Executive Summary

Neutron Tube Target Loading (NTTL) is an operation that involves the transferring (i.e. loading) of radioactive tritium gas onto metal target disks under an inert nitrogen atmosphere using a glovebox operation. The loaded disks can then be assembled into neutron tubes and ultimately into neutron generators. Neutron generators are used as nuclear weapon components. Because of the relatively short-half life of tritium, replacement of decayed neutron generators is an on-going process. NTTL operations were historically conducted at the DOE Pinellas Plant in Pinellas, Florida. The relocation of NTTL operations from the Pinellas Plant to the Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico, was addressed in the Nonnuclear Consolidation Environmental Assessment (EA) of June 1993. In accordance with that EA, and a subsequent Finding Of No Significant Impact (FONSI), the operations are in the process of being moved into Technical Area-21 (TA-21), Building 209 at LANL.

This EA analyzes a Proposed Action to relocate the NTTL operations at LANL from Building 209 at TA-21 to Building 450 at TA-16. The relocation of operations would provide sufficient capacity to meet U.S. nuclear weapon production requirements, consolidate NTTL operations with other LANL tritium operations, enhance Environmental, Safety and Health aspects of the process and provide operational and cost efficiencies. The Proposed Action would require the remodeling of Building 450 and some modifications to Buildings 205 and 205A, collectively referred to as the Weapons Engineering Tritium Facility (WETF) in TA-16. The construction of a change room addition would also be required to connect Building 450 and the WETF to take advantage of existing tritium control and confinement systems. Other construction activities and site modifications would include a new electrical substation, a new mechanical and electrical room, minor demolition work, two additional transportable buildings and a new parking area.

An alternative to the Proposed Action includes keeping the NTTL operations at TA-21 (No Action). Alternatives considered but dismissed include the construction of a new NTTL laboratory at LANL, and the renovation of an alternative facility to Building 450 for conducting NTTL operations. None of the alternatives would enable the DOE to meet its mission responsibilities at LANL in a timely manner, while enhancing the environmental, safety and health aspects of this process and providing operational and cost efficiencies.

The principle environmental issues associated with the Proposed Action include a minor amount of air emissions associated with construction activities and tritium operations and a small quantity of construction and low-level radioactive wastes. Human health and cumulative effects are expected to be negligible. On-site transportation of tritium between TA-21 and TA-16 to

1.0 PURPOSE AND NEED

1.1 Background Information

The Department of Energy (DOE) is in the process of streamlining and consolidating the Nation's nuclear weapons complex, the system of interrelated facilities that have for

several decades designed, tested, manufactured, and maintained the Nation's nuclear weapons arsenal. A relatively small-scale activity within the Nation's nuclear weapons complex is an operation referred to as Neutron Tube Target Loading (NTTL). NTTL operations involve the transferal of radioactive tritium gas onto metal target disks that are then assembled into neutron tubes and ultimately into neutron generators. Neutron generators are used as nuclear weapon components. Tritium is crucial to the continuing operations of DOE weapons programs at Los Alamos National Laboratory (LANL), Los Alamos, New Mexico. The radiological half-life of tritium is a relatively short 12.26 years. For that reason weapon components using tritium must periodically be replenished. NTTL operations are integrally tied to the neutron generator manufacturing program at Sandia National Laboratories (SNL) in Albuquerque, New Mexico.

The relocation of NTTL operations from the DOE Pinellas Plant located in Pinellas, Florida, to LANL was addressed in the Nonnuclear Consolidation Environmental Assessment (EA) of June 1993 (DOE/EA-0792). That EA proposed relocation of NTTL operations into Building 209, Technical Area-21 (TA-21) at LANL since it was an operating tritium facility. It is now recognized that extensive building modifications would be necessary to accommodate the physical size requirements of the proposed operations. These modifications would require about three years to implement, during which time building operations would need to be suspended. In accordance with the analysis provided by that EA, and a subsequent Finding Of No Significant Impact (FONSI) issued on September 14, 1993, the operations are in the process of being moved into Building 209 beginning with the first loading system. This loading system is scheduled to deliver War Reserve (WR) qualified targets to SNL in August 1997. Additional loading systems must begin the qualification process no later than April 1998 to satisfy eventual WR production needs.

At the time of the EA, the consolidation of all LANL tritium activities into the Weapons Engineering Tritium Facility (WETF) and adjacent Building 450 at TA-16 was under consideration. The WETF is composed of two buildings, a main Building (205) and an addition (205A), but only Building 205 had approval to operate at the time the Nonnuclear Consolidation EA was prepared. Because Building 205A was not yet operational and Buildings 205 and 450 were occupied, making a decision to move NTTL operations into TA-16 rather than TA-21 would have been premature. Since the issuance of the Nonnuclear EA FONSI, the entire WETF has become operational and the decision to relocate the occupants of Building 450 has been made (DOE/EA 1035, FONSI 1995). Consolidation of LANL

1.2 Purpose and Need for Agency Action

The current NTTL loading system in Building 209 at TA-21 does not have sufficient capacity to support the U.S. nuclear weapons stockpile management requirements. This loading system was the initial step in implementing the Nonnuclear Consolidation EA. Additional equipment had been anticipated to complete this implementation and to provide the production capability for neutron tube targets at a capacity that meets production requirements as discussed in the Nonnuclear Consolidation FONSI. The DOE needs to establish the required production capability at LANL, which must be qualified and operational by April 1998. With the availability of space at Building 450, the

opportunity now exists to complete the implementation of NTTL operations within the required time frame and to further consolidate LANL tritium operations. In addition, consolidation of NTTL operations with other tritium operations would enhance the environmental, safety and health aspects of the process and provide operational

2.0 DESCRIPTION OF OPERATIONS AND ALTERNATIVES

2.1 Description of NTTL Operations

Currently, equipment required to support the initial steps of NTTL operations is being tested at TA- 21 and will soon be fully operational. NTTL operations involve chemically bonding a radioactive gas, tritium, to a metal target disk that would be used in nuclear weapon applications. In this process, the reactive metal target disk would be placed into a high vacuum loading apparatus contained in a glovebox system. The reactive metal target disk would be capable of forming a metal hydride. The chamber would be evacuated and the targets heated to "activate" the surface film. The chamber would then be backfilled with known amounts of tritium and deuterium which are adsorbed by the metal disk (i.e. a loaded disk).

Target disks would be received from SNL. Unloaded disks would be shipped from SNL to LANL by commercial carriers. Disks that have been loaded with tritium would be returned to SNL by commercial carrier in the same shipping containers in which they are received. Tritium supplies would be contained within a small hydride bed and would be refilled approximately once a year. The process must be very clean and be conducted under vacuum conditions in an inert atmosphere. The NTTL loading system would be constructed in a modular fashion. The basic modules would include several control racks, a glovebox and hood with all internal and external attachments, a gas purifier, a chiller, and several oil-free vacuum pumps.

The major component of the NTTL loading system would be a double-sided stainless steel glovebox with measurements of approximately 10 ft long by 4 ft deep. The glovebox would contain a loader vacuum chamber, a video microscope, a HEPA filter/fan module and a tritium manifold. The maximum amount of tritium used in the NTTL loading system would be 2 grams (19.2 x 103 Ci) per year. Less than 0.1 gram (1.0 x 103 Ci) of tritium would be in use during a loading run. Unused tritium would be returned to the hydride bed and reused during future loading operations.

