TA-16 EA

M E M O R A N D U M

TO: Benito Garcia, Chief

FROM: DB Dave Baggett, Radiation Specialist

DATE: Oct. 6, 1994

SUBJECT: Relocation of Weapons Component Testing Facility

LANL is proposing to move their Weapons Component Testing Facility to a new building. The current location and the proposed new location (an already existing building) are both in TA-16.

They are not proposing any new operations, so the impact to the environment should not change, with the exception of a small amount of asbestos to be removed during modification to the existing building. On the plus side, operations would be consolidated and one NPDES outfall would be eliminated.

Operational procedures are not discussed in detail, but since the only new procedure would be using a larger hydraulic press, the impact to the environment should be negligible.

5955

John P —
Please prepare comments & forward to Gedi
Benito 9/21/94

NEW MEXICO ENVIRONMENT DEPARTMENT
ENVIRONMENTAL REVIEW COMMENT FORM

TO: Benito Garcia
HRMB

DATE: 9-20-94

FROM: **GEDI CIBAS**
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PROJECT TITLE: Relocation Weapons Component Testing Facility (DEA)

NMED FILE NO.: 856 ER **SAI NO.:** N/A

A. Please review the attached document and submit one hard copy of your comments to me no later than 9-27-94; also make sure to mail me an electronic copy through the DG network (User Name: D_P02). Your review ~~should include~~ at least the following:

(1) All requirements or conflicts with NMED laws and regulations of which you know;

(2) All deficiencies or inaccuracies in the information provided which prevent an adequate environmental assessment of the project;

(3) A response to the following question: Do the anticipated accomplishments of the proposal justify the requested funding level? (If "no" please explain in your review);

(4) Other information which may be helpful to understand the environmental impact of the project (e.g., other environmental problems in the vicinity; other project impacts; problems which may develop for which no specific NMED law and regulations apply).

B. **Unless otherwise noted, please always use the following procedure:**

(1) Return all documents after review;

(2) Use the above NMED File No. in reference to this project;

(3) Type all your comments.

G.C.:Revised 10/93

LAN 92-0037

DRAFT ENVIRONMENTAL ASSESSMENT

for the

RELOCATION OF THE WEAPONS COMPONENT TESTING FACILITY

LOS ALAMOS NATIONAL LABORATORY
LOS ALAMOS, NEW MEXICO

Revision 3
August 1994
Defense Programs Office
United States Department of Energy

CONTENTS

Executive Summary

The proposed action is to relocate the Weapons Component Testing Facility (WCTF) from Building 450 to Building 207, both within Technical Area 16 (TA-16), at Los Alamos National Laboratory (LANL). Relocation would allow the WCTF operations to become more efficient and productive by increasing the usable space, consolidating with similar testing operations, and increasing the testing capabilities for larger components. Increased efficiency and productivity would allow the WCTF to better fulfill a LANL programmatic responsibility to maintain weapons development capability and test stored weapons components.

The WCTF is one of the primary component instrumentation, diagnostics, and testing laboratories at LANL. The WCTF would move into the vacated, southern half of Building 207. The northeast half of the building is presently occupied by a shop for testing packages designed to transport hazardous materials (HAZPAC). HAZPAC will remain in Building 207.

The no action alternative is to keep the WCTF operations in Building 450. By not relocating to Building 207, the WCTF operations would not have more usable space, would not consolidate with similar testing operations, and would not increase the testing capabilities for larger components. Therefore, the no action alternative would not allow the operations to become more efficient and productive.

No changes in current operations of the WCTF are anticipated as a result of the relocation; no new waste would be generated in the operations after the relocation. The relocation would not change the quantity of sanitary effluent. Some renovations to Building 207 would take place in the relocation. Small amounts of asbestos waste would be produced during these renovations.

ENVIRONMENTAL ASSESSMENT FOR THE RELOCATION OF THE WEAPONS COMPONENT TESTING FACILITY

1.0 PURPOSE AND NEED FOR AGENCY ACTION

1.1 Introduction

Los Alamos National Laboratory (LANL) is operated by the University of California under contract to the U.S. Department of Energy (DOE). The relocation of the Weapons Component Testing Facility (WCTF) from Building 450 to Building 207 at LANL is the subject of this environmental assessment (EA). Both of the buildings are located within Technical Area 16 (TA-16).

1.2 Current Situation

The Weapons Component Testing Facility is one of the primary component instrumentation, diagnostics, and testing laboratories at LANL. The Weapons Analysis and Testing Group (ESA-11) uses the shop to test physical characteristics of non-explosive materials and structural components of weapons and other devices. The principal focus of the WCTF is to support LANL's weapons engineering groups as well as perform a variety of non-weapons structural testing applications.

1.3 Purpose and Need

DOE has an existing programmatic responsibility to maintain their weapons development capability and to continue to test stored weapons components for safety and treaty verification at LANL. By becoming more efficient and more productive in LANL testing operations, DOE would better fulfill this programmatic responsibility.

The testing operations would be made more efficient and more productive by

- consolidating with similar testing operations;
- increasing available space for current operations;
- increasing capabilities for larger components to be tested;
- centrally locating the testing operations within TA-16; and.
- adding a new load test machine.

1.4 Regulatory Framework

This EA has been prepared pursuant to the Council on Environmental Quality (CEQ) regulations implementing the procedural provisions of the National Environmental Policy Act (NEPA) (40 CFR 1500-1508) and the DOE regulations regarding NEPA compliance (10 CFR 1021).

2.0 PROPOSED ACTION

2.1. Description of Proposed Action

The proposed action is to move the existing WCTF from Building 450 into Building 207. Both of the buildings are located within Technical Area 16 (TA-16) at LANL (see Figure 1). Building 207 was used as a warehouse until 1991 when the building was vacated by the warehouse operations. The northeast half of the building was then modified to accommodate a shop for testing hazardous materials packaging (HAZPAC). HAZPAC will remain within Building 207. This operation is concerned with testing packages and packing materials only and does not use, test or handle hazardous materials. The southern part of Building 207 is presently unoccupied. The number of full-time workers in the WCTF is currently four; the number of workers in the WCTF will not change with the proposed action.

The proposed action would increase the efficiency and productivity of the weapons component testing operations by placing similar component testing laboratories in the same building. Part of Building 207 is currently used as a shop for testing HAZPAC. The relocation of the WCTF would move the WCTF into Building 207 with 207 with HAZPAC.

