# 2.0 DESCRIPTION OF ALTERNATIVES

Section 2.1 describes the Proposed Action for the EA that would allow NNSA to meet its purpose and need for agency action. Two additional alternatives are presented in Section 2.2 and 2.3, respectively. The No Action Alternative is presented in Section 2.4 as a baseline for comparison with the consequences of implementing the Proposed Action. Alternatives that were considered in this EA but were not analyzed further are discussed in Section 2.5, and related actions are identified in Section 2.6.

## 2.1 PROPOSED ACTION TO CONSTRUCT AND OPERATE A BSL-3 FACILITY AT LANL

NNSA proposes to construct and operate a BSL-3 facility at LANL to be operated for the purpose of preparing samples to be used in biological research projects (PC 2001j and 2001k). LANL's existing BSL-2 laboratory capability is primarily located at TA-43, HRL (PC 2001g) (see Figure 2-1). As proposed, the BSL-3 facility would be a pivotal asset for future advanced biological sciences research and development performed by LANL's Bioscience Division but would not replace the other biological laboratory capabilities at LANL. The Bioscience Division would continue to support current biological sciences initiatives at LANL through the existing BSL-2 laboratories.

Three locations at or near LANL's TA-3 (Figure 2-1) have been identified as potentially suitable sites for the BSL-3 facility in terms of accessibility to site utilities and infrastructure, engineering requirements (such as soil structure, stability and similar characteristics), seismic requirements, adequacy of construction space, space for vehicle parking, compatibility with other LANL functions, and other similar siting requirements. Each of the three potential sites is discussed in later subsections as optional sites for construction. In each instance, the building, parking, and access road could be sited anywhere within the identified optional sites. At all location options, the construction and operation of the facility would be the same (PC 2001l).

The BSL-3 facility would be designed as a state-of-the-art facility. It would include two BSL-3 laboratories with adjoining individual mechanical rooms separated by a central support BSL-2 laboratory, clothes-change and shower rooms, and associated office space. When complete, the BSL-3 facility would be about 3,000 $ft^2$ (279 $m^2$) in total size and occupied by no more than 10 workers. Up to five staff members from the existing HRL at TA-43 (Figure 2-1) could be relocated to the new facility while other part-time workers would retain offices at their current locations. Any difference in staffing may be made up by hiring locally or regionally, as necessary, to find qualified individuals.

The BSL-3 facility would be designed with a lifetime expectancy of 30 years (minimum) of operation. At the end of the facility's useful life, final decontamination and demolition would be performed as needed. A separate NEPA compliance review would be performed at

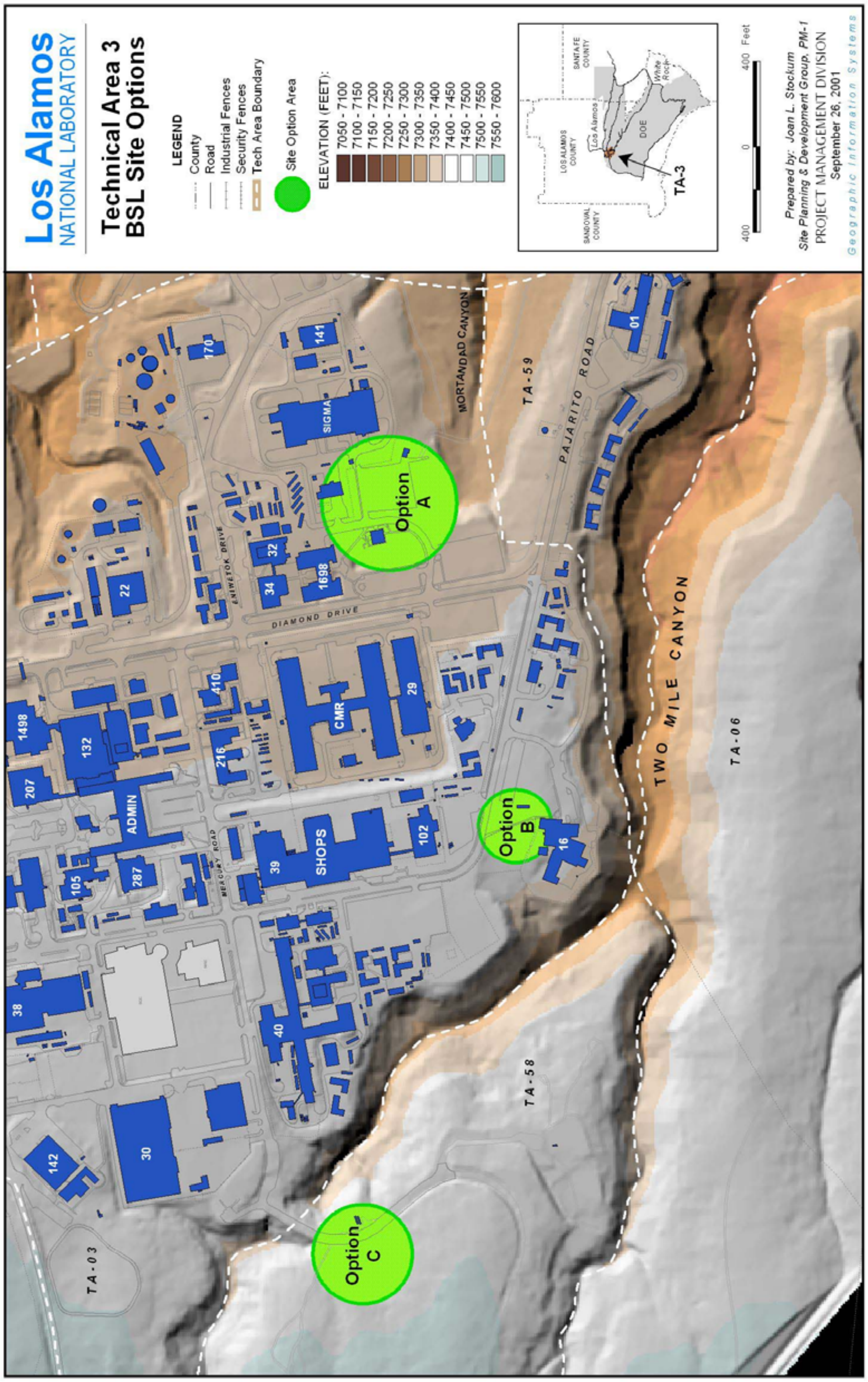


Figure 2-1. Three optional locations for the proposed BSL-3 facility at LANL.

that time. During the operational life of the building, the performance of routine maintenance actions would be expected.

The proposed BSL-3 facility would not be used to produce bioweapons. Additionally, the facility could not be converted for use as a BSL-4 level facility. Neither of these uses could be supported in a facility of this size and design and with the equipment that would be installed in the laboratory rooms as proposed. The facility would also not be used to support experiments that involve propellants or high explosives combined with microorganisms. The design of the facility would not facilitate work with such materials.