The glovebox would have an inert nitrogen atmosphere. This would be achieved by circulating the nitrogen through a commercially made purifier which strips oxygen and water vapor from the inert atmosphere of the glovebox. The glovebox would normally operate with a slight positive pressure and contain a bubbler. This bubbler would be connected to the facility exhaust to prevent damage to the glovebox in the event of either an over pressure or under pressure condition. The glovebox atmosphere would be monitored by a tritium monitor, an oxygen monitor, and a water vapor analyzer.

The purifier service connections would be cooling water, nitrogen, 94 percent Argon (Ar)/ 6 percent Hydrogen (H) regeneration gas, regeneration gas exhaust, vacuum pump exhaust, and 208 VAC single phase and 3 phase electrical power. The purifier cooling water would be supplied by a chiller located underneath the glovebox. The chiller would require water and electrical power service.

Materials, such as the target disks, would pass into the glovebox through one of two airlocks. These airlocks would be loaded, isolated, evacuated, and backfilled with nitrogen so that room air is not introduced into the glovebox atmosphere. The end product would be the hydrided (with tritium) metal disk. Product quality would be monitored by gas analysis instrumentation, microscopic inspection of the disk and surface analysis of the metal to tritium ratio. Quality evaluations would include the destructive testing of a limited number of hydrided disks. Disks would be destructively tested by heating them to measure the amount of tritium released from the surface of the disk. Materials would be assayed for tritium contamination before they are removed from the facility.
The effluent stream that potentially contains tritium contamination is the glovebox exhaust. Building 209 at TA-21 has an effluent treatment system that removes tritium from this waste stream before the exhaust is discharged to the monitored stack. The removal efficiency for the effluent treatment system exceeds 99 percent. Room air is not exhausted through the effluent treatment

2.2 Description of the Proposed Action

The Proposed Action is to remodel Building 450 and access selected services in Buildings 205 and 205A (i.e. WETF), within TA-16 at LANL. Building 450 would be remodeled to accept NTTL operations that would be transferred from TA-21, Building 209. Building 450 was selected because it meets the seismic criteria for a tritium facility, it is located adjacent to tritium systems at the WETF on which it depends, and it will soon be vacant. The remodeling of Building 450 would include the construction of a change room addition between Building 450 and Building 205. The Weapons Component Test Facility is currently being moved out of Building 450 (DOE/EA-1035). Operation of the WETF was included in an Environmental Assessment (DOE/EA-0504) completed in March 1991 that supported a FONSI signed on March 22, 1991. The EA analyzed the environmental consequences of conducting tritium packaging and handling operations at the WETF, including operations similar to NTTL operations, although the EA stopped short of addressing NTTL operations per se. All NTTL operations would be moved from TA-21 and relocated to TA-16 following completion of the remodeling of Buildings 450, 205 and 205A. General service requirements for NTTL operations (e.g. water, nitrogen, regeneration gas, and electrical power) will be the same at either the TA-16 (Proposed Action) or the TA-21 (No Action alternative) location.
Proposed TA-16 construction or building modifications planned to support NTTL operations can be summarized as follows and are addressed in more detail later in this section:
? Buildings 205 and 205A (WETF) and Building 450 would be joined by a change room addition. This structure would become the primary point of entry to the combined tritium facility. It would contain employee change rooms, a health physics lab and pipes and conduits so that Building 450 can be served by existing WETF tritium support and confinement subsystems.

- A new emissions stack would be constructed. The existing stack would be removed.

- A new electrical substation would be constructed. The new substation would feed all of the combined structure. The old substation would be removed.
- A new mechanical and electrical room would be added to Building 450. This room would contain ventilation and electrical equipment to support NTTL operations.
- The ancillary buildings attached to the south side of Building 450 would be demolished.
- Two additional transportable buildings needed for office space would be placed in proximity to Building 450. A new parking area would be constructed across the street from the WETF.
- The interior partitions and mezzanine within Building 450 would be demolished. The existing ventilation system and electrical distribution equipment in Building 450 would be removed. NTTL operations would be located on the ground floor of Building 450 and would occupy approximately 20 percent of the available floor space in the two level building.
- A 12,000 gallon collection tank for fire water and process wastewater potentially contaminated with tritium would be located in the basement of Building 450.
- Minor utility and ventilation system modifications would be made within the WETF in order to extend selected systems to NTTL operations in Building 450.

Standard mitigation measures would be in effect during all construction and building modification activities. Standard mitigation measures would include such actions as sampling of potentially contaminated construction debris and surplus equipment, dust and erosion control measures for site clearing and worker health and safety programs. As a result of preliminary discussions and previous experience with the U.S. Fish and Wildlife Service, mitigation measures for one protected wildlife species would be applied. The Northern goshawk is not a threatened or endangered species, but it is a candidate 2 species under the federal Threatened and Endangered Species Act. Potential habitat for this species occurs within the vicinity of the proposed project area. Mitigation measures for this species would include evaluation of forest vegetation to be disturbed for potential food foraging value, evaluation of the effects of tree removals and possible alternatives, and the establishment of a central staging area for construction equipment to minimize site disturbance.

Due to low ground visibility during previous archeological surveys and the potential for the presence of an archaeological site in the proposed parking lot area, an archaeological monitor would be required to be present during all clearing, grubbing and any other ground disturbing activities in this area.

Future projects that may occupy the vacant space in Building 450 will receive additional NEPA review when they are identified. At this time, no future projects are planned for the available space.

The location of TA-16 and TA-21 with respect to the Los Alamos town site, surrounding counties and federal lands is shown on Figure 2-1. A drawing of the WETF site (Building 205), including proposed modifications to Building 450 to support NTTL operations, is shown on Figure 2-2.

Figure 2-1 Location of LANL and TA-16 and TA-21

Figure 2-2 Layout of the Proposed Site for the Neutron Tube Target Loading Operations

Building 450 is an existing cast-in-place concrete building located a few feet from the WETF building. It has 836 m2 (9,000 ft2) of floor space on two levels. The lower level is below grade and the upper level is at ground level. The proposed project would demolish existing non-load bearing walls, an existing mezzanine, and ventilation and electrical equipment. Demolition would create debris consisting of gypsum board, masonry, steel, wire, sheet metal, metal, equipment, etc. Ancillary buildings attached to the south wall of the building would be demolished and the debris removed. Although Building 450 has contained low level radioactive sources, it is uncontaminated. A radiation survey would be performed to verify the uncontaminated state of the building prior to any construction activities. Uncontaminated waste would be disposed of at the Los Alamos County landfill. The existing interior steam system would be demolished. The steam pipe insulation contains asbestos. The asbestos insulation would be removed by a licensed asbestos abatement contractor. It would be disposed of in a landfill permitted to receive asbestos waste. Openings left in the Building 450 walls where services were connected to the exterior sheds would be sealed. Some interior surfaces of Building 450 would be sealed to inhibit potential tritium migration from the NTTL operations.

The NTTL laboratory area would be constructed on the ground floor of Building 450. It would contain a commercial modular clean-room that would occupy approximately 167 m2 (1,800 ft2) of floor space. A 12,000 gallon collection tank for fire water and tritium contaminated wastewater would be located in the basement of Building 450. No additional operations are currently planned to be located in the remaining vacant space in Building 450.