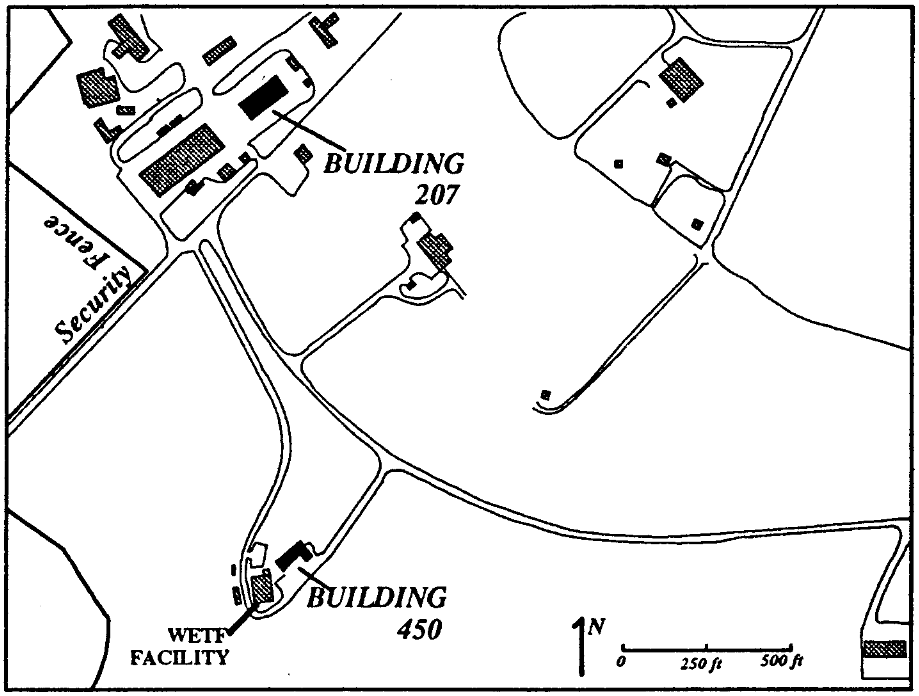

Figure 1: Location of Buildings 450 and 207 at TA-16

In addition, moving WCTF operations into Building 207 would increase the available space for current weapons component testing operations. The relocation would move the operations from two floors in Building 450 to one floor in Building 207; the overall square footage used would remain the same. Although the overall square footage would remain the same, the available open space on the one floor of Building 207 would allow equipment and rooms to be arranged in a way that would effectively increase the amount of available floor space for facility and operational use.

The relocation to Building 207 would also allow the weapons component testing operations to become more efficient by placing the WCTF closer to the ESA groups who frequently use the services of weapons component testing.

Several options are being considered for the future use of Building 450, but a final decision has not yet been made.

2.1.1. Operational Activities

Relocation of the WCTF would require modifications to Building 207, as described below, and the transfer of equipment and instruments from the existing WCTF shop area to Building 207. One new load test machine would be added to the lab in Building 207. This press has a greater test capacity (150,000 pounds of force) than the structural load testing devices currently in the facility. The new machine would perform the same kinds of load and pressure tests as the existing machines.

The kinds of operations taking place in Building 207 would be identical to those now being performed in Building 450. No new types or quantities of chemicals or materials would be used in the new location.

Solid depleted uranium (D-38) samples are part of the WCTF operations. An analysis by Health and Safety groups at LANL (ESH-1 and ESH-4) showed no detectable radioactivity in either the filters used for taking air samples during D-38 operations in Building 450 or in the building's air filters. The Health and Safety group analysis indicates that no decontamination of Building 450 would be necessary for its conversion to other uses.

Modifications to Building 207

A floor plan of Building 207 is shown in Figure 2. Modifications to the building include

- addition of an exterior room for hydraulic pumps,
- construction of a foundation for the new hydraulic press,
- construction of interior walls to separate some lab operations,
- addition of vents to the building in two locations,
- addition of a new air compressor,
- modification/upgrade of the building heating, ventilation, and air conditioning system,
- upgrade of all building lighting,
- addition of roof insulation,
- resealing of the floors and repainting of the ceiling,
- modification of the entry to the building,
- new exterior paint and a new sign,
- transport of ventilation systems for the machine shop and welding room from Building 450 to Building 207,
- extension of the existing crane rail,
- addition of a new pump cooling water exchanger, and
- new fixtures and paint in rest rooms.

Major changes are indicated in Figure 2.

Several new interior walls would be constructed beneath an existing mezzanine on the ground floor on the west end of the building. These walls would separate rooms for instrumentation, welding, and a machine shop from the main testing area where load test machines would be located. On the mezzanine, new walls would separate a room for the air handlers from the rest of the building. A new mechanical room for hydraulic pumps would be built on the existing loading dock on the south side of the building. Construction would primarily involve the addition of new walls to the dock.

An existing entry would be modified in Building 207. This would involve constructing new stairs to the existing loading dock, adding some short stub walls, and installing new doorways. In

