for the Plant Water Distribution System Chlorination Process	Use and possession occurred in October 2009. Activities were evaluated under *Safety & Environmental Improvements For FY06 and FY07*, approved September 20, 2005.	The project replaced the existing Pantex water distribution system chlorine gas disinfection process at Building 15-29 with a mixed oxidant (hypo-chlorination) generating system. This project eliminated the handling of chlorine gas cylinders and the associated toxic inhalation hazard at this location.
High Pressure Fire Loop, Zone 12 South, Material Access Area	This project is under construction. NEPA coverage was provided by the Pantex SWEIS; the Record of Decision was signed January 1997.	This project involves providing a reliable fire suppression system in Zone 12 South Material Access Area by replacing high pressure fire loop distribution piping.
Building 16-12 Visitor Center	Use and possession occurred in June 2010. Activities were evaluated under *Routine Administrative and Operating Activities Planned at Pantex Plant for FY2008 and FY2009,* approved in February 2008.	NNSA expanded the conference room in Building 16-12 and modified it to become a visitor center.

Table A-2. NEPA Actions Initiated Since Issuance of the SWEIS (continued)

Title of Project/Activity	Project/NEPA Status	Discussion
High Pressure Fire Loop Tank and Pump Replacement	This project is under construction. Use and possession expected in May 2012. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15. The NEPA review was approved in April 2011.	This project would construct and operate two new high-pressure fire loop pump houses and tank facilities to replace aging existing facilities. Demolition of the existing facilities is not included in this scope of work.
HE Pressing Facility	This project is under construction. Use and possession is expected in 2013. NNSA issued an EA in June 2008 (NNSA 2008b, 2008c). Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS	This project will provide a new 45,000-square-foot facility in Zone 11. It will consolidate current high-explosive pressing activities into a single facility and relocate the existing operations from two other buildings. The facility will include a main pressing facility, a magazine storage area, and a ramp. The 45,000 square feet measure is the net square footage. The planned gross square footage for the pressing facility, storage magazine area, and ramp is 53,712 square feet.
Operations Systems Development & Integration Project	This project started in January 2012. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.7. The NEPA review was approved in May 2010.	This project involves replacing the functionality of the Condition Assessment Survey software with a new product that will enhance Pantex manufacturing operations, utilizing modern software solutions. This project involves Pantex communications system and data processing equipment only and does not cause land disturbance or impacts related to water use, air emissions, or current Plant workforce.
Office of Secure Transportation Central Command, Agent Facility	The project is completed. Use and possession occurred in September 2010. The project was categorically excluded under 10 CFR Part 1021, Subpart D, Appendix B1.15, approved September 2010.	This project consists of completing the design and construction of a single-story administration facility (approximately 25,000 square feet) at a site contiguous to the area where the Office of Secure Transportation is currently located.
Mass Properties Equipment Replacement	This project is underway. The project was covered under an Internal NEPA Review Form, EXP-11-010N, approved March 16, 2011.	This project involves installing new Mass Properties Equipment, replacing the one destroyed in a flood. This is a “like-for-like” equipment replacement.

Table A-3. NEPA Actions Expected to be Initiated from 2012 Through 2016

Title	Project Status	Discussion
Nuclear Weapons Complex Roofing Program Support	This project began in 2002 and is expected to continue as long as funding is provided. Activities were originally evaluated under *Routine Administrative and Operating Activities Planned at Pantex Plant for FY2001 and FY2002,* which was approved in August 2000. Annual NEPA reviews will be completed and approved for each year. The description to the right is from the FY2012 Roofing NEPA document.	This project identifies roofing activities planned at the Pantex Plant for FY2012. The goal is to extend the service life of existing roof systems to their maximum extent possible, as well as to replace failed roofs. The requirements included in this document apply to buildings added in the future. If future roofing projects have unusual specifications that are not included in the scope of this document, an amendment would be required. This project does not cause land disturbance or impacts related to water use or operational workers. Nonradiological air emissions will be like those for adhesives, propane, and other chemicals used for specific buildings. Records of chemical usage will be tracked.
Steam Line Replacement, Zone 11	This project is currently funded and anticipated to be completed at the end of FY2013. A NEPA review will be completed prior to award of the contract.	This project involves replacement of some damaged underground steam lines with an aboveground steam line in Zones 11 and 12. Involves replacing less than one mile of line.
Fire Suppression Lead-Ins Project	This project is not funded at this time.	This project addresses the lead-ins for 35 mission-critical bays/cells. The existing piping is predominantly ductile and cast iron. Due to pipe aging and existing soil conditions, the lead-ins have experienced degradation from corrosion. This work is expected to be completed over a 10-year period as part of a bay/cell maintenance project and now involves 92 facilities.
HE Science, Technology, & Engineering Facility	This project is not funded at this time. CD-0 has been approved. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	This project involves the construction of a new facility capable of housing various Plant operations, including environmental aging, test fire operations, new lot testing, laser measurement, and sampling technology development. These operations are currently located in 15 separate facilities, which are an average of 58 years old and do not provide efficient work practices. This facility would support the NNSA mission to mature advanced weapons surety technologies, qualify weapon components, and provide data for annual stockpile assessments through weapon surveillance.