### 2.1.1 Proposed BSL-3 Facility Locations and Construction Measures

**Option A:** This proposed TA-3 location is adjacent to Sigma Road and the paved parking area southwest of the "Sigma" Building (Bldg. 3-66), north of the intersection of Pajarito Road and Diamond Drive (see Figure 2-1). During construction, approximately 15 parking spaces of the paved parking area would become temporarily unavailable for use (PC 2001c); this portion of the parking area would be required for construction material and equipment storage and used for BSL-3 facility pre-assembly activities. Less than 1 acre (43,560 $ft^2$ or 4,047 $m^2$) of previously disturbed land next to the parking area would be bladed over during the construction phase of the project (PC 2001c). The removal of some trees and ground cover would occur in selected portions of the site. Parking needs during the short construction phase would be met by having 15 to 20 parking spaces relocated to nearby parking areas (PC 2001d). Parking needs post construction would be adequately met by the existing parking lot. Utilities necessary for construction and operation of the BSL-3 facility would be available within 350 ft (107 m) of the construction site facility; this includes potable water within 350 ft (107 m), sewer within 350 ft (107 m), electricity within 275 ft (84 m), and telephone service within 250 ft (76 m). Trenches would have to be dug to bring utilities to the site with depths of about 4 ft (1.3 m) for potable water and sewer, 3 ft (1 m) for electrical power and 2 ft (0.6 m) for telephone and communications (PC 2001d). Infrastructure revitalization of LANL's "core planning area" which includes several TA's and all of TA-3 (this proposed site location) calls for near-term sewer line upgrades to current 10-in (25-cm) lines going to the wastewater treatment plant (LANL 2000b).

**Option B:** This proposed TA-3 location is just to the north of the "Ion Beam Facility" (Bldg. 3-16). The BSL-3 facility would be constructed on the west side of the building's northeast paved parking lot. The parking lot is also adjacent to the south side of Pajarito Road (see Figure 2-1). During construction, approximately 15 existing parking spaces would become temporarily unavailable (PC 2001d); this portion of the parking area would be required for construction material and equipment storage and used for BSL-3 facility pre-assembly activities. Less than 1 acre (43,560 $ft^2$ or 4,047 $m^2$) of previously disturbed land would be bladed over during the construction phase of the project (PC 2001c). The removal of some trees and ground cover could occur in selected portions of the site. Parking needs during the short construction phase would be met by having 15 to 20 parking spaces relocated to nearby parking areas (PC 2001d). Parking needs post construction would be adequately met by the existing parking lot. Utilities necessary for construction and operation of the BSL-3 facility would be available within 100 ft (31 m) of the construction site. These include potable water within 50 ft (15 m) away, sewer within 10 ft (3 m), electrical power within 75 ft (23 m), and telephone service within 100 ft (31 m). Trenches would have to be dug to bring utilities to the site with depths of about 4 ft (1.3 m) for potable water and sewer, 3 ft (1 m) for electrical power, and 2 ft (0.6 m) for telephone and communications (PC 2001d). Infrastructure revitalization of LANL's "core planning area" which includes several TA's and all of TA-3 (this proposed site location) calls for near-term sewer line upgrades to current 10-in (25-cm) lines going to the wastewater treatment plant (LANL 2000b).

**Option C:** This proposed location is within TA-58, southwest of the TA-3 main administrative area (Figure 2-1). Less than 1 acre (43,560 $ft^2$ or 4,047 $m^2$) of previously disturbed land would be bladed over during the construction phase of the project (PC 2001c) for the construction of the facility and associated vehicle parking needs. The removal of some trees and ground cover could occur in selected portions of the site. No parking is currently available on this site, therefore, there would be no disruption of parking during construction activities and no necessity to relocate parking spaces. Utilities necessary for construction and operation of the BSL-3 facility would be available within 550 ft (168 m) of the construction site facility. This includes potable water within 350 ft (107 m) away, sewer within 550 ft (168 m), electrical power within 500 ft (152 m), and telephone and communications within 450 ft (137 m). Trenches would have to be dug to bring utilities to the site with depths of about 4 ft (1.3 m) for potable water and sewer, 3 ft (1 m) for electrical power, and 2 ft (0.6 m) for telephone and communication (PC 2001d). Infrastructure revitalization of LANL's "core planning area" which includes several TA's and all of TA-58 (this proposed site location) calls for near-term sewer-line upgrades to current 10-in (25-cm) lines going to the wastewater treatment plant (LANL 2000b).

**Construction Measures:** The project construction sites are located at areas that have previously been cleared of buildings or structures or within existing paved parking areas. No undeveloped (so called "green field") areas would be involved. No construction would be conducted within a floodplain or a wetland. The building would not be constructed over a known geologic fault or vertical displacement of a fault line, nor would it be sited within 50 feet of such a condition. No construction would be conducted within solid waste management units (SWMUs) or near SWMUs in a fashion that might preclude their cleanup.

The BSL-3 facility building, as well as the parking area (in the case of the TA-58 optional site location), would be designed in accordance with guidance for BSL-2 and BSL-3 laboratories established by the CDC and NIH (CDC 1999, NIH 2001). Detailed construction plans would not be undertaken before NNSA makes a decision to pursue the action. The CDC would review the detailed construction plans prior to their implementation and make any recommendations for changes necessary. The building structure would meet or exceed the design requirements for a new building described in the LANL Facility Engineering Manual , Chapter 5-Structural (LANL 1999a, DOE 2000c) with respect to Dead, Live, Snow, Wind and Seismic Load Conditions and Design Criteria. DOE Order O420.1 (DOE

1996b) also requires natural phenomena hazard mitigation for these non-nuclear facilities and was used for preparing the design criteria. The Natural Hazards Performance Category for this facility was evaluated by the LANL Preliminary Hazards Analysis (PHA) (LANL 2001b) as "Performance Category 2 (PC-2) "analogous to the design criteria for essential facilities (for example, hospitals, fire and police stations, centers for emergency operations)." The PHA also evaluated the facility using DOE STD 1021 (DOE 1996a) and concluded that the proposed facility would be an "Important or Low Hazard" building classification (LANL 2001b). Also, in accordance with the hazard assessment and definitions contained within LANL Implementing Requirements (LIR) 300-00-05.0 for facility hazard categorization (LANL 1999e), this facility was determined to be a "moderate hazard" facility showing "the potential for considerable on-site but only minor off-site consequences to people or the environment…" (LANL 2001b).

Sustainable design features would allow the structure to operate with improved electric and water use efficiency and would incorporate recycled and reclaimed materials into the construction as much as practicable while still meeting the requirements specified by CDC for laboratory interiors. For example, the facility could incorporate building and finish materials and carpets and furnishings made of reclaimed and recycled materials, low-flow lavatory fixtures to minimize potable water use, and energy-efficient lighting fixtures and equipment to reduce electric consumption. The finished landscaping of the involved construction area would utilize captured precipitation, reused and recycled materials, and native plant species. Utility services are sufficiently located adjacent to or near the proposed building sites and would require minimal trenching to connect them to the new structures.

Clearing or excavation activities during site construction have the potential to generate dust and encounter previously buried materials. If buried materials or remains of cultural significance were encountered during construction, activities would cease until their significance was determined and appropriate subsequent actions taken. Standard dust suppression methods (such as water spraying) would be used onsite to minimize the generation of dust during all phases of construction activities.

Construction of the facility (and parking lot in the case of the TA-58 optional site location) would be performed using common construction industry methods, as the operational use of these structures does not have potential hazards that would entail unique structural requirements. All construction work would be planned and managed to ensure that standard worker safety goals are met. All work would be performed in accordance with good management practices, with regulations promulgated by the Occupational Safety and Health Administration, and in accordance with various DOE orders involving worker and site safety practices. The construction contractor would be prohibited from using chemicals that generate *Resource Conservation and Recovery Act* (RCRA)-regulated wastes (40 CFR 261). Engineering best management practices (BMPs) would be implemented at the building site chosen as part of a Storm Water Pollution Prevention (SWPP) Plan executed under a National Pollutant Discharge Elimination System construction permit. These BMPs may include the use of hay bales, plywood, or synthetic sedimentation fences with appropriate supports installed to contain excavated soil and surface water discharge during construction of the BSL-3 facility. After the facility is constructed, mounds of loose soil would be removed from the area.