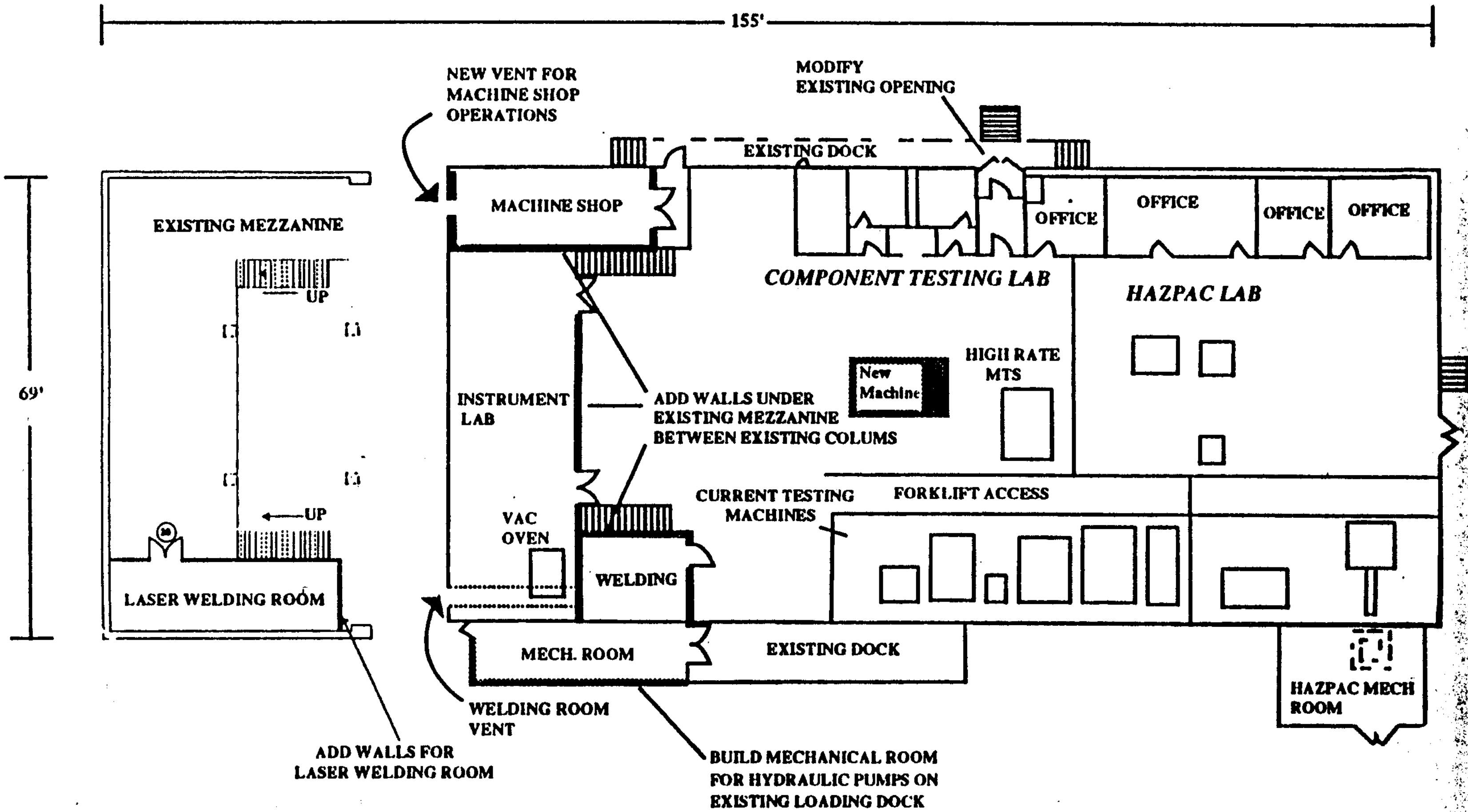

Figure 2: Floor Plan of Building 207 with Proposed Modifications

addition, two new openings would be placed in the walls to accommodate the vents for the machine shop and welding room. Overall, the remodeling and construction activities for the proposed action would take approximately six months to complete.

If the proposed action were completed, many routine support activities would be implemented, including routine maintenance, test-equipment replacement, and normal repair for safety reasons.

Component Testing Operations

The Weapons Analysis and Testing Group (ESA-11) would use the WCTF shop to test physical characteristics of non-explosive materials and structural components of weapons and other devices. The facility would be primarily equipped to perform structural load and high pressure tests. The tests would provide information to engineering organizations within and outside of LANL. (Engineering organizations outside of LANL bringing components to the WCTF for testing would include, among others, companies in the commercial airline industry, such as Boeing and McDonnell-Douglas, and companies in the aerospace industry.) The principal focus of the WCTF is to support LANL's weapons engineering groups. As a secondary focus, the WCTF is also used for a variety of non-weapons applications; ESA-11 personnel would use specialized equipment to apply load tests to individual components or component assemblies. ESA-11 has also used WCTF equipment to test airplane wings, fuselages, engines, and other aircraft components for the commercial aircraft industry, and to test the structural integrity of well casings and bridge components.

The load and pressure testing done in the WCTF would determine the response of structural components to varying degrees of physical stress. The equipment inventory of the lab would include several commercial structural load testing machines, which are upright load frames supporting vertically-oriented pistons to apply tensional (pulling apart) or compressive force to test components. The two MTS Corporation structural load testing machines in the lab would be hydraulic, closed-loop, servo-controlled presses. One would be capable of applying 220,400 Newtons (N) (50,000 pounds [lb]-force) and the other 89,000 N (20,000 lb-force). (See the Glossary for a definition of units and terms.) Electronic controls would allow precise control of the duration and intensity of the force. Three load test machines would have 220,400, 89,000, and 8,900 N (50,000, 20,000 and 2,000 lb-force) capacity. These would be lead-screw driven with constant velocity servo controls. ESA-11 would also use a 22,000 N (5,000 lb-force) high strain rate machine for load tests. It would be hydraulically actuated with a closed-loop servo control system. Hydraulic fluid pressurized to 3,000 pounds per square inch (psi) would be distributed to the machines via a remotely located pump. The hydraulic hoses would be routed through overhead cable carriers to the machines.

A servo-controlled autoclave hydraulic pressurization system, capable of applying hydraulic pressures of up to 100,000 psi, would be used for pressure testing parts and assemblies and occasionally for pressure vessel certification. Pressurized hydraulic fluid would be provided by the same system that provides fluid for the load testing machines, and a single action, remotely located pump would intensify the pressure to 100,000 psi.

The new machine to be included in this proposed action is a load testing machine, capable of 670,000 N (150,000 lb-force). The new machine, like other machines currently used at the WCTF, would be a hydraulic, closed loop, servo-controlled press. Personnel would use the machine, as they do with the current machines, to apply load tests to individual components or component assemblies.

Actuator and Actuator Valve Testing

Actuators are small electro-explosive devices that are used in nuclear weapons. Each actuator consists of an internal subassembly and an external housing; the two-part unit screws into the weapon (Figure 3). The purpose of the device is to provide a short pulse of pressurized gas to operate one or more valves in a weapon. The pressurized gas is created by a small explosion inside the actuator. The pressure pulse moves a piston fitted tightly inside a cylinder, which in turn actuates one or more valves in the weapon. The valves move in as little as two-thousandths of a second, allowing materials in the weapon (primarily gases under pressure) to be transferred very quickly to initiate weapon detonation.

Actuators are not manufactured at LANL but are shipped to LANL from various manufacturers and DOE laboratories. The actuators would be test-activated in the WCTF to evaluate various aspects of valve and actuator performance, such as the electrical current required to detonate the explosive charge, the response time of the valve, the effectiveness of the valve seal, the strength of the pressure pulse, and other important parameters. Each actuator contains up to 300 milligrams of ball powder, primary explosive, secondary explosive, or mixes thereof—a quantity that classifies the actuators as Class C explosives, according to Department of Transportation regulations.

The actuator tests would be initiated remotely; this would take place in a containment box. During the test-fire, the small charge of powder (typically commercial grade lead styphanate) would be detonated inside the actuator by applying an electrical current to its contact pins. The detonation sends a pulse of pressurized gas from the actuator into an attached valve (not shown in Figure 3). Except for the actuators themselves, the units in which the actuators are contained are inert, and present no explosion hazard. Any gases produced in the detonation of the explosive