A preliminary seismic/structural analysis for Building 450 has indicated that it would meet the Design Basis Earthquake performance criteria appropriate for a tritium facility at TA-16. Under such an earthquake event it would be expected that the building structure would not be seriously damaged and no systems critical to the safe operation of the building would fail. NTTL operations would be integrated with WETF support and confinement subsystems and would be inter-connected via new construction so that a single contiguous building is created.

Multiple tube target loading systems would be installed in Building 450 as part of the NTTL operations. Each would be a custom designed and built system. One of these loading systems has been constructed and is presently being tested in Building 209 at TA-21. This loading system would be relocated to Building 450 at TA-16. Prior to shipment, this loading system would by cleaned, monitored for radiation contamination, and packaged in an approved shipping configuration based on the amount and type of radiation contamination for shipment to TA-16. Also, the small hydride bed containing 99 percent of the tritium would be removed from the loading system prior to shipment and transported separately in an approved shipping container to TA-16. The loading system would be transported across LANL and public roadways in accordance with DOT requirements and LANL standard operating procedures. Upon arrival, the loading system would be installed and made operational in Building 450. In addition, the WETF contains a mass spectrometer that would support the NTTL operations. Table top benches and a ventilation fan hood for supporting laboratory activities are also part of the NTTL equipment requirements.

A new mechanical and electrical building would be constructed as an addition on the north side of Building 450. It is estimated that the addition would be 233 m2 (2,500 ft2).

The mechanical and electrical building would be a steel frame structure set on a concrete slab. The ventilation equipment and electrical distribution center would be located in this building. The addition would be structurally isolated from Building 450 so that it would not impose an additional structural load in the event of an earthquake. A flexible seal would fill the gap between the mechanical and electrical building and Building 450. Openings would be cut in the Building 450 wall for air duct and electrical conduit penetrations.

A change room addition of about 288 m2 (3,100 ft2) would be constructed in the space between the WETF and Building 450. This structure would become the primary point of entry to the combined tritium facility. It would contain change rooms, a health physics lab, and a corridor connecting the WETF and Building 450. The addition would be structurally isolated from Building 450 so that it would not impose additional loads on the building structure in the event of an earthquake. The gap between the structures would be filled with a flexible seal. The building would be a steel frame and masonry structure on a concrete slab.

A new and larger emissions stack would be constructed to accommodate the additional square footage required for supporting NTTL operations and for meeting personnel workplace air exchange requirements. The stack would be a steel pipe mounted on a concrete pad. A small enclosure may be constructed at the base of the stack to house the stack monitor. The current WETF stack would be removed. The WETF stack is presumed to be tritium contaminated since it has been exposed to tritium contaminated exhaust. Debris would be packaged and disposed of at the LANL Low Level Waste burial site at TA-54.

The new parking area of 928 m2 (10,000 ft2 or approximately 0.25 acres) would be built to accomodate additional staff. It would require the clearing of a previously disturbed site located across the WETF access road adjacent to an existing parking area.

A new electrical substation would be constructed. It would consist of an electrical transformer mounted on a 4.7 m2 (50 ft2) concrete pad. The old substation would be removed. Since it contains Polychlorinated Biphenyls (PCBs), it would be removed by a contractor trained to handle PCB contaminated equipment. The transformer would be sent to a permitted disposal site for removal and destruction of the PCBs.

The expected lifetime of the new construction and emission stack is between 20 to 30 years. After that time, Building 450 and required support structures would likely be Decontaminated and Decommissioned (D&D). A separate NEPA analysis for D&D activities would be conducted at that time. D&D of Building 209 in TA-21 is not currently scheduled and is not a part of the Proposed Action. When D&D of the building is scheduled, additional NEPA review will be required.

Approximately 32 construction workers and 15 full time employees would be required to construct and operate the NTTL laboratory at TA-16. It is anticipated that it would take less than 2.5 years to complete construction at TA-16, close-out operations at TA-21 and go to full scale NTTL operations in

2.3 No Action Alternative

The No Action alternative would be to perform NTTL operations in Building 209 at TA-21. The relocation of NTTL operations from the DOE Pinellas Plant to LANL was

evaluated in the Nonnuclear Consolidation EA and a FONSI was issued. A detailed description of planned NTTL operations at TA-21 as well as weapons stockpile support requirements are contained in the EA and FONSI. Since the issuance of the FONSI, initial planning, preparations, and testing are underway to conduct limited NTTL start-up operations at TA-21. These limited NTTL operations must be conducted at LANL because Pinellas is no longer able to perform these activities and this capability must be available to support the U.S. nuclear weapons stockpile.

The No Action alternative provides an environmental baseline to compare to the potential effects of the Proposed Action. Continuing NTTL operations at TA-21 would cause delays and inefficiencies in the DOE's ability to support the nuclear weapons stockpile. The DOE would not be able to provide the production capabilities for NTTL operations at a capacity that meets production requirements by April 1998. Inefficiencies in fabricating the neutron tube targets would result because the operations at TA-21 are configured such that multiple tritium loading systems (gloveboxes) could not be located in the same room without major building modifications during which building operations would be suspended. In addition, inefficiencies would occur from a lack of centralization of tritium operations. Tritium supplies would be provided primarily by the WETF and would continue to be transported over public roads between TA-16 and TA-21 under this alternative. Waste types generated would be similar to what is projected under the Proposed Action for routine operations, except that no new construction wastes would be generated and no PCB wastes would be expected. Inefficiencies from the physical separation of operations would not support DOE's objective to consolidate LANL tritium operations. Therefore, the No Action alternative does not meet the DOE's purpose and need for action.

However, consistent with the Council on Environmental Quality and DOE NEPA regulations (40 CFR 1500 and 10 CFR 1021, respectively), this alternative, to retain the NTTL laboratory at its present location is analyzed for comparison of

2.4 Alternatives Considered but Eliminated fromFurther Analysis

Further Analysis

The following alternatives were considered but eliminated from further analysis in this environmental assessment because they do not reasonably meet the purpose and need for agency action provided in Section 1.2. Conflicts with existing operations, support facility inadequacies, inability to improve NTTL operations to meet stockpile support requirements preclude these alternatives from being reasonable alternatives to the Proposed Action.

2.4.1 Construct a New Facility at LANL

The construction of a new NTTL facility at LANL was considered but was dismissed from a detailed evaluation. Construction would entail the building of a new facility at an undeveloped site. Site disturbance would be extensive with the potential for affecting biological or cultural resources. In addition to the new structure, utilities, access roads and parking areas would be required. The extensive amount of time required to procure funding and to construct a new facility would not allow the DOE to support stockpile

requirements in a timely manner. Because this alternative would not meet the DOE need to support stockpile requirements in a timely manner, to improve the efficiency of NTTL capabilities and to consolidate LANL tritium operations, it is not addressed further in this environmental assessment.