During site preparation and construction noise levels would be consistent with single-story frame non-residential construction using metal studs and cross members. The use of welding equipment, graders, air compressors, riveting tools, and heavy equipment is reported to range from 65 to 125 dBA[6] continuous or intermittent noise. Power actuated tools (for example, those for setting fasteners into concrete) can go up to 139 dBA of impact-type noise near the point of generation (ACGIH 2000).

Vehicles (such as dump trucks) and heavy machinery (such as bulldozers, dump trucks, cranes, and cement mixer trucks) would be used onsite during the construction phase. These vehicles would operate primarily during the daylight hours and would be left onsite over night. If needed, temporary task lighting would be used. Wastes generated by site preparation and construction activities are expected to be nonhazardous. Soil would be staged at the building site or at the construction debris storage yards located at TA-60 along Sigma Mesa until reuse on the site or at other LANL or off-site locations. Non-reclaimable or recyclable wastes would be disposed of in the Los Alamos County Landfill or its replacement facility.

Construction of the BSL-3 facility is estimated to start in 2002 and take approximately 12 months to complete. Construction materials would be procured primarily from local New Mexico suppliers. Construction workers would be drawn from local communities and those across northern New Mexico.

After construction of the facility, gravel or other natural material may be placed at close-in areas to enhance site drainage away from the building. Landscaping materials would consist of native species planted with soil amendments as necessary, depending on the site chosen. Site soil and rock removed during construction would be returned and used as landscaping as practicable. The areas surrounding the building (and TA-58 parking lot) would be cleared of excess soil and landscaped. The landscaping would incorporate, to the maximum extent practicable, a design to capture and utilize area precipitation to minimize the need for permanent water augmentation. Low-pressure sprinklers may be required to supply water for the establishment of plants and grassy areas over the first year or two of growth. Native plants of the Pajarito Plateau would be used primarily where practicable. Other native New Mexico plants that may require drip system water augmentation could be used minimally.

[6] dBA refers to sound level in decibels measured on a sound level meter using the A-weighted scale as established by the American National Standards Institute (ANSI, 1983)

**Figure 2-2. Conceptual floor plan for the proposed BSL-3 facility at LANL**

### 2.1.2 BSL-3 Facility Description and Operations

**Facility Description:** The proposed BSL-3 facility would be a one-story building with about 3,000 $ft^2$ (279 $m^2$) of floor space (Figure 2-2) housing two BSL-3 laboratories, and one BSL-2 laboratory, as well as associated support office space, lavatories, and mechanical and electrical equipment areas. The BSL-3 facility would be constructed using concrete footing and stem walls with concrete slab-on-grade floors (PC 2001j). Walls would be steel stud framed and the roof construction would consist of metal decking over steel bar joists. The exterior walls would have an application of stucco and the painting of the building would be visually consistent with surrounding structures. The interior surfaces of walls, floors, and ceilings of the BSL-3 laboratory areas would be constructed for easy cleaning and disinfection. The walls would be finished with an easily cleanable material with sealed seams, resistant to chemicals and disinfectants normally used in the laboratory. Floors would be monolithic and slip-resistant. All penetrations in floors, walls, and ceiling surfaces would be sealed, or capable of being sealed to facilitate disinfection, aid in maintaining ventilation system air pressures and keep pests out. Laboratory furniture would be capable of supporting anticipated loading and use, bench tops would be impervious to water and resistant to moderate heat, chemicals used, and disinfection solutions. Spaces between benches, cabinets, and equipment would be accessible for cleaning. Figure 2-3 shows a conceptual equipment layout for the facility.

The two BSL-3 laboratories and the BSL-2 laboratory would each have two Class II biological safety cabinets[7] (BSCs) (CDC 2000b) (Figure 2-4) with thimble connections.[8] Class II BSCs provide their own airflow, have High Efficiency Particulate Air-Purifying (HEPA)[9] filtration internally within the cabinet and are designed to provide personal, environmental, and product protection (that is, the samples being processed). Exhaust air from the BSCs exits the room via the thimble connection to HEPA filters in the mechanical rooms, then outside the building. BSCs are designed to operate at a minimum inward flow of a 100 linear ft per min (30.5 linear m per min) at the sash opening (face) (CDC 2000b). BSCs would be located away from doors, room supply louvers, and heavily traveled laboratory areas (LANL 2001b). BSC interiors are cleaned by use of appropriate methods and could include ultraviolet light or chemical disinfection. No windows would be installed in the BSL laboratory's exterior walls. Non-opening observation windows on interior walls would be placed between the BSL-2 and BSL-3 laboratories (Figure 2-2). Centrifuges or other equipment that may produce aerosols would be operated in BSCs or with appropriate combinations of personal protective equipment (PPE) and other physical containment devices. Vacuums would be provided to critical work areas using portable vacuum pumps

---

[7] A BSC is a piece of equipment often referred to as a "hood," which is the primary means of containment developed for working safely with infectious microorganisms.

[8] A thimble connection is where an inverted cone-like duct with a flexible connector fits over the BSC exit duct with a 1 inch gap between the two ducts allowing for room air to be exhausted.

[9] HEPA is a disposable, extended-medium, dry-type filter with a particle removal efficiency of no less than 99.97% for 0.3-micron particles.