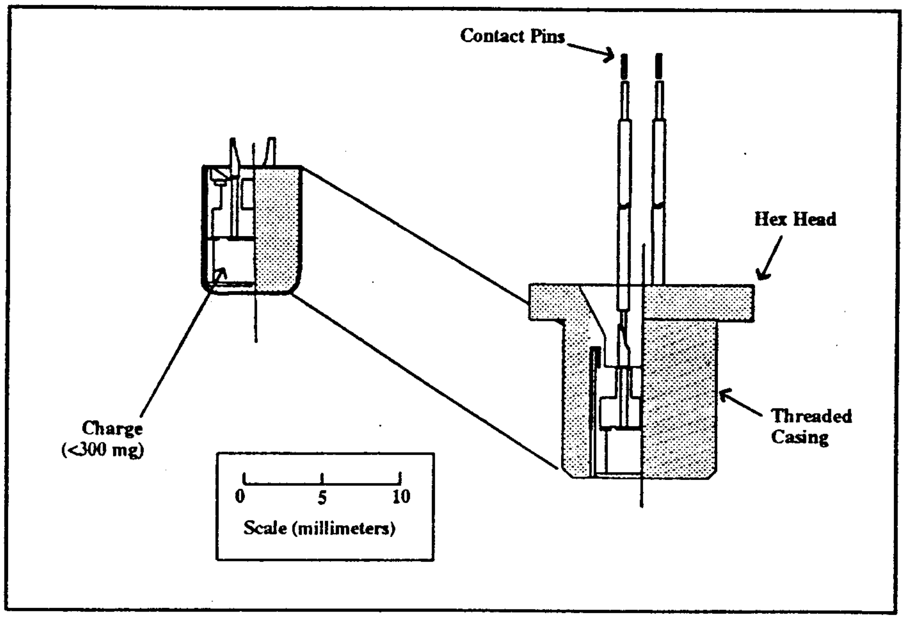

Figure 3: Diagram of an Actuator

Instrumentation of Depleted Uranium and Beryllium Components

Specialized instruments such as strain gauges and accelerometers would be regularly attached to test components made of depleted uranium (D-38) and beryllium. Once instrumented, these components would be sent for testing to other facilities, including Oak Ridge National Laboratory in Oak Ridge, Tennessee, Sandia National Laboratories in Albuquerque, New Mexico, or any one of the aerospace manufacturers. Occasionally, D-38 and beryllium components would be tested in the WCTF using the load and pressure machinery described above. Preparation of the surface of the component for instrumentation may include cleaning with one or more commercial solvents, such as methanol, kerosene, acetone, isopropyl-alcohol or ammonia, applied with sand paper. The area cleaned on each test sample would be typically less than 6.5 cm^2 (1 in^2). D-38 samples may be heated to cure adhesives used to attach instrumentation. In this case, samples would be heated in a small oven in the WCTF to a maximum of 90°C (194° F)—well below the melting point of uranium (1135° C/2075° F). Dual thermostats would provide redundant control of the device used to heat the D-38 to ensure that it is not heated above the desired temperature.

Beryllium Deforming Operations

ESA-11 personnel would occasionally use a small oven in the WCTF to slowly heat and deform beryllium components. The oven is capable of heating test samples to approximately 480° C (900° F). This makes beryllium less brittle, but the oven would not be hot enough to melt or volatilize the beryllium (melting point = 1289° C/2352° F). The heated test part would then be deformed with a set of dies that are hydraulically operated by a remotely located hand pump.

WCTF Operations in Support of Tests

Laser Welding

A pulsed laser welder would be located within an enclosed room at Building 207. The laser would be used for instrumentation applications where a small and accurately placed weld is required. It operates in the invisible, near infrared region at a wavelength of 1.06 microns.

Conventional Welding and Soldering

Four basic forms of conventional welding would be used in Building 450: oxygen-acetylene, 300-ampere arc, tungsten inert gas (TIG), and 250 watt/second resistance spot welding. All the welding operations would be performed in an enclosed welding room. Two types of soldering operations—soft soldering and silver soldering—would also be performed in the WCTF.

Machine Shop Operations

The small machine shop in Building 207 would be used for test fixture fabrication. The shop would not accept and would not machine D-38, beryllium, or any other hazardous material. The shop would include a small lathe, a vertical milling machine, a band saw, a drill press, a grinder, and a belt sander. A ventilation system with inlet ducts over each machine would be integral to the shop. It is designed to remove smoke and particulate material from standard machining of non-hazardous metals. Only ESA-11 personnel certified to work with the machine shop equipment would work in the machine shop.

Chemical Operations

The chemicals to be stored in Building 207 and used in WCTF operations would consist of solvents/cleaners, adhesives, coatings, and lubricants. These chemicals would be used in a wide variety of support operations associated with instrumentation and testing. They would be stored in a standard chemical cabinet and generally used in a diluted form that would not require special ventilation or control. A ventilated hood would be used when handling hazardous chemicals in concentrated form. Solvents/cleaners would be used to clean components prior to instrumentation. Adhesives would most often be used for mounting instrumentation, such as strain gauges, to test components. Coatings would be used on components to protect them from surface oxidation. The sanding done would be a wet sanding process which would not generate any dust. Used sand paper would be collected and disposed of as radioactively-contaminated waste. The D-38 and beryllium would be stored in testing or instrumentation areas of the building. Neither D-38 nor beryllium would be stored in the WCTF beyond the time needed for instrumentation and/or testing.

Personnel Protection

Building design and safe operating procedures are well established for the WCTF in its present location. Design features for Building 207 would include a separation of the component testing, welding, machine shop, and instrumentation functions. A chemical hood would be used for handling hazardous chemicals. Ventilation systems would be provided in the welding rooms and machine shops. Containment apparatus would isolate tests involving high pressure fluids and explosive devices. Optional shielding materials would be available for use in special circumstances.

Safe operating procedures include written guidelines for personnel training, for handling of all hazardous materials involved in normal laboratory operations, and for operating the equipment of the facility. Administrative limits restrict the quantities of hazardous materials—primarily actuators containing a small amount of explosive—in the facility at any time. These guidelines would continue to be reviewed at least annually and updated as required.

The Health Physics Analysis Laboratory at LANL (ESH-1) has evaluated the potential for radioactive emissions during spot welding of D-38 test components at the WCTF. Air samples taken within 30.5 cm (12 in.) of the D-38 welded sample showed no detectable radioactivity in the ESH-1 analysis. This indicates that there is no inhalation danger of the D-38 particles for workers .

Similarly, air samples taken during spot welding of beryllium components were analyzed by the LANL Health and Safety Division (ESH-5) to determine personnel exposure. The results of the personal air sample and the area sample for beryllium were 0.0001 mg/m^3 and less than 0.0001 mg/m^3 respectively. The results of the analysis indicated that the concentrations of beryllium in the sample were well below the threshold limit value for beryllium of 0.002 mg/m^3 for an eight hour work day. Threshold limit values (TLV) are set by the American Conference of Governmental Industrial Hygienists.

The ammonia concentrations taken in the sample for ammonia were below the detection limit for ammonia according to the length of stain in the ammonia detector tube. The results of these samples indicate that the health risk of these operations is well within acceptable health and safety standards.

Building 207 would not be equipped with an exhaust air filtration system because in the present location (Building 450), there is no dust production, and therefore no associated hazards, from the regular WCTF operations. Each month Health and Safety personnel from LANL would continue to take spot swipes of the interior of the building to monitor the building for radioactivity, analyze the swipes and make a report. No health hazard to personnel or to the surrounding environment has ever been found from WCTF operations. The proposed project does not anticipate off-site releases to anyone outside the boundaries of LANL.

Transportation/Shipping

The Fabrication and Assembly group at LANL (ESA-3) manages any shipping and transporting, from both inside and outside LANL, of components, instruments, or actuators that are tested in the WCTF. ESA-3 would continue to follow appropriate procedures for packaging components, instruments, and actuators. With regard to shipping and transporting the components, instruments, and actuators, ESA-3 follows Department of Transportation (DOT) regulations and LANL guidelines. DOT regulations govern the movement of hazardous and radioactive materials on public access roads.

2.2. Foreseeable Related and Future Actions

No major related or future actions are anticipated in the relocated WCTF. In 1991, the DOE evaluated the operations of HAZPAC in Building 207 and determined that they are categorically excluded from requiring either Environmental Assessment or Environmental Impact documentation because they do not either singularly or cumulatively have a significant effect on the human environment (AL tracking number LAN-91-0068).