2.4.2 Renovate an Alternative Facility at LANL

Renovation of an alternative facility to Building 450 was considered for expanded tritium operations but was dismissed from a detailed evaluation. Use of an alternative facility for NTTL operations at LANL would require the procurement and installation of tritium confinement infrastructure and other facility support equipment needs as discussed in Section 2.1. The costs for obtaining and installing this equipment could be unreasonable depending on the capabilities of the alternative site selected to support tritium operations. The efficiency of the NTTL operations would not improve because activities would not be consolidated into one central location. Renovation of an existing building could result in extensive programmatic delays if the alternative building selected would require major facility upgrades and safety reviews to meet current design criteria for a nuclear facility. Because of potential programmatic delays, the lack of improvement in efficiency of NTTL capabilities or consolidation of LANL tritium operations under this alternative, it is not

3.0 AFFECTED ENVIRONMENT

This section presents a summary of information regarding the general environmental setting of LANL and the immediate TA-16 site vicinity. More extensive information describing the LANL environment is presented in the annual LANL Environmental Surveillance Report (LANL 1994) as well as the LANL Site-Wide Environmental Impact Statement (DOE/EIS-0018), the WETF EA and the Nonnuclear

3.1 General Site Setting

LANL is located on 111 square kilometers (43 square miles) of land in Los Alamos County in north-central New Mexico, approximately 100 kilometers (60 miles) north-northwest of Albuquerque, 40 kilometers (25 miles) northwest of Santa Fe, and 30 kilometers (20 miles) southwest of Espanola. It is situated on the Pajarito Plateau, a series of mesas and canyons at an elevation of 2,200 meters (7,200 feet) above sea level. San Ildefonso Pueblo borders LANL to the east and Bandelier National Monument to the southwest (See Figure 2-1). LANL is divided into 30 active Technical Areas (TAs) for administrative purposes. The population within the three county (Los Alamos, Rio Arriba, and Santa Fe) Region Of Influence for LANL is just over 152,000 and is projected to exceed 250,000 by the year 2010.
Los Alamos has a semiarid, temperate mountain climate. Average annual precipitation is about 45 centimeters (18 inches). Typical winds consist of light westerly surface winds. Water occurs as on-site surface waters, shallow ground water, and as the main aquifer underlying LANL. The on-site surface and shallow ground waters are not a source of municipal, industrial, or agricultural supply.

LANL is located on the western edge of the Rio Grande Rift. Only one earthquake of magnitude 5.5 is suspected to have occurred in the vicinity of Los Alamos in the last 150 years. Los Alamos lies on the boundary between Zones 1 and 2 of the Uniform Building Code. Current LANL facility designs are based on the more stringent Zone 2 criteria. The Design Basis Earthquake (DBE) for Los Alamos has a force of 0.38 **g** and a predicted return period of 5,000 years. Buildings are constructed to remain standing and fully operational with only minor damage after withstanding the DBE.

TA-16 is a level, partially wooded area supporting a ponderosa pine community with an understory of mixed grasses and shrubs. The animal population consists primarily of birds, field rodents, deer and elk. Soils at the site are primarily very fine, sandy loams. They are well-drained on nearly level to moderately sloping mesa tops. These soils have slow to medium run-off and a moderate erosion hazard. The site contains no floodplains or wetlands. Before WETF construction began in 1982, the site was surveyed and it was determined that no historical or archaeological sites or threatened or endangered species would be adversely affected by construction and operation of the facility. The proposed locations for constructing additional support facilities for NTTL operations are considered to be highly developed or previously disturbed sites. High explosive materials and testing activities occur in various parts of TA-16; however, WETF is not designated as a high explosives area. The distance from Building 450 in TA-16 to the nearest member of the public (Royal Crest Trailer Park) is approximately 6 kilometers (3.6 miles).

TA-21 is primarily an industrialized area. The mesa top is heavily developed with no large undisturbed areas of native habitats, wetlands or protected species. Canyon areas adjacent to the mesa top are relatively undisturbed. The distance from Building 209 in TA-21 to the nearest member of the public (Los Alamos Townsite) is approximately 0.7 kilometers (0.4 miles)

3.2 Environmental Issues Considered but Dismissed

The following environmental issues are not evaluated in detail in this document because they either do not exist in the vicinity of the Proposed Action or there is no reasonable way that the Proposed Action could have any identifiable effect on these resources or communities:

- natural or biological resources including floodplains, wetlands, surface water, or groundwater
- prime or unique farmlands
- state or national parks; forests or conservation areas; wild or scenic rivers
- threatened or endangered species
- historic or archeological sites
- Native American or minority and low-income populations

Based upon field survey data and potential project effects, the U.S. Fish and Wildlife Service has concurred with the DOE that the Proposed Action would not have an adverse effect on any threatened or endangered species. In addition, based upon site specific information that no sites eligible for nomination to the National Register are located

within the survey area, the State Historic Preservation Officer has concurred with the DOE that the Proposed Action would not affect any cultural or historic resources (See Chapter 6.0 for more detail).
Under the Presidential Executive Order 12898, Federal agencies are responsible for identifying and addressing the possibility of disproportionately adverse health and socioeconomic impacts of Proposed Actions on minority (all people of color, exclusive of white non-Hispanics) and low-income (household incomes less than $15,000 per year) populations. Within an 80 km (50 mi) radius of the proposed site at WETF, about 54 percent of the population is of a minority status. In terms of low-income populations, 24 percent of the

3.3 Environmental Issues Considered for Further Analysis

3.3.1 Air Quality

Prevailing winds at LANL are affected by several factors, including large-scale atmospheric wind patterns, regional weather disturbances (thunderstorms and cold fronts), complex surface terrain, and local cold-air drainage across the Pajarito Plateau. Winds in Los Alamos consist of light westerly surface winds that average 2.8 meters per second (m/s) (6.3 miles per hour [mph]). The strongest winds typically occur between March and June, when intense seasonal storms and cold fronts move through the region. During this season, sustained winds blow from the southwest to the northeast and can exceed 11 m/s (25 mph), with peak gusts exceeding 22 m/s (50 mph). Historically, no tornadoes have been reported to have touched down in Los Alamos County. Strong dust devils can produce winds up to 34.4 m/s (77 mph) at lower elevations in the area. The irregular terrain at Los Alamos affects wind motion and spreading. Localized wind gusts may not be in the same direction of average wind patterns. The wind behavior results in greater dilution of air contaminants that are released into the atmosphere.
Air quality in the LANL area is typical of arid-climate clean air. Median visibility ranges between 106.3 km and 161 km (66 mi and 100 mi). Current emissions from operations around the proposed project site are within the required and existing permitted thresholds for LANL. Los Alamos County air quality meets National Ambient Air Quality Standards and is designated as an attainment area under the Clean Air Act.

3.3.2 Human Health

Ongoing tritium experiments and operations at LANL are conducted according to strict guidelines established by existing LANL Standard Operating Procedures (SOPs). Under these SOPs, engineering and administrative controls are implemented to minimize worker and public exposure to radiation. For the purpose of evaluating hazards to workers or the public, radiation is generally considered to be either an internal or external hazard in terms of how it affects the human body. Tritium emits beta particle radiation. Tritium beta radiation is considered to be an internal hazard. That is, it must be taken into the body to cause a dose. Its energy level is too low to penetrate human skin. In contrast, radiation types such as gamma or neutron have sufficient energy to penetrate skin and are considered to be external hazards.

Exposure to radiation is closely monitored under the implementation of existing health and safety requirements for maintaining worker exposure to As Low As Reasonably Achievable (ALARA) standards, but not to exceed the current threshold of 5 rem per year. Radiation protection requirements are set forth in DOE Orders and in DOE N5480.6, "DOE Radiation Control Manual."

