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Final

Environmental Assessment for the Proposed Consolidation of Certain Dynamic Experimentation Activities at the Two-Mile Mesa Complex Los Alamos National Laboratory, Los Alamos, New Mexico

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Department of Energy
National Nuclear Security Administration
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ACRONYMS AND TERMS

ac	acres
AEA	*Atomic Energy Act*
AEIs	areas of environmental interest
AOC	area of concern
BACMs	best available control measures
BMPs	best management practices
CAA	*Clean Air Act*
CERL	Collaborative Energetics Research Laboratory (Building)
CFR	Code of Federal Regulations
CHEM	Characterization of Highly Energetic Materials
DARHT	Dual-Axis Radiographic Hydrodynamics Testing (Facility)
dBA	A-weighted frequency scale
DOE	(U.S.) Department of Energy
DOI	(U.S.) Department of the Interior
DQF	Detonator Qualification Facility
DU	depleted uranium
DX	Dynamic Experimentation (Division)
EA	environmental assessment
EDE	effective dose equivalent
EDF	Electronics Diagnostic Facility
EIS	environmental impact statement
EO	Executive Order
EOC	Emergency Operations Center
EPA	(U.S.) Environmental Protection Agency
ER	Environmental Restoration
ERPG	Emergency Response Planning Guideline
ft	feet
ft^2	square feet
ft^3	cubic feet
FY	fiscal year
ha	hectares
HAPs	hazardous air pollutants
HE	high explosive
HEPA	high-efficiency particulate air
HMP	Habitat Management Plan
HVAC	heating, ventilation, and air conditioning
IDLH	immediately dangerous to life or health
kg	kilograms
km	kilometers
km^2	square kilometers
kV	kilovolt
LANL	Los Alamos National Laboratory
lb	pounds
LLW	low-level radioactive waste
m	meters
m^2	square meters
m^3	cubic meters
MEI	maximally exposed individual
mi	miles
mi^2	square miles
NAAQS	National Ambient Air Quality Standards
NEPA	*National Environmental Policy Act of 1969*
NESHAP	National Emission Standard for Hazardous Air Pollutants
NFA	no further action
NMAC	New Mexico Administrative Code
NMAAQS	New Mexico Ambient Air Quality Standards
NMED	New Mexico Environment Department

NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
Plan	Contractor Safety Plan
PPE	personal protective equipment
PRSs	potential release sites
Rad NESHAP	NESHAP for Radiation
RCRA	*Resource Conservation and Recovery Act*
ROD	Record of Decision
SDP	Shock and Detonation Physics (Building)
SEA	Special Environmental Analysis
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SR	State Road
SWEIS	Site-Wide Environmental Impact Statement
SWMUs	solid waste management units
SWSC	Sanitary Wastewater System Consolidation
TA	Technical Area
TLV	Threshold Limit Value
UC	University of California
U.S.	United States
WTA	Western Technical Area
yd^3	cubic yards

EXPONENTIAL NOTATION: Many values in the text and tables of this document are expressed in exponential notation. An exponent is the power to which the expression, or number, is raised. This form of notation is used to conserve space and to focus attention on comparisons of the order of magnitude of the numbers (see examples):

1×10^{4}	=	10,000
1×10^{2}	=	100
1×10^{0}	=	1
1×10^{-2}	=	0.01
1×10^{-4}	=	0.0001

Metric Conversions Used in this Document

Multiply	By	To Obtain
Length		
inch (in.)	2.50	centimeters (cm)
feet (ft)	0.30	meters (m)
yards (yd)	0.91	meters (m)
miles (mi)	1.61	kilometers (km)
Area		
acres (ac)	0.40	hectares (ha)
square feet (ft^2)	0.09	square meters (m^2)
square yards (yd^2)	0.84	square meters (m^2)
square miles (mi^2)	2.59	square kilometers (km^2)
Volume		
gallons (gal.)	3.79	liters (L)
cubic feet (ft^3)	0.03	cubic meters (m^3)
cubic yards (yd^3)	0.76	cubic meters (m^3)
Weight		
ounces (oz)	29.60	grams (g)
pounds (lb)	0.45	kilograms (kg)
short ton (ton)	0.91	metric ton (t)

EXECUTIVE SUMMARY

The National Nuclear Security Administration (NNSA)[1] has assigned a continuing role to Los Alamos National Laboratory (LANL) in carrying out NNSA's national security mission. To enable LANL to continue this enduring responsibility requires that NNSA maintain the capabilities and capacities required in support of its national mission assignments at LANL. These assignments include maintaining core intellectual and technical competencies in nuclear weapons and a safe, and reliable, national nuclear weapons stockpile. The NNSA fulfills this commitment through the Stockpile Stewardship Program. LANL's Dynamic Experimentation Division's (DX) primary function is nuclear stockpile stewardship, with certification responsibility for the substantial majority of the nation's active nuclear weapons stockpile. DX's stockpile stewardship activities currently involve facilities primarily located in buildings and structures at Technical Area (TA) 6, TA-8, TA-9, TA-14, TA-15, TA-22, TA-36, TA-39, TA-40, and TA-69. Most of these buildings have many identified structural and systemic problems that make it difficult to meet the functional and safety requirements of the operations that these facilities house. Wildfire and traffic safety issues at DX facilities have also been identified. NNSA needs to correct these problems so that the necessary programmatic, management, and support functions housed at LANL can continue to function with a high level of efficiency. Additionally, NNSA also needs to minimize energy and resource consumption and reduce the cost of maintaining operations.

The Proposed Action is to construct and operate offices, laboratories, and shops within the Two-Mile Mesa Complex, located at TA-22, TA-6, and TA-40, where work would be consolidated from other locations at LANL. The Proposed Action would also remove or demolish certain vacated structures that are no longer needed. The Proposed Action includes constructing 15 to 25 new structures over a 10-year time frame to replace about 59 structures currently used for DX operations. These new structures would consist of two to five combination office and laboratory buildings, a Characterization of Highly Energetic Materials laboratory, an Engineering Diagnostic Facility, five Contained Firing Capability buildings and the associated support structures, a High Bay Laboratory, a Detonator Qualification Laboratory, two to four Gas Gun Facility buildings, a Machine Shop, a Classified High Explosives Storage building, and a lecture hall. The Proposed Action would also involve upgrading or constructing new roads, parking, fencing, and utilities within the Two-Mile Mesa Complex, including construction of a new road and security gate to provide access to the DX complex. In addition, when construction is completed, the Two-Mile Mesa Complex would be landscaped. Many existing DX operations, personnel, and support staff would be relocated to the new buildings at the Two-Mile Mesa Complex. Once temporary buildings are vacated, they would be removed from the DX complex and made available for reuse. Permanent buildings that are vacated as part of the Proposed Action are not expected to have future uses and, consequently, this Environmental Assessment analyzes demolition of these structures. If any other use is identified before demolition, additional *National Environmental Policy Act of 1969* compliance reviews would be performed to consider future use of the structures.

[1] The NNSA is a separately organized agency within the United States Department of Energy (DOE) established by the *1999 National Nuclear Security Administration Act* [Title 32 of the *Defense Authorization Act* for Fiscal Year 2000].

The No Action Alternative is also considered. Under this alternative DOE would not construct new buildings for the functions described in the Proposed Action—nor would DOE demolish the buildings that currently contain those functions. Outdoor firing tests would continue to be performed. Environmental advantages of contained firing tests would not be realized. Poor-quality office and laboratory space would continue to be used, and the effectiveness of current staff and the ability to recruit and retain qualified employees would remain problematic. DX operations would continue to be conducted in dispersed facilities; there would be no reduction in the cost of facility maintenance. Aging heating, ventilation, and air conditioning systems and other building components would fail and would be expensive or impossible to repair or replace. Areas of buildings or entire structures that are deemed unsuitable for continuous human occupancy would be abandoned in place. This is not an alternative that meets NNSA's purpose and need for action.

The proposed construction sites would be located within the Two-Mile Mesa Complex area. Some mature trees may need to be removed from areas near the periphery of the complex. No construction would be conducted within a floodplain or a wetland. New construction areas would be sited to avoid adverse effects to cultural resources and sensitive habitat areas. There are several potential release sites at Two-Mile Mesa; however, these areas would be avoided, where possible, or, if affected by the Proposed Action, would be sampled and remediated in accordance with New Mexico Environment Department requirements before construction. The Proposed Action is designed to decrease current traffic congestion in the area. There would be adequate parking for University of California (UC) personnel and construction workers. Construction and demolition wastes would be trucked to a licensed commercial landfill or reused for backfilling. Construction and demolition activities for the proposed Two-Mile Mesa complex would be expected to produce only temporary and localized air emissions. Once construction was complete, operational emissions may decrease due to increased efficiency with more modern equipment and facilities. Consolidation of operations under the Proposed Action would have no effects on visual resources, water quality, or adverse health effects on UC employees or construction workers. None of the buildings to be constructed as part of the Proposed Action would be sited over the geological fault trace or within 50 ft (15 m) of any known active fault. The demolition of various buildings could have an adverse effect on some historical structures that are eligible for the National Register of Historic Places. The importance of these buildings to LANL's history is being assessed. A plan is being developed that will identify research tools to preserve the historical knowledge and features of these structures.

Cumulative effects of the Proposed Action, along with past, present, and reasonably foreseeable actions, on LANL and surrounding lands are anticipated to be negligible. No increases in LANL operations are anticipated as a result of this action.

1.0 PURPOSE AND NEED

1.1 Introduction

The *National Environmental Policy Act of 1969* (NEPA) requires Federal agency officials to consider the environmental consequences of their proposed actions before decisions are made. In complying with NEPA, the United States (U.S.) Department of Energy (DOE), National Nuclear Security Administration (NNSA)[2], follows the Council on Environmental Quality regulations (40 CFR 1500-1508) and DOE's NEPA implementing procedures (10 CFR 1021). The purpose of an environmental assessment (EA) is to provide Federal decision makers with sufficient evidence and analysis to determine whether to prepare an environmental impact statement (EIS) or issue a Finding of No Significant Impact.

Los Alamos National Laboratory (LANL) is a national security laboratory located at Los Alamos, New Mexico, that comprises about 40 square miles (mi^2) (103.6 square kilometers [km^2]) of buildings, structures, and forested land (Figure 1). It is administered by NNSA for the Federal government and is managed and operated under contract by the University of California (UC). The NNSA must make a decision whether to consolidate and construct new facilities for the Dynamic Experimentation Division (DX) to create a central core area of facilities, including offices, laboratories, and other support structures, at LANL's Two-Mile Mesa Complex, which comprises portions of Technical Area (TA) 6, TA-22, and TA-40. This Proposed Action would involve constructing new buildings; consolidating existing operations and offices; enhancing utilities, roads, and security infrastructure; and demolishing or removing older buildings, structures, and transportables at various technical areas used by DX (Figure 2). This EA has been prepared to assess the potential environmental consequences of this proposed construction, operational consolidation, and demolition project.

The objectives of this EA are to (1) describe the underlying purpose and need for NNSA action; (2) describe the Proposed Action and identify and describe any reasonable alternatives that satisfy the purpose and need for agency action; (3) describe baseline environmental conditions at LANL; (4) analyze the potential indirect, direct, and cumulative effects to the existing environment from implementation of the Proposed Action, and (5) compare the effects of the Proposed Action with the No Action Alternative and other reasonable alternatives. For the purposes of compliance with NEPA, reasonable alternatives are identified as being those that meet NNSA's purpose and need for action by virtue of timeliness, appropriate technology, and applicability to LANL. The EA process provides NNSA with environmental information that can be used in developing mitigative actions, if necessary, to minimize or avoid adverse effects to the quality of the human environment and natural ecosystems should NNSA decide to proceed with implementing the Proposed Action at LANL.

Ultimately, the goal of NEPA, and this EA, is to aid NNSA officials in making decisions based on an understanding of environmental consequences and in taking actions that protect, restore, and enhance the environment.

[2] The NNSA is a separately organized agency within the DOE established by the *1999 National Nuclear Security Administration Act* [Title 32, of the *Defense Authorization Act* for Fiscal Year 2000 (Public Law 106-65)].

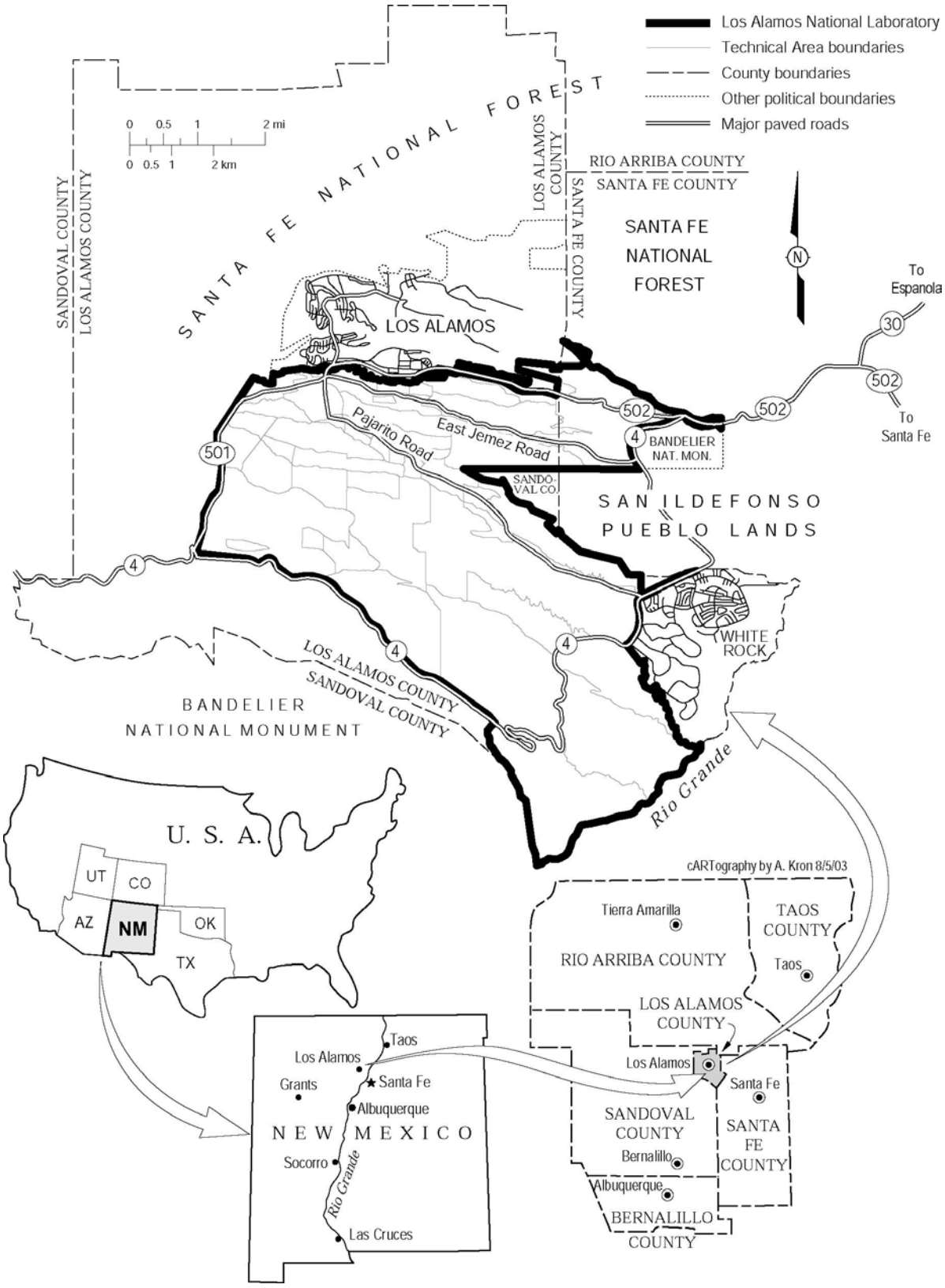

Figure 1. Location of Los Alamos National Laboratory.

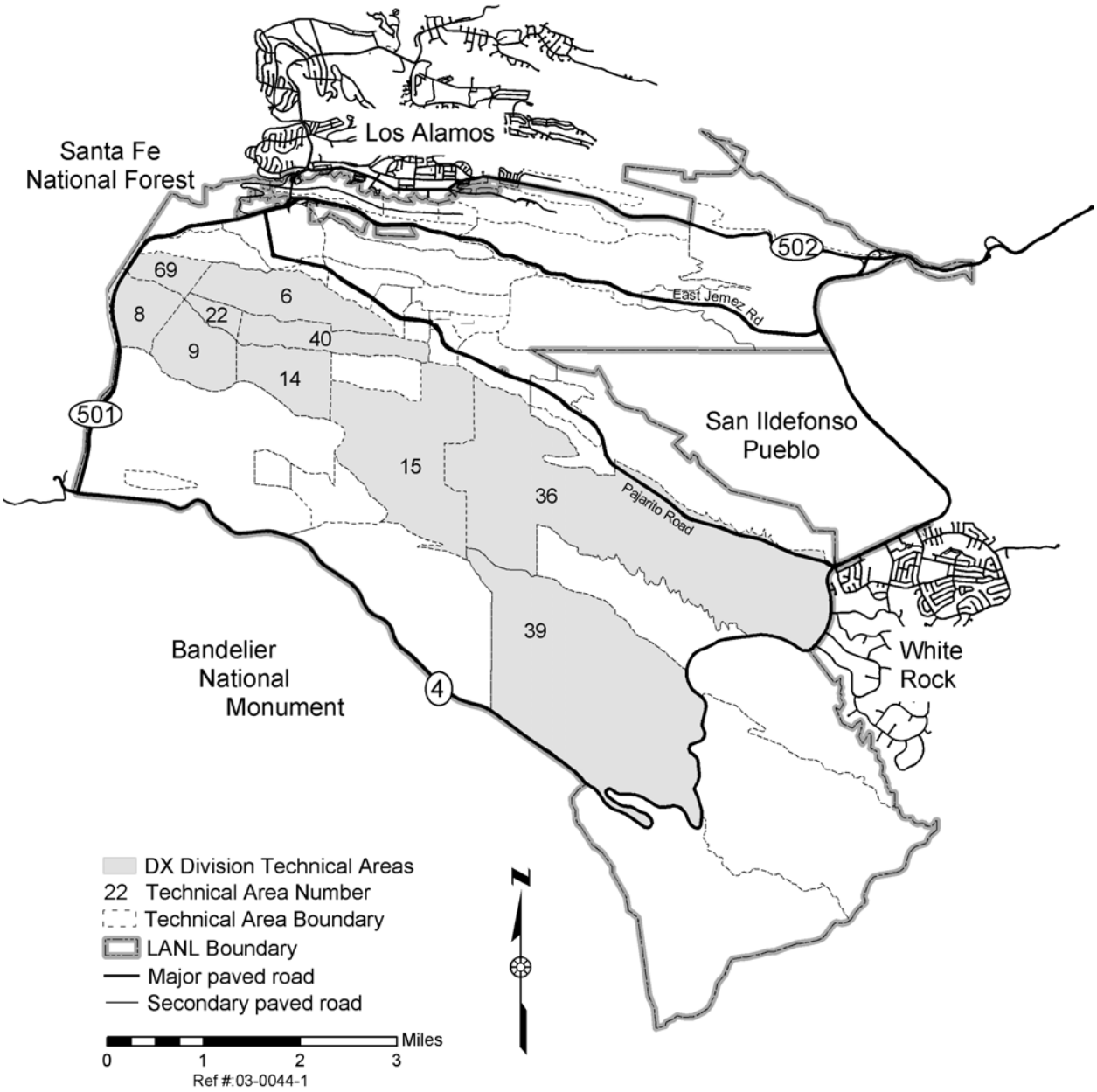

Figure 2. DX technical areas at LANL.

1.2 Background

The U.S. National Security Policy requires NNSA to maintain core intellectual and technical competencies in nuclear weapons and to maintain a safe, and reliable, national nuclear weapons stockpile. NNSA fulfills its national security nuclear weapons responsibilities through the Stockpile Stewardship Program, which involves activities performed at LANL. LANL is one of three national laboratories that support DOE's responsibilities for national security, energy resources, environmental quality, and science. NNSA's national security mission includes the

safety and reliability of the nuclear weapons in the stockpile; maintenance of the nuclear weapons stockpile; stemming the international spread of nuclear weapons materials and technologies; developing technical solutions to reduce the threat of weapons of mass destruction; and production of nuclear propulsion plants for the U.S. Navy. The energy resources mission of DOE includes research and development for energy efficiency, renewable energy, fossil energy, and nuclear energy. The DOE's environmental quality mission includes treatment, storage, and disposal of DOE wastes; cleanup of nuclear weapons sites; pollution prevention; storage and disposal of civilian radioactive waste; and development of technologies to reduce risks and reduce cleanup costs for DOE activities. DOE's science mission includes fundamental research in physics, materials science, chemistry, nuclear medicine, basic energy sciences, computational sciences, environmental sciences, and biological sciences and often contributes to the other three DOE missions. LANL provides support to each of these departmental missions, with a special focus on national security.