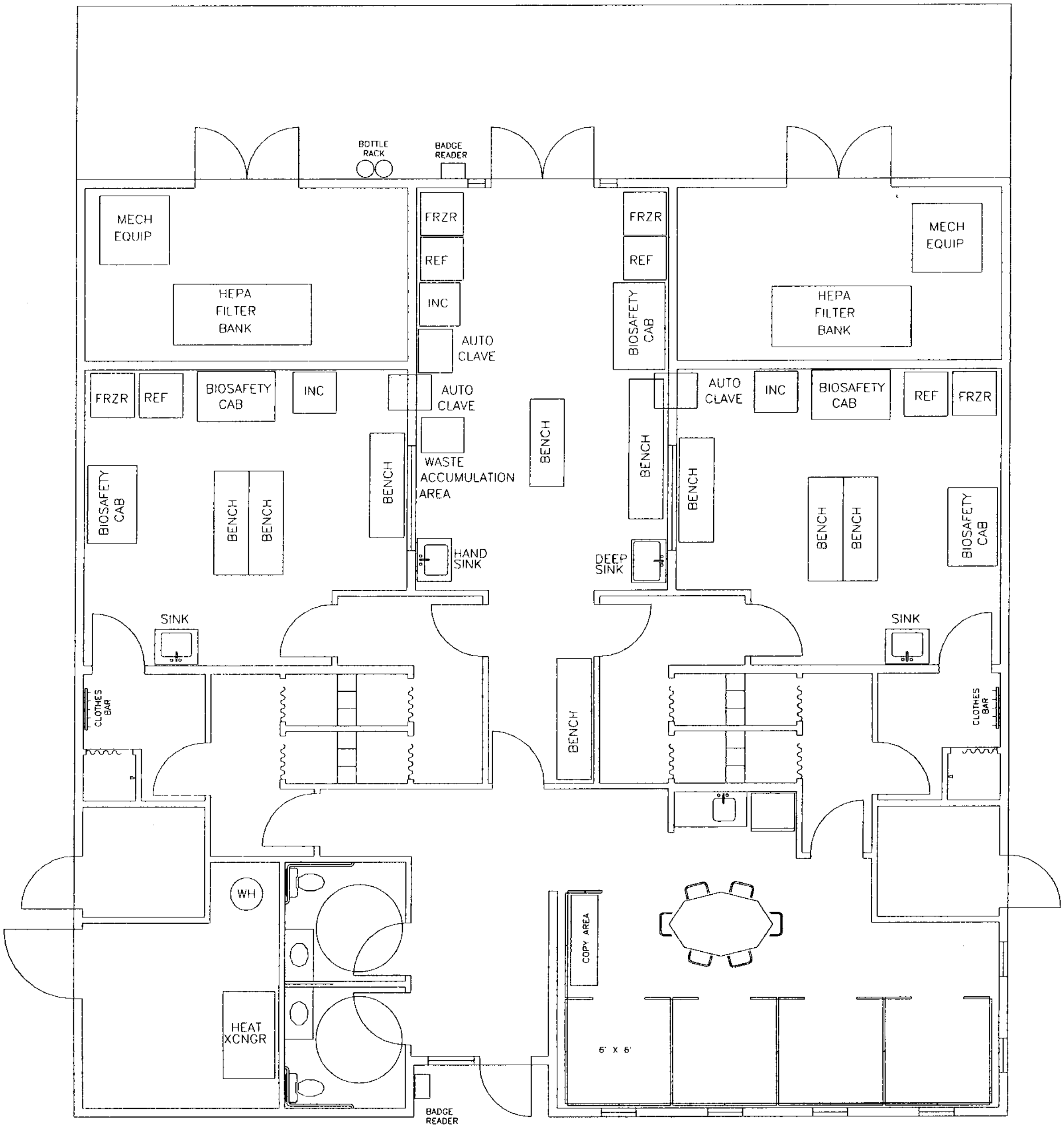


Figure 2-3. Conceptual floor plan showing equipment layout for the proposed BSL-3 facility at LANL

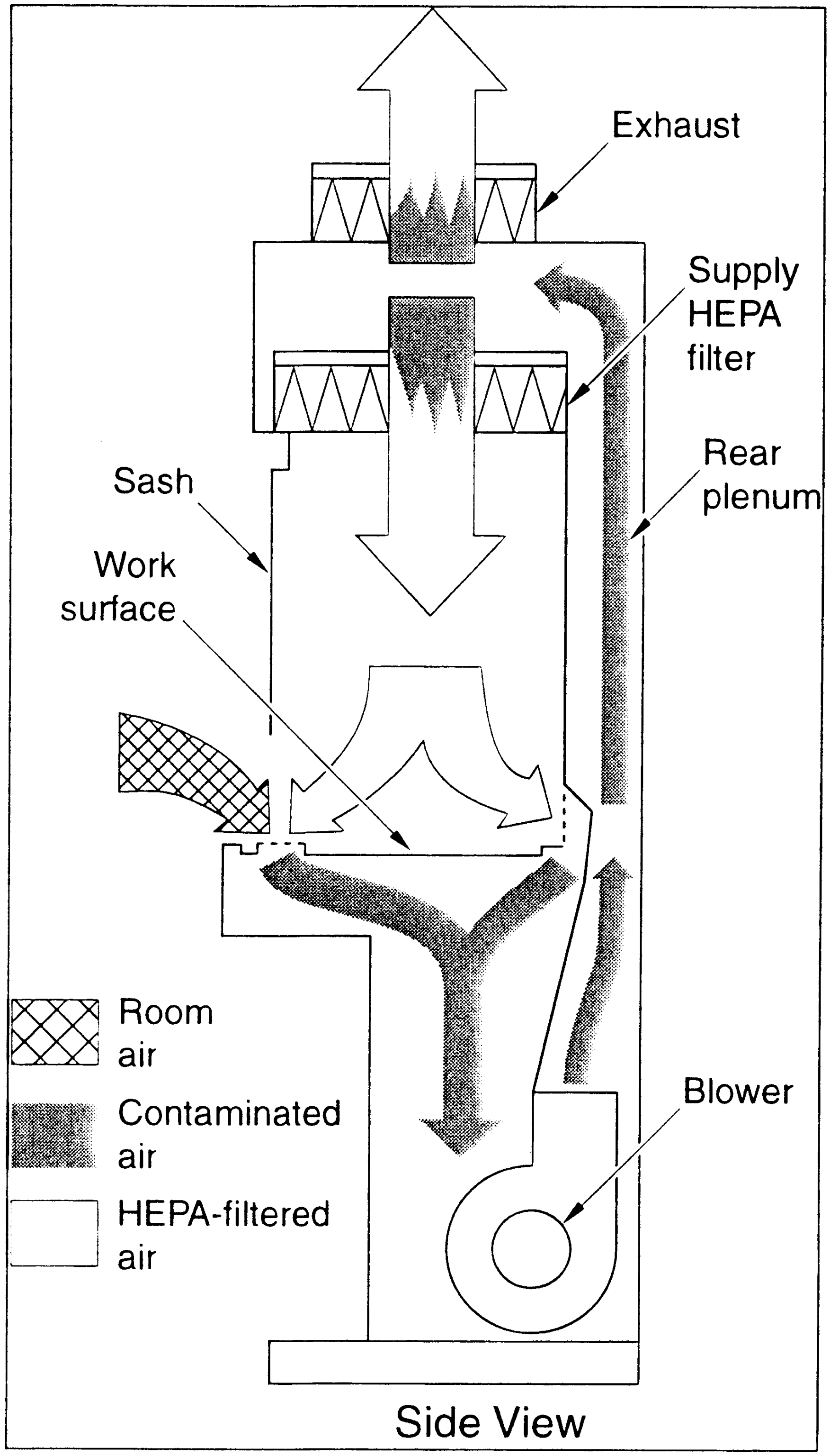


Figure 2-4. Schematic diagram of a typical Class II Type B3 BSC (CDC 2000b)

properly fitted with traps and HEPA filtration. Operation of all equipment is designed to avoid interference with the air balance of the cabinets or the designed airflow of the building (Figure 2-5). No "real time" monitoring instruments for microbes are presently available. When such instruments have been developed and become available they may be installed at the BSL-3 facility.

Physical security would be implemented commensurate with the level of work being performed within the facility. Examples of physical security measures could include badge readers, perimeter fencing and anti-vehicle collision barriers. In regards to national security the facility status would be based upon a security analysis. As in all facilities managed by the LANL Bioscience Division, security in the proposed facility would be maintained by limiting access to only authorized DOE-badged personnel. Employee qualifications and training are described in CDC-NIH guidelines (CDC 1999) along with appropriate management of security concerns.

Fire suppression for the BSL-3 facility would be provided by a standard wet-pipe fire sprinkler system. Waterflow alarms would be connected to LANL's fire alarm monitoring station so that designated responders would be notified. Water used for fire suppression that might become pooled on the building floor would be treated with chemical disinfectants. There would be no floor drains or subsurface sumps to collect this water (PC 2001g).

Separate mechanical rooms containing the facility air-handling systems are proposed for the BSL-3 facility with access provided only from the exterior of the building (Figure 2-5). The two BSL-3 laboratories would each have their own separate mechanical rooms that would also contain each labs' respective HEPA filter banks that would filter all room air one-time-through and provide secondary filtration for exit air from the BSCs. Routine maintenance of the filter bank would be conducted, including replacement of the filters. Replaced filters would be chemically sterilized prior to disposal. The BSL-2 laboratory and the rest of the facility would be on a separate mechanical air-handling system that would be exhausted without HEPA filtration. There would be only one electrical room with access from the exterior of the building. The BSL-3 facility would employ lightning protection designed to meet the requirements of the National Fire Protection Association (NFPA 1997 and 2000). Entry of personnel into the BSL-3 laboratories would be from the BSL-2 or office areas through two doors that are interlocked so that only one can be opened at a time. A rear entry area into the BSL-2 would permit entry of delivery items, access to compressed gas cylinders, and a 120 liter liquid-nitrogen container, and serve as a second point of egress from the building under emergency situations (Figure 2-3) (LANL 2001b).