3.0 ALTERNATIVE ACTIONS

3.1. Alternatives Considered and Eliminated from Detailed Analysis

Addition to Building 450

Building an addition to Building 450 could fulfill the need for increasing the capability of the WCTF operations by increasing the space available for operations. Adding on to Building 450 would give more space to WCTF operations, but it would not consolidate the operations with similar activities, nor would it move the operations closer to the WCTF customers. As such, building an addition to Building 450 would not fulfill the need for increasing the efficiency of WCTF operations. Therefore, this alternative will not be considered further in this document.

Construction of A New Facility

There would be few advantages in constructing a new facility for component instrumentation, diagnostics and testing. New construction—entailing fabrication of a new facility and providing utilities, parking areas, access roads, etc.—would cause environmental impacts greater than those of renovating and using an existing building. It is LANL policy to use existing buildings whenever possible to discourage a continuing spread of abandoned buildings, which must be maintained or razed. Building 207 is adequate from an environmental and a safety standpoint and, after modifications, would be superior to Building 450 because of health and safety improvements. For these reasons, the alternative of constructing a new facility is not considered further in this assessment.

Relocation to a Different LANL Facility

Relocating to a different LANL facility would not support the need to become more efficient in WCTF operations. By moving out of TA-16, the WCTF operations would be situated even farther away from facilities with related activities. A relocation to a different LANL facility

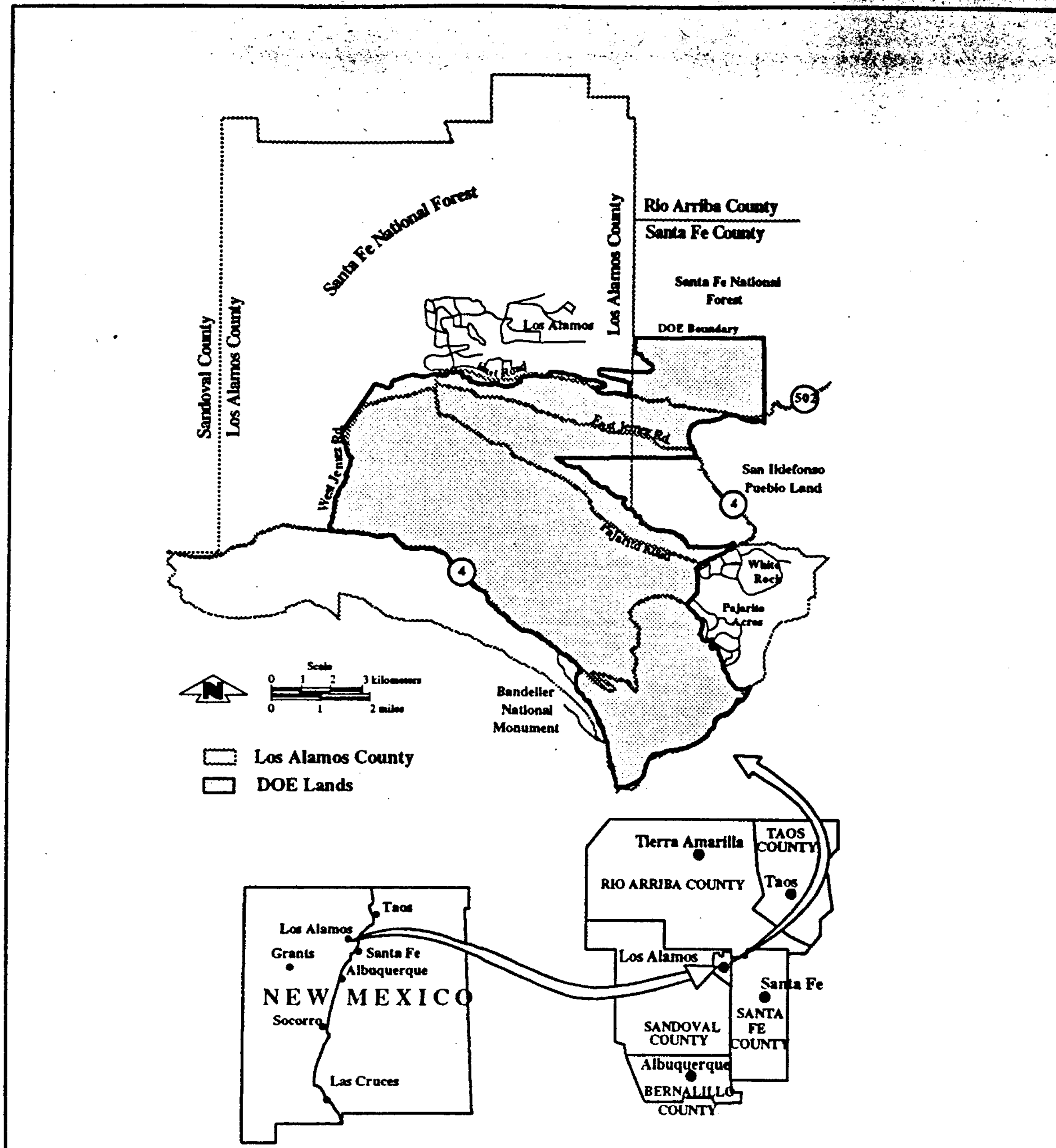

Figure 4: Regional Location of LANL

farther away from facilities with related activities. A relocation to a different LANL facility would also place the LANL customers of the WCTF farther away from the WCTF's present location. Therefore, the alternative of relocating WCTF operations to another facility is not addressed further in this assessment.

Relocation to a Different DOE Facility

The WCTF operations are part of an existing programmatic responsibility at LANL to maintain weapons development capability and to continue to test stored weapons components. To relocate