To carry out its Congressionally assigned mission requirements, NNSA must maintain a safe and reliable infrastructure at each of the national security laboratories. The 1999 Final *Site-Wide Environmental Impact Statement for Continued Operations of the Los Alamos National Laboratory* (SWEIS) (DOE 1999a) discusses each of the previously identified DOE missions in greater detail and analyzes four different levels of operations at LANL that support these missions. The SWEIS identified the various technical areas at LANL, their associated activities, and buildings. The SWEIS also identified emerging actions at LANL (see Section 1.6.3.1 of the SWEIS) and included a discussion of a variety of options for the renovation of infrastructure at LANL's TA-3 that could include the replacement of a number of aging structures either individually or as part of a multi-building effort. The SWEIS stated that more than half of LANL facilities are aging and are in poor, fair, or failing condition. Many of the buildings and structures at LANL were built after World War II ended in the mid-1940s. When the SWEIS was finalized in 1999, it was anticipated that one or more building replacements (offices and laboratories) would be needed to continue housing existing types of activities pursued at TA-3. Planning for renovations and replacements in TA-3 was still underway and the effects of these actions were not considered in the SWEIS. Proposals to replace aging structures at other technical areas at LANL were not sufficiently developed to be analyzed in the SWEIS. Soon thereafter, however, tighter budget allocations and newly identified possible solutions for saving overall costs once again raised the issue of replacing aging structures. Proposals to consolidate activities into grouped facilities at LANL, with an overall reduction in the size of facilities, have resulted from evaluations of the capabilities needed to meet the requirements of mission programs, the cost savings in long-term operating dollars, and the efficiency of operations that consolidation would bring.

The existing DX facilities at LANL were constructed before and during the Cold War Era when the mission of DOE's predecessor agency was to sustain aggressive system development, nuclear testing, and stockpile deployment. Today DX's primary function is nuclear stockpile stewardship, with certification responsibility for a substantial majority of the nation's active nuclear weapons stockpile. DX's stockpile stewardship activities currently involve facilities primarily located in buildings and structures at TA-6, TA-8, TA-9, TA-14, TA-15, TA-22, TA-36, TA-39, TA-40, and TA-69. Many of the buildings and structures in the technical areas that support weapons research and development and processing were built in the 1940s and 1950s (Photo 1). Most of these buildings (with the exception of the office buildings and buildings and

Photo 1. TA-9 Building 21, built in 1952.

structures with similar support functions, such as craft[3] shops and storage areas) and their operations are described in the SWEIS. NNSA has become aware of structural and systemic problems at DX facilities at LANL that make it difficult to meet the functional and safety requirements of the operations that these facilities house. The identified problems include the physical condition of the buildings and the reliability of the major building systems, namely, the electrical, mechanical, and plumbing systems. Not only are many of the buildings' systems required to meet demands that were unforeseen in the 1940s and 50s (such as today's needs for increased electric power and high-speed computer and communication systems), but system components are also failing because of normal stresses, strains, and general fatigue resulting from operating long beyond their individual design lives. With these component failures, it is becoming increasingly difficult to provide replacement parts for equipment that is no longer being manufactured for today's markets. The basic plumbing systems are deteriorating, frequently leak, and can no longer be reliably maintained (Photo 2). The heating, ventilation, and air conditioning (HVAC) systems do not meet current commercial standards for shops and office facilities. Several of the buildings do not have air conditioning, while others are cooled by multiple systems, including through-wall systems (window air conditioners) that have been installed over the years. These through-wall systems are very noisy and inefficient. In many instances, the equipment employs outdated technology and is expensive to maintain and operate. The electrical distribution system does not function reliably, contains many current code violations (few of which are subject to waivers), and does not include surge protection capabilities needed to protect modern office equipment, especially personal computers. The lighting systems fail to meet current standards for appropriate ergonomic illumination or energy use. Many modifications to the existing buildings are needed to comply with *Americans with Disabilities Act* requirements. Accommodating changes in levels of staff and operations that have occurred over the past 40-plus years is also difficult in the existing buildings.

[3] Crafts include carpentry, pipefitting, sheet-metal working, and similar activities.

Photo 2. Maintenance problems at DX facilities.

A recent study by DOE's National Renewable Energy Laboratory (NREL 1999) showed that it is possible to achieve energy cost savings of up to 63 percent when constructing office and laboratory buildings in a climate similar to Los Alamos. Additionally, DX operations are spread over approximately 22 mi^2 (57 km^2) and occupy more space in LANL buildings than is required for those operations, leading to a loss of efficiency and increased cost compared to consolidated activities. Operational, routine, and emergency maintenance costs for the DX buildings and structures are estimated to be several million dollars per year more than required by newer, more efficient buildings of similar sizes. Reduced operational and maintenance costs for consolidated activities, with appropriate square footage to support current mission activities, would result in additional cost savings.

After the May 2000 Cerro Grande Fire, NNSA instituted a wildfire hazard reduction program at LANL. As part of this program, LANL staff has expedited efforts to replace transportable structures with permanent constructed facilities and to remove facilities that house employees or critical missions support activities from forest interface areas at LANL. A number of site DX employees are housed in transportables (Photo 3) that are dispersed in remote locations, some of which are in forested or forest interface areas. This situation makes these facilities, which are less fire resistant than permanent structures, particularly vulnerable to fire damages, as they are difficult to defend in the event of fire.

Photo 3. Transportable at TA-69 (Building 2).

In addition to wildfire safety issues, there are several traffic safety problems at DX technical areas, particularly at the existing TA-69 access-control station (Photo 4, top left). Because the gate is not equipped to handle a large volume of vehicles and pedestrians, traffic congestion is frequently severe. Often traffic is backed up onto State Road (SR) 501. There have been a number of vehicle and pedestrian accidents at the location (Photo 4).

1.3 Statement of Purpose and Need for Agency Action

NNSA has assigned a continuing role to LANL in carrying out NNSA's national security mission. To enable LANL to continue this enduring responsibility requires that NNSA maintain the capabilities and capacities required in support of its national mission assignments at LANL. Several buildings and structures that house programmatic research and support functions essential to the overall LANL operations and nuclear weapons work performed for DOE and NNSA have many identified deficiencies associated with them. NNSA has also identified wildfire and traffic safety issues at DX facilities. NNSA needs to correct these problems so that the necessary programmatic, management, and support functions housed at LANL can continue to function with a high level of efficiency. Additionally, NNSA also needs to minimize energy and resource consumption and reduce the cost of maintaining operations.

Photo 4. Traffic congestion and accident at entrance gate.

1.4 Scope of This EA

A sliding-scale approach (DOE 1993) is the basis for the analysis of potential environmental and socioeconomic effects in this EA. That is, certain aspects of the Proposed Action have a greater potential for creating environmental effects than others; therefore, they are discussed in greater detail in this EA than those aspects of the action that have little potential for effect. For example, implementation of the Proposed Action would affect waste disposal resources in the LANL area. This EA, therefore, presents in-depth descriptive information on these resources to the fullest extent necessary for effects analysis. On the other hand, implementation of the Proposed Action would cause only a minor effect on socioeconomics at LANL. Thus, a minimal description of socioeconomic effects is presented.

When details about a Proposed Action are incomplete, as are a few for the Proposed Action evaluated in this EA (for example, the exact amount of waste generation), a bounding analysis is often used to assess potential effects. When this approach is used, reasonable maximum assumptions are made regarding potential emissions, effluents, waste streams, and project activities (see Chapters 2 and 3 of this EA). Such an analysis usually overestimates potential effects. In addition, any proposed future action(s) that exceeds the assumptions (the bounds of this effects analysis) would not be allowed until an additional NEPA review could be performed. A decision to proceed or not with the action(s) would then be made.

1.5 Public Involvement

NNSA provided written notification of this NEPA review on June 6, 2002, to the State of New Mexico, the four Accord Pueblos (San Ildefonso, Santa Clara, Jemez, and Cochiti), Acoma Pueblo, the Mescalero Apache Tribe, and to over 30 stakeholders in the area. In addition, upon release of this draft EA, NNSA will allow for a 21-day review period. Where appropriate and to the extent practicable, concerns and comments will be considered in the final EA.

2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES

This section discusses the Proposed Action and a No Action Alternative. Section 2.1 describes the Proposed Action for the EA that would allow NNSA to meet its purpose and need for agency action. The No Action Alternative is presented in Section 2.2 as a baseline for comparison with the consequences of implementing the Proposed Action. Alternatives that were considered but dismissed from further analysis in this EA are discussed in Section 2.3, and related actions are discussed in Section 2.4.

Current DX facilities include offices and a research and development complex east of SR 501 (TA-6, TA-8, TA-9, TA-22, and TA-69) and high-explosive (HE) operational areas at several technical areas (TA-14, TA-15, TA-36, TA-39, and TA-40). The existing Two-Mile Mesa Complex contains offices, an exercise facility, crafts operations and other support activities, and experimental facilities including firing sites and non-firing site type activities. The existing Two-Mile Mesa Complex is shown in Photo 5.

Photo 5. Aerial view of the existing Two-Mile Mesa Complex in 2000.

2.1 Proposed Action

The Proposed Action is to construct and operate offices, laboratories, firing facilities, and shops within the Two-Mile Mesa Complex where work would be consolidated from other locations. The approximate locations of new structures, roads, and parking areas are shown in Figure 3. The Proposed Action would also remove or demolish certain vacated structures that are no longer needed. DX would vacate approximately 200,000 square feet (ft^2) (18,000 square meters [m^2]) of space in existing buildings.

The Proposed Action includes constructing 15 to 25 new buildings over about a 10-year time frame to replace about 59 structures currently used for DX operations. Two of the new buildings would be combined office and laboratory buildings (a Shock and Detonation Physics [SDP] Building and a Collaborative Energetics Research Laboratory [CERL] Building); three additional combination office and laboratory buildings may be constructed if DX staffing levels increase as anticipated. Laboratories combined with office buildings would involve only conducting research with low-hazard, non-HE, nonradioactive materials. Typical laboratory operations would involve electronic testing and development using small amounts of chemicals such as

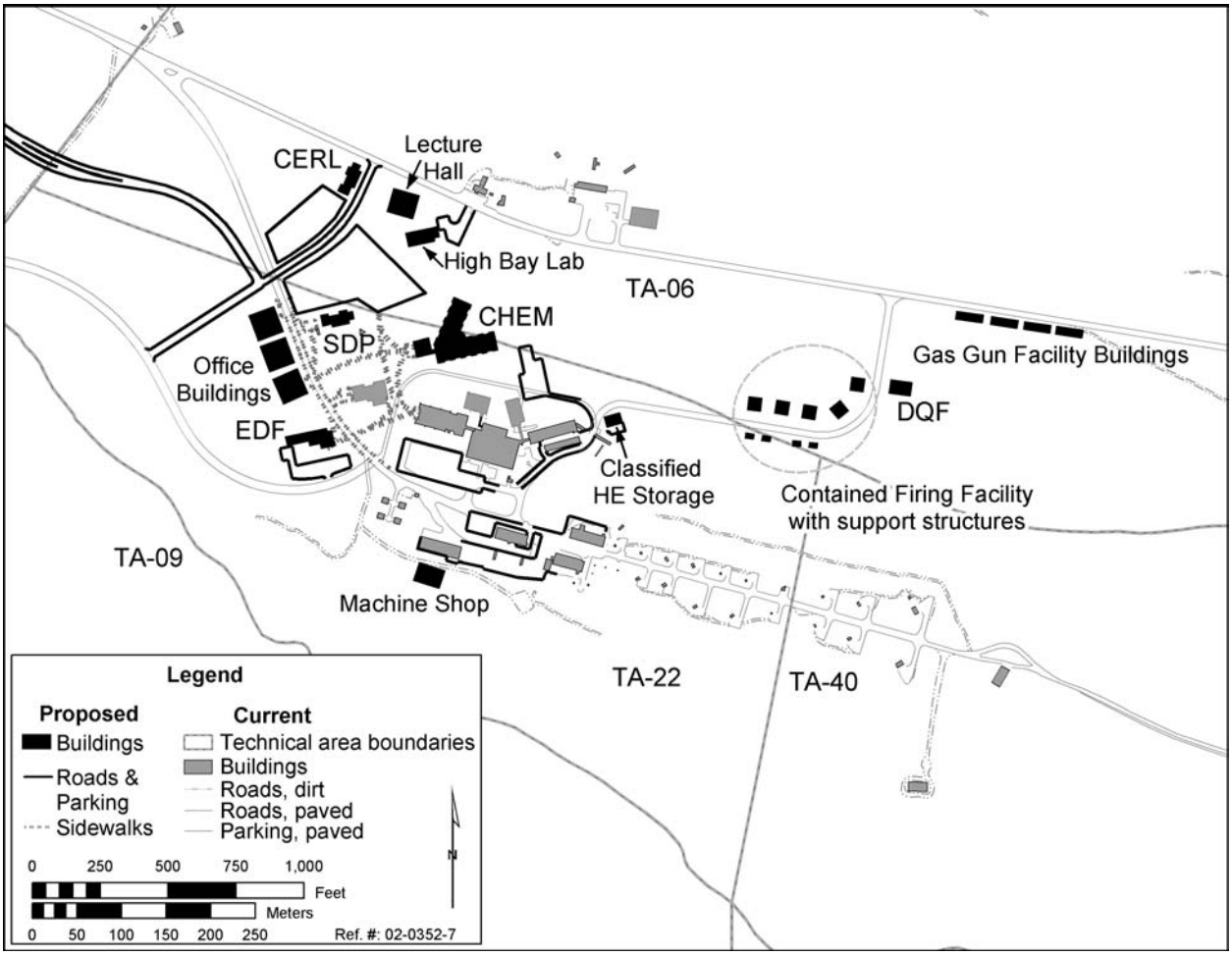

Figure 3. Conceptual drawing of the proposed Two-Mile Mesa Complex, the area of the Proposed Action (building locations and footprints approximate).

solvents. The other new buildings would consist of a Characterization of Highly Energetic Materials (CHEM) Laboratory, an Engineering Diagnostic Facility (EDF), five Contained Firing Capability buildings, a High Bay Laboratory, a Detonator Qualification Facility (DQF), two to four Gas Gun Facility buildings, a Machine Shop, a Classified HE Storage Building, and a lecture hall. The Proposed Action also involves upgrading or constructing new roads, parking, fencing, and utilities within the vicinity of the Two-Mile Mesa Complex, including construction of a new security gate and road entrance from SR 501 (Figure 4). As construction of new buildings is completed, the Two-Mile Mesa Complex would be landscaped. Many existing DX operations, personnel, and support staff would be relocated to the new buildings at the Two-Mile Mesa Complex and various buildings in other parts of LANL would be vacated. Temporary buildings (transportables) vacated as part of the relocations would be removed and made available for other LANL uses or eliminated from use through the LANL excess property program. According to LANL policy, permanent buildings that are vacated as part of the Proposed Action would also be made available for other uses under the LANL property management program. It is not expected that these buildings would have future uses and, consequently, this EA analyzes demolition of these structures. If other uses are identified, additional NEPA compliance reviews would be performed. Table 1 summarizes the buildings that would be vacated as part of the Proposed Action.

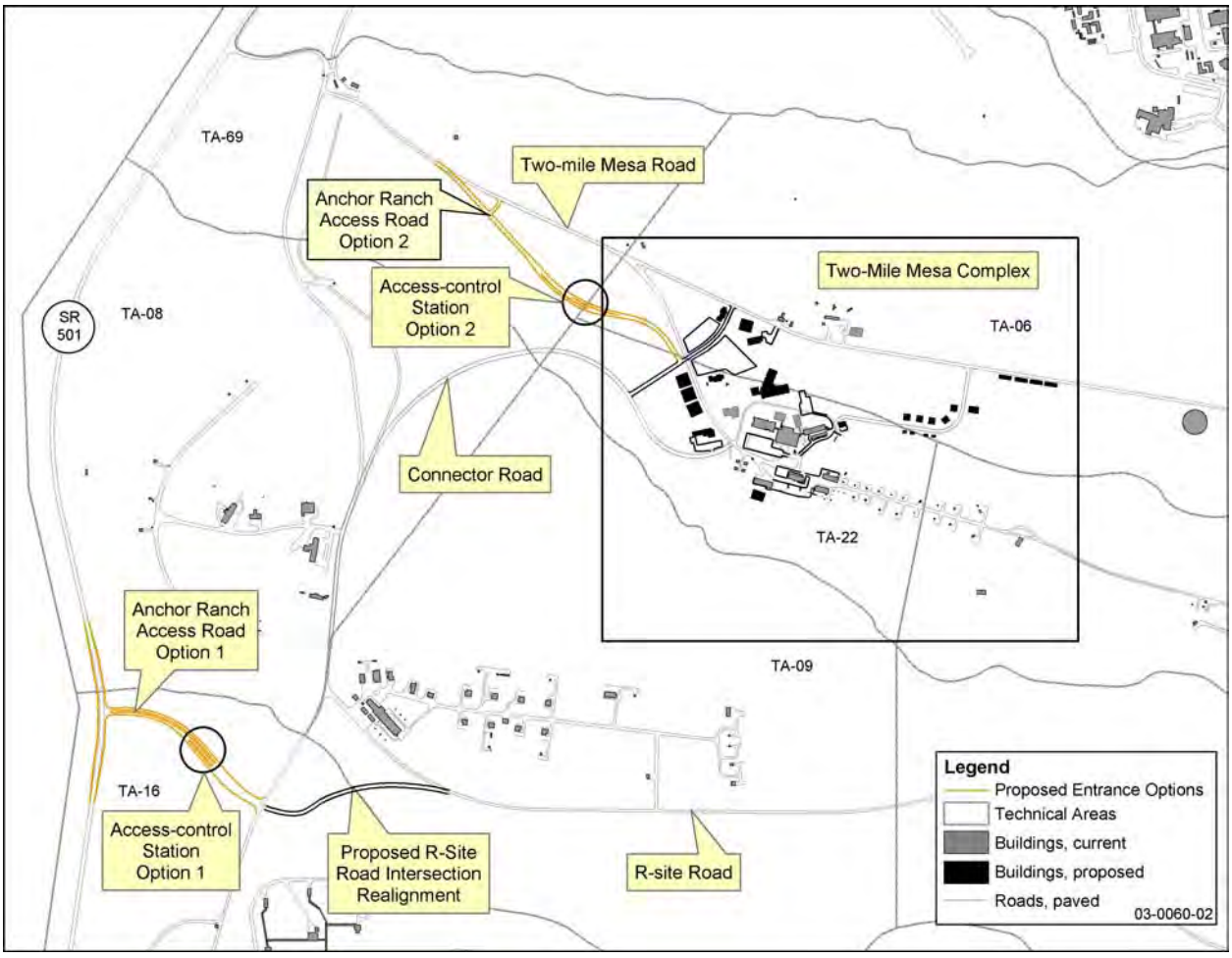

Figure 4. Proposed new access road and access-control station.

Table 1. Buildings to be Vacated as Part of the Proposed Action

TA	Building	Current Use
TA-9	21	HE Research and Development Laboratory and Office Building
TA-9	28	Shop Building (Machine Shop)
TA-9	29	Stock and Equipment building
TA-9	30	Gas Storage
TA-9	31	Solvent Storage
TA-9	32	Laboratory and Offices
TA-9	33	Laboratory Building
TA-9	34	Process Laboratory
TA-9	35	Process Laboratory
TA-9	36	Magazine
TA-9	37	Process Laboratory
TA-9	43	Process Laboratory Storage
TA-9	49	Magazine
TA-9	50	Receiving and Shipping.
TA-9	52	Magazine
TA-9	53	Magazine Office
TA-9	54	Magazine
TA-9	55	Magazine
TA-9	272 and 273	Transportables
TA-9	265	Boiler Building Office Transportables
TA-9	48	Machining Building
TA-9	28	Shop Building
TA-14	6	Storage Building
TA-14	22	Magazine
TA-14	23	Control Building
TA-14	24	Magazine
TA-15	30	Guard Station
TA-15	40	Laboratory and Office Building
TA-15	46	Exercise Facility (Former Guard Station)
TA-15	140	Storage Building
TA-15	183	Laboratory and Office Building
TA-15	447	Trailer
TA-15	448	Trailer
TA-15	456	Transportable
TA-15	476	Trailer
TA-22	52	Machine Shop
TA-22	66, 67,68,69	Storage Buildings
TA-36	5	Preparation Building
TA-36	3, 6, or 8	Firing Site
TA-39	2	Laboratory and Office Building
TA-39	6	Firing Chamber
TA-39	67	Support Building for Chamber 6
TA-39	103	Transportable
TA-39	107	Transportable
TA-39	138	Support Building for Chamber 6
TA-40	1	Laboratory and Office Building
TA-40	2	Magazine
TA-40	3	Preparation Building
TA-40	4	Firing Point
TA-40	8	Contained Firing Vessel
TA-40	9	Firing Point to be vacated
TA-40	12	Crystal Laboratory
TA-40	13	Magazine
TA-40	14	Preparation Building
TA-40	15	Firing Point

Table 1. continued

TA	Building	Current Use
TA-40	23	Machine Shop
TA-40	36	Magazine
TA-40	37	Magazine
TA-40	38	Magazine
TA-40	39	Magazine
TA-40	40	Inert Preparation Building
TA-40	41	Laboratory Building
TA-40	45	Solvent Shed
TA-40	90	Transportable
TA-69	1	Guard Station #431
TA-69	2	Doublewide Trailer outside fence building
TA-69	5	Trailer
TA-69	26	Guard Station

All phases of the Proposed Action, including construction, operation, and demolition, would be conducted in accordance with LANL's requirements for waste management (LANL 1998a). These requirements specify that waste shall be reduced as much as technically and economically feasible. Waste minimization practices (such as material substitution, source reduction, hazard segregation, recycling, and reuse) would be incorporated into all waste-generating activities. Waste disposal would occur only after waste minimization options have been implemented or when other options are not safe or are not technically or economically feasible. Wastes would be recycled or salvaged in accordance with LANL's property management process. In the case of construction, a Waste Minimization Plan would be prepared and followed.

Demolition activities could involve structures that are eligible for listing on the National Register of Historic Places. None of the structures involved in the Proposed Action have been identified as being desirable for retention based solely on its historic significance. Appropriate compliance with the *National Historic Preservation Act* would be undertaken, and, if a treatment plan was necessary, this would be negotiated with the State Historic Preservation Officer (SHPO). All construction and demolition actions would then proceed based on the implementation of that treatment plan.