The air-handling systems, including the heating, ventilation and air conditioning (HVAC) systems, would be designed to provide for individual temperature and ventilation control zones as required in the BSL-2 and BSL-3 laboratories and in accordance with LANL directives (LANL 2001h). A ducted exhaust HVAC system would draw air into the BSL-3 laboratories from the office areas toward and through the BSL-3 laboratories areas with no recirculation from the BSL laboratories to other areas of the building (Figure 2-5). The

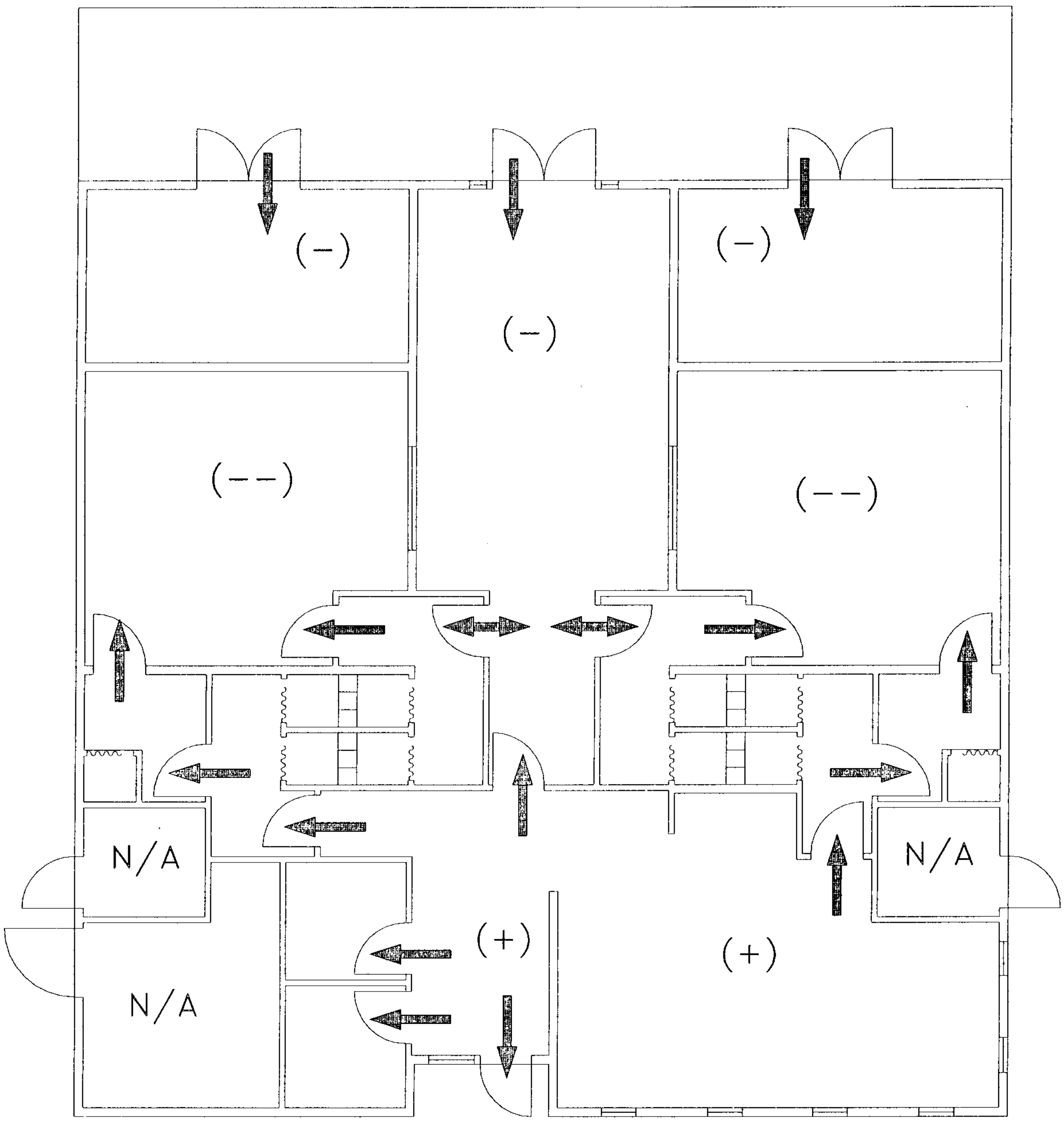


Figure 2-5. Schematic diagram of airflow in the proposed BSL-3 facility at LANL

BSL-3 laboratories would be under the most negative pressure with respect to all other areas of the building. Air exhaust would be dispersed away from occupied areas. Direction of airflow into the laboratories and the BSCs would be verifiable with appropriate gauges and an audible alarm system to notify personnel of HVAC problems or system failure. In the event of a power outage, all biological materials would immediately be placed in a "safe" configuration, such as confinement or chemical disinfection. The HVAC systems may be supplied with backup power from a dedicated BSL-3 facility diesel generator to minimize power supply interruption. Exhaust stacks would be placed well above the roof (10 ft or 3 m or greater) and away from the buildings' air intakes.

The non-laboratory areas of the building would be provided with separate air circulation. Should power be lost to the building and the HVAC system, the air supply system would shut down and zone-tight dampers would close automatically to prevent air migrating from the laboratory areas to other areas of the building. Interior doors located between the BSL-2 and BSL-3 laboratory areas would be equipped with interlocking hardware to prevent simultaneous opening.

All liquid waste from the BSL-3 laboratory work would undergo autoclaving in accordance with LANL waste management directives (LANL 1999b, 2000c) and would then be discharged into the sanitary waste disposal system through laboratory sinks. Tap water entering the BSL-2 and BSL-3 laboratories through spigots in the sinks would have backflow preventers to protect the potable water distribution system from contamination (PC 2001g). Biological cultures could be disposed of in the sinks after undergoing treatment with chemical disinfectants for at least one hour (PC 2001g).

At any of the optional locations the electrical requirements for the BSL-3 facility would be about 60 kilowatts (kW); the building would be equipped with a diesel generator sized to supply laboratories with electric power in the event of a power failure from the supply grid system. In the event of a power outage, the generator would immediately supply electricity to the laboratories so that workers could shut down the laboratories safely. The main building electricity supply would come from a 13.2-kilovolts (kV) overhead feeder line to the site. A 112.5-kV Amperage (kVA) pad mounted transfer and a 480-volt (V) distribution panel-board would be installed to provide 480 V electrical service to the building with transformers to drop the power to the 120 V and 208 V needed to operate facility equipment. This electrical power supply system would also be equipped with Transient Voltage Surge Suppression (TVSS) devices. HVAC systems, boilers, and heaters would use the 480-V service.

At all three optional locations, parking would be in a common-use lot with at least 10 standard parking spaces, plus two for handicapped accessible near the building entry (ANSI 1998) and two for visitors. Exterior lighting would be provided for all parking conforming to applicable building codes and minimizing light dispersion particularly towards canyons habitat areas (PC 2001l).