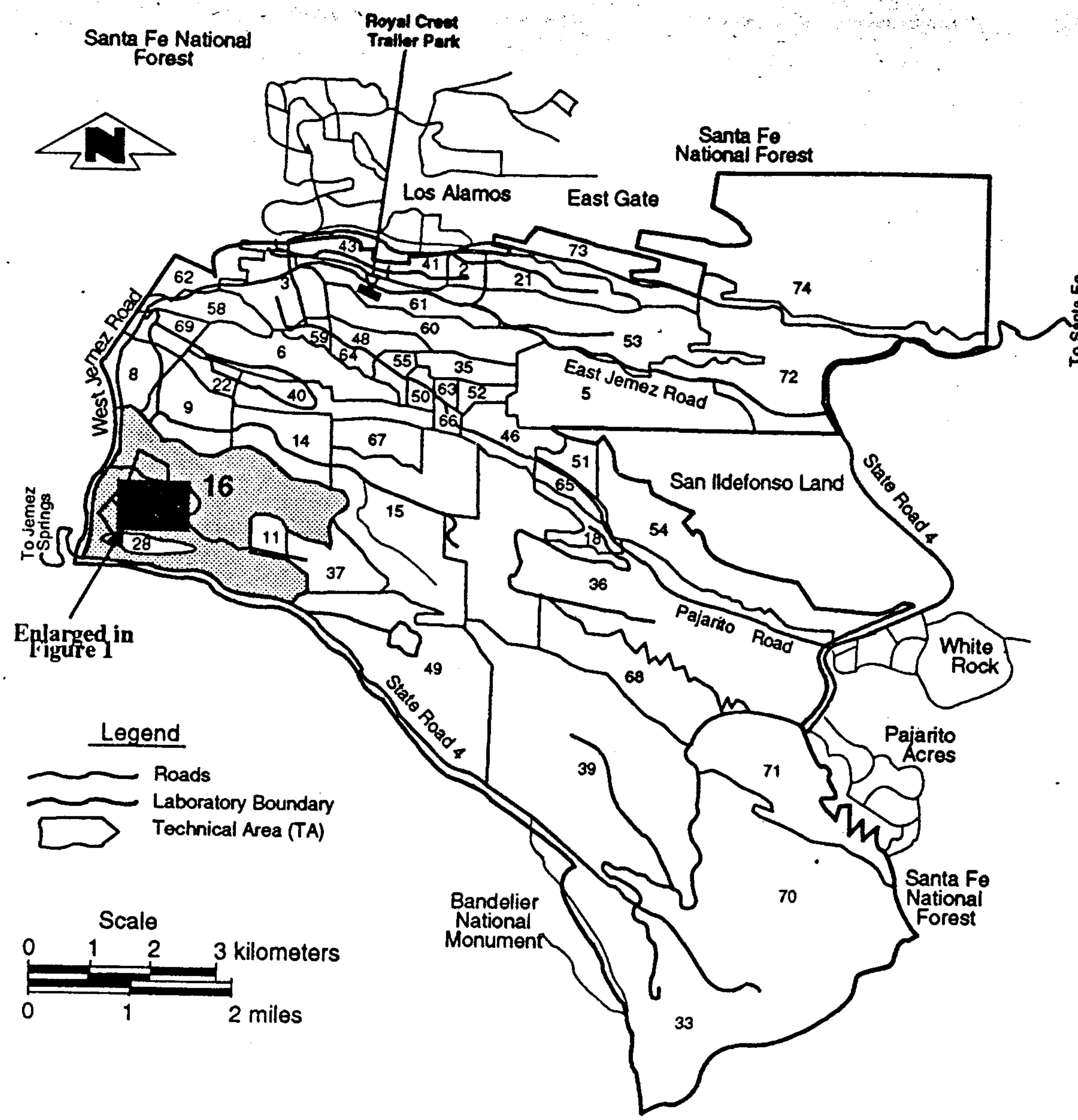

Figure 5: Location of TA-16 at LANL

to a different DOE facility would be inconsistent with DOE's programmatic responsibility and is therefore not considered further in this assessment.

3.2. No Action Alternative

The no action alternative is to continue the operational activities, described in the proposed action, in Building 450. This would result in inefficiencies because similar testing operations would not be consolidated; space for current operations would not be increased; testing operations within TA-16 would not be centrally located; and certain tests would not take place because Building 450 cannot presently accommodate a new, larger hydraulic press. In keeping with the requirements of DOE Orders (10 CFR 1021.321[c]), this alternative, to retain the WCTF activities in their present location, is analyzed for comparison of its impacts with those of the proposed action.

4.0 AFFECTED ENVIRONMENT

4.1. Current Conditions

Laboratory Setting: The LANL Environmental Impact Statement (DOE 1979) and the annual environmental surveillance reports (for example, LANL 1992) describe in detail the archaeology, geology , hydrology, seismology, climatology, and meteorology of the LANL area. LANL is located on 111 km^2 (43 mi^2) of land in Los Alamos County in north-central New Mexico, approximately 100 km (60 mi) north-northeast of Albuquerque (Figure 4). LANL Technical Areas are widely dispersed over canyons and mesas of the Pajarito Plateau at an elevation of about 2200 meters (m) (7200 ft) above sea level (Figure 5). Los Alamos has a semiarid, temperate mountain climate with 45 cm (18 in) of annual precipitation.

Project Area: The project area is situated in the western portion of LANL property within TA-16 (Figure 4). The area is generally level and partially wooded, supporting a ponderosa pine (*Pinus ponderosa* Martin) community with an understory of mixed grasses, forbs, and shrubs. The area has been used for high explosives research and testing for many years and is, in general, heavily impacted by these and previous ranching activities. The proposed relocation would involve buildings with only minor modifications necessary.

4.2. Environmental Resources

4.2.1. Environmental Resources Not Affected

In keeping with Council on Environmental Quality (CEQ) regulations that require environmental assessments to be kept concise (CEQ 1986, Section 1508.9), this assessment only discusses resources which may actually be affected by the proposed action. The elements listed below are not discussed further in this EA because they would not be affected by the proposed action:

- air quality
- radioactive and hazardous waste management
- threatened and endangered species and their critical habitat
- agricultural resources
- historic sites
- floodplains and wetlands
- recreational resources
- noise levels
- right-of-way on public lands
- dredge and fill activities
- scenic resources

4.2.2. Water Quality and Effluents

Water is found in the LANL area in surface waters, shallow ground waters in alluvial fill, and in the main aquifer, which is located 180 to 360 m (600 to 1200 ft) deep below dry tuff and volcanic sediments. The shallow ground water occurs in perched zones that are not known to extend beyond the boundaries of LANL and are tapped only by monitoring wells.

There are no naturally-occurring, permanent surface waters in the project area. The nearest source of permanent surface water is the Rio Grande, which flows through White Rock Canyon about 11 km (7 mi) to the southeast of TA-16. All surface flows within the boundaries of LANL are temporary and result from storm runoff or from National Pollutant Discharge Elimination System (NPDES)-permitted outfalls from LANL facilities. These intermittent flows infiltrate alluvium in the canyon bottoms until their movement is impeded by less permeable tuff and volcanic sediment, creating shallow alluvial ground water bodies. Building 450 is currently attached to NPDES Outfall # 04A091.

The main aquifer, used for Los Alamos townsite and LANL drinking water supplies, lies 180-360 m (600-1200 ft) below the ground surface, separated from alluvial and perched waters by 110-190 m (350-620 ft) of dry tuff and volcanic sediments. There is no known hydrologic connection to the main aquifer from on-site alluvial groundwater.

4.2.3. Waste Products

LANL generates a variety of hazardous and non-hazardous waste products in the course of its research and development, maintenance, demolition, construction, and environmental restoration activities. Hazardous and radioactive wastes are collected and managed by the Waste Management group (CST-7) at LANL. Between 1986 and 1991, LANL generated an annual average of 5380 cubic meters (m^3) (190,106 ft^3) of low-level radioactive waste, 329 m^3 of transuranic wastes, 1736 m^3 (61,340 ft^3) of hazardous chemical wastes, and 365 m^3 (12,900 ft^3) of mixed (radioactive and hazardous) wastes. Of these totals, the WCTF contributes 0.2 m^3 (7.1 ft^3) per year to the hazardous waste category, or 0.01% of the total. No mixed waste is generated at the facility. (See the Glossary for a definition of waste types.) Low-level radioactive waste is buried at the existing TA-54, Area G landfill. Hazardous waste is shipped off-site for treatment and disposal.