Information that is common to all the construction activities included in the Proposed Action is presented in the following section (2.1.1). Subsections of Section 2.1.1 include discussion of the construction of each of the buildings and structures. Operations are discussed in Section 2.1.2, and the demolition actions included as part of the Proposed Action are summarized in Section 2.1.3. The projected schedule for completion of the Proposed Action is described in Section 2.1.4.

2.1.1 Construction

The Proposed Action would involve new construction within the Two-Mile Mesa Complex. This complex is located in a developed area containing about 40 structures and occupied by about 200 workers. The proposed new construction sites would be located within the Two-Mile Mesa Complex area shown in Figure 3. Some mature trees may need to be removed from areas near the periphery of the complex. No construction would be conducted within a floodplain or a wetland. New construction areas would be sited to avoid impacts to prehistoric and Homestead Era cultural resources and to sensitive habitat areas. Should previously unknown cultural resources be discovered during construction, work would cease in that area until LANL's

cultural resources specialists could review the evidence, identify procedures for working in the vicinity of the cultural resources, and initiate any necessary consultations with Federal, state, and tribal entities.

New building construction, asphalt removal, utility corridor excavation, or post-construction landscaping could disturb some potential release sites (PRSs)[4]. When possible, PRSs would be avoided. If disturbance of PRSs were necessary, soils from PRSs would be returned to the excavated area after disturbance when feasible or would be characterized and disposed of appropriately. Should a previously unknown or suspect disposal site be disclosed during subsurface construction work, work would cease until LANL's ER Project staff could review the site and would identify procedures for working within that site area.

With the exception of buildings used for larger quantities of HE (the CHEM building, one of the contained firing structures, and associated magazine/explosive experiment preparation structures) (discussed in Sections 2.1.1.3 and 2.1.1.6 below), construction of new buildings would be performed using common construction industry methods since the operational uses of these structures do not have potential hazards that would entail unique structural requirements. The CHEM building and other buildings with larger quantities of HE would be designed and constructed in accordance with U.S. Army guidelines (DOA 1990) meet DOE's and LANL's HE loading requirements. All new buildings would be constructed in accordance with seismic criteria in current building codes. No buildings would be constructed over known faults or within 50 feet (ft) (15 meters [m]) of known seismic faults active since the beginning of the Holocene (approximately 100,000 years ago).

Each of the new buildings and structures would be designed according to general design criteria for a new facility (LANL 1999a). Buildings would be designed with a minimum lifetime expectancy of 30 years of operation. Unless otherwise stated in the facility descriptions below, buildings would typically consist of a concrete slab foundation with a one- to two-story superstructure. The total height of the buildings above ground level would be less than 32 ft (9.6 m). Various kinds of spaces would be included in these buildings, such as photocopying rooms, file servers, mail alcoves, building reception areas, locker rooms, visiting staff rooms, equipment receiving areas, shipping and storage spaces, main and satellite telecommunication rooms, mechanical rooms, electrical rooms, large and small conference rooms, break rooms, janitorial storage rooms, restrooms, fire protection areas, elevator lobbies, equipment rooms, stairwell areas, security control points, vaults, and hallway spaces.

Building exteriors (such as surface finish, roof lines, and windows) would be designed to be architecturally compatible with one another and with other recent buildings in the Two-Mile Mesa Complex. Typically roof drains would collect snowmelt and rain water from these buildings and would channel the runoff to appropriate release points, such as landscaped areas.

[4] PRS—The Environmental Restoration (ER) Project Glossary (ER 2000-0095) refers to PRSs as potentially contaminated sites at LANL that are identified as either solid waste management units (SWMUs) or areas of concern (AOCs). AOCs are areas at LANL that might warrant further investigation for releases based on past facility waste-management activities. A SWMU is any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released. This includes regulated units (i.e., landfills, surface impoundments, waste piles, and land treatment units) but does not include passive leakage or one-time spills from production areas and units in which wastes have not been managed (e.g., product-storage areas).

Storm water runoff systems would be designed to minimize soil erosion. Each of the newly constructed buildings would be designed with safety and security features appropriate to the work to be performed in that building. These features could include air handling and filtration systems, standby emergency generators, alarms, security equipment, monitoring equipment, emergency lighting, and similar kinds of equipment and systems.

Consistent with DOE Order 413.3 (DOE 2000a), *Program and Project Management for the Acquisition of Capital Assets*, the buildings would be constructed, remodeled, or refurbished according to sustainable design concepts. The design would include features that would allow the structures to operate with improved electric and water use efficiency and would incorporate recycled and reclaimed materials into their construction to the extent possible. For example, construction might incorporate elements made of reclaimed and recycled materials, use low-flow lavatory fixtures to minimize potable water use, and employ natural lighting and energy-efficient lighting fixtures and equipment to reduce electric consumption. The finished landscaping would be designed in compliance with DOE Order N 450.4 (DOE 2001), *Assignment of Responsibilities for Executive Order 13148, Greening the Government Through Leadership In Environmental Management*. This order establishes new goals and requirements that affirm DOE's approach to improving environmental performance through the use of environmentally and economically beneficial landscaping practices. U.S. Environmental Protection Agency (EPA) guidance (60 FR 40837) identifies a framework for these landscape practices on managed Federal lands and Federally funded projects. One of the guiding principles focuses on the use of regionally native plants in site design and implementation where cost-effective and to the maximum extent practicable; a native plant species is defined as one that occurs naturally in a particular region, ecosystem, or habitat without direct or indirect human actions.

As noted in Section 2.1, all activities at LANL are required to minimize waste generation. Operational and administrative activities (such as recycling office waste) that would enhance overall LANL waste minimization efforts and efforts to reduce the use of potable water and energy sources would be employed. Every effort would be made to recycle and re-use construction (and demolition) materials. LANL has existing recycling contracts for the following materials: metal, paper, cardboard, concrete, asphalt, wire, smoke detectors, exit signs, and light bulbs. To the maximum extent possible, construction (and demolition) contractors would be required to segregate these materials for recycling. Waste Minimization Plans would be developed and followed for each construction project.

The new buildings would be heated by natural gas-fired boilers. New refrigeration units would comply with applicable air quality regulations. Combustion sources such as electrical generators, boilers, water heaters, and furnaces would be registered in compliance with Title 20 of the New Mexico Administrative Code (NMAC) (20 NMAC 2.72). Average water and power use and waste generation amounts in the new buildings would be similar to other modern office and shop buildings.

Onsite utilities (gas, water, sewer, electric, communications, computer networks) would be reconfigured and upgraded for efficient distribution to the existing and new buildings. Utility corridors would be established and utilities relocated to provide a consolidated, efficient utility network that can be serviced without major disruption to the complex. In addition, consolidation of utilities would reduce future site ground disturbance. Connections and upgrades to the existing underground utilities would be necessary. Electrical power distribution may need to be upgraded to the Two-Mile Mesa Complex to serve the proposed new buildings in the complex;

however, no additional electrical power transmission lines are anticipated. Other utilities within the Two-Mile Mesa Complex may also need to be upgraded to serve the consolidated complex, although no major changes in utility mains outside the Two-Mile Mesa Complex are anticipated. These corridors and related utility installation would require excavation of approximately 16,000 linear ft (4,800 m) of trenches.

Clearing or excavation activities during site construction have the potential to generate dust. Dust suppression would be conducted as necessary using best available control measures (BACMs) (such as water spraying or use of soil tackifiers[5]) to minimize the generation of dust during construction activities. The application of specific BACMs would be determined on a case-by-case basis.

Work at the site would require the use of heavy equipment such as cranes, forklifts, backhoes, cement trucks, and other similar construction equipment. The work would also require the use of a variety of hand tools and equipment. Noise at the site would be audible primarily to the involved workers and to workers housed in the Two-Mile Mesa Complex area. Involved site workers would be required to wear appropriate personal protective equipment (PPE), including hearing protection. During the construction phase, space in the immediate vicinity would be available for equipment storage and material staging. To the extent possible, the security fences at the Two-Mile Mesa Complex would be realigned so that construction could take place outside the security area. After construction, the security fences would be relocated so that most, but not all, of the new buildings would be inside the security fence. Temporary parking areas, staging areas, laydown yards, and construction access roads may be established during the construction phases. These areas would be reclaimed or used for permanent parking under the Proposed Action.

Construction work would be planned and managed to ensure that standard worker safety goals are met and that work would be performed in accordance with good management practices, regulations promulgated by the Occupational Safety and Health Administration, and various DOE orders involving worker and site safety practices. A Notice of Intent to Discharge would be filed under the National Pollutant Discharge Elimination System (NPDES) *General Permit for Stormwater Discharges Associated with Large Construction Activities*. Engineering best management practices (BMPs) would be implemented for each construction site as part of a construction Storm Water Pollution Prevention Plan required by the NPDES General Permit. These BMPs may include but not be limited to, the use of hay bales, plywood, or synthetic sedimentation fences with appropriate supports installed to contain excavated soil and surface water discharge during construction of each building and structure. After each building and structure was constructed, loose soil and debris that was not part of the landscaping design would be removed from the area.

Foot and vehicular traffic would be affected for short periods during delivery of construction materials and by the addition of construction workers in the area. Approximately 80 construction workers would be onsite during the peak construction period, adding approximately 35 vehicles to local roadways during the construction period. These construction workers would park their personal vehicles either in existing parking lots or in other designated parking areas.

[5] Tackifiers are chemical dust suppressants often added to water that act to disperse the chemicals, then evaporate after application. The chemicals that are left behind bind the soil particles together into larger particles that are less easily blown in the air.

In addition, about three NNSA and 20 UC workers may perform site inspections and monitor construction and demolition activities during peak activity periods.

Vehicles (such as dump trucks) and heavy machinery (such as bulldozers, drill rigs, dump trucks, cranes, and cement mixer trucks) would be used onsite during the construction phase. These vehicles would operate primarily during the daylight hours and would be left onsite over night. Temporary construction lighting would be directed toward the work area.

Construction materials would be procured primarily from New Mexico suppliers. Construction workers would be drawn primarily from communities across New Mexico.

Site preparation and construction activities would produce a type of material called "construction and demolition" waste, which is a nonhazardous subcategory of "solid" waste as defined in New Mexico State regulations[6]. Solid waste refers to the regulatory definition of waste in Federal regulation (40 CFR 261) and not to its physical state; solid wastes may be solid, liquid, or gaseous. Typically, construction and demolition waste consists of such items as packaging and strapping material, unused pieces of gypsum board, glass, copper wire, broken or bent nails and screws, and empty material containers. Some of these materials, such as glass and copper wire, are recyclable; they would be sent to offsite recycle facilities. Soil and reclaimed asphalt material and crushed concrete rubble would be staged at an existing site on Two-Mile Mesa for potential construction use at the Two-Mile Mesa Complex or at other existing LANL storage yards until these materials could be reused at LANL or at other offsite locations. Non-reclaimable and non-recyclable construction and demolition waste would be disposed of in the Los Alamos County Landfill or at its replacement facility for solid waste disposal.

If wastes from construction activities (or demolition activities) are mixed with hazardous constituents as defined in 20 NMAC 9.1, their disposal is not regulated as construction and demolition waste but as hazardous waste. Hazardous waste as defined in Federal regulations (40 CFR 261) may be either "characteristic" (for example, toxic, flammable, or corrosive) or "listed." Listed wastes are derived from specific processes listed in 40 CFR 261. Proposed construction is not expected to generate any *Resource Conservation and Recovery Act* (RCRA) characteristic or listed hazardous wastes.

Routine maintenance actions would be performed during the operational life of the various buildings and structures. At the end of each facility's useful life, final demolition would be performed as needed. Separate NEPA compliance reviews would be performed at that time.

In addition to construction of buildings, the Proposed Action would include changing traffic patterns around the Two-Mile Mesa Complex as well as landscaping the entire complex. Employee recreation areas within the Two-Mile Mesa Complex may be incorporated into the landscaping plan.

Traffic circulation in the immediate Two-Mile Mesa Complex would be modified as part of the construction activities in the Two-Mile Mesa Complex. Most personal vehicles of site workers would be restricted to the perimeter of the Two-Mile Mesa Complex. The interior portion of the site would be preserved for pedestrian walkways and landscaping. Some parking spaces would remain within the interior of the Two-Mile Mesa Complex; these would be reserved for handicap parking and other authorized vehicles. Parking areas would be added to accommodate about 400

[6] Waste types are defined in more detail in the footnotes in Section 3.2.

to 600 additional vehicles. Most of the roads that would be utilized around the perimeter of the Two-Mile Mesa Complex already exist but there would be some new road construction.

Artificial lighting would be modified or added to provide adequate lighting for pedestrian walkways inside the Two-Mile Mesa Complex. Additional lighting may be added to existing perimeter parking areas and newly constructed parking areas. This artificial lighting would be directed downward toward the parking and walking areas and away from wooded locations and canyons. Outdoor lighting for the newly constructed buildings and structures would conform to the requirements of the *New Mexico Night Sky Protection Act* (NMSA 74-12).

Some of the existing concrete pads, asphalt covered areas, and power poles would be removed as part of the Proposed Action. The newly developed portions of the Two-Mile Mesa Complex would be landscaped or reseeded with native grasses and allowed to return to a more natural state. Low-pressure sprinklers and a drip irrigation system may be required to establish and maintain landscaping if native grasses are not used.

The following subsections describe construction of each component of the Proposed Action in detail.

2.1.1.1 New Shock and Detonation Physics (SDP) Office Building

The new SDP Building would have one or two stories with approximately 20,000 ft^2 (1,800 m^2) of available floor space that would accommodate approximately 65 LANL workers. The building would provide offices, conference rooms, carpenter and staff shops, communications, and laboratory space. Functionally, this building would provide working space for the employees who are currently housed at TA-9, TA-39, TA-40, and other technical areas. Operations would consist of normal office work, laboratory work with electronics and lasers, fabrication of wood and metal explosive experiment stands, diagnostics, and prototype machining typical of existing DX operations.

The SDP Building would be constructed in the general location shown on the conceptual design (see Figure 3). No known PRSs are present within the proposed structure footprint at the construction site.

Approximately 806 cubic yards (yd^3) (613 cubic meters [m^3]) of solid waste would be generated during construction of the SDP Building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.2 New Collaborative Energetics Research Laboratory (CERL) Building

The new CERL Building would have one or two stories with approximately 15,000 ft^2 (1,350 m^2) of available floor space that would accommodate 40 to 50 LANL and non-LANL workers. The building would provide offices, conference rooms, and laboratory space. Functionally, this building would provide security-reconfigurable working space for DX employees and collaborators who are housed both inside and outside the current LANL security perimeter.

The CERL Building would be constructed in the general location shown in the conceptual diagram (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 806 yd^3 (613 m^3) of solid waste would be generated during construction of the CERL Building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.3 New Characterization of Highly Energetic Materials[7] (CHEM) Laboratory

The new CHEM Laboratory would have one or two stories with approximately 50,000 to 85,000 ft^2 (4,500 to 7,650 m^2) of available floor space that would accommodate 100 to 200 LANL workers. The building would provide offices, conference rooms, analytical and organic chemistry laboratories, small-scale formulation and synthesis of energetic materials, an HE crystal laboratory, communications, laboratories, and safety and performance testing. Functionally, this new building would provide office and working space for the DX employees who conduct energetic materials research currently housed at TA-9 Buildings 21, 32, 33, and 34 (Photo 6), and TA-40 Building 12. Much like the DX chemistry facility at TA-9 Building 21, the building would be divided into an area where use of energetic materials is allowed and an area where use of energetic materials is not permitted. The building would be designed according to HE loading criteria described in the DOE Explosive Safety Manual (DOE 1996) and the DOE Order for Facility Safety (DOE Order 420.1).

Photo 6. Typical energetic materials research building (TA-9 Building 34).

[7] Highly Energetic Material – Any chemical compound or mechanical mixture that, when subject to heat, impact, friction, shock, or other suitable initiation stimulus, undergoes a very rapid chemical change with the evolution of large volumes of gas, light, or heat. Examples include high explosives, pyrotechnics, and thermites.

The proposed CHEM Building would be constructed in the general location shown in the conceptual design (see Figure 3). No known PRSs are present within the identified structure footprint at that construction site.

Approximately 2,465 yd^3 (1,873 m^3) of solid waste would be generated during construction of the CHEM Building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.4 New Engineering Diagnostics Facility (EDF)

The new EDF would provide office and laboratory space for 40 to 60 LANL employees. The building would have one or two stories and would provide approximately 20,000 ft^2 (1,800 m^2) of available floor space. The building would provide office space, conference rooms, staff shop, communications, and laboratory space. Activities would be typical of office work, electronics, computers, communications, lasers, and electronic fabrication.

The EDF would probably be constructed in the location shown in the conceptual drawing (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 806 yd^3 (613 m^3) of solid waste would be generated during construction of the EDF. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.5 New High Bay Laboratory

The new High Bay Laboratory would provide office space for approximately six LANL employees, a small conference area, staff shop, and large, open, high bay experimental laboratory space with a total of approximately 10,000 ft^2 (900 m^2) of available space. The High Bay Laboratory could be configured with crane and loading dock service and reinforced floor to support many "bulky" experimental research and development activities that demand open laboratory space. The activities that would be consolidated in this building include shock tubes, pre-experiment setup evaluations, large rotating masses, laser-based diagnostics, x-ray laboratories, and work with gram quantities of explosives in "boom boxes," which are small, portable containment vessels.

The High Bay Laboratory would probably be constructed in the location shown in the conceptual drawing (see Figure 3). No known PRSs are present within the proposed structure footprint at that construction site.

Approximately 616 yd^3 (468 m^3) of solid waste would be generated during construction of the laboratory building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.6 New Contained Firing Capability Buildings

The new Contained Firing Capability buildings would be structures that would house portable vessels to contain the effects of detonating 22 pounds (lb) (10 kilograms [kg]) of TNT-equivalent HE or that would be separate concrete "bombproofs" in which HE tests may be performed. As many as five 22-lb (10-kg) TNT-equivalent rated containment vessels, including the vessel currently located at TA-40 Building 8, may be located at the Two-Mile Mesa Complex. Each vessel would be housed in a one-story building of approximately 3,000 ft^2 (270 m^2). A

"bombproof," which is an earth-covered concrete or metal chamber capable of containing 110 lb (50 kg) of TNT-equivalent HE, may be substituted for one of the containment vessel buildings. The bombproof would be approximately the same size as the other contained firing buildings. It would be separated from the other buildings by 100 ft (30 m) and would be oriented with doors facing away from nearby structures. Four magazine, diagnostic, and explosive experiments preparation support buildings totaling approximately 2,000 ft^2 (180 m^2) would also be provided. No offices would be located in this facility. Approximately six workers would conduct experiments in each of these buildings.

The new Contained Firing Capability buildings would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 yd^3 (613 m^3) of solid waste would be generated during construction of the new Contained Firing Capability structures. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.7 New Gas Gun Facility Building(s)

The new Gas Gun Facility would consolidate the gas gun operations currently located at TA-39 and TA-40. This new facility would include two to four single story buildings totaling approximately 12,000 ft^2 (1,080 m^2) to house the gas guns. Operations would be the same as those currently conducted at TA-40 Building 9, TA-39 Building 69, and TA-39 Building 89, which include operating gas guns to study inert and explosive target materials under various conditions.

The new Gas Gun Facility would be located near the new Contained Firing Capability buildings as shown in the conceptual drawing (see Figure 3). No offices would be located in this facility. Approximately six workers would conduct experiments in these buildings.

The new Gas Gun Facility would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 yd^3 (613 m^3) of solid waste would be generated during construction of the Gas Gun Facility building. This waste would be disposed of at the Los Alamos County Landfill or other replacement landfill or may be stockpiled as clean fill for future projects.

2.1.1.8 New Detonator Qualification Facility (DQF)

The new DQF would consolidate detonator testing operations currently located at TA-40 Building 5 and TA-40 Building 15. The new facility would consist of a one- to two-story building totaling approximately 4,000 ft^2 (360 m^2) to house detonator testing operations. Approximately four workers would conduct operations in this building. Operations would be the same as those currently conducted, which include testing detonators with small quantities of explosives (approximately 6.7 ounces [200 grams]) in containment enclosures. The DQF would generally be located near the new Contained Vessel Firing Capability Buildings as shown on the conceptual drawing (see Figure 3).

The new DQF would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 yd^3 (468 m^3) of solid waste would be generated during construction of the DQF. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.9 New Additional Combination Office and Laboratory Buildings

If staffing levels increase as projected, additional combined office and laboratory buildings would be constructed at the Two-Mile Mesa Complex. The new buildings would consist of one to three buildings, each one to two stories high, totaling approximately 20,000 ft^2 (1,800 m^2). Operations would involve typical office work and some laboratory activities, such as electronics assembly. These new buildings would be located in the general area of the SDP and CERL Buildings as shown in Figure 3. Approximately 80 workers would eventually be housed in each of these buildings.

The new buildings would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 806 yd^3 (613 m^3) of solid waste would be generated during construction of each office/laboratory building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.10 New Lecture Hall

A new 350-seat lecture hall would be constructed at the Two-Mile Mesa Complex. The new lecture hall would consist of a one-story building, totaling approximately 9,000 ft^2 (810 m^2). The building would be used for conducting large meetings and colloquiums in support of programmatic work. The building would include an entry vestibule, restrooms, equipment, storage, and utility rooms in addition to the 350-seat lecture hall. This building would be located near the SDP and CERL Buildings as shown in Figure 3.

The new lecture hall would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 yd^3 (468 m^3) of solid waste would be generated during construction of the lecture hall. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.11 New Machine Shop

The new Machine Shop would replace the existing DX machine shop at TA-22 Building 52. The new facility would consist of a one- to two-story building totaling approximately 7,000 ft^2 (630 m^2) to house machining operations. Operations would be the same as those currently conducted at TA-22 Building 52, which includes machining metals and various plastics as well as welding operations. The new Machine Shop would be located near the existing machine shop as shown in Figure 3. Approximately 15 workers would be housed in this facility.