**Operations:** The BSL-3 facility would be operated according to all guidance and requirements established by the CDC and NIH (CDC 1999). Prior to operating the facility using select agents, the facility would be registered with a unique registration number from the Secretary of the US Department of Health and Human Services (HHS) according to the U.S. *Code of Federal Regulations* (CFR) requirements by providing "sufficient information that the facility meets biosafety level requirements for working with the particular biological agent" (42 CFR 72). The CDC is the supporting governmental agency under the HHS responsible for the management of the Laboratory Registration/Select Agent Transfer (LR/SAT) Program and would be the main point of contact for LANL's Facility Responsible Official. UC would be required to participate in the CDC LR/SAT Program for handling of select agents[10] and must follow the six LR/SAT components as appropriate, which include (1) the list of approximately 40 "select agents" that are "viruses, bacteria, rickettsia, fungi, and toxins whose transfer in the U.S. is controlled due to their capacity for causing substantial harm to human health;" (2) registration of the facilities; (3) filing of approved transfer form; (4) verification using audits, quality control, and accountability mechanisms; (5) agent disposal requirements; and (6) research and clinical exemptions (42 CFR 72). No select agents would be handled in the proposed BSL-3 laboratories without prior CDC registration and approval, and UC would be required to follow the LR/SAT requirements. Microorganisms that are not select agents would also be used in the BSL-3 laboratories but would still be handled according to CDC and NIH guidances and requirements (PC 2001g). Experimental microorganisms expected to be cultured at the BSL-3 facility would be the select agents, tuberculosis (certain *Mycobacterium spp*.), and influenza viruses (see Appendix E). The CDC and NIH guidances and requirements also extend to handling genetically altered microorganisms. All microbiology laboratories routinely alter microbial genomes in standard procedures approved by NIH (NIH 2001). It is likely the facility would receive genetically altered microorganisms. Before any infectious microorganisms would be handled in the BSL-3 laboratories, the IBC and the researcher, in accordance with CDC guidance, would perform a risk analysis. LANL occupational medicine and the local medical community would be informed of the microorganisms to be handled in the BSL-3 laboratories and would be aware of the methods of identification and control of associated diseases.

All work with infectious microorganisms in the proposed facility must be approved by the IBC and authorized by UC management in strict accordance with the following directives:

- Biological Weapons Convention Treaty (BWC 1972) permits defensive research for the purpose of developing vaccines and protective equipment
- DOE Biosurety Program provides oversight and guidance on biological programs within the DOE complex. This includes the recently issued DOE Notice N450.7 on handling transfer and receipt of etiologic agents at DOE facilities (DOE 2001c)

[10] Select agents are biological agents of human disease whose transfer or receipt requires a facility to be registered with the CDC under 42 CFR Part 72.6; select agents have historically been associated with weaponizing efforts.

- Appendix G of the UC Contract with DOE specifies among other things, Work Smart Standards, which include adopted standards from CDC (CDC 1999, 42 CFR 72), NIH (2001), and the U.S. Occupational Safety and Health Administration (OSHA) (29 CFR 1910, 29 CFR 1926)
- LANL Administrative Requirements, such as Laboratory Performance Requirements and Laboratory Implementation Requirements (for example, LANL 1999b, 1999d, 1999f, 1999g, 2000c, 2001d) provide partial frameworks for the operation of facilities
- LANL Institutional Biosafety Committee Charter reviews and approves of each biological research project before it can be undertaken at LANL
- When completed,[11] LANL safety and security documentation (Facility Safety Basis, Facility Safety Plans, Hazard Control Plans, Human Pathogens Exposure Program, and security assessments) would provide partial framework for operation of the BSL-3 facility
- When completed, division and facility specific protocols (for example, Laboratory Implementation Guidance, standard operating procedures, and technical memos) would provide partial framework for operation of the BSL-3 facility

Operation of the proposed BSL-3 facility would also be in compliance with a variety of state and Federal regulations. For example, these regulations would include those promulgated by the U.S. Department of Agriculture (7 CFR 330, 9 CFR 92), U.S. Department of Commerce (15 CFR 730), OSHA (29 CFR 1910.1030), U.S. Postal Service (USPS) (39 CFR 111), U.S. Department of Transportation (DOT) (49 CFR 171-178), and the HHS (42 CFR 72). NNSA, LANL, and CDC requirements would be certified as having been met before operations would begin at the proposed BSL-3 facility (DOE 1996a, 1996b; LANL 1999b, 1999c, 2000c, 2001c; PC 2001j, 2001k). Other non-governmental organizations that provide guidance for transportation of infectious agents include the *Dangerous Goods Regulations,* the *Infectious Substances Shipping Guidelines* of the International Air Transport Association (IATA 2001), and the *Guidelines for Safe Transport of Infectious Substances and Diagnostic Specimens* of the World Health Organization (WHO) (WHO 1997).

Once all the regulatory conditions are met and the required approvals' are obtained then operations would commence at the BSL-3 facility. A typical workflow for the use of the building's laboratories is outlined in the schematic diagram presented in Figure 2-6. The process steps are discussed in more detail in the following paragraphs.

Appropriate PPE used by employees entering the laboratories would include eye protection, gloves (in some cases the worker would be double-gloved), and disposable lab coat or clothing (including disposable booties and disposable cap). Workers' hands would be

[11] Safety and security documentation, as well as facility specific protocols, are not completed until after decisions have been made to construct and operate buildings and detailed building designs have been completed. Therefore, these are future documents that would be completed for the BSL-3 facility if NNSA decides to proceed with its construction and operation.

**BSL-3 Laboratory**
**Sample Process Flowchart**

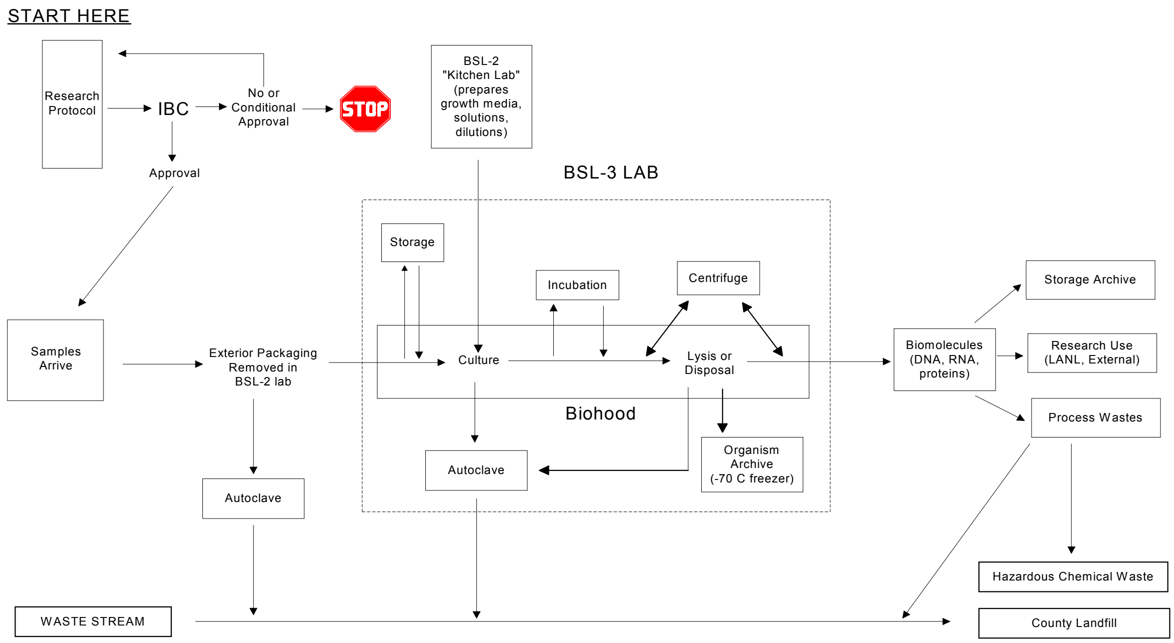


Figure 2-6. Conceptual workflow schematic for the proposed BSL-3 facility at LANL.