3.3.3 Waste Management

Low-level radioactive waste is any waste that contains radioactivity and is not classified as high- level waste, transuranic waste, or spent nuclear fuel. LANL generates a variety of low-level radioactive and non-hazardous waste products from research and development, maintenance, weapons program support, construction and environmental restoration activities. Radioactive and non-hazardous wastes are collected and managed on site at LANL. Between 1986 and 1991, LANL generated a yearly average of 5,380 m3 (190,106 ft3) of low-level radioactive waste (DOE/EA-1035). Low-level radioactive solid waste is buried at the existing TA-54, Area G Landfill. Low-level radioactive liquid waste is treated and disposed of at the LANL Radioactive Liquid Waste Treatment Facility in TA-50.
Non-hazardous construction wastes and solid sanitary wastes generated at LANL are collected and delivered to the Los Alamos County Landfill for disposal. Liquid sanitary wastes are collected via a LANL-wide collection system and treated at LANL's central waste water treatment plant before discharge via a National Pollutant Discharge Elimination System (NPDES) permitted outfall. At LANL, PCB's and asbestos are removed when found and taken off-site to licensed disposal facilities.

3.3.4 Transportation

Radioactive materials are transported at LANL in accordance with U.S. Department of Transportation (DOT) regulations. Packages used to transport radioactive materials are designed to limit personnel exposure to radiation under normal conditions and to limit the probability of an accidental release. Packaged tritium has no detectable external radiation at 1 m (3.3 ft) from the surface of the container. Radioactive materials are transported over public roads that run through or around the LANL facility. Shipping procedures for radioactive materials follow DOE orders, DOT regulations, and LANL SOP's. Radioactive materials shipped by commercial carriers either to or from LANL would be required to comply with DOT regulations as appropriate. The safe transport of these materials would be the responsibility of the commercial

4.0 ENVIRONMENTAL CONSEQUENCES

The environmental consequences of conducting the various activities associated with NTTL operations and with tritium handling operations at LANL were analyzed in detail in the Nonnuclear Consolidation EA and in the WETF EA, respectively. Each of these EAs resulted in the issuance by DOE of a FONSI regarding the conduct of these operations at their respective LANL locations. However, neither EA assessed the potential effects of conducting NTTL operations at TA-16 or the associated proposed

construction activities. A review of the two EAs indicates that most of the areas for potential changes in environmental consequences of relocating NTTL operations from TA-21 to TA-16 are bounded by the analysis in the WETF and Nonnuclear Consolidation EA's. The WETF EA analyzed in detail the potential risks to LANL workers and the environment from tritium operations and accidental releases including operations similar to NTTL operations. However, the EA stopped short of addressing NTTL operations per se. The Nonnuclear Consolidation EA emphasized programmatic issues such as locating NTTL operations at LANL and the potential for complex-wide cumulative impacts. Areas that are not clearly bounded by the environmental analysis presented in the two previous EAs include construction activities, low-level liquid and sanitary wastes, shipments of targets between LANL and SNL and site-specific cumulative effects. Where potential environmental issues are not adequately described or bounded by either the Nonnuclear Consolidation EA or the WETF EA, they are addressed in more detail in Chapters 4.0 and 5.0. A summary of potential environmental issues from the Proposed Action and from the No Action alternative is presented in Table 4-1.
The issues summarized in Table 4-1 are discussed in more detail for both the Proposed Action and for the No Action alternative in sections 4.1 and 4.2, respectively. Neither the Proposed Action nor the No Action alternative would pose a disproportionate adverse health or environmental effect on minority or low-income populations within an 80 km (50 miles) radius of the proposed site.

Table 4-1 Comparison of Potential Environmental Issues

Issue	Proposed Action	No Action Alternative
Air Quality	Minor emissions from construction and building modifications (total of 1000 kg). Minor tritium emissions from routine operations (5.0 Ci/yr.).	No construction emissions but some emissions from building modifications. Minor tritium emissions from routine operations (15.0 Ci/yr.).
Human Health	Negligible health risk to workers, co- located workers and the public.	Negligible health risk to workers, co-located workers and the public.
Waste Management	Small quantity of construction waste, scrap, asbestos and PCB's. Approximately 1.53 m3 of solid and 10,000 L of liquid low-level waste per year.	No construction waste but a small amount of building modification waste including asbestos. Approximately 1.53 m3 of solid and 10,000 L of liquid low-level waste per year.
Transportation	Transport of targets between LANL and SNL continues. Eliminates on-	Transport of targets between LANL and SNL continues. Continues on-site transport of NTTL tritium supplies between TA-16

	site transport of NTTL tritium supplies between TA-16 and 21.	and 21.
Abnormal Event	Minor increase in potential for dose to workers, co-located workers and the public.	Moderate increase in potential for dose to workers, co-located workers and the public.
Cumulative Effects	Negligible effect	**Negligible effect 4.1 Proposed Action**

4.1.1 Air Quality

All construction emissions would be the result of consumed fuel and dust generated as a result of site disturbance and grading operations required for new facilities and parking areas. Sulfur dioxide and carbon monoxide generated by operating construction vehicles would total less than 1,000 kg (1 ton). This amount of emissions would not have a detectable effect on the surrounding public or the environment over existing background conditions. No other regulated, non-radioactive emissions would result from NTTL operations and no air quality control permits would be required.

Radioactive tritium gas would be emitted from proposed NTTL operations at TA-16. The maximum amount of tritium used for NTTL operations would be 2.0 grams (19.2 x 103 curies) per year. Under routine conditions, approximately 0.1 gram (1.0 x 103 curies) of tritium would be available during the loading of each batch of target disks. Unused tritium would be captured and re-used. Glovebox exhaust would pass through a central exhaust portal and would be monitored for tritium. Glovebox exhaust from NTTL operations would be directed to the WETF Tritium Waste Treatment System (TWTS) in the event that a release should occur in the glovebox or when the exhaust tritium monitor indicates a high level of tritium is present.

It is expected that the exhaust would normally have a very low tritium content (less than 5.0 Ci/yr) and would be acceptable for direct discharge into the emission stack. The TWTS would be connected to the new emission stack for the remodeled facility.

The existing WETF subsystems are more efficient at cleanup of room air than the subsystems at TA-21. NTTL operations would be connected to these existing subsystems under the Proposed Action. The WETF includes a three level gas confinement system. The first level is provided by process piping and vessels. The second level of confinement is provided by the gloveboxes. An inert atmosphere is circulated through the gloveboxes. Tritium gases routed to the TWTS are catalytically oxidized to tritiated water vapor. The tritiated water vapor is then stripped from the gas and captured on molecular sieve material before the atmosphere is exhausted through the monitored stack. The third level of confinement is provided by the isolation of the tritium handling areas from the stack in the event tritium is released into the rooms. Building 450 will be modified to add the three levels of confinement. In addition to the three-level confinement system, WETF also has an alarm system to alert operators when a tritium leak may have occurred. Should a tritium leak occur in a room where tritium operations are routinely conducted, an Emergency Tritium Cleanup Subsystem can be activated either manually or automatically to prevent a release from the building.