The new Machine Shop would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 yd^3 (468 m^3) of solid waste would be generated during construction of the new Machine Shop. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.12 New Classified HE Storage Building

The new Classified HE Storage Building would consolidate HE storage operations currently located at TA-16, TA-9, and TA-22. The new facility would consist of a one-story building totaling approximately 3,000 ft^2 (270 m^2) to store classified HE materials. Operations would be the same as those currently conducted. The new HE Storage Building would probably be located in the general area shown in the conceptual drawing (see Figure 3).

The new Classified HE Storage Building would be constructed in the general location shown in the conceptual drawing (see Figure 3). A PRS is present in this area; however, the buildings would be located such that the PRS would be avoided.

Approximately 616 yd^3 (468 m^3) of solid waste would be generated during construction of the storage building. This waste would be disposed of at the Los Alamos County Landfill or its replacement landfill or may be stockpiled as clean fill material for future projects.

2.1.1.13 New Access Road and Access-Control Improvements

A new access-control station, the Anchor Ranch Station, would be created to replace the existing access-control station at TA-69. Two options for modifying the existing access are under consideration: The preferred option would be to close the existing access-control station at TA-69 and construct a new access road and access-control station farther south within TA-16. This option would relieve congestion on SR 501 where vehicles queue to pass through the existing access-control station and would increase the sight distance along SR 501 at the intersection of SR 501 and the new access road. The new access road would begin at the northeast corner of TA-16 approximately where the TA-8 boundary intersects the TA-16 boundary. The new access road would extend east from SR 501 approximately 1,600 ft (480 m) and intersect the existing Anchor Ranch Road and the road connecting TA-8 and TA-22. About 1,600 ft (480 m) of roadway at the west end of the existing R-Site Road would be realigned and upgraded to intersect the new access road. Turning lanes would be added to SR 501 at the approaches to the new access road. The access-control station would be constructed some distance east of SR 501 to reduce traffic congestion at the intersection of SR 501.

The second option would be to relocate the existing access-control station at TA-69 farther east near the Two-Mile Mesa Complex and to construct a new access road about 2,400 ft (720 m) in length in the approximate location shown on Figure 4. This option would reduce traffic congestion at the intersection of Two-Mile Mesa Road and SR 501 but would not increase sight distance along SR 501 at the approaches to the turn-off to Two-Mile Mesa Road.

With either option, short access roads would be constructed within the Two-Mile Mesa Complex. The access roads would connect the new access-control station to existing roads, parking areas, and buildings. The new access roads would be designed to facilitate traffic movement within the complex and to and from other DX technical areas. Both options would

also include installing or relocating signs, fences, and safety elements, such as guardrails. Both options would also entail removal of the existing access-control station and closure or removal of portions of existing roadways. The proposed access road and access-control station construction would not affect cultural resources, sensitive habitat, or PRSs at any of the siting location.

2.1.2 Operations

DX operations that would be consolidated in the Two-Mile Mesa Complex as part of the Proposed Action are currently conducted in various DX facilities (see Table 1). The SWEIS (DOE 1999a) analyzed these operations as part of the total LANL operations. Therefore, these operations will not be analyzed again in this document, although any operational effects due to co-locating activities close to one another are included in the analyses of effects (Chapter 3). Since the SWEIS was finalized, all of the other operations involved in the Proposed Action have been operating at, or below, the levels projected in the SWEIS for the Expanded Alternative, which DOE selected in its 1999 Record of Decision (ROD) (LANL 2002a). Operations would be expected to continue at or below the Expanded Alternative levels analyzed in the SWEIS (DOE 1999a) after the consolidation of operations in the Two-Mile Mesa Complex.

In addition to relocating some existing equipment as part of the Proposed Action, new operational equipment may be purchased and installed. New, more efficient equipment would be expected to provide additional safety and environmental controls and to reduce energy and resource use.

Under the Proposed Action, some operations that use radioactive materials (DU) would be consolidated in the Two-Mile Mesa Complex. No other special nuclear materials would be involved in the relocated operations. Relocation of these operations would not require EPA pre-approval under (40 CFR 61). Subpart H (the National Emission Standard for Hazardous Air Pollutants [NESHAP] for Radiation [Rad NESHAP]). Stack and exhaust monitoring would be conducted as needed at the new locations.

Some components that would be used in various buildings may contain solid beryllium, as is the current practice. None of these operations would involve dispersable beryllium or would result in dispersal of beryllium.

Environmental controls to protect workers and the environment would be established to control emissions and exposures as effectively as, or more effectively than, the controls in the existing facilities where these operations are currently conducted. The quantity of waste generated would be reduced as much as technically and economically feasible by using material substitution, good housekeeping, hazard segregation, recycling, and reuse.

2.1.3 Demolition

Temporary buildings, such as transportables, would be removed from the DX technical areas previously identified and made available for other uses elsewhere at LANL or would be disposed of through the existing LANL excess property program. After DX operations are removed from permanent buildings, the buildings would be made available for other uses, starting in about fiscal year (FY) 05. If no further uses were identified (and none are anticipated), the buildings would be scheduled for demolition. Demolition would probably not occur immediately as these are not high-hazard buildings that would require immediate demolition. The schedule for demolition of buildings and structures would be dependent upon a number of factors, including

completion of any required regulatory compliance actions. Schedules would also be dependent upon funding and staffing requirements.

All vacated buildings would be regularly inspected for potential hazards to workers, the public, or the environment. If hazards were identified, appropriate maintenance or repair work would be conducted in accordance with LANL procedures. Inspections, and maintenance as necessary, would continue until building demolition was conducted.

The proposed demolition would involve several major work elements. Before any demolition, surfaces and fixtures would be tested or sampled to determine if contamination is present and in what quantities. Based on the sampling results, the buildings to be demolished would then be divided into contaminated and uncontaminated zones. Physical barriers would be established between work areas to protect workers and manage wastes and emissions. Workers would remove contaminated materials before demolition of uncontaminated areas begins. Asbestos is present in most of the buildings being considered for demolition or renovation. The asbestos would be removed according to established industry and regulatory procedures. Asbestos wastes generated during renovation and demolition activities are regulated under the NESHAP for Asbestos (40 CFR 61) and would be managed in accordance with all applicable regulations. Air emissions generated during asbestos removal activities would be controlled by use of containment tents (such as plastic drapes) and of high-efficiency particulate air (HEPA) filtered particulate collection devices, as necessary. Similar methods of containment would be used for removal and demolition of materials and structures that are contaminated with radioactive or hazardous materials. As wastes are removed, they would be packaged and managed according to established LANL procedures.

After contaminated materials are removed, general demolition of the remaining materials and structural elements would begin. Demolition of uncontaminated and decontaminated structures would be performed using standard industry demolition processes. After roof and walls are removed, concrete foundations and paved areas would be removed. A variety of equipment and techniques may be used in the demolition process. Typical equipment used in demolition include front-end loaders, bulldozers, wrecking balls, and pneumatic hammers, as well as various hand tools for removing such items as windows and copper wiring. Materials removed in the demolition process would be segregated to the extent feasible to facilitate recycling and waste management. Dust suppression would be conducted as necessary using BACMs, such as spraying with water or chemical dust suppressants. The application of specific BACMs would be determined on a case-by-case basis. After demolition is completed and waste and recycled materials are removed from the site, the area would be recontoured and revegetated or landscaped as appropriate.

Before starting demolition activities, a site-specific health and safety plan would be prepared and approved. Appropriate personal protection measures, such as the use of PPE (gloves, hard hats, steel-toed boots, eye shields, and ear plugs or covers), monitoring of hazards and worker exposures, and engineered controls would be a routine part of the demolition activities required to protect worker health and safety. In addition, LANL staff can provide site-specific hazard training as needed. Waste Minimization and Pollution Prevention Plans would be prepared under the Proposed Action to address waste issues for the demolition of the vacated buildings. As already discussed, building demolition materials would be recycled and reused to the extent practicable. All waste requirements for demolition-generated wastes would be met.

All wastes generated would be disposed of properly according to waste type. About 21,001 yd^3 (15,961 m^3) of uncontaminated building debris would be generated. In addition, about 191 yd^3 (145 m^3) of hazardous waste may be produced; and about 610 yd^3 (464 m^3) of asbestos would be generated. Wastes would be managed through the LANL waste management program. Solid waste would be disposed of at the Los Alamos County Landfill or sent offsite; hazardous waste would be shipped offsite to commercial facilities for treatment and disposal; low-level radioactive waste[8] (LLW), if any, would be disposed of within Area G, TA-54, at LANL or is sent offsite by to appropriate permitted facilities. Asbestos waste would be shipped offsite for disposal at a specifically permitted disposal facility. Refrigeration units to be replaced would be subject to the proper requirements (40 CFR 82) for evacuation and disposal of ozone-depleting substances (refrigerants).

After buildings were demolished, the concrete slabs and other building debris would either be crushed onsite or moved to LANL's Two-Mile Mesa or other existing LANL clean fill material storage sites. The crushed concrete would be used for fill and other activities at LANL or offsite. Clean fill dirt would be placed on the sites of the demolished buildings, and the entire area would be landscaped.

2.1.4 Schedule

Table 2 outlines the projected schedule for the Proposed Action. The final schedule would depend on the availability of funding.

Table 2. Projected Chronology of Proposed Action Construction and Operations

Start Date	Completion Date	Activity	Subsequent Actions
FY 03	FY 05	Design and construct new entrance gate and access roads	Close Anchor Ranch Road and TA-69 entrance gate
FY 03	FY 05	Design and construct SDP Building	Relocate some personnel and operations from TA-9, TA-39, and TA-40
FY 05	FY 06	1) Design and construct CERL Building 2) Design and construct EDF	Relocate some personnel and operations from TA-15, TA-39, TA-46, TA-53, and TA-69
FY 05	FY 09	Design and construct CHEM Building	Relocate personnel and operations from TA-9, TA-14, and TA-40
FY 05	FY 06	Design and construct first contained firing facility	Close TA-39 Firing Point 6 operations
FY 06	FY 07	Design and construct second contained firing facility	Close TA-40 Firing Site Building 15
FY 07	FY 08	Design and construct third contained firing facility	Close some storage buildings at Two-Mile Mesa Complex
FY 08	FY 09	Design and construct fourth contained firing facility	Close one of the TA-36 firing sites
FY 07	FY 08	Design and construct High Bay Laboratory	Relocate personnel and operations from TA-36 and TA-39
FY 08	FY 10	Design and construct gas gun facilities	Relocate gas gun operations from TA-39 and TA-40
FY 03–FY 13	FY 03–FY 13	Design and construct • Three office/laboratory buildings • DQF • Lecture hall • Classified HE Storage Building • Machine Shop	Relocate personnel and operations from TA-15, TA-46, TA-39, and various other technical areas

[8] LLW is radioactive waste that is not high-level waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in Section 11e(2) of the *Atomic Energy Act* [AEA] of 1954, as amended), or naturally occurring radioactive material (DOE Order 435.1).

Table 2. continued

FY 03–FY 10	FY 03–FY 13	Replace and upgrade utilities and infrastructure Landscape	
FY 05–FY 10	FY 05–FY 13	Determine that vacated buildings have no further use; demolish or salvage buildings with no determined use	

2.2 No Action Alternative

The No Action Alternative provides a description of projected conditions that would occur if NNSA did not implement the Proposed Action. This alternative must be considered even if NNSA is under a court order or legislative command to act (10 CFR 1021). Under the No Action Alternative NNSA would not construct new buildings for the functions described in the Proposed Action—nor would NNSA demolish the buildings that currently contain those functions. Outdoor firing tests would continue to be performed. Environmental advantages of contained firing tests would not be realized. Poor-quality office and laboratory space would continue to be used and the effectiveness of current staff and the ability to recruit and retain qualified employees would remain problematic. DX operations would continue to be conducted in dispersed facilities; there would be no reduction in the cost of facility maintenance. Access to DX facilities would continue to be provided by the existing access roads and access-control stations; no traffic improvements would occur along SR 501. No disturbance of DX sites would occur. There would be no construction or demolition debris requiring disposal. Utility usage would remain essentially the same. Expenses for repairs and replacement of aging HVAC systems and other building components would increase. As building systems and other components fail and cannot be replaced or repaired, areas of the buildings would be closed. Areas of buildings or entire structures that are deemed unsuitable for continuous human occupancy would be abandoned in place. All buildings, including vacated buildings, would be regularly inspected. Any building exhibiting hazards to workers, the public, or the environment would be subject to appropriate repair or remediation in accordance with LANL maintenance procedures.

2.3 Alternatives Considered but Dismissed

2.3.1 Use of Other Existing Space

UC staff at the LANL Space Management Office have determined that no comparable space is available at this time that could house the DX functions with the necessary security, safety, and other requirements. Office spaces for small numbers of personnel are available at scattered locations both within LANL and within Los Alamos town site; however, this fragmented approach to housing DX personnel would further negatively affect productivity and may increase operating costs. The ability to provide adequate security could likely not be met through this method of space procurement. This alternative was considered to be unreasonable as it would not meet NNSA's need to act and was not analyzed further in this EA.

2.3.2 Renovation of Existing Buildings and Structures without Construction of New Buildings or Demolition of Outmoded Buildings and Structures

Correcting all identified problems, inefficiencies, and inadequacies of the existing DX facilities would not meet NNSA's purpose and need for action. Modifications to existing facilities are expensive, inefficient, and would fall short of meeting operations and security requirements. The

existing spaces are too small or much too large and some of the existing equipment is outmoded and is no longer suitable for the DX mission. Renovating buildings does not change the size or cost of maintenance or resolve the issues of DX personnel: 1) housed in transportables that are vulnerable to fire and 2) dispersed in remote locations that make communication and cooperative work difficult. The ability of engineers to reconfigure the buildings to meet current needs within their existing footprints would also be difficult and costly. New HVAC, plumbing, electrical, and other building systems would have to be installed to replace the existing systems that are failing. Performing renovations of this nature and magnitude while the buildings are occupied would result in work slowdowns or require temporary relocation of some workers.

The overall effort required to retrofit the existing buildings to meet all current building design and safety codes, needs and requirements of operations, and security needs would be prohibitively difficult and expensive. The costs and time expenditures would be much greater than the cost and time required to plan and build new structures to house the programmatic, management, and support functions needed by UC.

In any event, there are not enough permanent buildings within the engineering complex that could be remodeled to consolidate the operations from the entire DX Division. Therefore, these operations could not be co-located and NNSA's purpose and need would not be met. This alternative was considered to be unreasonable and was not analyzed further in this EA.

2.4 Related Actions

2.4.1 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Los Alamos National Laboratory

The Final LANL SWEIS (DOE 1999a), dated January 1999, was issued in February of that year. A ROD was issued in September 1999, and a Mitigation Action Plan was issued in October 1999. As already noted in this EA, the SWEIS included the information that more than half of LANL facilities are aging and in poor, fair, or failing conditions. An analysis of the effects of replacing these facilities was not included in the SWEIS (DOE 1999a).

The SWEIS included an analysis of effects of the existing DX operations at levels that were very slightly greater than are currently being forecast to be needed in the foreseeable future. The analysis of effects is therefore bounding of the operations, as they would be conducted if the Proposed Action's construction were to occur and operations were consolidated from around LANL into the consolidated Two-Mile Mesa Complex. This EA tiers from the SWEIS and a re-analysis of the operations will not be provided in this EA. Any points of difference from the effects attributable to consolidation of activities will, however, be included in the Chapter 3 analysis of effects within this EA.

2.4.2 Demolition of Vacated Buildings

The demolition of vacated buildings and removal of trailers and transportables are ongoing at LANL. Demolition activities are individually evaluated for NEPA compliance purposes. Various buildings and structures at LANL, other than those involved in the Proposed Action, have been categorically excluded from the need to prepare either an EA or an EIS. Others, such as the replacement of the existing Administration Building (TA-3 Building 43), have been the subject of EAs and EISs. Future demolition of vacated buildings may occur if NNSA decides to replace various aging buildings. These actions would be subject to separate NEPA compliance reviews.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the natural and human environment that could be affected by the Proposed Action and the No Action Alternative and the potential environmental consequences of those actions. Based on the Proposed Action description, environmental resources that may potentially be affected as a result of implementing the Proposed Action have been considered. Environmental issues were identified and either addressed in this section or not, based on the "Sliding Scale Approach" discussed earlier in this EA (Section 1.4). Table 3 identifies the subsection where potential environmental issues are discussed or notes why they are not addressed in this document.

Table 3. Potential Environmental Issues

Environmental Category	Applicability	Subsection
Waste Management	Yes	3.2.1
Air Quality	Yes	3.2.2
Cultural Resources	Yes	3.2.3
Visual Resources	Yes	3.2.4
Transportation, Traffic, and Infrastructure	Yes	3.2.5
Geologic Setting	Yes	3.2.6
Water Quality	Yes	3.2.7
Human Health	Yes	3.2.8
PRSs	Yes	3.2.9
Noise	Yes	3.2.10
Socioeconomic	Yes	3.2.11
Land Use	No. Land uses and land use designations as a result of the Proposed Action would not change or be affected. The Proposed Action is consistent with the Comprehensive Site Plan 2000 (LANL 2000) land use designations for HE research and development within the Experimental Engineering Planning Area, and the SWEIS hazard characterization of the project area for "Explosives" land uses.	N/A
Environmental Justice	No. Populations that are subject to Environmental Justice considerations are present within 50 miles (mi) (80 kilometers [km]) of Los Alamos County; potential effects of this project would be localized within a 10-mi (16-km) radius. Populations nearest to the construction site and within this radius are not predominantly minority and low-income populations.	N/A
Biological Resources	Yes	3.2.12
Floodplains and Wetlands	Yes	3.2.13

3.1 Regional Setting

The Proposed Action would be located within the area of Los Alamos County that includes LANL. LANL comprises a large portion of Los Alamos County and extends into Santa Fe County. LANL is situated on the Pajarito Plateau along the eastern flank of the Jemez Mountains and consists of 49 technical areas. The Pajarito Plateau slopes downward towards the Rio Grande along the eastern edge of LANL and contains several fingerlike mesa tops separated by relatively narrow and deep canyons.

Commercial and residential development in Los Alamos County is confined primarily to several mesa tops lying north of the core LANL development, in the case of the Los Alamos town site, or southeast, in the case of the communities of White Rock and Pajarito Acres. The lands surrounding Los Alamos County are largely undeveloped wooded areas with large tracts located to the north, west, and south of LANL that are administered by the U.S. Department of Agriculture, Santa Fe National Forest, and the U.S. Department of the Interior (DOI), National Park Service, Bandelier National Monument; and to the east by the DOI, Bureau of Land Management.

DX facilities fall mainly within the Experimental Engineering and Dynamic Testing Planning Areas described in the Comprehensive Site Plan 2000 (LANL 2000). The plan designates the Experimental Engineering Planning Area as "HE research and development" and "administration" land uses. The Dynamic Testing Planning Area is a primary locus for stockpile stewardship and nonnuclear testing. These areas have been continuously used since the early days of the Manhattan Project.

Lands immediately west of SR 501 are in the Santa Fe National Forest. Bandelier National Monument lies approximately 0.6 mi (1 km) away south of SR 4. The general public uses both SR 4 and SR 501.

LANL's natural resources environment, cultural resources, socioeconomics, waste management, regulatory compliance record, and general operations are described in detail in the SWEIS (DOE 1999a). Additional information is available in the most recent annual Environmental Surveillance Report (LANL 2002b) and the *Special Environmental Analysis for the Department of Energy, National Nuclear Security Administration, Actions taken in Response to the Cerro Grande Fire at Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE 2000b). These documents may be found in the LANL library and are also available at the Public Reading Room at 1619 Central Avenue, Los Alamos, New Mexico.

3.2 Potential Environmental Issues

This section addresses the issues listed in Table 3. The first part of each subsection describes the resources potentially affected by the Proposed Action. The second part analyzes the anticipated effects of implementing the Proposed Action on that resource. The third part of the subsections describe the anticipated effects of implementing the No Action Alternative on the resources.

3.2.1 Waste Management

3.2.1.1 Affected Environment

LANL generates solid waste[9] from construction[10], demolition, and facility operations. These wastes are managed and disposed of at appropriate solid waste facilities. Both LANL and Los Alamos County use the same solid waste landfill located within LANL boundaries on DOE land. The Los Alamos County Landfill also accepts solid waste from other neighboring communities. The Los Alamos County Landfill receives about 50,000 tons of solid waste per year (45,500 metric tons per year), with LANL contributing about 10,500 tons per year (9,555 metric tons per year), or about 21 percent of the total. Because of the combined use of the Los Alamos County Landfill by NNSA, LANL, and Los Alamos County, these parties are now considering new solid waste management and disposal options for solid waste generated during LANL operations, as well as, for the management and disposal of Los Alamos County community solid wastes.

Construction and demolition debris storage yards on Sigma Mesa, the Los Alamos County Landfill or other approved material management areas at LANL are currently used to store concrete rubble, asphalt, and clean soil for future re-use at LANL or for recycling offsite. Asbestos removal is stringently controlled. Asbestos disposal is regulated under RCRA as a nonhazardous waste. It is classified as a New Mexico Special Waste that has unique handling, transportation, and disposal requirements to ensure protection of the environment and the health, welfare, and safety of the public. Asbestos wastes generated during demolition activities are regulated under the NESHAP for Asbestos (40 CFR 61) and would be managed in accordance with all applicable regulations. Hazardous waste[11] regulated under RCRA is transported to TA-54 at LANL for proper management, which is carried out in accordance with applicable laws, regulations, and DOE Orders. RCRA-regulated and non-RCRA-regulated hazardous wastes may be treated and then both types of waste are disposed of offsite at various commercial disposal sources. The disposal sites are audited for regulatory compliance before being used by UC for the disposal of such waste. Hazardous waste disposal sites currently used by UC are located across the U.S. Potential disposal locations for hazardous waste that could be produced by LANL demolition activities are shown in Table 4.