washed with disinfectant immediately before and after putting gloves on or after any potential contamination with infectious agents. Workers could shower after finishing their laboratory work upon removal of their PPE clothing. Worker's hair would be kept short or secured away from the face and no skin would be exposed below the neck; workers would be required to wear socks, closed shoes, and long pants underneath the disposable coverings. The majority of all materials used in the BSL-3 facility would be disposable, but some reusable laboratory apparatus, such as glass test tubes or culture dishes may be needed for sterile work. No open flames would be allowed within the BSCs. Work in the three laboratories would be scheduled and planned to avoid conflicts within the laboratory areas. All workers in the BSL-3 laboratory areas would be informed of what other workers are handling so that appropriate staging of work can occur. Open cultures would only be handled in BSCs. No "sharps" would be used in the facility (such as needles). There would be no procedures for these laboratories to intentionally produces aerosols that could cause microbes to become airborne. BSCs would be negative-pressure with respect to the room and airflow and would always be directed away from the worker and into the BSC. Workers would be offered appropriate immunizations for the microorganisms being handled, they would be tested for normal immunocompetancy[12], and would have medical treatment readily available in the event of an accidental exposure (PC 2001g). As part of LANL's Emergency Management and Response Program, DOE has agreements in place for the education and

[12] Immunocompetancy is the ability to have normal immunity from infection.

assistance of local hospital personnel to facilitate their participation in the event of any type of accident, including any accidental exposures from the operation of the proposed BSL-3 facility.

No radiological material would be used or stored in the BSL-3 facility. Additionally, no macroorganisms, such as research animals or plants, would be housed or used in the facility. UC does not maintain an animal colony at LANL. A pest program would be in place to control vector populations.

The BSL-3 facility would not be a large-scale research or production facility, which is defined as working with greater than 10 liters of culture quantities (NIH 2001). Quantities of each cultured microorganism would be further limited per experiment-specific IBC approval procedures. Samples would be provided by commercial suppliers, research collaborators, or other parties seeking culture identification. Samples may contain either previously identified or unidentified organisms or strains. Identification provides diagnostic, reference or verification of strains[13] of microorganisms present. Diagnostic and reference strains, which may include the geographic source of the sample, contribute to the understanding of the microorganism's ability to cause disease. Rapid, accurate reference or verification of strains improves containment of infection through early and effective medical intervention, potentially limiting the progress of illness for those exposed to pathogens.

The CDC would periodically inspect the facility over the life-time of its operation. The inspections would be performed by CDC staff or their contractors.

**Samples Arrive at the LANL BSL-3 Facility for Processing:** Sample shipments would only be received at the BSL-3 facility within all established guidelines and requirements. Select agents would only be accepted when the CDC form (EA-101) has been completed per regulations, registration verified, and the requesting facility responsible official had been notified in advance of shipment according to CDC registration requirements. Samples could only be shipped to LANL by commercial package delivery services, the U.S. Postal Service, other authorized entity, or delivered to the receiving area from an origination point within LANL by a designated LANL employee acting as a courier (39 CFR 111; 42 CFR 72; 49 CFR 171-178; LANL 1999b). Generally, shipment sample sizes would be small; a typical sample would consist of about a milliliter of culture media (agar solid) with live cells (a milliliter is about equal to a teaspoon in volume size). Smaller samples could be shipped that would be microliters in size; the maximum possible sample size would be 15 milliliters. Occasionally samples would be shipped frozen in culture media. Receipt of the select agents must be acknowledged electronically by the requesting facility responsible official within 36 hours of receipt and a paper copy or facsimile transmission of receipt must be provided to the transferor within 3 business days of receipt. Upon this acknowledgement, the transferor would be required to provide to the LANL-requesting-facility responsible official a

[13] Strains are the very lowest taxonomic (naming organisms) designation, it generally means cells descended from a single isolate which have not mutated from the exact DNA sequence of that original single cell.

completed paper or facsimile transmission copy of the CDC form within 24 hours to the registering entity (holding that facility's registration), in accordance with §72.6(c)(2) (42 CFR 72) for filing in a centralized repository.

All in-coming packages (regardless of origination point) containing infectious agents would have to have been packaged in DOT-approved packages (42 CFR 72) (see Figure 2-7). These packages would be about 6 to 8 inches (15 to 20 cm) in height and about 3-4 inches (8 to 10 cm) in cylinder diameter. All shipping containers would be made of plastic and the samples would be double or triple contained. Transportation and interstate shipment of biomedical materials and import of select agents would be subject to the requirements of the U.S. Public Health Service Foreign Quarantine (42 CFR 71), the Public Health Service and DOT regulations. Additionally, the U.S. Department of Agriculture regulates the importation and interstate shipment of animal or plant pathogens (7 CFR 330 and 9 CFR 92). Strict chain-of-custody procedures for samples arriving at the LANL receiving site would be followed.

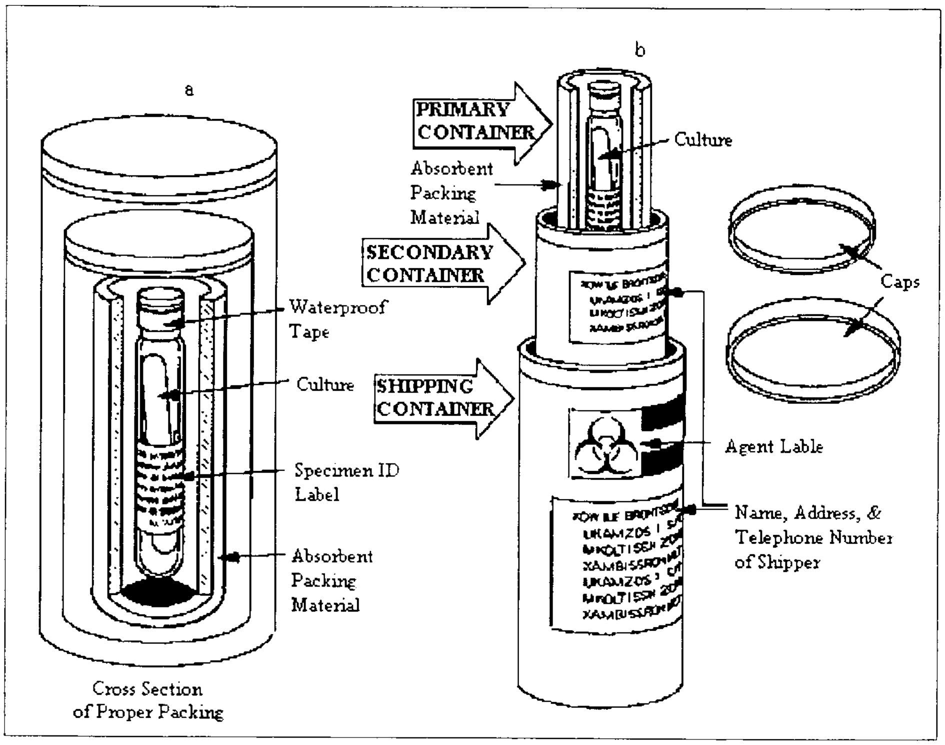


Figure 2-7. Example of a Primary Shipping Package.