Table A-3. NEPA Actions Expected to be Initiated from 2012 Through 2016 (continued)

Title	Project Status	Discussion
Flame Detector Upgrade	This project is not funded at this time.	This project addresses upgrades to flame detector equipment due to new regulatory requirements, component obsolescence, and the availability of new technologies for increased capabilities. This work is expected to be completed over a 10-year period as part of a bay/cell maintenance project and now involves 66 facilities.
Perched Groundwater Corrective Measures	Construction started in FY2007. NNSA issued an EA in May 2007; the associated FONSI was issued in June 2007 (NNSA 2007a, 2007b).	The specific scope of this environmental restoration project has depended on regulatory decisions made by the State of Texas. In early FY2013, NNSA will draft and submit the CERCLA 5-Year Review Report to TCEQ and EPA. This report will be finalized and approved no later than August 2013. The purpose of this review is to evaluate the remedial actions to determine if they need to be modified to achieve the objectives in the Record of Decision and to ensure that they remain protective of human health and the environment. Depending on the report, the following could require further work: • The Zone 11 In-Situ Bioremediation System may need to be expanded to the west (addition of up to 20 wells). The location potentially could end up with some pump and treat systems as an enhancement to the current ISB system; however, it is too early to tell. • NNSA might install a storage pond and conveyance piping to improve capacity for beneficial use of treated perched groundwater. Siting of the pond and conveyance path has not yet been determined. • Additional extraction wells could be required on property east of FM 2373 that would be tied into the Southeast Pump and Treat Facility (Building 16-28). • Additional monitoring wells could be required.
HE Packaging & Staging Facility	This project is not funded at this time. CD-0 has been submitted, but not approved. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	This project would consolidate packaging and staging operations currently being performed in 10 separate buildings into a new facility. This would result in an estimated 38% reduction in square footage and provide for efficient work processes for both research and development and production.

Table A-3. NEPA Actions Expected to be Initiated from 2012 Through 2016 (continued)

Title	Project Status	Discussion
Pantex Renewable Energy Project	NNSA may issue the Request for Proposal in May 2012. The RFP will include a 25-year contract between the NNSA and a private energy company that wins the bid. The deal, called an Energy Savings Performance Contract, allows Federal agencies to initiate energy saving projects without up-front capital costs from the Federal government. The EA and FONSI were approved in July 2010 (NNSA 2010a, 2010b).	This project is in response to the *Energy Policy Act of 2005*. The project involves the design, construction, operation, maintenance, and decommissioning of a wind generator farm and its associated distribution infrastructure on Pantex Federal property or leased land using Federal funding. The wind turbine generators, at a minimum, would have sufficient capacity/power to satisfy Pantex Plant energy demand when conditions are favorable to generate electrical power. The project would be completed in three phases. Phase 1 would consist of 4 to 7 wind turbine generators constructed on Federal property, with a total average generating capacity of 5 to 7.5 megawatts that would connect to the existing Pantex Plant south substation's 12.5-kilovolt distribution system.
HE Formulation Facility	This project is not funded at this time, but is supported by the CWG starting in FY2020. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	This project would support the expected workload and provide backup capability of sufficient quantities of HE through the construction of a new facility. Currently, operations are being performed in several facilities. The project would relocate those operations currently performed in Zone 12 to Zone 11, thereby improving both quality and consistency.
HE Component Fabrication and Qualification Facility	This project is not funded at this time, but is supported by the CWG starting in FY2021. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	This facility would relocate various explosives operations, quality assurance inspection and gauging activities, and explosives studies from two 1950s-era facilities that are wrongly configured, have inadequate explosives limits, and are in poor repair.
Non-Destructive Evaluation Facility	This project is not funded at this time, but is supported by the CWG starting in FY2021.	This facility would address the need to conduct critical non-destructive evaluations and laboratory analysis of gases to support analytical and scientific evaluations of weapon systems in modern facilities. Currently, these evaluations are being performed in aging WWII structures.
High Pressure Fire Loop – Zone 11	This project is not funded at this time, but is supported by the CWG starting in FY2022. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	The high pressure file loop would be designed to provide water at a pressure, flow rate, and quantity to meet the demands of the fire suppression system in each facility.