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[9] Solid waste, as defined in 40 CFR 261.2 and in 20 NMAC 9.1, is any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities.

[10] As defined in 20 NMAC 9.1, construction and demolition debris means materials generally considered to be not water soluble and nonhazardous in nature, including, but not limited to, steel, glass, brick, concrete, asphalt roofing materials, pipe, gypsum wallboard, and lumber from the construction or destruction of a structure as part of a construction or demolition project, and includes rocks, soil, tree remains, trees, and other vegetative matter that normally results from land clearing. If construction and demolition debris is mixed with any other types of solid waste, whether or not originating from the construction project, it loses its classification as construction and demolition debris. Construction and demolition debris does not include friable, category I non-friable, or category II non-friable asbestos or liquids, including, but not limited to, waste paints, solvents, sealers, adhesives, or potentially hazardous materials. Construction and demolition debris that is not also hazardous waste as defined by RCRA is regulated as a solid waste by the State of New Mexico as well.

[11] Hazardous waste, as defined in 40 CFR 261.3, which addresses RCRA regulations, and by reference in 20 NMAC 4.1, is waste that meets any of the following criteria: a) waste exhibits *any* of the four characteristics of a hazardous waste: ignitability, corrosivity, reactivity, or toxicity; b) waste is specifically *listed* as being hazardous in one of the four tables in Subpart D of the CFR; c) waste is a mixture of a *listed* hazardous waste item and a nonhazardous waste; d) waste has been *declared* to be hazardous by the generator.

Table 4. Potential Offsite Disposal Locations for Hazardous Waste

Location	Type of Hazardous Waste					Distance from Los Alamos (mi/km)
	Asbestos	Lead	Beryllium	HE-contaminated waste	Photo-chemicals	
Mountainair, NM	X					130/209
Phoenix, AZ	X					550/880
Albuquerque, NM		X				90/144
Henderson, CO			X			380/608
Kettleman Hills, CA			X			965/1,544
Lake Charles, LA				X		1,253/2,005
Fernley, NV					X	1,080/1,728

Dedicated pipelines to the Sanitary Wastewater System plant at TA-46 deliver sanitary liquid wastes from the Two-Mile Mesa Complex and other technical areas at LANL. The plant has a design capacity of 600,000 gallons (2.27 million liters) per day and, in 2001, processed about 94.7 million gallons of treated wastewater and sewage, an average of about 259,275 gallons (0.97 million liters) per day (LANL 2002c).

LLW from LANL operations is disposed of at LANL, TA-54 Area G or is shipped to appropriate permitted facilities. Depleted uranium (DU) waste may be managed solely as a radioactive waste or as a mixed waste depending on various factors[12]. DU waste is transported to TA-54 where it is managed either as LLW or mixed LLW[13] and is stored and disposed of at appropriate facilities in accordance with appropriate laws, regulations, and DOE Orders.

3.2.1.2 Proposed Action

The Proposed Action would have no effect on waste management operations since it would not require establishment of any new waste treatment, storage, or disposal facilities. As previously discussed in the Proposed Action description in Section 2.1.1, the Two-Mile Mesa Complex would be designed, constructed, and operated to incorporate, to the maximum extent practical, waste minimization practices required by LANL's Laboratory Implementing Requirement for General Waste Management (LANL 1998a).

Construction

The Proposed Action would generate solid waste from construction that would be disposed of at the Los Alamos Country Landfill, its replacement facility, or other New Mexico solid waste landfills in accordance with the waste minimization plan. Table 5 identifies estimated waste types generated by construction activities and includes estimated bounding quantities, effect on traffic, and potential disposal locations. Construction solid waste is estimated at 11,993 yd^3 (9,115 m^3).

[12] Waste that consists solely of DU that is also source, special nuclear, or byproduct material as defined by the AEA is typically not a hazardous or mixed waste – even if it exhibits a hazardous characteristic. However, if DU waste is mixed with hazardous waste, regardless of the status of the DU relative to its AEA characterization, the mixture would generally be categorized as a mixed waste. Lastly, waste DU that is not source, special nuclear, or byproduct material as defined by the AEA, is generally categorized as a mixed waste because it is both radioactive and exhibits a hazardous characteristic.

[13] Mixed LLW is LLW that is also a RCRA hazardous waste or is combined with a RCRA hazardous waste.

Table 5. Estimated Construction Wastes: Sources, Quantities, and Transportation

Source	Quantity yd^3 (m^3)	Traffic (truck/week)	Start Date	Duration (months)
SDP Building	806 (613)	2	FY 03	6
CERL Building	806 (613)	2	FY 05	6
CHEM Laboratory	2,465 (1,873)	6	FY 05	6
EDF Building	806 (613)	2	FY 05	6
High Bay Laboratory	616 (468)	1–2	FY 07	6
Contained Firing Capability structures	806 (613)	2	FY 05	6
Gas Gun Facility building(s)	806 (613)	2	FY 08	6
Three Office/Laboratory buildings	2,418 (1,839)	6	FY 04	6
Classified HE Storage Building	616 (468)	1–2	FY 10	6
Detonator Qualification Laboratory	616 (468)	1–2	FY 10	6
Lecture Hall	616 (468)	1–2	FY 10	6
Machine Shop	616 (468)	1–2	FY 10	6

The waste quantities shown in Table 5 have been developed from preliminary estimates and from similar post-project knowledge and are expected to bound the actual waste amounts generated. The estimates would be refined as additional information becomes available during the development of the project design.

Operations

Proposed operations would have minimal effects on waste management. Operations that would be consolidated in the Two-Mile Mesa Complex under the Proposed Action would generally produce the same types of waste, possibly in lower quantities, as are generated in the facilities where these operations are currently located. No new radioactive or other wastewater or hazardous waste streams would be generated. DX would utilize environmentally responsible processes to the extent possible, which could result in a decrease in hazardous wastes generated.

Under the Proposed Action, use of the sanitary sewer system in vacated buildings would be discontinued and the sanitary sewer system would be expanded in the refurbished complex to include the newly constructed buildings. The total volume of sanitary waste generated, treated, and disposed of at LANL would remain unchanged.

Demolition

Demolition activities would not adversely affect waste management. The Proposed Action would require managing and disposing of wastes from demolition activities. No new solid waste landfills or hazardous waste treatment, storage, or disposal facilities would need to be established to manage these wastes.

As part of the demolition program, a waste characterization study would refine the estimates of the types and volumes of waste that would be generated by these activities. Not all waste types would be present in all buildings. The volume of solid waste from demolition activities is estimated to be approximately 21,800 yd^3 (16,568 m^3). Most of the waste would be uncontaminated building debris.

Hazardous wastes would be identified and removed from buildings scheduled for demolition before general structural demolition begins. Some buildings at TA-9, TA-14, TA-36, TA-39, and TA-40 that may be demolished are likely to be HE-contaminated or DU-contaminated. Sampling would be done to verify the presence or absence of HE or DU contamination. No

other buildings are expected to be HE- or DU-contaminated, but there would be hazardous waste generated from demolishing buildings containing asbestos-contaminated material, buildings with lead-based paints, and buildings contaminated with photochemicals (including silver components). Asbestos-contaminated waste would be disposed of offsite. Lead- and silver-contaminated items are RCRA-designated "characteristic" hazardous waste constituents. The wastes would be managed and disposed of offsite through the existing LANL waste management program. Disposal of these waste streams would not require new facilities and the date of closure of existing facilities would not be appreciably advanced.

Table 6 identifies estimated waste types and bounding volumes generated by demolition activities and potential disposal locations. Transportation needs are also shown in Table 6.

Table 6. Estimated Demolition Waste Types, Quantities, Traffic Effects, and Disposal Locations

Type/Source	Quantity yd^3 (m^3)	Traffic over a 96 month period (truck/year)	Potential Disposal Location
Uncontaminated building debris	21,001 (15,961)	131	Los Alamos County Landfill or other Offsite Facility
Asbestos building components	610 (464)	less than 4	Mountainair, NM, or Phoenix, AZ
Lead-based paint	2 (1.5)	less than 1	Albuquerque, NM
Photochemicals (silver*)	9 (7)	less than 1	Fernley, NV
HE-contaminated material	160 (122)	less than 20	Lake Charles, LA
LLW (DU)	20 (15)	less than 1	LANL, Area G, TA-54

3.2.1.3 No Action Alternative

There would be no additional waste generation under the No Action Alternative as there would be no construction or demolition wastes generated. The construction and demolition waste shipments to other landfills or recycling centers would not occur.

3.2.2 Air Quality

3.2.2.1 Affected Environment

The *Clean Air Act* (CAA) (40 CFR 50) establishes air quality standards to protect public health and the environment from the harmful effects of air pollution. The act requires establishment of national standards of performance for new stationary sources of emissions, limitations for any new or modified structure that emits or may emit an air pollutant, and standards for emission of hazardous air pollutants (HAPs). In addition, the CAA requires that specific emission increases be evaluated to prevent a significant deterioration in air quality.

The EPA is the regulating authority for the CAA. However, EPA has granted the State of New Mexico primacy for regulating air quality under an approved State Implementation Plan[14] (SIP). In New Mexico, all of the CAA regulations, with the exception of NESHAP for radionuclides (40 CFR 61), certain provisions relating to Stratospheric Ozone Protection (40 CFR 82), and the Risk Management Program (40 CFR 68) have been adopted by the state as part of the SIP, and are regulated under the *New Mexico Air Quality Control Act*.

[14] The purpose of the SIP is to ensure that Federal emission standards are being implemented and National Ambient Air Quality Standards (NAAQs) are being achieved.

The New Mexico Environmental Improvement Board, as provided by the *New Mexico Air Quality Control Act*, regulates air quality through a series of air quality control regulations in the NMAC. These regulations are administered by the New Mexico Environment Department (NMED). Under the federal CAA and the SIP, LANL is subject to Federal air quality regulations, including those that are not part of the SIP, and performs all work in accordance with EPA requirements and LANL standards. In addition to the existing Federal programs, the 1990 amendments to the CAA mandate new program requirements that include control technology for HAPs, enhanced monitoring, prevention of accidental releases, and chlorofluorocarbon replacement.

LANL is considered a major air emission source under the State of New Mexico Operating Permit program because it emits more than 100 tons (91 metric tons) per year of certain nonradioactive substances. Specifically, LANL is a major source of nitrogen oxides, emitted primarily from the TA-3 steam plant boilers. Combustion units are the primary point sources of criteria pollutants (nitrogen oxides, sulfur oxides, particulate matter, and carbon monoxide) emitted at LANL.

The Proposed Action would be located in Los Alamos County. This area is in attainment with NAAQS and all New Mexico Ambient Air Quality Standards[15] (NMAAQS). Air quality is a measure of the amount and distribution of potentially harmful pollutants in ambient air. The ambient air quality in and around LANL meets all EPA and DOE standards for protecting the public and workers (LANL 2001a). Air surveillance at Los Alamos includes monitoring emissions to determine the air quality effects of LANL operations. UC staff at LANL calculate annual actual LANL emissions of regulated air pollutants and report the results annually to the NMED.

In 2000, independent auditors completed a report of LANL's 1999 compliance status with the Rad NESHAP. The independent audit found that in 1999, LANL was in compliance with the Rad NESHAP requirements of the CAA. In addition, at a public meeting in Los Alamos on October 22, 2002, an independent technical audit team (Risk Assessment Corp., a South Carolina-based team) announced the results of its recently performed independent audit, the third in a series mandated by a 1997 Consent Decree resulting from a lawsuit brought against DOE and LANL by the Concerned Citizens for Nuclear Safety. The team's findings reported that LANL was in compliance with air quality standards for the audit year 2001. Total radioactive emissions during 2001 were less than 20 percent of the maximum allowed at the LANL boundary. The team further determined that there were no substantive deficiencies requiring another audit in 2003, as allowed under the Consent Decree.

Both EPA and NMED regulate nonradioactive air emissions. NMED does not regulate dust from excavation or construction, but UC or their subcontractors would take appropriate steps during construction activities to control fugitive dust and particulate emissions using, for example, BACMs such as water sprays and soil tackifiers. Excavation and construction activities are not considered stationary sources of regulated air pollutants under the New Mexico air quality requirements; these activities are not subject to permitting under 20 NMAC, Parts

[15] Ambient air is defined in 40 CFR 50.1 as "that portion of the atmosphere external to buildings, to which the public has access." It is defined in the NMAC Title 20, chapter 2, part 72, as "the outdoor atmosphere, but does not include the area entirely within the boundaries of the industrial or manufacturing property within which the air contaminants are or may be emitted and public access is restricted within such boundaries."

2.70 and 2.72. Annual dust emissions from daily windblown dust are generally higher than short-term construction-related dust emissions. LANL would ensure that the NMAAQS and the NAAQS for particulate emissions are met throughout any construction activities.

Some actions relevant to construction operations and demolition require notifications or registration to the EPA or NMED. All demolition actions, as well as installation of ignition sources (such as boilers and generators), require UC to notify NMED. Mobile sources, such as automobiles and construction vehicles, are additional sources of air emissions; however, mobile sources are not regulated by NMED. Diesel emissions from conveyance vehicles are not regulated as stationary sources of emissions. Mechanical equipment including bulldozers, excavators, backhoes, cranes, tamper compactors, trenchers, and drill rigs are exempt from permitting (20 NMAC 2.72) and do not require notification to NMED.

Under the State's permit requirements listed in 20 NMAC 2.72, standby emergency generators operating less than 500 hours per year are exempt from permitting; however, a notification to the State is required. Therefore, hours of generator use are metered to qualify for this exemption.

Asbestos is present in most of the older LANL buildings being considered for demolition. Asbestos removal involves such techniques as the use of plastic barriers and HEPA filtration to mitigate airborne emissions. UC is required to provide advance notice of demolition and major renovations at LANL to NMED, to take steps to mitigate airborne emissions, and to ensure proper packaging and disposal of asbestos and asbestos wastes (40 CFR 61).

3.2.2.2 Proposed Action

Construction and demolition activities for the proposed Two-Mile Mesa Complex would be expected to produce only temporary and localized air emissions and the effects on air quality would also be temporary and localized. There would be no long-term degradation of regional air quality. Proposed operations at the new Two-Mile Mesa Complex already exist in various LANL locations and would be consolidated in a single location within the new Two-Mile Mesa Complex. Operational emissions may decrease due to increased efficiency with more modern equipment and facilities and due to a reduction in the scope or level of some operational activities.

Construction

The Proposed Action would include construction of new buildings. Construction and earth-moving activities, including landscaping, paving of parking areas, and soil contouring, associated with the Proposed Action would temporarily increase localized particulate (dust) emissions at the construction sites during the construction phase.

Although new building construction is not expected to disturb PRSs, any hazardous wastes from PRSs that cannot be avoided in the siting process would be removed by the Two-Mile Mesa Complex project before the proposed construction activities begin. Remediation activities could potentially affect air quality on a temporary basis. Excavation activities for the purpose of removing contaminated soil from the PRSs for treatment or transport could result in a minor amount of airborne fugitive dust. The amounts of air emissions would be kept to a minimum by the control measures proposed as part of the Proposed Action, such as the use of water spray trucks and soil tackifiers.

Demolition

The Proposed Action also involves demolition of buildings determined to be of no further use to LANL operations. Demolition would also be a potential temporary source of increased particulate emissions. Effects of demolition activities on air quality would be distributed over a period of several years.

Demolition activities associated with buildings that are contaminated with DU, such as the TA-36 firing sites, would be evaluated for potential requirements, such as emissions monitoring and prior approval by EPA, under the Rad NESHAP. Asbestos is present in most of the buildings being considered for demolition or renovation. Emissions from asbestos and asbestos wastes generated during renovation and demolition activities would be stringently controlled and emissions would be negligible. As noted in Section 2.1.3, BACMs would be used to control particulate dust emissions. BACMs would be selected and applied based on the particular demolition under consideration.

Waste transport and construction vehicles, such as dump trucks, bulldozers, and cranes, would also produce temporary and localized emissions of air pollutants. These emissions would be expected to be similar to those from other recent construction actions, such as the construction of the Strategic Computing Complex and the Nonproliferation and International Security Center buildings, and from recent demolition activities at LANL.

Operations

The Proposed Action would involve the relocation of existing operations from other areas of LANL. Air emissions would not increase and, in some cases, air emissions would decrease because of use of more efficient equipment facilities. No effects on air quality are expected.

Vehicle use associated with operation of the Two-Mile Mesa Complex would result in negligible localized increases in some nonradioactive air emissions. There would be no change in overall LANL vehicle emissions since there is no increase in LANL personnel attributed to the Proposed Action.

3.2.2.3 No Action Alternative

There would be no change in air quality effects associated with implementing the No Action Alternative. Buildings would be maintained to the extent necessary to prevent airborne releases of asbestos or other materials that could pose a risk to workers, the public, or the environment.

3.2.3 Cultural Resources

3.2.3.1 Affected Environment

Cultural resources include any prehistoric sites, buildings, structures, districts, or other places or objects considered to be important to a culture or community for scientific, traditional, religious, or any other reason. They combine to form the human legacy for a particular place (DOE 1999a). To date, over 2,000 archaeological sites and historic properties have been recorded at LANL.

The criteria used for evaluating cultural resources depends upon their significance as sites eligible for listing to the National Register of Historic Places (NRHP) as described in the *National Historic Preservation Act* (16 USC 470). These determinations of significance are met

by evaluating each cultural resource based on it meeting any one or more of the following criteria:

Criterion A association with events that have made a significant contribution to the broad pattern of our history,

Criterion B association with the lives of persons significant in our past,

Criterion C illustration of a type, period, or method of construction; for its aesthetic values or for its representation of the work of a master; or if it represents a significant and distinguished entity whose components may lack individual distinction, and

Criterion D it has yielded, or may be likely to yield, information important in prehistory or history.

One historic archaeological site, a historic homestead, is located near the existing Two-Mile Mesa Complex. The remaining evidence of the homestead, located on the edge of Pajarito Canyon, consists of a stone cabin foundation, stone pens and corrals, various outbuildings, an *horno*, rock walls, and barbed-wire fences. There are also trails to the bottom of the canyon. Remnants of the original fence line and a rock retaining wall still define the perimeters of the homestead. A cleared field area is located north of the central site. No concentrated refuse disposal area was located; but scattered surface refuse is present. Based on the artifacts and the known history of the area, this site was determined to have been occupied between the 1890s and 1943.

Five archaeological sites are located in the vicinity of the proposed new access roads and access-control stations. The preferred option for the entrance road at TA-16 passes between two archaeological sites east of Cañon de Valle; these archaeological sites would be avoided. There are three prehistoric archaeological sites in the area of the second option for the access road and access-control station at TA-69. Two of these sites (a historic rock alignment and a prehistoric lithic scatter) have been determined to be ineligible for the NRHP and need not be avoided. The NRHP-eligible site would be avoided.

Numerous structures in TA-9, TA-14, TA-15, TA-22, TA-36, TA-39, TA-40, and TA-69 have been identified as historic or potentially historic structures. Fifty-three Manhattan Project and Cold War Era properties (1943–1963) and three later buildings, which were identified as significant Laboratory properties in the SWEIS (DOE 1999a), are located within the proposed area of consolidation at TA-9, TA-14, TA-15, TA-22, TA-36, TA-39, TA-40, and TA-69. With exception of four buildings, these buildings have not had a formal determination of eligibility for the NRHP. NRHP eligibility recommendations for buildings affected by the Proposed Action are listed in Table 7. A Cultural Resource Management Plan is being prepared for LANL that will include a management strategy of historic and prehistoric properties, including those affected by the Proposed Action.

3.2.3.2 Proposed Action

The planned consolidation of the DX complex would not affect the recorded historic archaeological site or the recorded prehistoric archaeological sites. The demolition of various historic buildings would have an adverse effect on NRHP-eligible and potentially eligible historic structures. The primary effect would be the loss of NRHP-eligible and potentially eligible properties through demolition. The importance of these buildings and others to LANL's history has not been assessed. Many buildings are considered eligible for the NRHP under

Criteria A, B, or C. An NRHP eligibility assessment for these buildings would be completed and sent to the New Mexico SHPO for concurrence. Also, the Advisory Council on Historic Preservation would be notified of any adverse effects. NRHP-eligible properties that could be adversely affected by the Proposed Action are identified in Table 7. Adverse effects to NRHP-eligible properties would have to be resolved before implementing the Proposed Action.