Solid sanitary waste is collected by Johnson Controls, Inc., and delivered to the Los Alamos County Landfill. The WCTF contributes a small proportion of the total sanitary waste generated by LANL. Liquid sanitary wastes are collected via a LANL-wide collection system and treated at LANL's central waste water treatment plant before discharge via an NPDES outfall. The WCTF contributes a small amount to the total waste treated at the plant.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1. Environmental Consequences of the Proposed Action

5.1.1. Water Quality and Effluents

The relocation of the WCTF would not change the quantity of sanitary effluent produced by the lab. However, if the WCTF was relocated from Building 450, cooling water for pumps moved to Building 207 would then be supplied by a closed-loop system installed therein, eliminating the need for an industrial waste water outfall.

Building 450 is currently attached to NPDES Outfall # 04A091. The operations in the building place very little water into the industrial drain supplying this outfall, and evaporation usually eliminates the water before it reaches the actual outfall point. As a result, there has been no output from the outfall for several years. Upon the relocation of the WCTF, this outfall would be closed with cement and permanently eliminated. Since the recirculating pump cooling system in the relocated WCTF in Building 207 will not require an outfall, the proposed relocation would result in a net decrease in potential effluents.

5.1.2. Waste Products

The proposed action would produce some demolition waste from remodeling Building 207. This would consist primarily of broken concrete and other conventional construction materials that would be disposed of in the Los Alamos County Landfill by Johnson Controls, Inc. The proposed action would have no effect on the quantity of hazardous or radioactive waste produced by WCTF operations.

The renovation of Building 207 is also expected to produce a small amount of asbestos waste (less than 0.30 m^3 [<10 ft^3]) from the removal of the old heating system. Insulation around the steam pipes that enter the building contains uncontaminated asbestos. Certified subcontractors would conduct asbestos abatement (encapsulation, enclosure, and removal) before WCTF operations are relocated, and thus reduce the risk of worker exposure to asbestos. The subcontractors would conduct asbestos abatement in accordance with state and federal regulations. Appropriate personnel protective equipment, including respirators, would be used for the asbestos removal. Removed asbestos would be replaced by non-asbestos materials, if necessary. Uncontaminated asbestos wastes are held at TA-54, Area G pending shipment and disposal off-site by an independent contractor.

5.1.3. Personnel Protection

All of the personnel protection present in the existing WCTF (as discussed above in Section 2.1.1) would be incorporated into the new facility. The radioactive hazard associated with solid D-38, primarily from alpha and beta radiological emissions, would be minimal. WCTF personnel would occassionaly handle small quantities of D-38 material and then only for brief periods of time. They would also wear protective rubber gloves when they handle the D-38 material to further decrease their potential for beta radiation exposure. In comparison, in the Laboratory's Sigma D-38 foundry and the SM102 D-38 machine shop, personnel work with greater quantities of D-38 for longer periods of time, and yet their whole body doses, ranging from 10 to 50 mrem per month, are less than the Laboratory's yearly administrative limit of 2 rem and DOE's annual limit of 5 rem.

The primary hazard to workers would involve the particle or dust form of D-38 or beryllium, which would be hazardous if inhaled, ingested, or absorbed in a cut in the skin. However, because only wet sanding on the D-38 and beryllium would be allowed, and the operations do not produce dust, worker exposure to dust would be greatly reduced . Also, during sanding operations gloves would be worn to reduce the risk of particles entering the skin, and thorough hand washing would be required after handling.

In the new location, hydraulic lines would be completely enclosed in a stainless steel duct to reduce the possibility of injury from the accidental escape of high pressure hydraulic fluid.

5.1.4. Abnormal Events

Abnormal events, or accidents, are incidents that are not a planned part of normal operations. Even though industrial accidents are by far the most common type of accident, they are not considered in this assessment because they pose no greater risk than is normally accepted by the public and industry. Accidents can be classified into three categories: natural phenomena events, operational accidents, and external (non-operational) human-caused accidents. An example of an external event is an airplane crash into a facility. No external accidents are considered in this assessment because none is determined to be reasonably foreseeable during the lifetime of the WCTF. Although some natural phenomena accidents, such as an earthquake, may be reasonably foreseeable in the LANL area, the consequences of these events would not cause the release or dispersion of hazardous substances for either the proposed action or no action alternative. If test components with D-38 or beryllium were smashed in an earthquake, for instance, they would only break into smaller, solid pieces with no production of dust. The physical nature of D-38 is such that it is unlikely to shatter or break up into small, widely dispersed pieces. Beryllium, though more brittle, would not produce dust either. Therefore, accidents related to natural phenomena will not be considered here. Instead, operational accidents, the primary concern for facilities considered in this assessment, will be addressed here.

Potential Accidents During Test Operations

During structural load testing, a failed or misaligned component could result in the ejection of the test component. Standard Operating Procedures (SOPs) for the WCTF call for the placement of a large shield (made of a synthetic, very hard polycarbonate material) between personnel and the test component to mitigate this hazard, and additional smaller shielding may be placed immediately around the test sample when deemed necessary. Personnel would wear eye protection during testing. The failure of a component containing uranium or beryllium could result in the dispersion of fragments of this material within the lab. The physical nature of D-38 is such that it is unlikely to shatter or break up into small, widely dispersed pieces. Large chunks of a failed D-38 component would be easily gathered with very little potential for dust production. Beryllium, though more brittle, would not produce dust either. Personnel would wear appropriate protective gear including gloves to pick up broken pieces. D-38 and beryllium components are inspected before testing and are normally not tested if a failure seems possible. Because there would be no dust production in this type of accident, dispersion of radioactive or hazardous materials outside of the building is extremely unlikely in the event of a component failure. There would be no opportunity for workers or members of the public to inhale or ingest D-38 or beryllium particles.

Personnel injury by the impact of flying debris is also possible during pressure tests. This hazard is minimized by use of a containment box to contain pressure test samples. Electrical interlocks on the lid of the box prevent pressurization until the lid is securely closed. Escape of fragments outside the box or the building is extremely unlikely.

Tests involving assemblies containing actuators also present hazards. Up to ten components containing actuators may be kept in the facility at any time. Storage of bare actuators is not allowed. Accidental firing of the actuator could operate the valve, which could release a small quantity of gas or create a flying missile hazard that could injure personnel. To reduce the possibility of accidental firing, the following procedures are followed: The actuator assemblies are not subjected to temperatures in excess of 82° C (180° F); all circuit test equipment used on actuators would not have an output current exceeding 10 milliamperes; actuators would not be physically altered without ESA-11 Group Office approval; shorting plugs are installed on the actuators when they are handled; and assemblies are handled away from any sources of stray electrical currents. Following these procedures, actuators installed in valves present no chance of injury to personnel or equipment while being handled.