Potential tritium emissions from WETF operations were evaluated in detail in the WETF EA. For the sake of impact analysis, the WETF EA used a conservative emission estimate of 400 Ci/yr for routine operations. Based on the

ratio of the amount of tritium in inventory at the WETF (250 grams) over the previous twelve months to the estimated amount released (400 Ci/yr in the WETF EA), it is possible to calculate that approximately 2.0 Ci/yr of tritium would be released per gram of tritium in inventory. Thus the addition of 2.0 grams of tritium per year to the WETF inventory from NTTL operations could result in an increase in emissions of less than 5.0 Ci/yr. The incremental increase in the amount of tritium emissions from adding the NTTL operations to the WETF emissions would be less than 1.25 percent of the amount evaluated in the WETF EA.

Although the WETF EA used a conservative emission estimate of 400 Ci/yr, the actual emissions for the WETF were 75 curies over the 12 month period from October, 1994 to September, 1995. Assuming that emissions from NTTL operations are additive to the WETF emissions of approximately 75 Ci/yr, relocation of the NTTL operations would increase the total emissions from the WETF emissions stack to approximately 80 Ci/yr. This amount would be well under the amount evaluated in the WETF EA.

Airborne emissions evaluated in the WETF EA were estimated to pose only a minor potential for adversely affecting LANL workers or the public. The highest dose to an individual member of the public, assuming 400 Ci/yr are emitted, was estimated to be 2.1 x 10-4 (0.00021) millirem per year (mrem/yr). Therefore, the incremental amount of increase in tritium emissions are expected to be well below the threshold levels for offsite doses to the public (0.1 mrem/yr) that would require the permitting of this operation under the Clean Air Act.

4.1.2 Human Health

No materials that would pose a chemical hazard to workers or to the public would be used in the NTTL operations. No hazardous materials or hazardous operations above those routinely encountered in site construction and laboratory operations are anticipated under the Proposed Action. Alcohol for cleaning purposes, inert nitrogen gas for the gloveboxes and deuterium (a non-radio-active isotope of hydrogen) would be the principle materials consumed during NTTL operations.

The only radioactive material present during NTTL operations would be tritium, which emits low energy beta particle radiation. The tritium decay beta particle cannot penetrate the containment vessels or gloveboxes under routine conditions. For determining hazards to workers and the public, radiation from tritium is considered to be an internal hazard. It must be inhaled, ingested or absorbed through the skin to have an effect. Tritium monitors and routine contamination surveys of laboratory surfaces would be used to warn of potential tritium hazards to workers. No radiation from external penetrating sources (e.g. gamma or neutron radiation) would result from NTTL operations. Therefore, no doses from external radiation hazards would be received by workers conducting NTTL operations or by the public.

The potential for adverse human health effects from the relocation of NTTL operations comes primarily from potential radiation exposures to tritium gas. NTTL personnel may also be exposed to tritiated water vapor and to tritium contaminated wastes during routine NTTL operations. Approximately 2 grams (19.2 x 103 Ci) of tritium per year would be consumed from all activities and waste streams associated with NTTL operations. It is estimated that 15 full time employees would be required

to assemble and conduct NTTL operations at TA-16. Based on current program planning, all 15 of the full time NTTL employees are expected to work in positions where accidental exposure to tritium could occur. However, routine exposure to radiation is not anticipated. Potential health effects to workers and to the public from NTTL operations are bounded by the analysis contained in the WETF EA. Estimated doses to workers and to the public as well as the increased incidence of cancer from all sources of WETF operational exposures were evaluated in detail in the WETF EA. Doses to workers, co-located workers and the public from routine WETF operations were estimated to be 200 mrem/yr, 0.004 mrem/yr and 2.1 x 10-4 (0.00021) mrem/yr, respectively. These doses pose a minimal health risk to workers and to the public and are well below DOE, U.S. Environmental Protection Agency (EPA) and U.S. Nuclear Regulatory Commission (NRC) regulatory guidelines for workers (5,000 mrem/yr) and the public (100 mrem/yr). The highest increase in incidence of cancer for WETF operations was calculated to be 3.0 x 10 -9 (0.000000003) additional cancers in the affected population. Estimated tritium emissions of 5.0 Ci/yr from NTTL operations are approximately 1.25 percent of the amount analyzed in the WETF EA. These emissions together with the handling of tritium components and tritium contaminated wastes from proposed NTTL operations would result in a negligible dose and subsequent cancer risk to workers and the public and would not exceed regulatory health and safety guidelines.

4.1.3 Solid and Liquid Waste Management

Construction activities would result in the

generation of solid wastes from clearing a new parking lot, the demolition of existing structures and equipment, and from construction scrap. The types of demolition wastes and construction scrap, the estimated amounts and the method of disposal are listed in Table 4-2. A PCB contaminated transformer would be removed and replaced by a new electrical substation. The contaminated transformer would be disposed of at a permitted offsite facility. Asbestos waste would be generated from interior building modifications and would be disposed of at an off-site disposal facility.

Table 4-2 Demolition Waste and Construction Scrap

Waste Types	Quantity	Disposal
Asbestos	2.49 m3 (3.2 yd^3)	Offsite Landfill
PCB Contaminated Transformer	7.65 m3 (10.0 yd^3)	Offsite Facility
Concrete	29.06 m3 (38 yd^3)	Los Alamos County Landfill
Steel	38,182 kg (42 tons)	Salvage
Excess Equipment	9,091 kg (10 tons)	Salvage
Low-level waste (old emission stack)	9,091 kg (10 tons)	LANL TA-54

The old emissions stack would be replaced with a new and larger stack during the construction phase. The old stack is assumed to be contaminated with tritium and would require disposal at TA- 54 of approximately 9,091 kg (10 tons) of solid low-level waste. The total amount of non- radioactive and radioactive wastes generated from construction activities would be a minor contribution to the total amount of solid wastes generated at LANL.

The gaseous waste stream from the facility would include building air and glovebox/ process vacuum exhaust. The glovebox/process vacuum pump exhaust would be treated by the TWTS in WETF to remove over 99 percent of the tritium before it is discharged to

the environment. The exhaust stream is anticipated to contain less that 5.0 Ci/yr of tritium.

Low-level radioactive solid wastes from routine NTTL operations would be added to the WETF radioactive waste stream and would consist of rejected tritium contaminated or loaded targets, destructively tested targets and replacement components, molecular sieve material, some used equipment, and occasional debris such as clothing, gloves, and mops from minor spill cleanups. The water vapor produced by the purifier would be captured by the TWTS and solidified. The molecular sieve material would be regenerated in the TWTS and the tritium would be recovered. However, the regeneration process does not recover 100 percent of the tritium. Minimal amounts of contaminated molecular sieve materials would require disposal. Other materials would be buried or stored depending upon the level of radioactivity. Approximately 1.53 m3/yr (2 yd 3/yr) of solid low-level waste are estimated to be produced each year. It would be disposed of at the low-level radioactive solid waste disposal area at TA-54. No mixed wastes (i.e. radioactive and hazardous) are expected to be generated.

Low-level radioactive liquid waste from NTTL operations at TA-16 would consist mainly of low-level contaminated water generated from janitor mop water and mop water from minor spill clean-up. Tritium contaminated water would be collected in the new radioactive liquid waste tank in Building 450. Waste would be periodically removed from the tank and taken by tanker truck to the TA-50 radioactive liquid waste treatment facilities. Approximately 10,000 L/yr (2,642 gal/yr) of liquid low-level waste are estimated to be produced from NTTL operations. Low-level liquid wastes would be disposed of at the TA-50 radioactive liquid waste treatment plant. Before liquid radioactive effluents are discharged to the environment via Mortandad Canyon, they are monitored to assure compliance with NPDES permit requirements.