Table 7. NRHP Eligibility Recommendation for Buildings to be Vacated under the Proposed Action

Building Number	Building Name	Date Built	Eligible or Potentially Eligible	Effect on NRHP-Eligible Historic Buildings
TA-9-21	Laboratory and Office Building	1952	Yes	Yes
TA-9-28	Shop Building (Machine Shop)	1952	Yes	Yes
TA-9-29	Stock and Equipment Building	1952	Yes	Yes
TA-9-30	Gas Storage	1952	Yes	Yes
TA-9-31	Solvent Storage	1952	Yes	Yes
TA-9-32	Laboratory/Office Building	1952	Yes	Yes
TA-9-33	Laboratory Building	1952	Yes	Yes
TA-9-34	Process Laboratory	1952	Yes	Yes
TA-9-35	Process Laboratory	1952	Yes	Yes
TA-9-36	Magazine	1952	Yes	Yes
TA-9-37	Process Laboratory	1952	Yes	Yes
TA-9-43	Process Laboratory	1952	Yes	Yes
TA-9-49	Magazine	1952	Yes	Yes
TA-9-50	Receiving and Shipping	1952	Yes	Yes
TA-9-52	Magazine	1952	Yes	Yes
TA-9-53	Magazine	1952	Yes	Yes
TA-9-54	Magazine	1952	Yes	Yes
TA-9-55	Magazine	1952	Yes	Yes
TA-9-28	Shop Building	1952	Yes	Yes
TA-9-48	Machining Building	1952	Yes	Yes
TA-9-272	Transportable	1988	No	No
TA-9-273	Transportable	1984	No	No
TA-9-265	Boiler Building	2000	No	No
TA-14-6	Storage	1944	Yes	Yes
TA-14-22	Magazine	1952	Yes	Yes
TA-14-23	Control Building	1952	Yes	Yes
TA-14-24	Magazine	1952	Yes	Yes
TA-15-30	Guard Station	1949	Yes	Yes
TA-15-40	Laboratory and Office Building	1951	Yes	Yes
TA-15-46	Exercise Facility (Former Guard Station)	1951	Yes	Yes
TA-15-140	Storage Building	1952	Yes	Yes
TA-15-183	Laboratory and Office Building	1961	Yes	Yes
TA-15-447	Trailer	1984	No	No
TA-15-448	Trailer	1984	No	No
TA-15-456	Transportable	1984	No	No
TA-15-476	Trailer	1986	No	No
TA-22-52	Machine Shop	1952	Yes	Yes
TA-22-66	Storage Building	1956	Yes	Yes
TA-22-67	Storage Building	1956	Yes	Yes
TA-22-68	Storage Building	1956	Yes	Yes
TA-22-69	Storage Building	1956	Yes	Yes
TA-36-5	Preparation Building	1950	Yes	Yes
TA-36-6	Control Building	1950	Yes	Yes
TA-39-2	Laboratory/Office Building	1953	Yes	Yes
TA-39-6	Firing Chamber #1	1953	Yes	Yes

Table 7. continued

Building Number	Bldg Name	Date Built	Eligible or Potentially Eligible	Effect on NRHP-Eligible Historic Buildings
TA-39-67	Capacitor Bank Enclosure (Support for Chamber #1, TA-39-6)	1964	No	No
TA-39-103	Transportable	1985	No	No
TA-39-107	Transportable	1987	No	No
TA-39-138	Neutron Flux Storage (Support for Chamber #1, TA-39-6)	1979	Yes	Yes
TA-40-1	Laboratory and Office	1950	Yes	Yes
TA-40-2	Magazine	1950	Yes	Yes
TA-40-3	Preparation Building	1950	Yes	Yes
TA-40-4	Firing Point	1950	Yes	Yes
TA-40-8	Firing Point	1950	Yes	Yes
TA-40-9	Firing Point	1950	Yes	Yes
TA-40-12	Crystal Laboratory	1950	Yes	Yes
TA-40-13	Magazine	1950	Yes	Yes
TA-40-14	Preparation Building	1950	Yes	Yes
TA-40-15	Firing Point	1950	Yes	Yes
TA-40-23	Machine Shop	1950	Yes	Yes
TA-40-36	Magazine	1952	Yes	Yes
TA-40-37	Magazine/Firing Chamber	1952	Yes	Yes
TA-40-38	Magazine	1952	Yes	Yes
TA-40-39	Magazine	1952	Yes	Yes
TA-40-40	Inert Preparation Building	1952	Yes	Yes
TA-40-41	Laboratory Building	1951	Yes	Yes
TA-40-45	Solvent Shed	1970	No	No
TA-40-90	Transportable	1999	No	No
TA-69-1	Guard Station	1955	Yes	Yes
TA-69-2	Doublewide Trailer	1987	No	No
TA-69-5	Trailer	1986	No	No
TA-69-26	Guard Station #431 (placed at this site approximately 1996) (Building physically has number TA-69-4 attached to it)	1991	No	No

Because the demolition of NRHP-eligible Manhattan Project and Cold War Era buildings would be an adverse effect to the property under Section 106 of the *National Historic Preservation Act of 1966* (as amended) and (36 CFR 800), "Assessment of Adverse Effects," a treatment plan to resolve these adverse effects would be negotiated between the SHPO and NNSA. One treatment plan would cover all of the eligible buildings affected by the Proposed Action. The treatment plan for the affected buildings could include a combination of the following elements: archival medium-format photographs, existing architectural blueprints, preparation of as-built drawings, preparation of detailed reports on buildings' histories, and interviews with past and present workers. Not all elements would necessarily be applied to all of the eligible buildings. Changes to the treatment plan could result from negotiations with the SHPO over the resolution of the adverse effects.

A Memorandum of Agreement between NNSA and the SHPO for resolution of adverse effects would be prepared following SHPO concurrence on the NRHP eligibility assessment. The treatment plan would be implemented and would proceed parallel with this EA. The Advisory Council on Historic Preservation would be notified of the Memorandum of Agreement and would have an opportunity to comment.

Archaeological sites in the vicinity of the proposed access roads and access-control stations would be avoided. Road alignments and designs would be reviewed as design proceeded into final phases to ensure that archaeological sites are sufficiently protected from construction impacts.

3.2.3.3 No Action Alternative

The effect of the No Action Alternative on cultural resources is that potentially NRHP-eligible historic structures would not be demolished and would continue to be used in their current fashion. As portions of buildings or entire structures were deemed to no longer be suitable for continuous human occupancy, those buildings or portions of buildings would be abandoned. The structures would deteriorate with no or minimal maintenance. This type of deterioration is also considered an adverse effect under Section 106.

3.2.4 Visual Resources

3.2.4.1 Affected Environment

The visual environment of LANL is described in the SWEIS (DOE 1999a). The natural setting of the Los Alamos area is panoramic and scenic. The mountain landscape, unusual geology, varied plant communities, and archaeological heritage of the area create a diverse visual environment. Portions of the viewshed underwent substantial changes as a result of the Cerro Grande Fire. The fire burned large areas of the mountain slopes that form the principal scenic background in the Los Alamos area. The resulting landscape is both more stark and less uniform than before the fire (DOE 2000b).

Much of the development within LANL is austere and utilitarian. Overcrowded conditions have often resulted in an unplanned, visually discordant assembly of temporary and permanent structures. Much of the development has occurred out of the public's view. The most visible developments are a few tall structures, facilities at high, exposed locations, and those beside well-traveled, publicly accessible roads. The extremely dense mixed development in areas such as TA-3 has been identified as an adverse visual effect (DOE 1999b).

The Proposed Action would be implemented mainly within LANL's Experimental Engineering and Dynamic Experimentation Planning Areas. These areas consist of undeveloped forested areas and areas of secondary forest growth interspersed with clusters of buildings. Some of the building clusters are industrial in appearance; others, such as that at the existing Two-Mile Mesa Complex, resembles an industrial park. Vistas of the Sangre de Cristo Mountains and the east face of the Jemez Mountains are common in the areas affected by the Proposed Action. Views across the Two-Mile Mesa Complex, and in other areas of DX facilities, are generally pleasant, with industrial elements visually subservient to other landscape elements.

3.2.4.2 Proposed Action

Construction activities under the Proposed Action would have some local short-term adverse effects; long-term effects on the viewscape from construction and demolition are expected to be minimal. Consolidation of operations under the Proposed Action would have no effects on visual resources.

The Proposed Action is consistent with goals for architectural and landscaping upgrades identified in LANL's Comprehensive Site Plan 2000 (LANL 2000). The proposed Two-Mile

Mesa Complex is generally not visible from public roads; the proposed buildings would be similar in height to existing buildings. The visual effects of construction would be confined to the immediate area of the existing Two-Mile Mesa Complex.

Short-term temporary adverse visual effects would occur during the construction period. These effects involve staging and use of construction vehicles and erecting construction fences. Occasional fugitive airborne dust from soil disturbance may temporarily obscure local views for short periods of time.

In the long term, the area would experience minimal effects. After completion of proposed construction, the Two-Mile Mesa Complex would still resemble an industrial park but on an expanded scale. Buildings would generally be more prominent elements within the overall landscape but vistas would typically not be affected. The proposed campus setting of the Two-Mile Mesa Complex would incorporate buildings of similar style and would include unifying landscaping which would enhance the immediate visual environment.

Demolition activities would generally result in the same local, short-term adverse effects as would occur during the construction phase. Overall, the removal of buildings would enhance the visual characteristics of the areas where they are currently located. Depending on the extent to which buildings are removed from the various technical areas, some areas would be returned to more natural conditions.

3.2.4.3 No Action Alternative

Under the No Action Alternative, the existing building appearance and configuration would be retained. No visual resources effects would occur from construction or demolition. Adverse visual effects could result over time from deteriorating structures.

3.2.5 Transportation, Traffic, and Infrastructure

3.2.5.1 Affected Environment

The transportation system in and around the Two-Mile Mesa Complex consists of local roads. Currently, the only access to the complex is via Anchor Ranch Road and Two-Mile Mesa Road. A new connector road links Two-Mile Mesa Complex with Anchor Ranch Road in TA-08. These interior roads are not open to public traffic. SR 501, a highway owned by DOE but open to the public, provides access to these interior roads. SR 501 links Los Alamos town site and SR 502 with SR 4. Parking lots are currently provided next to all of the buildings in the Two-Mile Mesa Complex.

The water system in the Anchor Ranch area and at the Two-Mile Mesa Complex is in fair to marginal condition. The distribution lines are constructed of asbestos containing cement and are reaching the end of their design life. Asbestos containing cement lines are susceptible to ground movement and surges, which create cracks and joint leaks that are expensive to repair. There are several distribution lines in the area that need to be replaced and upgraded to meet current fire protection standards. The existing water storage and distribution system would have to be upgraded to support future growth.

The natural gas distribution system, which is in generally good condition, can provide excess capacity to support another two to three buildings in the TA-22, TA-40, TA-16, and TA-15 areas. To determine if there is sufficient capacity for additional buildings at the Two-Mile Mesa

Complex, a load study of the existing system is necessary. If additional capacity is required to supply the Two-Mile Mesa Complex, the existing 2.5-inch (6.25-centimeter) gas main could be upgraded in its current location.

The electrical distribution system serving the Anchor Ranch area and Two-Mile Mesa Complex is adequate to support the current loads, but cannot accommodate any expansion. Due to its length, the existing 13.8-kilovolt (kV) circuit is prone to lightning-caused interruption. An electrical upgrade, currently under construction, will provide a new 13.8-kV line to TA-15 and will include the new Western Technical Area (WTA) substation located just north of Two-Mile Mesa Complex. This substation has a 50-megawatt capacity and will support growth in the Anchor Ranch area while improving service reliability. A new 115-kV transmission line that would cross the Anchor Ranch area is now in the design stage (DOE 2000c). This line would provide electrical power to support operations at the Two-Mile Mesa Complex and would provide another connection to the northern New Mexico power grid. This connection would allow more power to be delivered to the new WTA substation, giving LANL a more robust system that could support larger loads. There will be sufficient power capacity at the new WTA substation and more power could be delivered through the proposed 115-kV line from outside sources to WTA, but projects or programs at the Two-Mile Mesa Complex would have to install new feeder connections from WTA to accomplish this. These new feeders would also provide redundancy and increased reliability.

The sewers at the Two-Mile Mesa Complex are in fair to good condition but there are concerns about deterioration because of some of the materials (such as vitrified clay, asbestos cement, and concrete) that were used in the system when it was installed. There is capacity to support development at the Two-Mile Mesa Complex, but the collection system would need to be upgraded to accommodate new buildings and population. There are two major lift stations that handle the site; one installed for Buildings 90 and 91 at TA-22, and another installed for the Sanitary Wastewater System Consolidation (SWSC) project in 1991. The collection line and lift station for Buildings 90 and 91 would be the most likely place to add flow and the pumps could be upgraded if necessary since these pump to the SWSC lift station. The SWSC lift station at the south side of the site could handle a larger population because it is sized to handle higher discharges.

Telecommunications and data systems for the Two-Mile Mesa Complex are connected to telecommunications and data systems in TA-3. The present telecommunications capacity at the complex consists of approximately 250 lines. An additional copper feeder cable would be needed as the Two-Mile Mesa Complex is developed. Fiber optic capacity at the Two-Mile Mesa Complex is sufficient to serve the planned new facilities.

3.2.5.2 Proposed Action

Implementing the Proposed Action would have a net beneficial effect on transportation and safety at LANL. It would also have an overall benefit on utility use and infrastructure.

The proposed new access control station and access road from SR 501 to Anchor Ranch would address traffic safety concerns that have resulted from the queuing that now occurs along SR 501 at TA-69 and Anchor Ranch Road. There would also be localized enhancements to vehicle access and circulation and parking in and around the Two-Mile Mesa Complex. Walkways would also be provided for pedestrians.

The net increase in worker population at the Two-Mile Mesa Complex over the 10-year build out would be approximately 460 persons. However, most of these workers already commute to other technical areas accessed from SR 501; therefore, there would be no substantial increase in traffic on SR 501. Approximately 80 construction workers would be engaged during the peak construction period and this would add about 70 average daily trips to the local road network. These workers would park their personal vehicles either in existing parking lots or in other designated parking areas. In addition, about three NNSA and 20 UC workers may perform site inspections and monitor construction and demolition activities during peak activity periods. Vehicles (such as dump trucks) and heavy machinery (such as bulldozers, drill rigs, dump trucks, cranes, and cement mixer trucks) would be used onsite during the construction phase. These vehicles would operate primarily during the daylight hours and would be left onsite over night.

Utilities may be upgraded to assure capacity and reliability and to reduce maintenance costs. Approximately 16,000 linear ft (4,800 m) of trenches would need to be excavated to accommodate these upgrades. As stated earlier, new construction projects would incorporate energy efficient technologies and designs. The Proposed Action is expected to decrease overall utility use per building. Utility usage would increase at the Two-Mile Mesa Complex and decrease at other DX technical areas after operations in those areas are moved to new structures in the Two-Mile Mesa Complex.

3.2.5.3 No Action Alternative

Under the No Action Alternative, the new entrance from SR 501, new parking lots, and proposed utility upgrades would not be constructed in and around the Two-Mile Mesa Complex area. Traffic hazards and related accidents along SR 501 at TA-16 and Anchor Ranch Road would remain unchanged. However, the additional construction traffic generated by development of the Two-Mile Mesa Complex would not materialize. Existing utilities would be maintained and repaired as required when there are service disruptions but additional utility capacity would not be added to existing systems.

3.2.6 Geologic Setting

3.2.6.1 Affected Environment

The Jemez Mountains volcanic field is located in northern New Mexico at the intersection of the western margin of the Rio Grande Rift and the Jemez Lineament (Figure 5) (Gardner et al. 1986; Heiken et al. 1996). The Jemez Lineament is a northeast-southwest-trending alignment of young volcanic fields ranging from the Springerville volcanic field in east-central Arizona to the Raton volcanic field of northeastern New Mexico (Heiken et al. 1996). The Jemez Mountains volcanic field is the largest volcanic center along this lineament (LANL 1992). Volcanism in this volcanic field spans a roughly 16-million-year period beginning with the eruptions of numerous basaltic lava flows. Various other eruptions of basaltic, rhyolitic, and intermediate composition lavas and ash flows occurred sporadically during the next 15 million years with volcanic activity culminating in the eruption of the rhyolitic Bandelier Tuff at 1.79 and 1.23 million years ago (Self and Sykes 1996). All of LANL is within this volcanic field along the western edge of the Rio Grande Rift. Most of the bedrock immediately underlying LANL is composed of Bandelier Tuff.

The geologic structure of the area is dominated by the north-south-trending Pajarito Fault system. The Pajarito Fault system forms the western structural boundary of the Rio Grande Rift,

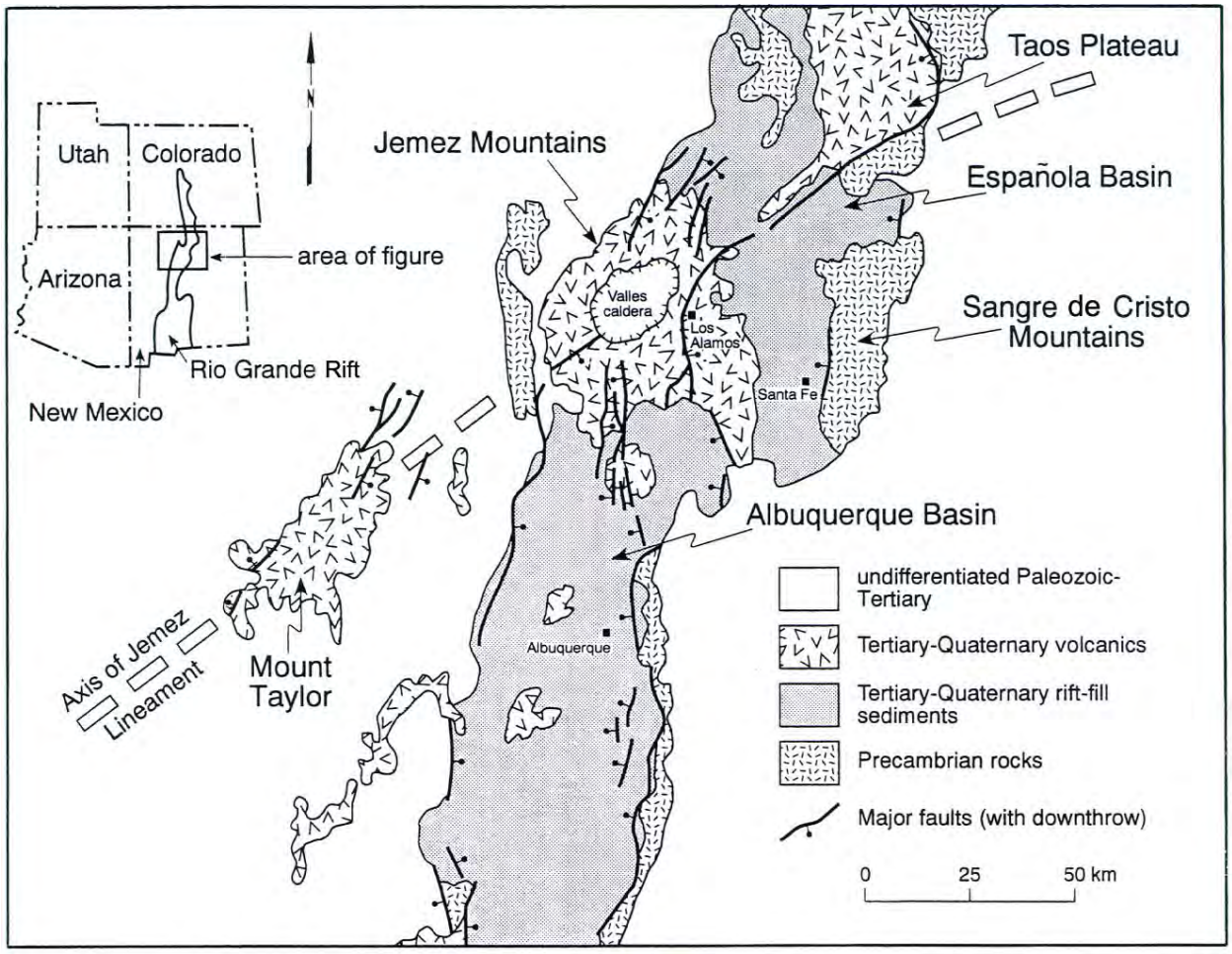

Figure 5. Generalized geologic map of the Rio Grande Rift in the vicinity of the Jemez Mountains volcanic field. From Self and Sykes (1996).

along the western edge of the Española Basin, and the eastern edge of the Jemez Mountains volcanic field. The Pajarito Fault system consists of three major faults and numerous secondary faults with vertical displacements ranging from 80 ft to 400 ft (24 m to 120 m). Estimates of the timing of the most recent surface rupturing paleoearthquakes along this fault range from 3,000 to 24,000 years ago (LANL 2001c).

The bedrock in the area of the Two-Mile Mesa Complex consists of units 3 and 4 of the Tshirege member of the Bandelier tuff (LANL 2002c). Atop the tuff units sits various alluvial gravels containing reworked post-Bandelier pumice beds. The source of the pumice is the Cerro del Medio dome complex within the Valles Caldera. These gravels are no younger than ca. 50 to 60 thousand years (LANL 2002c).

Faulting and fracturing between TA-3 and TA-16 are dominated by north-northeast- to north-northwest-striking faults and associated folds with small amounts of downward displacement to the east and west. The deformation in this area extends at least 5,000 ft (1,500 m) to the east of the main escarpment of the Pajarito Fault, which is immediately west of and roughly parallel to SR 501. This deformation appears to be associated with the Pajarito Fault.

Immediately southwest of TA-22 Buildings 66, 67, 68, and 69 is a series of small northeast trending faults in Figure 6 (LANL 2002c). These faults represent the eastern edge of a sedimentary basin bounded on two sides by faults (a feature known as a "graben"). This graben is about 1,000 ft (300 m) wide near Two-Mile Mesa Complex and widens to about 2,000 ft (600 m) near TA-16. The length of the graben is about 4,000 ft (1,200 m). This graben is the largest structure within the area. The F3 faults have an overall displacement of about 10 ft (3 m) down to the west. The western bounding fault of this graben may connect to a mapped fault northwest of Building 9-48 near the Two-Mile Mesa Complex area. This fault has a displacement of about 5 ft (1.5 m) down to the east. The graben may extend northward in the subsurface through the Two-Mile Mesa Complex (west of Building 22-90) although this has not been substantiated.