Table A-3. NEPA Actions Expected to be Initiated from 2012 Through 2016 (continued)

Title	Project Status	Discussion
Fire Protection Building Lead-Ins Replacement Project	This project is not funded at this time, but is supported by the CWG starting in FY2021.	This project addresses the lead-ins for the mission-dependent, non-critical facilities in Zone 12 South MAA.
Inert Machining Facility	This project is not funded at this time, but is supported by the CWG starting in FY2020. Note: This project is part of the Center of Excellence as described in the Complex Transformation Supplemental PEIS.	This facility would support the characterization, sanitization, and disposition of components generated from dismantlement processes. The quantity of components would significantly increase as each nation works to reach its agreed threshold limits. This increase is anticipated to exceed the current capability at Pantex. This facility would also support new HE technology.
Material Staging Facility	This project is not funded at this time. CD-0 approval documents have been requested, and initial drafts were submitted to NNSA. Note: This project is part of the Complex Transformation Supplemental PEIS.	This facility would involve relocating the current staging operations to an area closer to production. This would reduce the safety and security risk associated with transporting nuclear weapons and nuclear parts through limited and protected areas. It would also eliminate inclement weather risks that may cause delays and postpone weapon movements between the two areas.
Environmental Testing Facility	This project is not funded at this time. A preliminary Project Design Agreement and a Rough Order of Magnitude Estimate have been completed. Note: This project is part of the Complex Transformation Supplemental PEIS.	The project would prepare two existing facilities at Pantex to accept SNM-surveillance testing equipment from LLNL to Pantex. It would include planning, design, and installation of SNM-surveillance testing equipment. Removal and refurbishment of the equipment is the responsibility of LLNL.
Weapon Surveillance Facility (formerly called the Component Evaluation Facility)	This project is not funded at this time and will not receive funding any time soon. Currently, this project is not supported by the CWG. This project would probably require an EA.	This project would involve construction of a new facility to consolidate and increase the capability and capacity of existing technologies and to provide space for new technologies required for surveillance and requalification of weapons and components. Consolidation of these activities into this new facility would allow bays currently used for evaluation to be returned to weapon assembly/disassembly operations.
Physical Training/Intermediate Use of Force	The U.S. Army Corps of Engineers will do the design and construction for this project. The Corps has received funding and is now in design. Groundbreaking is expected in the first quarter of FY2013.	This would be a new facility for the Office of Secure Transportation and Pantex Site Project Office personnel to train and certify in physical fitness activities and intermediate use of force activities.

Table A-3. NEPA Actions Expected to be Initiated from 2012 Through 2016 (continued)

Title	Project Status	Discussion
Security Upgrade Projects	This project involves four security line item projects. The PIDAS Upgrade and Portal Upgrade projects are in the 10-year time frame and are currently not funded. Two other projects are in the 10- to 20-year time frame. None of the projects are currently supported in FY2012. PIDAS is proposed for initial studies in FY13, but it is unknown if that is supported in Security's budget.	Several projects are proposed to support new DOE orders and enhancements of the design basis threat posture, including renovating or expanding buildings and training facilities, upgrading guard towers, and upgrading security booths.
Building Demolition Projects	The FY2012 proposed demolition projects will most likely be pushed back to FY2013 based on no expected demolition funding in FY2012.	Demolition would be conducted to remove aging facilities that are no longer useful. It is estimated that these demolitions would reduce the facility footprint by approximately 89,300 square feet. Demolition would also count toward maintaining the total facility footprint. The majority of planned future demolitions are contingent on construction of replacement facilities. (See Attachment E-1 of *Pantex FY2012-2021 Ten-Year Site Plant* [NNSA/B&W Pantex 2011] for the list of building eligible to be demolished. Current funding levels will not support all demolitions.)
Stage Pu metal and/or Pu oxide in designated SNM storage areas.	Activity is expected to commence FY2013.	The Pantex Site is currently authorized to stage/store up to 20,000 pits onsite. In FY2012, B&W Pantex expects to receive a programmatic request to temporarily stage plutonium metal and/or plutonium oxide resulting from pit disassembly and conversion processes occurring elsewhere within the National Security Enterprise. The bulk of the material would result from processing pits currently residing at Pantex. The total quantity of plutonium in pit, metal, and oxide form staged/stored at Pantex shall not exceed that amount currently authorized in 20,000 pits.

CD = critical decision; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act ; CWG = Construction Working Group; EPA = U.S. Environmental Protection Agency; FM = farm-to-market (road); FY = fiscal year; RHE = high explosives; FP = request for proposal; PIDAS = Perimeter Intrusion Detection and Surveillance; Pu = plutonium; SNM = special nuclear material; TCEQ = Texas Commission on Environmental Quality.

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