Non-contaminated solid sanitary wastes (e.g. office trash) will be taken to the Los Alamos County landfill for disposal. The NTTL staff would add 302,800 L/yr (80,000 gal/yr) of sewage to the TA-16 sanitary sewer system. This is expected to be a redistribution of the existing sewage plant load from TA-21 and not an incremental increase to the overall sewage treatment system.

4.1.4 Transportation

Under the Proposed Action, the transport of NTTL tritium supplies between TA-16 and 21 and associated risks to workers, the public and to the environment would be eliminated. The relocation of the loader used in the NTTL operations in Building 209 would involve moving equipment that contains trace amounts of tritium contamination from TA-21 to TA-16. The components of the loading system would be moved in accordance with LANL SOPs and DOT regulations and would pose only a negligible environmental hazard or health and safety risk. No additional intrasite transportation for NTTL operations would be required if operations were consolidated at TA-16. Unloaded target disks would be brought to LANL from SNL by way of a commercial carrier and stored at the WETF. New targets would be shipped in special containers under vacuum. They would contain no radioactive materials. Target disks loaded with tritium would be shipped back to SNL by commercial carriers in the same special containers under vacuum. The U.S. Postal Service could also be used to ship targets. The DOT has set a

limit of 200 curies for tritium shipped in a solid form. It is anticipated that shipments from LANL to SNL will probably average less than 20 curies per shipment. Since the loaded targets would contain tritium in a solid form chemically bound to the targets and would be shipped in accordance with DOT regulations, they would pose only a negligible radiation hazard to anyone.

4.2 No Action Alternative

The potential environmental effects under this alternative would be the same as those that are described in the Nonnuclear Consolidation EA. NTTL operations would be conducted at TA-21 and tritium would be supplied for the operation primarily from the WETF at TA-16. Operations at TA-21 would be similar to those addressed under the Proposed Action. However, NTTL operations at LANL would be suspended during building modifications necessary at TA-21. In addition, LANL tritium operations would not be consolidated and they would be conducted under conditions and in facilities that are not as efficient as those existing and planned for TA-16.

4.2.1 Air Quality

Nonradioactive air emissions under this alternative would be less than those anticipated under the Proposed Action. The No Action Alternative would not involve construction activities and associated emissions. However, the conduct of NTTL operations at TA-21 would require extensive modifications to existing buildings. The modifications would temporarily increase particulate matter emissions such as dust, dirt and vehicle emissions. Radioactive air emissions would be higher under the No Action alternative than those anticipated under the Proposed Action. Based on the ratio of the amount of tritium in inventory in Building 209 (70 grams over the previous twelve months) to the amount emitted over the previous year (450 curies) and the assumption that NTTL operations would require approximately 2.0 grams of tritium per rear, it is estimated that less than 15.0 curies of tritium could be released each year from NTTL operations at TA-21. This limited amount of tritium emissions would not have an adverse effect on existing air quality at LANL. Therefore, in accordance with the Nonnuclear Consolidation EA and subsequent FONSI, NTTL operations conducted at TA-21 are not be expected to have any significant impacts on air quality at LANL.

4.2.2 Human Health

Human health risks under the No Action alternative are expected to be negligible but would be slightly higher for both workers and the public compared to those projected under the Proposed Action. Based on recent tritium inventories and annual emission levels described in Section 4.2.1, conducting NTTL operations in Building 209 at TA-21 could result in approximately 15.0 Ci/yr being released from routine NTTL operations. Since TA-21 is physically closer (0.7 kilometers or 0.4 miles) to areas used by the general public, i.e. the Los Alamos townsite, any emissions from NTTL operations are likely to be more concentrated when they reach the site boundary. Because of the minimal, but greater amount of tritium emissions (increase of 10.0 Ci/yr), the proximity

of TA- 21 to the public and the absence of tertiary confinement in Building 209, conducting NTTL operations at TA-21 could result in a slightly higher potential dose and associated health risk to workers and to the general public. However, estimated doses to workers or to the public would be negligible and would be well below health and safety standards. Therefore, as described in the Nonnuclear Consolidation EA and subsequent FONSI, NTTL operations conducted at TA-21 would not be expected to have any significant impacts on human health.

4.2.3 Waste Management

The total amount of waste generated and disposed of is expected to be less under this alternative when compared to the Proposed Action. The types of waste generated from routine operations would be the same as the types generated under the Proposed Action. However, waste generation under the No Action alternative would not include the types and amounts of waste generated from clearing an area for a new parking lot, from PCB removal and from new construction activities. Low-level radioactive and sanitary waste types and amounts generated from routine operations should not change from those estimated under the Proposed Action. Approximately 1.53 m3 (2 yd3/yr) of solid and 10,000 L/yr (2,642 gal/yr) of liquid low-level waste per year would be generated per year. Approximately 302,800 L/yr (80,000 gal/yr) of sewage would be sent to treatment facilities. Facilities currently exist at LANL to handle low-level radioactive and sanitary wastes. Therefore, as described in the Nonnuclear Consolidation EA and subsequent FONSI, NTTL operations conducted at TA-21 would not be expected to have any significant impacts on LANL waste management programs.

4.2.4 Transportation

The potential for transportation accidents under this alternative would be slightly greater compared to the Proposed Action. The potential for a greater number of accidents could occur as a result of continuing vehicular traffic between TA-21 and TA-16. However, the number of shipments of tritium between TA-21 and TA-16 in support of NTTL operations averages only about 2 per year. Shipping the targets between SNL and LANL would continue to be conducted over public roads by commercial carriers or by the U.S. Postal Service under either the Proposed Action or the No Action alternative. Therefore, as described in the Nonnuclear Consolidation EA and subsequent FONSI, NTTL operations conducted at TA-21 would not be expected to have any significant impacts on onsite or

4.3 Cumulative Effects

Cumulative effects take into account potential consequences on the human environment which may result from the incremental effect of the Proposed Action considered together with other past, present and reasonably foreseeable future actions. Proposed activities associated with the relocation of NTTL operations to Building 450 at TA-16 have the potential to have a cumulative effect on workers, the public and the environment with

activities currently conducted in Buildings 205 and 205A at TA-16 and Building 209 at TA-21.
The effects of operating the WETF on the human environment were evaluated in detail in the WETF EA. Tritium emissions are the primary mechanism by which the WETF has an effect on the human environment. However, the WETF EA and the subsequent FONSI determined that the operations conducted at this facility would not have a significant adverse impact on the human environment. The incremental increase in emissions from NTTL operations conducted in TA-16 (5.0 Ci/yr) are considered to be bounded by the emissions amount evaluated in the WETF EA (400 Ci/yr). The proposed relocation of operations from TA-21 to TA-16 is expected to result in a decrease in annual tritium emissions (from 15.0 Ci/yr to 5.0 Ci/yr) for NTTL operations. New construction activities and a new parking lot would be located in previously disturbed areas. Workers that currently perform tritium operations at TA-21 would continue to conduct NTTL operations at TA-16 and would not be expected to exceed radiation doses allowed by DOE and LANL guidelines. Low-level radioactive and sanitary wastes generated by the Proposed Action would be a redistribution of these wastes from TA-21 to TA-16.The Proposed Action would generate approximately 1.53 m3/yr (2yd3/yr) of solid low-level waste and approximately 10,000 L/yr (2,642 gal/yr) of liquid low-level waste. The entire LANL facility generates approximately 4,500 m3/yr (5,925 yd3/yr) of solid low- level waste and approximately 20,000,000 L/yr (5,284,000 gal/yr) of liquid low-level waste. Therefore, NTTL operations should have only a negligible cumulative effect on the human environment with tritium operations conducted at WETF or for the entire LANL facility.
Potential effects associated with conducting the NTTL operations at TA-21 at LANL were evaluated in the Nonnuclear Consolidation EA. Cumulative effects on LANL infrastructure and on the surrounding communities and the environment were considered. The Nonnuclear Consolidation EA and the subsequent FONSI determined that the relocation of NTTL operations to LANL would not result in a significant adverse environmental impact. The LANL Site-wide EIS, currently in process, will further address cumulative effects for all LANL operations. A Record of Decision is expected in the spring of 1997 for the LANL Site-wide EIS. No other activities requiring an EA or an EIS are planned that could affect NTTL