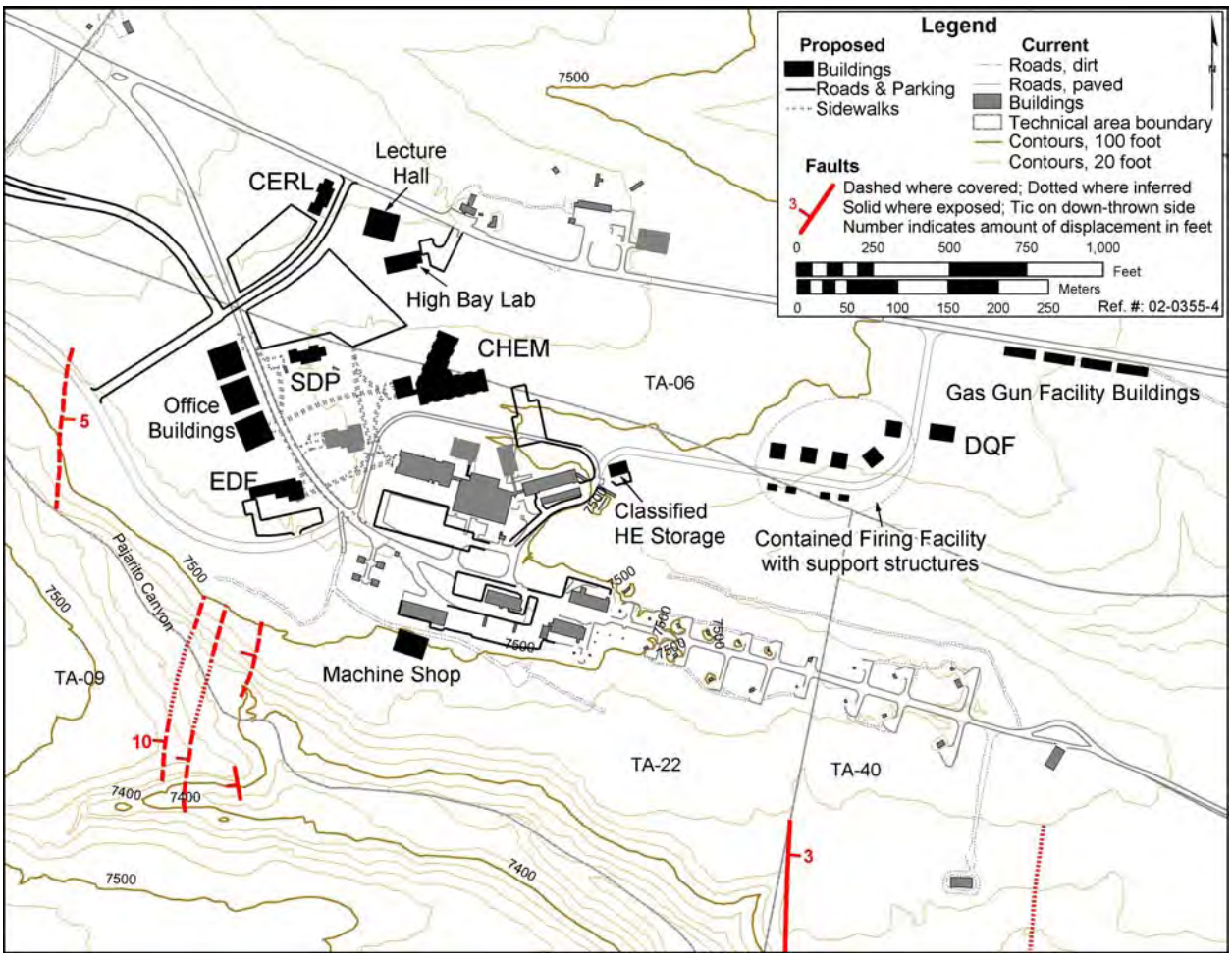

Figure 6. Conceptual drawing of the proposed Two-Mile Mesa Complex showing the approximate locations of the Pajarito and other faults (LANL 2002c).

Most, if not all, of the area of the Two-Mile Mesa Complex lies within the Pajarito Fault Zone. Therefore, the area has a generally higher potential for seismic surface rupture, relative to locations farther removed from the Pajarito Fault Zone (LANL 2001b, 2002b). However, probabilistic analysis of 1 in 10,000 year seismic events suggests that significant seismic events

are only expected to occur along, or on, the main trace of the Pajarito Fault (LANL 2001b, 2002b) west of SR 501. Even though probabilities are low, the Pajarito Fault Zone must be considered active or "capable" in the definitions of 10 CFR 100 Appendix A. The LANL Seismic Hazards Program recommends that siting new facilities over the trace of a potential fault active since the Holocene should be avoided (LANL 1999b).

3.2.6.2 Proposed Action

The Proposed Action would not affect or be affected by geological conditions. A review of existing information on local geology at the Two-Mile Mesa area indicates that there are no *known* geologic hazards in the immediate vicinity of this site. However, faults were mapped immediately south of the proposed buildings (see Figure 6) where they are exposed in the canyon wall. Projection of some of these mapped faults northward takes them directly through proposed building locations. There are currently insufficient data to determine exactly where faults pass through the Two-Mile Mesa Complex. It is also not known if these mapped faults are active. Other similar subsidiary faults to the Pajarito fault within the boundaries of LANL have been shown, through paleoseismic trenching investigations, to be active (LANL 2002d). Because of uncertainties regarding the exact location of these faults and the unknown potential for surface rupture on any newly identified faults, a site-specific seismic hazards survey would be performed early in the design phase to determine the locations of these faults and to what degree they might be active. This will allow for the proper siting of new facilities with respect to seismic hazards in the area. Facilities would be sited, designed, and constructed to meet appropriate seismic code requirements, LANL construction standards, and DOE guidance. However, probabilistic analysis of 1 in 10,000 year seismic events suggests that seismic events are expected to be significant only along, or on, the main trace of the Pajarito Fault (Gardner et al 2001), which is sub-parallel to, and west of, SR 501 along the western boundary of LANL.

3.2.6.3 No Action Alternative

Under the No Action Alternative, operations would not be consolidated in the Two-Mile Mesa Complex area and various operations would continue in buildings that do not meet the seismic hazard standards that apply to new construction. If operations in these facilities are not relocated as part of the Proposed Action, NNSA would evaluate the seismic hazards and would implement mitigation measures as necessary. Probabilistic analysis of 1 in 10,000 year events indicate that surface rupture would only become a notable hazard on the main trace of the Pajarito Fault [(LANL 2001b, 2002b) and references therein].

3.2.7 Water Quality

3.2.7.1 Affected Environment

Analysis of LANL surface water and groundwater samples taken from streams and test wells indicate that LANL operations and activities have affected the surface water within LANL boundaries and some of the alluvial and intermediate perched zones in the LANL region. Details on the surface and groundwater quality can be found in the annual LANL Environmental Surveillance Report (LANL 2001a).

Radiation (gross alpha, gross beta, and gross gamma) and radionuclide levels in surface waters are generally below drinking water and public dose standards, although surface waters at LANL are not used for drinking water. However, some measurements exceeding drinking water

standards have been recorded at those locations on LANL where former or current radioactive liquid waste discharges occurred: Acid and Pueblo, DP and Los Alamos, and Mortandad Canyons. There are no permitted outfalls within the existing Two-Mile Mesa Complex. Most buildings, however, have roof drains that empty into the environment.

Metals in surface water samples are typically below applicable standards when the samples are filtered before analysis. However, metal concentrations exceeding drinking water standards are relatively widespread when samples are not filtered. Radionuclide concentrations exceed regional comparison values in several sediment samples below former or current radioactive liquid waste discharges. In general, while some sediment samples exceed regional comparison value concentrations for trace metals, most of these metals may occur naturally in the sediments. The exception to this is selenium in sediments from upper Los Alamos Canyon and mercury in several locations (LANL 2001a).

In the regional aquifer, which serves LANL and Los Alamos County, drinking water standards have been met for all radionuclides. Trace amounts of tritium, plutonium, americium, and strontium have been detected in regional aquifer test wells, but not in the potable water supply. Organic compounds have been detected in the regional aquifer from test wells at TA-49 and TA-16. Inorganic compounds have also been detected in the regional aquifer at LANL. Nitrate has been detected down-canyon from the Bayo Wastewater Treatment Plant in Pueblo Canyon on the north side of LANL and perchlorate was detected below drinking water standards in one water supply well. Contaminants also have been detected in alluvial and intermediate perched groundwater near former or present effluent discharge points (DOE 1999b).

3.2.7.2 Proposed Action

Water quality in this area would not be affected by the Proposed Action. New facilities would be designed using pollution prevention processes that lead to minimal waste generation. BMPs, as specified in the Storm Water Pollution Prevention Plan, would be employed during construction to restrict surface water movement and minimize soil erosion that could degrade surface water quality. Post construction landscaping would also serve to protect surface and groundwater quality.

No new outfalls, wastewater, or hazardous waste streams would be created by implementing the Proposed Action. Use of the sanitary sewer system in the buildings to be vacated would be discontinued and a reconfiguration of the sanitary system would be made in the Two-Mile Mesa Complex. Water quality would not change as a result of operations of new buildings in the Two-Mile Mesa Complex.

Removal of asphalt in some areas would decrease surface water runoff and would increase surface water infiltration. Establishment of new asphalt parking areas would have the reverse effect. Water use would be expected to be static. The net increased infiltration is not expected to have any adverse effects on groundwater quality.

3.2.7.3 No Action Alternative

There would be no effects to water quality under the No Action Alternative. No increased infiltration because of asphalt removal would occur.

3.2.8 Human Health

3.2.8.1 Affected Environment

This section considers the health of LANL workers and non-UC construction or demolition workers. These two categories are considered in this EA because each category of worker would either be involved in the routine operation of the proposed consolidation of DX operations, work on the construction of new buildings, demolition of vacated buildings and structures, or could be affected by potential accidents at the new Two-Mile Mesa Complex. Members of the public are not considered because they are not likely to be affected by routine operations, construction or demolition activities, or any potential accident scenarios that could result from the Proposed Action.

The health of LANL workers is routinely monitored depending upon the type of work performed. Health monitoring programs for LANL DX workers consider a wide range of potential concerns including exposures to radioactive materials, HE, hazardous chemicals, and routine workplace hazards. In addition, LANL DX workers involved in hazardous operations are protected by engineering controls and required to wear appropriate PPE. Training is also required to identify and avoid or correct potential hazards typically found in the work environment and to respond to emergency situations. Because of the various health monitoring programs and the requirements for PPE and routine health and safety training, LANL workers are generally considered to be a healthy workforce with a below average incidence of work-related injuries and illnesses.

UC staff monitor environmental media for contaminants that could affect non-UC workers or members of the public. This information is reported to regulatory agencies, such as the NMED and to the public in accordance with various permits and reporting mechanisms and it is used to assess the effects of routine operations at LANL on the general public. For detailed information about environmental media monitoring and doses to the public, see LANL's Environmental Surveillance Report for 2001 (LANL 2002b). For those persons that work within the boundaries of LANL as subcontractors or construction workers and could be exposed to radioactive or other hazardous materials, their exposures are monitored in the same manner as LANL workers. In addition, site-specific training and PPE requirements would also apply to these workers.

3.2.8.2 Proposed Action

Construction and demolition work planned under the Proposed Action would not be expected to have any adverse health effects on LANL workers. LANL workers would not be directly involved in the construction or demolition of buildings and structures, parking areas, road upgrades, or the movement of fencing and utilities but they would be active in management, site inspections, and utility hook-ups. Approximately three NNSA and 20 LANL workers would perform site inspections and monitor construction and demolition activities during periods of peak activity. Applicable safety and health training and monitoring, PPE, and work-site hazard controls would be required for these workers.

The Proposed Action is not expected to result in an adverse effect on the health of construction workers. Approximately 80 peak-period construction workers, including approximately 35 construction vehicles, would be actively involved in potentially hazardous activities such as heavy equipment operations, soil excavations, and building construction. Construction activities would occur over about a 10-year period ending about 2013. Potentially serious exposures to

various hazards or injuries are possible during the construction phase of the Proposed Action. Adverse effects could range from relatively minor (e.g., cuts or sprains) to major (e.g., broken bones or fatalities). To prevent serious injuries, all site construction contractors are required to submit and adhere to a Contractor Safety Plan (Plan). This Plan is reviewed and approved by LANL staff before construction activities can begin. Following approval of this Plan, LANL and NNSA site inspectors would routinely verify that construction contractors are adhering to the Plan, including applicable Federal and state health and safety standards. Adherence to an approved Plan, use of PPE and engineered controls, and completion of appropriate hazards training are expected to prevent adverse health effects on construction workers.

Demolition work could begin during the construction phase but would likely be completed by about 2013. Approximately 80 peak-period demolition workers would be actively involved in the same potentially hazardous activities as would construction workers. In addition, exposures to radioactive debris, beryllium, asbestos, uranium, HE, and hazardous chemicals could also pose a potential health hazard to these workers. Adherence to the Plan, use of PPE and engineered controls, and completion of appropriate hazards training are expected to prevent adverse health effects on construction workers. Engineered controls and the use of hazard control plans to protect worker health and safety would be a routine part of construction activities.

Improvements in facilities and operations planned under the Proposed Action are expected to have a beneficial effect on the health of LANL and subcontractor workers. Applicable safety and health training and work-site hazard controls would be required for these workers and for any hazardous operations they would perform. The health effects of hazardous operations planned under the Proposed Action have been analyzed in detail in the SWEIS (DOE 1999a). In particular, worker health hazards are possible from exposure to radioactive materials, HE, electrical fields, pyrophoric metal, metal work, saws and lathes, and other physical hazards. Machining of nontoxic metals pose respiratory and disease risks. Exposures to various chemicals used in the fabrication of plastics can also cause injury.

Although all of the hazardous activities performed at the Two-Mile Mesa Complex and analyzed in the SWEIS would continue to be performed under the Proposed Action, the relocation of these activities into remodeled or new and modern facilities would reduce the potential for worker exposures and injuries or illnesses. Improvements in ventilation controls, storage and transport of hazardous materials, use of automated and remotely operated equipment, and other process improvements would effectively reduce worker health and safety risks below the risk levels that currently exist in DX operating facilities.

3.2.8.3 No Action Alternative

Under the No Action Alternative, the potential for injuries to UC workers, construction workers, demolition workers, and members of the public would not occur from the construction of the proposed buildings. No exposures to hazardous or radioactive materials would occur as a result of demolition activities. Existing facilities would continue to be used to perform hazardous operations and to house workers. Because of the age of existing facilities and the difficulties in meeting current health and safety codes and standards, the needs for additional controls would likely increase over time. Therefore, it is expected that either more safety measures would need to be put into effect or the existing facilities would need to be vacated over time.

3.2.9 Environmental Restoration

3.2.9.1 Affected Environment

DOE and LANL staff at LANL are jointly responsible for implementing the DOE ER Program at LANL, which is a designated RCRA hazardous waste facility. The ER Project is governed primarily by the corrective action process prescribed in the RCRA, but it is also subject to LANL policies and to other applicable laws and regulations. The NMED administers RCRA in New Mexico. DOE conducts site characterization and waste cleanup (corrective action) activities at PRSs at LANL. Site characterization and cleanup is needed to reduce risk to human health and the environment posed by potential releases of contaminants at ER Project sites.

PRSs include SWMUs and AOCs, collectively. PRSs at LANL include septic tanks and lines, chemical storage areas, wastewater outfalls (the area below a pipe that drains wastewater), material disposal areas (landfills), incinerators, firing ranges and their impact areas, surface spills, and electric transformers. PRSs are found on mesa tops, in material disposal areas, in canyons, and in a few areas in the Los Alamos town site.

The primary means of contaminant release from these sites are surface water runoff carrying potentially contaminated sediments and soil erosion exposing buried contaminants. The main pathways by which released contaminants can migrate are infiltration into alluvial aquifers, airborne dispersion of particulate matter, and sediment migration from surface runoff. The contaminants involved include volatile organic compounds, semivolatile organic compounds, polychlorinated biphenyls, asbestos, pesticides, heavy metals, beryllium, radionuclides, petroleum products, and HE. The 1999 LANL SWEIS (DOE 1999a) contains additional information on contaminants.

There are nine PRSs in the vicinity of the proposed Two-Mile Mesa Complex according to the LANL ER Program database. These are described in Table 8. Five of these PRSs overlap and are depicted on ER Project maps as a single consolidated site. Development may occur in clean areas of the consolidated PRS.

Table 8. Potential Release Sites in the Vicinity of the Proposed Two-Mile Mesa Complex

PRS #	Description	Status
06-002	Former septic tank	NMED requires further sampling
C-06-005	Location of former Detonator Assembly Building	NMED requires further sampling
06-003(c)	Inactive firing site	"Clean," recommended for No Further Action (NFA)
C-06-006	Location of former Explosives Pressing Building	"Clean," recommended for NFA
C-06-016	Location of former explosives magazine	"Clean," recommended for NFA
C-06-020	Location of former employee resthouse	"Clean," recommended for NFA
08-009(a)	Former storm drain outlet, drainline, outfall	Requires further investigation
08-009(e)	Drains and outfall	Recommended for NFA; may require additional sampling
22-015(c)	Former NPDES-permitted outfall	Inactive; cleaned up; removal from facility permit requested

3.2.9.2 Proposed Action

The Proposed Action is not expected to adversely affect PRSs. The PRSs near the intersection of the proposed road and Two-Mile Mesa Road have all been characterized. The NMED has determined that both PRS 06-002 and PRS C-06-005 require additional sampling to characterize

the contamination. At some point, it will be necessary to further characterize and define the contamination, the extent of the contamination, and finally, assess the seriousness of the contamination. If the contamination poses an unacceptable risk to the public or to LANL workers, the sites must be cleaned up. Samples should be taken in the area where the proposed construction might disturb, or bury, known contamination.

The other PRSs in the area (PRS 06-003[c], C-06-006, C-06-016, and C-06-020) have been recognized as "clean." No further cleanup is planned at these sites. SWMU 22-015(c) is a former NPDES-permitted outfall that has been inactive since 1977. The site has been cleaned up and regraded to minimize erosion. Verification samples have been collected to ensure that cleanup was successful. New construction of buildings, roads, and utility corridors is not expected to disturb PRSs. If they cannot be avoided, the areas would be remediated or otherwise mitigated to allow for construction. If required, PRSs would be sampled and remediated in accordance with the NMED requirements before ground disturbance would commence at these locations.

3.2.9.3 No Action Alternative

Under the No Action Alternative, the PRSs would not be disturbed by construction, demolition, or excavation activities. Site cleanup activities would not be accelerated to provide remediation of any PRS before its scheduled date.

3.2.10 Noise

3.2.10.1 Affected Environment

Noise is defined as unwanted sound. Noise is categorized into two types: *continuous noise,* which is characterized as longer duration and lower intensity, such as a running motor, and *impulsive* or *impact noise,* which is characterized by short duration and high intensity, such as the detonation of HE. The intensity of sound is measured in decibel units and has been modified into an A-weighted frequency scale (dBA) for setting human auditory limits.

Noise measured at LANL is primarily from occupational exposures that generally take place inside buildings or at open-air firing sites compared against an established Threshold Limit Value (TLV). The TLV is administratively defined as the sound level to which a worker may be exposed for a specific work period without probable adverse effects on hearing acuity. The TLV for continuous noise is 85 dBA for an 8-hour workday. The TLV for impulsive noise during an 8-hour workday is not fixed because the number of impulses allowed per day varies depending on the dBA of each impulse, however, no individual impulse should exceed 140 dBA. An action level (level of exposure to workplace noise that is below the TLV, but the use of PPE is recommended) has been established for noise in the workplace at LANL. The action level for continuous noise is 82 dBA for an 8-hour workday. Although there is the potential for high impact noise levels at open-air firing sites, hearing protection is not required for firing site operators who are inside buildings at the time of the detonation.

Environmental noise levels at LANL are measured outside of buildings and away from routine operations. These sound levels are highly variable and are dependent on the generator. The following are examples of typical sound levels (dBA) for certain noise producing activities: barking dogs (58), sport events (74), nearby vehicle traffic (63), aircraft overhead (66), children playing (65), and birds chirping (54). Sources of environmental noise at LANL consist of

background sound, vehicular traffic, routine operations, and periodic HE testing. Measurements of environmental noise in and around LANL facilities and operations average below 80 dBA.

The averages of measured values from limited ambient environmental sampling in Los Alamos County were found to be consistent with expected sound levels (55 dBA) for outdoors in residential areas. Background sound levels at the White Rock community ranged from 38 to 51 dBA (Burns 1995) and from 31 to 35 dBA at the entrance of Bandelier National Monument (Vigil 1995). The minimum and maximum values for LANL and the County ranged between 38 dBA and 96 dBA, respectively.

3.2.10.2 Proposed Action

The Proposed Action would result in limited short-term increases in noise levels associated with various construction and demolition activities. Following the completion of these activities, noise levels would return to existing levels. Noise generated by the Proposed Action is not expected to have an adverse effect on construction workers, LANL workers, or the public.

The construction of new office space and the demolition of some buildings would require the use of heavy equipment for clearing, leveling, construction, and demolition activities. Heavy equipment such as front-end loaders and backhoes would produce intermittent noise levels at around 73 to 94 dBA at 50 ft (15 m) from the work site under normal working conditions (Canter 1996; Magrab 1975). Construction truck traffic would occur frequently but would generally produce noise levels below that of the heavy equipment. The finishing work within the building structures would create noise levels slightly above normal background levels for office work areas. Noise levels may go up to around 80 dBA at the work site if light machinery is used in this stage of construction (Canter 1996). Workers would be required to have hearing protection if site-specific work produced noise levels above the LANL action level of 82 dBA for steady-state noise. Sound levels would be expected to dissipate to background levels within the Two-Mile Mesa Complex and along SR 501 and should not be noticeable by members of the public or disturb local wildlife. Traffic noise from commuting construction workers would not be expected to noticeably increase the present traffic noise level on Diamond Drive or East Jemez Road and SR 501 during rush hour. The vehicles of construction workers would remain parked during the day and would not contribute to the background noise levels during this time. Therefore, noise levels are not expected to exceed the established TLV. After construction and demolition activities are completed, noise levels would return to background levels.