To further reduce personnel risk, the actuator assemblies would be test fired remotely in a containment box. If the actuators are installed in valves that are not connected to gas filled reservoirs, the actuators may be tested outside of the containment box; in this case, adequate barriers would be placed between the actuator and personnel. Except for the actuators, the test components are inert. In addition, established SOPs would be used when handling and testing actuators. The potential for worker injury would be small and there would be little chance of significant environmental release. In over 25 years of testing at LANL, there has never been an accident involving actuators in WCTF operations.

The beryllium deforming tests would be conducted in an oven that normally attains temperatures of up to 480° C (900° F). This is not hot enough to melt or volatilize beryllium

The potential for worker injury would be small and there would be little chance of significant (melting point = 1289° C/2352° F). A ventilation system is installed over the oven to remove heat, and this would be installed with the unit in its new location. Although the heated equipment presents a burn hazard, an accidental release of beryllium particulate or vapor from operation of this equipment is extremely unlikely. The oven provides containment and the test samples are not likely to fragment and disperse. The heating mechanism is fitted with redundant temperature controls to prevent an accidental overheating of the samples. Even if redundant temperature controls should fail, the likelihood of reaching temperatures high enough to melt beryllium is remote because the heating mechanism would self-destruct at a temperature lower than the melting point of the material.

Potential Accidents During D-38 and Beryllium Instrumentation

The potential for a radioactive release during the instrumentation of D-38 and beryllium is minimal. Few of the operations in the WCTF could cause a fragmentation into particulate. SOPs in place at the facility require all cleaning of D-38 and beryllium to be done with a small amount of solvent in order to minimize dust hazards. As mentioned above in Section 4.2.4, air samples taken within 0.305 m (12 in.) of D-38 during cleaning and spot welding showed no detectable radioactivity, and air samples taken during cleaning and spot welding of beryllium components indicated that the concentrations of beryllium and ammonia were well within acceptable health and safety standards as set by the American Conference of Governmental Industrial Hygienists. If prescribed SOPs were violated and a series of components was cleaned with dry sand paper, production of D-38 dust would be extremely small and still below detection limits. Contamination of the outside atmosphere would be extremely unlikely. D-38 is sometimes heated to approximately 90°C (194°F)—well below its melting point of 1135°C (2075°F)—to cure adhesives used in instrumentation. The heating mechanism is fitted with dual, redundant thermostats to prevent an accidental overheating of samples. Even if both temperature controls should fail, the heating mechanism would fail at a temperature lower than the melting point of uranium.

The WCTF operations involve the use of flammable chemicals. The potential for a fire, however, is very low because only very small quantities of flammable chemicals are used, and SOPs for the facility require flammable chemicals to be stored in a special cabinet. During their use, the chemicals are handled under a ventilation hood, and afterwards they are disposed of according to proper LANL disposal procedures. Welding activities would be done in a dedicated room with safety provisions in place to prevent the possibility of a fire. Neither D-38, beryllium, or any flammables would be allowed in the welding room. Because the likelihood of a fire is very low, an accident involving a fire is not discussed here.

Potential Accidents in Support Operations

Abnormal events associated with support activities in the WCTF might include skin and/or eye damage from laser welding operations, injuries from the escape of high pressure hydraulic fluids, and burns, cuts and electrical shock resulting from machine shop operations. These are all mitigated by building design, which isolates laser and conventional welding operations, and by safe operating procedures. None of these has the potential to cause significant environmental impacts.

5.2. Environmental Consequences of the No-Action Alternative

The no action alternative would mean that the activities described above in Section 2.1.1, Operational Activites, would continue where they are presently, Building 450. Because there would be no change in operational activities, the no action alternative would not cause any changes in air quality and water quality. For this same reason, the no action alternative would continue to generate the same amounts and types of waste products from the current operations. The one difference between the proposed action and the no action alternative is the generation of asbestos waste: no asbestos waste would be generated in the no action alternative because the operations would not relocate to nor necessitate remodeling Building 207.

5.2.1. Abnormal Events

Abnormal events associated with the no action alternative are the same as those discussed for the proposed action, described above.

6. LIST OF AGENCIES AND PERSONS CONSULTED

No groups or persons external to LANL were consulted for this assessment.

7. PERMIT REQUIREMENTS

No environmental permits have been determined to be needed for this project at this time.

APPENDIX A: REFERENCES

CEQ 1986, "Provisions for Implementing the Procedural Provisions of the National Environmental Policy Act (40 CFR Parts 1500-1508). " Office of the President of the United States, Council on Environmental Quality.

DOE 1979, "Final Environmental Impact Statement, Los Alamos Scientific Laboratory Site, Los Alamos, New Mexico," United States Department of Energy, Los Alamos National Laboratory, DOE/EIS-0018.

LANL 1993, *Environmental Surveillance at Los Alamos During 1991*, Los Alamos National Laboratory LA-12271-MS (March 1992).

Martin, W.C., and C.R. Hutchins, *A Flora of New Mexico* (J. Cramer, Germany, 1980).

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, ACGIH (American Conference of Governmental Hygienists, Cincinnati, Ohio 1992).

APPENDIX B: GLOSSARY OF UNITS AND TERMS

D-38	depleted uranium, >99% uranium 238
EA	Environmental Assessment
EPA	United States Environmental Protection Agency

g gram: a unit of mass and weight in the metric system, equal to the mass of one cubic centimeter of water: equivalent to 0.035 ounces

Hazardous Waste any non-radioactive waste ultimately destined for treatment or disposal that is corrosive to living tissue, flammable, reactive, toxic, carcinogenic, teratogenic, mutagenic, or infectious, or that in any way presents a threat to human health or the environment as defined in 40 CFR Part 261. These wastes are regulated under RCRA subtitle C. Common hazardous wastes generated at LANL includes all types of research chemicals, solvents, acids, bases, carcinogens, and compressed gases. This category may also include equipment, containers, structures, etc., intended for disposal and contaminated with hazardous waste.

LANL the Los Alamos National Laboratory.

lb-force a unit of force equivalent to 4.448 Newtons

Low-Level Radioactive Waste (LLW) any waste that is derived from a radioactive material or becomes contaminated during process, or becomes activated by a high energy particle beam—excluding spent nuclear fuel, high level radioactive waste, and transuranic waste. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided that the concentration of transuranics is <100 nCi/g of waste.

m meter, a unit of length equal to 3.28 feet

micron unit of measure in the metric system, equal to one millionth of a meter (1×10^{-6} meters); equivalent to 0.00004 inches.

Mixed Waste waste containing both radioactive and hazardous components as defined by the Atomic Energy Act and the Resource Conservation and Recovery Act. Included are solvents, pyrophoric substances, spray cans, and other chemically contaminated radioactive items.

N A unit of force equal to the force needed to accelerate a mass of one kilogram one meter per second per second.

NESHAPs National Emissions Standards for Hazardous Air Pollutants—a set of standards, in the Clean Air Act, that sets limits for beryllium and radionuclides.

TA Technical Area, a location designation at LANL

TLV the Threshold Limit Value expresses airborne concentrations of a material to which nearly all workers can be exposed day after day without adverse effects.