5.0 ABNORMAL EVENTS

Abnormal events or accidents are incidents that are not a planned part of routine operations. This section considers a bounding case accident that could be associated with NTTL operations planned for TA-16 that could affect site workers, co-located workers, the public and the environment. The WETF EA evaluated four abnormal event scenarios that had an annual credible probability of at least one in a million chances (greater than 10-6) of occurring. The four scenarios included an earthquake, an unpackaging release of tritium, a low-pressure boundary failure in the glovebox and a ruptured tank in the tritium waste treatment subsystem. Of these four scenarios, the one most likely to affect NTTL operations would be an earthquake. In addition, the earthquake scenario was selected because it evaluated a more conservative source term than either the unpackaging release or the low-pressure boundary failure. The ruptured tank scenario was rejected because it

addressed an equipment failure that would not be associated with NTTL operations and it had the lowest probability of occurrence of all four scenarios considered.
The WETF EA used a conservative assumption that a postulated earthquake could result in the release of 100 grams of tritium (9.6 x 105 curies) from the glovebox that would be exhausted through the Emergency Tritium Clean-up subsystem to the stack. Only 1.9 curies are calculated to be emitted to the atmosphere outside the facility. The NTTL operations would involve approximately 2 grams of tritium. This amount would be subject to the WETF at risk limit of 100 grams and would not be in addition to the facility limit. Building 450 would be seismically qualified to the latest codes for earthquakes following the completion of the proposed modifications. Therefore, the earthquake accident scenario evaluated in the WETF EA could be considered an extremely conservative (by a factor of 50) analysis of an accident that could result from NTTL operations relocated to TA-16.
Assuming that the 2 grams of tritium from the NTTL operations are included in the 100 grams released in the accident scenario, the WETF EA estimated that the tritium release to the public from the earthquake accident scenario could result in doses to on-site workers, individuals at the site boundary and to the nearest population centers that would be well below established guidelines for protecting health and safety. The highest radiation dose would be to site workers and that dose was estimated to be 3.3 x 10-7 rem (0.00000033 rem). The contribution in dose that could result from the NTTL operations could be assumed to be approximately two percent of 3.3 x 10-7 rem or 6.6 x 10-9 rem (0.0000000066 rem). The contribution in dose from NTTL operations would not be expected to change the estimated health risk from the calculated incidence of excess cancers to workers or to the public provided in the WETF EA. Therefore, the potential accident scenario for NTTL operations is not expected to result in

6.0 LIST OF AGENCIES AND PERSONS CONSULTED

In 1982, initial surveys of the WETF site for threatened or endangered species were conducted in support of constructing the facility. In addition, surveys were conducted more recently (1994) in support of the LANL environmental restoration program in the same areas that would be affected by the Proposed Action. These surveys did not reveal the presence of any listed species. Informal consultation with the U.S. Fish and Wildlife Service (FWS) was initiated on November 7, and completed on December 5, 1995. The FWS agreed with the DOE determination that the Proposed Action would have no effect on any endangered or threatened species or their critical habitats.
On June 8, and again on November 7, 1995, the DOE Los Alamos Area Office (LAAO) provided details of the Proposed Action to the New Mexico State Historic Preservation Officer (SHPO) in compliance with the National Historic Preservation Act. On November 17, 1995, the SHPO concurred with the DOE finding of no effect on cultural resources for the Proposed Action.
In addition, the Nonnuclear Consolidation EA was provided for review to

7.0 PERMIT REQUIREMENTS

The emission of radionuclides at DOE facilities is regulated by the National Emission Standards for Hazardous Air Pollutants (NESHAPs) under the Clean Air Act. The DOE Los Alamos Area Office has determined that the relocation of NTTL operations would not require an air emissions permit, permit modification or additional periodic confirmatory monitoring. No other environmental permits

8.0 GLOSSARY OF TERMS AND ACRONYMS

ALARA
: As Low As Reasonably Achievable. Applies to radiation exposures.

cfm
: cubic feet per minute

Ci
: Curie--a unit of radioactivity, the amount of any nuclide that undergoes exactly 3.7 x 1010 radioactive disintegrations per second.

DBE
: Design Basis Earthquake. An engineering design criteria

DOE
: United States Department of Energy

D&D
: Decontamination and Decommissioning

EA
: Environmental Assessment

EPA
: United States Environmental Protection Agency

FONSI
: Finding of No Significant Impact

FWS
: United States Fish and Wildlife Service

gr
: gram-unit of mass and weight in the metric system, equal to the mass of one cubic centimeter of water

g
: symbol denoting acceleration of gravity, used in measuring effective peak horizontal acceleration of an earthquake, usually at the earth's surface

HEPA
: High Efficiency Particulate Air filter used in ventilation systems

LAAO
: Los Alamos Area Office of the DOE

LANL
: Los Alamos National Laboratory

m3
: cubic meter

mCi
: millicurie--one-thousandth of a curie

mrem

millirem--one-thousandth of a rem

NEPA
: National Environmental Policy Act

NESHAPs
: National Emission Standards for Hazardous Air Pollutants

NPDES
: National Pollutant Discharge Elimination System wastewater permit

NRC
: United States Nuclear Regulatory Commission

NTTL
: Neutron Tube Target Loading

PCB's
: Polychlorinated Biphenyls (an aliphatic, long-lived hydrocarbon)

rem
: the amount of ionizing radiation required to produce the same biological effect as one roentgen of high-penetration x-rays; unit of dose equivalent for a single individual, used in the field of radiation dosimetry

scf/yr
: standard cubic feet per year

SHPO
: State Historic Preservation Officer

SNL
: Sandia National Laboratory, Albuquerque, NM

TA
: Technical Area. Term for areas at LANL

tritium
: a radioactive form or isotope of hydrogen gas

TWTS
: Tritium Waste Treatment System

mCi
: microcurie--one-millionth of a curie

WETF
: Weapons Engineering Tritium Facility

WR
: War Reserve. Refers to weapons or components required to fight a war.

EXPONENTIAL NOTATION: Many values in the text and tables of this Environmental Assessment are expressed in exponential notation., An exponent is the power to which the express, 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):

1x104 = 10 000
1x102 = 100
1x100 = 1
1x10-2= 0.01

9.0 REFERENCES

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