Under the Proposed Action, the continued use of open-air firing sites would pose a potential health risk from infrequent but high levels of impact noise. However, consistent with current operations, hearing protection for workers should not be required. Also, members of the public should not be adversely affected. Based on a number of physical features (such as vegetation, topography, and distance to occupied areas) that can attenuate or reduce sound intensity, noise levels should return to background levels within about 200 ft (66 m) of the noise source (Canter 1996). In addition, the number of operational firing sites would be reduced under this proposal; however, the total number of explosive experiments are expected to remain about the same. Also, planned containment of smaller explosive experiments would further reduce the potential for impulse noise levels to pose a concern to nearby workers. Impact testing work would continue to generate minor and temporary increases in impact noise in certain work areas.

Once the new and remodeled facilities become operational, noise generated by routine building operations would be negligible. Noise levels would be similar to those encountered around

typical office buildings, crafts and machine shops (such as ventilation fans and testing of back-up power and emergency response systems), operating power equipment, and vehicle traffic.

3.2.10.3 No Action Alternative

Under the No Action Alternative, ambient noise levels would remain unchanged in the vicinity of the Two-Mile Mesa Complex. Potential noise from construction and demolition activities associated with the Proposed Action would not occur, but ongoing routine operations, vehicle traffic, and construction activities from other projects in the vicinity of the Two-Mile Mesa Complex would continue to generate noise. In addition, the firing sites scheduled for dispositioning under the Proposed Action would remain operational under the No Action Alternative. However, the environmental noise levels in and around facilities or operations at LANL would be expected to remain below 80 dBA on average.

3.2.11 Socioeconomics

3.2.11.1 Affected Environment

LANL operations have a notable and positive influence on the economy of north-central New Mexico. Specifically, in FY 01 (the latest year for which such information is available) LANL had an operating budget that was 1.667 billion dollars and a total workforce of 13,570. Salaries and benefits accounted for 880 million dollars. This translated into a 3.8 billion dollar impact on the tri-county region that includes Los Alamos, Santa Fe, and Rio Arriba Counties. In effect, nearly one of every three jobs in the tri-county region was created or supported by LANL. FY 01 procurements in northern New Mexico were 357 million dollars (LANL 2002e). Approximately 80 percent of the jobs created indirectly by LANL in the region occurred in the trade, finance, insurance, real estate, and services sectors (DOE 1999c).

3.2.11.2 Proposed Action

This project would not have a long-term effect on socioeconomic conditions in north-central New Mexico but there would be short-term benefits during construction in the form of jobs and procurement. The projects included in the DX Strategic Plan in and around the Two-Mile Mesa Complex would include construction of several buildings, along with work on roads, parking, landscaping and utilities, and also some demolition. At least 70 million dollars and possibly up to 110 million dollars would be spent for this project on design, oversight, and construction contracts over a 10-year period. Most materials would be purchased in New Mexico. There would be no increase in the number of LANL employees as a result of this project. An additional 80 peak construction jobs would be filled by the existing employees in the regional work force, which includes mostly Los Alamos, Rio Arriba, and Santa Fe Counties. Because these temporary jobs would be filled by existing regional work force, there would be no effect on area population or increase in the demand for housing or public services in Los Alamos or the region.

3.2.11.3 No Action Alternative

There would be no short- or long-term socioeconomic benefits under the No Action Alternative. Construction of the facilities in and around the Two-Mile Mesa Complex would not occur, and therefore no construction revenue would be generated within the local economy.

3.2.12 Biological Resources

3.2.12.1 Affected Environment

A number of protected and sensitive (rare or declining) species have been documented in the LANL region. These include one Federally listed endangered species (the southwestern willow flycatcher [*Empidonax traillii*]) and two Federally listed threatened species (the bald eagle [*Haliaeetus leucocephalus*] and the Mexican spotted owl [*Strix occidentalis*]). Under the *Endangered Species Act of 1973* (16 USC 1531), government agencies are required to consider the potential effects of all its activities on Federally listed threatened or endangered species and their critical habitat.

The LANL Habitat Management Plan (HMP) (LANL 1998b) establishes Areas of Environmental Interest (AEIs) that are being managed and protected because of their significance to biological or other resources. Habitats of sensitive species that occur or may occur at LANL are designated as AEIs. In general, an AEI consists of a core area that contains important breeding or wintering habitat for a specific species and buffer area around the core area. The buffer protects the area from disturbances that would degrade the value of the core area to the species. The HMP contains guidelines for certain activities, including construction, in core and buffer area. For instance, activities are restricted in core area and buffer during breeding season until it is determined that the habitat is not occupied for that year. LANL personnel perform annual surveys of the AEI early in the breeding season to determine the presence of breeding pairs. If the habitat is occupied, the restrictions remain in place until the completion of breeding season. Any activities that cannot operate within the guidelines of the HMP require consultation with the U.S. Fish and Wildlife Service.

Potential Mexican spotted owl habitat is located in the area of the Proposed Action and in the vicinity of several of the structures proposed for demolition. Certain decontamination and demolition activities would be restricted between March and mid-May when surveys are completed or until August 31 if it is determined that the AEI is occupied.

Terrestrial animals in the LANL area include 57 species of mammals, 200 species of birds, 28 species of reptiles, and 9 species of amphibians. Small mammals and birds typically occupy disturbed and developed areas around the Two-Mile Mesa Complex. The most prevalent big game species at LANL are mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*). Numerous raptors and some carnivores, such as black bear (*Ursus americanus*) and bobcat (*Lynx rufus*) also occur and may migrate through the Two-Mile Mesa Complex area.

3.2.12.2 Proposed Action

There would be no effects to sensitive species or their critical habitat due to construction under the Proposed Action. Several technical areas where demolition activities would occur are within the AEI for the Mexican spotted owl. In these areas, BMPs, such as noise and activity restrictions, would be followed so that there would be no effect to this species. Certain decontamination and demolition activities would be restricted between March and mid-May when surveys are completed or until August 31 if it is determined that the AEI is occupied. Small mammals and birds at the Two-Mile Mesa Complex building sites would be temporarily displaced by construction activities. These would be expected to return to the area after construction was completed. Game animal migration is not likely to be altered.

3.2.12.3 No Action Alternative

Under the No Action Alternative, construction and demolition activities would not occur. There would be no habitat disturbances. Effects on biological resources would be unchanged.

3.2.13 Floodplains and Wetlands

3.2.13.1 Affected Environment

There are no floodplains or wetlands within the area of the proposed action. There are, however, riparian and wetland areas immediately north of the Two-Mile Mesa Complex and a floodplain in Two-Mile Canyon north of Two-Mile Mesa Complex.

In its management of wetlands, LANL is subject to Section 404 of the *Clean Water Act*, DOE regulations, and Executive Order 11990 (EO 11990). Pursuant to EO 11990, Protection of Wetlands, each Federal agency is to avoid, to the extent practicable, the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands if a practicable alternative exists. The Special Environmental Analysis (SEA) (DOE 2000b) discusses issues of cumulative effects due to erosion, contaminant transfer and flooding in wetland areas. About 20 percent (16 acres [6.4 hectares]) of the total wetlands were burned in the Cerro Grande Fire. Wetlands in Mortandad, Pajarito and Water Canyons received increased amounts of ash and runoff as a result of the fire (LANL 2001c).

Pursuant to Executive Order 11988 (EO 11988), Floodplain Management, each Federal agency is required, when conducting activities in a floodplain, to take actions to reduce the risk of flood damage; minimize the impact of floods on human safety, health, and welfare; and restore and preserve the natural and beneficial values served by floodplains. The SEA (DOE 2000b) describes the actions taken in response to the fire, particularly for flood water control. As a result of the fire, soil erosion, water flow, and ash and silt transport increased exponentially compared to pre-fire conditions. As burned areas are revegetated and stabilized, these effects are expected to diminish

3.2.13.2 Proposed Action

The Proposed Action would not entail any direct effects on floodplains or wetlands since there are none within the areas proposed for construction or demolition. BMPs would be established so that there would be no indirect effects from construction or demolition conducted as part of the Proposed Action.

3.2.13.3 No Action Alternative

Under the No Action Alternative, construction and demolition activities would not occur. There would be no effect on floodplains or wetlands under the No Action Alternative.

4.0 ACCIDENT ANALYSIS

The purpose of an accident analysis under NEPA is to provide the decision makers and stake-holders with an estimate of impacts that would not necessarily occur, but which are reasonably foreseeable. "Reasonably foreseeable" includes impacts that may have very large or catastrophic consequences, even if their frequency of occurrence is low, provided that the impact analysis is supported by credible scientific evidence, is not based on pure conjecture, and is reasonable.

Under NEPA a review is performed of existing documentation covering the same or similar activities as the Proposed Action to identify primarily nonstandard industrial accidents that might present threats to the safety and health of workers or the general public. Although the proposed construction activities, including demolition, are performed on a routine basis in standard industry, the consequences of a construction-type accident can be serious; therefore, under NEPA, in addition to nonstandard industrial accidents, the potential effects of high-consequence standard industrial accidents such as construction accidents are routinely analyzed.

Hazards for the Proposed Action can be grouped into operational hazards, construction hazards, and transportation hazards. Potential accidents associated with the Proposed Action are most likely to occur during construction (including demolition) activities. No fatalities are likely to result from any likely accident scenario. The operational hazards of the Proposed Action have been previously assessed in the LANL SWEIS (DOE 1999a) at the current locations of those operations. Most of the operations proposed for consolidation at the Two-Mile Mesa Complex were eliminated from further analysis in the SWEIS on the basis of hazard categorization; i.e., no hazards existed beyond those routinely encountered in an office or standard industrial laboratory environment. As there would be no substantial changes (such as in quantities of hazardous materials at risk, etc.) in operations from implementing the Proposed Action, the potential outcomes of accidents involving operations-related hazards are bounded by the operational hazard analyses in the SWEIS. This EA tiers from the broader scope of analyses in the SWEIS.

4.1 Operations Hazards

Of the current operations under the Proposed Action, only operations at TA-9 Building 21 (Analytical Chemistry Building) were the subject of further review in the SWEIS on the basis of hazard categorization. A small inventory (3 lbs [1.3 kg]) of phosgene in this building constitutes a potential hazard to workers only. Therefore, an accident involving this hazard was selected for further analysis. The potential release of phosgene, a toxic gas, was assessed in a qualitative and quantitative consequence analysis in site-wide accident scenarios. The initiator of an accident causing a phosgene release of this sort was an earthquake with a frequency of occurrence range from about once in 1,000 to once in 100,000 years depending on the magnitude of earthquake assumed. If the entire inventory of phosgene were released in such an accident, one to two persons could be affected, depending on weather conditions. They would probably experience irreversible health effects (ERPG-2) or life threatening health effects (ERPG-3) at distances from the facility of 0.76 mi (ERPG-2) and 0.32 mi (ERPG-3) (1.22 km and 0.52 km, respectively) under worst-case weather. Under average weather conditions, they would experience these effects at distances of 0.23 mi (ERPG-2) and 0.10 mi (ERPG-3) (0.37 km and 0.16 km, respectively). The number of people that could be affected from this accident at the Two-Mile Mesa Complex could be greater than at the TA-9 site because of a relatively larger workforce in the immediate area of the Two-Mile Mesa Complex. The actual number of workers that could be involved in such an accident at the Two-Mile Mesa Complex, and the actual toxicological

effects that could occur depends on the final complex configuration, operations, and surrounding workforce population.

The Contained Firing Capability buildings would provide containment vessels or concrete "bombproofs" in which HE tests may be performed. As many as five containment vessels, including the vessel currently located at TA-40 Building 8, may be located at the Two-Mile Mesa Complex. A bombproof, an earth-covered concrete or metal chamber, may be substituted for one or more of these vessels. DU may be used in some of these tests. DU is uranium having a smaller percentage of uranium-235 than found in natural uranium in the earth's crust. DU is radioactive. The anticipated inventories of DU for this new operation would be well below the threshold of nuclear facilities.

In the SWEIS, operations at TA-40 Building 8 were not selected for accident screening since only higher risk scenarios were analyzed in detail. Furthermore, the operations at TA-40 Building 8 do not currently involve DU, therefore SWEIS accident analyses at the TA-40 facility would not apply to the Proposed Action. The Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility conducts operations similar to the contained firing operations that could be conducted at the Two-Mile Mesa Complex under the Proposed Action, with some important differences. Potential accidents for the DARHT operations were extensively analyzed in the DARHT Facility EIS (DOE 1995). The inventories of explosives and DU used at DARHT are substantially higher than proposed at the Two-Mile Mesa Complex, thus potential accident dose consequences and effects from DARHT are large enough to assume that an accident at Two-Mile Mesa Complex would have much lower consequences. A DARHT accident that applies to, and bounds, potential accidents involving contained firing and DU under the Proposed Action at the Two-Mile Mesa Complex is described below.

The DARHT EIS considered both vessel and building containment accidents involving DU. Containment breach releases have potentially greater effects than uncontained releases because the radiological material released into the atmosphere is more concentrated. A DARHT accident in which an explosion causes catastrophic failure of the vessel containment bounded the contained firing test accidents. Similar to many other industrial-type accidents involving overpressure, the most serious consequence from these type of accidents is fatalities to involved workers from the force of the blast and the physical impacts from container fragments that become projectiles. The actual number of workers that could be involved in such an accident at the Two-Mile Mesa Complex depends on the final configuration of the new buildings and their operations. In any event, consequences to workers are expected to be substantially less than those projected for a similar accident at DARHT.

The DARHT bounding accident results in the release of all of the test assembly materials, including DU, to the environment, resulting in chemical and radiological doses to noninvolved workers and the public. The DARHT accident involves both radiological (carcinogenic) hazard and its chemical (toxicological) hazards from the DU. For the DARHT accident, a noninvolved worker could receive up to 0.7 percent of the uranium inhalation level that is considered immediately dangerous to life or health (IDLH). The maximally exposed individual (MEI) member of the public could receive up to 0.2 percent of the IDLH for uranium toxicity for inhalation. The maximum total radiological dose from the bounding accident at DARHT was estimated at 0.05 rem effective dose equivalent (EDE) for the noninvolved worker and 0.01 rem EDE for the MEI. The maximum estimated population dose was 17 person-rem but only a

portion of this dose was associated with DU. The population dose associated only with DU would produce no latent cancer fatalities (less than 0.0085).

The final configuration of the Two-Mile Mesa Complex, its operations, and the surrounding populations of workers and members of the public would determine the actual consequences of a DU containment failure at that site. In any event, the toxicological and radiological consequences, including cancer fatalities, to workers and the public are expected to be substantially less than those projected for a similar accident at DARHT.

In summary, the operational hazards of the Proposed Action are primarily either hazards that are routinely encountered in standard industry or hazards that pose only small risks to workers and the public. The risks to workers are easily mitigated using controls and technology that currently apply at operating facilities at LANL.

4.2 Construction and Demolition Hazards

An estimate of the potential number of fatalities that might occur from construction-related activities of the Proposed Action was derived from recent risk rates of occupational fatalities for all industries. The average fatality rate in the U.S. is 3.9 deaths per 100,000 workers per year (Saltzman 2001). If the peak construction period is assumed to last for one year, no deaths (0.0031) would be expected for the estimated 80 onsite construction workers from construction- or demolition-related activities that include falls, exposure to harmful substances, fires and explosions, transportation incidents, and being struck by objects, equipment, or projectiles. Even assuming the peak number of workers for the duration of the project (about 10 years) and adding three NNSA and 20 UC site inspectors, no deaths (less than 1.0) would be expected from implementing the Proposed Action.

4.3 Transportation Hazards

Transportation hazards can be associated with construction, operations, or demolition activities. Construction activities would involve the transport of building materials to the Two-Mile Mesa Complex, of construction waste from the Two-Mile Mesa Complex, and of demolition waste from various DX technical areas, primarily TA-9. Of the different types of transportation occupations nationwide, truck drivers, including all types of trucks, experience the highest fatality rate (26 deaths per 100,000 full-time workers per year) (Saltzman 2001). The estimated number of fatalities associated with the Proposed Action as discussed in Section 4.2 included transportation incidents in general. Consolidating DX facilities and operations would generally result in a reduction in transport of materials, hazardous and otherwise, because the required processing capabilities would be consolidated. Ignoring any special training or mitigation of accidents that might occur at LANL, the chance of a fatality occurring to a driver of a medium or heavy truck hauling hazardous waste is about three in one million (2.7×10^{-6}) based on 1993 nationwide statistics (NSC 1994). Considering all these factors, no transportation fatalities are expected under the Proposed Action.

5.0 CUMULATIVE EFFECTS

Cumulative effects are caused by the aggregate of past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes them. These effects can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1500-1508).

The Two-Mile Mesa Complex consolidation was not specifically considered as a proposed project in the SWEIS (DOE 1999a). The cumulative effect analysis in the SWEIS, however, documents the regional effect of the expanded operations alternative and provides context for this EA. This section considers the Proposed Action and the possible effects on resources in context to any ongoing or reasonably foreseeable future actions. Resources dismissed from further cumulative effects consideration include land use, transportation, infrastructure, visual, noise, health effects, water, air, geology, and PRSs for reasons discussed in the following paragraphs. Cultural resources and waste volumes are discussed further in this section. This analysis concludes that there would not be cumulative effects on cultural resources, waste management, or other aspects of the environment.

Other projects in the vicinity of the Two-Mile Mesa Complex include the TA-16 engineering complex consolidation and the construction and operation of the new TA-69 Emergency Operations Center (EOC). Moreover, use of the forest areas west and south of LANL and Los Alamos County for recreation, habitat management purposes, and timber production (only with the Santa Fe National Forest) would likely remain unchanged. Land between the DX, EOC, and TA-16 is DOE controlled and, therefore, precludes the prospect of urban development anywhere near the Two-Mile Mesa Complex in the foreseeable future. There are no tracts of land near the proposed project area identified for land transfer. Consequently there would be no other future construction or operational activities that would contribute to cumulative effects on land use, infrastructure, visual, noise, health effects, water, air geology, and PRSs at DX technical areas or adjacent areas. Noise and visual effects resulting from consolidation of the TA-16 engineering complex would be temporary and minor but would likely occur at the same time as construction activities at the Two-Mile Mesa Complex.

The TA-16 engineering complex consolidation would involve about 80 construction workers during peak periods. Therefore, traffic on SR 501 is not expected to increase substantially due to this construction or other proposed development. There would be no additional sources of air or water emissions and no need to increase the capacity of utility systems. The consolidation of TA-16 would produce about 35,270 yd^3 (26,805 m^3) of nonhazardous construction and demolition waste. Waste generation at LANL during the next 10 years, both from decontamination and demolition of buildings and through environmental restoration efforts, could be large. Construction and demolition wastes would be recycled and reused to the extent practicable. Existing waste treatment and disposal facilities would be used according to specific waste types. Solid wastes would be disposed of at the Los Alamos County Landfill or other appropriate permitted solid waste landfills. Demolition wastes would similarly be disposed of at the appropriate permitted facilities. No aspect of the Proposed Action or other planned actions would result in NNSA establishing a new disposal facility or expanding an existing one. Tables 9 and 10 identify total waste types for the TA-16 and DX consolidation projects generated by construction and demolition activities respectively.

Table 9. Combined TA-16 and DX Estimated Waste Quantity, Traffic Effect, and Disposal Location: Construction Phase

Quantity yd^3 (m^3)	Traffic truck(s) per year	Potential Disposal Location
20,517 (15,593)	142	Los Alamos County Landfill or other offsite facility

Table 10. Combined TA-16 and DX Estimated Waste Quantity, Traffic Effect, and Disposal Location: Demolition

Type/Source	Quantity yd^3 (m^3)	Traffic truck(s) per year	Potential Disposal Location
Uncontaminated building debris	51,001 (38,761)	143	Los Alamos County Landfill or other offsite facility
Asbestos building debris	730 (555)	3	Mountainair, NM, or Phoenix, AZ
Lead-based paint	3 (2.3)	<1	Albuquerque, NM
Photochemicals (silver)	10 (7.6)	<1	Fernley, NV
HE contaminated material	305 (232)	16	Lake Charles, LA
LLW	30 (22.8)	<1	LANL, Area G, TA-54

The Proposed Action would result in the demolition of several structures including some buildings that are eligible for the NRHP. There are a number of actions taking place at LANL that affect historic structures and it is likely that over the next several years, many of the historical buildings at LANL would be demolished. Many of the buildings at LANL are Manhattan Project and early Cold War Era structures that are important aspects of the Los Alamos story. Examples of the buildings that are under consideration for demolition activities include the Manhattan Project detonator buildings at TA-6, office buildings at TA-41, several structures at TA-21 related to early thermonuclear weapons, the Hollow at TA-15 where the Rex accelerator was located, several buildings at TA-33 associated with early weapon development, and the Van de Graff accelerator (TA-3). Hundreds of buildings are on the LANL excess property list or may be proposed for demolition over the next several years, including most of the permanent buildings that date to the early Cold War Era (1947–1963). A few of these buildings may be suitable for preservation and reuse for other functions; this potential must be considered as part of NNSA's management of historic properties. In response to these factors, NNSA and UC are preparing a Cultural Resource Management Plan in accordance with the mitigation action plan set forth in the SWEIS ROD. This management plan, which is due to be completed by the end of 2004, will address the rapid attrition of historic buildings and will establish a framework for identifying historic properties with exceptional importance in LANL's history. Since the Proposed Action would occur over several years, mitigation measures in the form of documentation would be considered in light of the Cultural Resource Management Plan. Therefore, the Proposed Action is not expected to result in a cumulative adverse effect on historic resources at LANL.

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