The BSL-2 laboratory within the proposed facility would serve as the shipping and receiving point for biological samples and materials shipped from the facility or shipped to the facility. Biological shipments to and from LANL could initially be as much as ten times the current levels (4 in and 2 out per month now) of shipments to existing LANL biological research laboratories. Current estimates are that shipments to and from LANL would be about 10 to

60 per month (PC 2001i) for the BSL-3 facility. Once the facility became fully operational and "stocks" were established, the level of shipments would remain above current levels for these types of shipments but decrease from start-up levels. Due to the perishable nature of the samples at the BSL-3 facility, receiving and shipping of samples normally would only occur during weekday daylight hours and samples must be opened and used or restored (put in growth media) within 8 hours of arrival (PC 2001g). External packaging material from packages received at the facility would be inspected, removed, autoclaved,[14] and disposed of according to LANL waste handling procedures (LANL 1999b, 1999c, and 2000c). The biological material samples and their packaging would be left intact and in accordance with the established chain-of-custody record. The packages would be placed in safe and secure condition within the respective BSL-3 laboratory where workers would process them. Shipment of samples from the BSL-3 facility to other researchers or the CDC would require following the same guidelines and requirements for the sample shipment that applied to samples received at the facility.

The samples may arrive at LANL in various fresh, frozen, or "fixed" (for example, in formaldehyde) forms (shown in Appendix E-1, LANL-Proposed Action Microorganisms) including aqueous liquids, solids, or contained in bodily fluids (PC 2001g). Samples would normally only contain vegetative forms (active growing stage) of microorganisms but some spores could be present in samples. Other samples may contain proteins, DNA, or attenuated microorganisms (organisms that have been partially inactivated). Purified or diluted biological toxins work would not be planned for these BSL-3 laboratories, but incidental quantities may be present due to the microorganism producing them (PC 2001g).

Upon arrival at the BSL-3 facility, these samples would be examined for damage, logged in, and taken to the BSL-2 laboratory for removal of the external packaging material (LANL 2001b). Damaged packages would be handled in accordance with procedures for BSL-3 laboratories. The removed packaging would then be autoclaved and disposed as solid waste (LANL 1999c). The interior packing with the intact sample would be placed safely and securely in the respective BSL-3 laboratory under chain-of-custody procedure until the authorized researcher is ready to process the samples. Unpacking the select agent primary container would only be done in the BSC. The samples would be stored in the BSL-3 laboratory within a locked freezer or refrigerator, according to the needs of the sample for preservation. Inventories of all samples and cultures would be kept. Samples and cultures would be identified by a numeric or alpha-numeric code rather than by the name of the microorganism or source. Sensitive information about samples and results would be maintained elsewhere at LANL in a safe and secure manner in accordance with applicable NNSA and LANL security requirements. The samples could also be immediately processed, in which case the materials would be placed directly into culture media (such as a liquid or semi-solid nutrient material or media prepared in the BSL-2 laboratory). All preparations and manipulations of cultures or samples would only occur within a fully operating BSC either in a BSL-2 or a BSL-3 laboratory as appropriate for the microorganism. When the

[14] An autoclave is an apparatus using superheated steam under pressure to kill or sterilize microorganisms.

external packaging materials are removed they would be autoclaved within the facility and disposed of according to LANL's solid waste handling procedures (LANL 1999c).

**<u>Culture of Samples in a BSL-3 Laboratory:</u>** Once the samples would be removed from their primary containers in a BSC, a tube, flask or plate containing a specific nutrient media would be innoculated with the sample to create a culture. All culture work would be completed and cleaned up within one work shift (8 hours) except for materials being incubated. Culture and culture-storage containers would typically be made of plastic and always be double-contained. The culture container would be transferred to a temperature-controlled incubation chamber to grow the organisms (multiply the number of microorganisms) for a period lasting up to several days. Centrifugation of live, intact microorganisms would be conducted in sealed containers placed inside sealed tubes to minimize the potential for aerosolization[15] of microbes, or, if appropriate, centrifugation could be conducted inside a BSC. Cultured materials, which are sources for research materials, could be "lysed" (broken open) or killed (inactivated) by the addition of a variety of chemicals such as detergents or a chemical known as phenol. The lysed or killed cells could be processed into biomolecular samples that would later be analyzed by various research methods at various LANL bioscience research laboratories and other laboratories off-site. Following incubation (hours to days), all cultured materials would be cleaned up within one shift (8 hours).

**<u>Waste Generation at the BSL-3 Facility:</u>** It is expected that little soil and construction debris would be generated from site preparation and construction activities of the proposed BSL-3 facility that would require disposal and removal from the construction site. Construction debris that is generated would be sent to the Los Alamos County Landfill at TA-61 (or its replacement facility) for disposal or recycling as appropriate. Sanitary waste from portable toilets used during construction would be removed by commercial vendors and be disposed in a sanitary sewer system offsite from LANL in accordance with their permit requirements.

During operation of the BSL-3 and BSL-2 laboratories, the interior working surfaces of the BSCs would be disinfected after each use, which would generate waste products. All wastes generated in the laboratories of the facility (including sample packaging materials, culture materials, petri dishes, PPE, and associated process wastes) would leave the laboratories only after decontamination using the facility's autoclave or after being chemically sterilized. Additionally, waste regulated as "infectious" biological waste (20 NMAC 9.1) would be segregated from other wastes at the point of generation and would also undergo autoclaving. The autoclaving process involves placing waste to be autoclaved in a special container. When autoclaving occurs, an indicator strip on the container changes color. This allows facility workers and waste management workers to be able to tell at a glance whether waste has undergone autoclaving. Performance of the autoclave is automatically tracked

[15] Aerosolization is the process of converting a liquid into droplets that are small enough to become dispersed in the air. In this case the droplets may contain one or more microbes.

electronically to insure its effectiveness. This method is the same waste management method used by hospitals and similar facilities to sterilize their waste. These "treated" special wastes would be disposed of at the Los Alamos County Landfill or other appropriate facility. Solid waste landfills may accept autoclaved or chemically sterilized wastes for disposal according to their individual waste acceptance criteria and operating permit requirements. Alternatively, UC could contract to send sterilized wastes produced by the proposed BSL-3 facility to a commercial incinerator located offsite for waste disposal. These special wastes would have a production rate of about 50 lbs (23 kg) per week for a total of about 2,600 lbs per yr (1,200 kg per yr) (PC 2001g). Other "solid waste" generated in the offices and other non-laboratory portions of the facility would raise the total solid waste production to about 5,200 lbs per yr (2,360 kg per yr) (PC 2001g). Solid wastes would be disposed of at the Los Alamos County Landfill or its replacement facility.

Sanitary liquid waste, solid waste, and hazardous waste would be generated from the proposed BSL-3 facility. Sanitary waste would be generated from toilets, showers, and sinks in the building bathroom facilities. Sinks in each of the three laboratories would also generate sanitary waste. Soluble or liquid waste materials generated from laboratory operations could be disposed in the laboratory sinks after first being treated with disinfectants (PC 2001i). This waste, which would be about 300 gal per day, would be transported to the Sanitary Waste Systems Consolidation (SWSC) Plant via the LANL sanitary sewer system (see Section 3.3.4). No industrial waste and no radiological waste would be generated by the facility. None of the waste generation would be relocated from another LANL facility.

Wastes regulated by the State of New Mexico as "hazardous" would be generated when organic solvents (such as phenol, chloroform, and isoamyl alcohol) would be used to lyse cells for DNA, ribonucleic acid (RNA), proteins, and lipids research. These would be small volumes of materials (less than 10 ml per sample) that could amount to about 230 lbs per yr (104 kg per yr) (PC 2001g). Hazardous wastes would be collected at the site of generation in a satellite accumulation area and would be managed by the LANL waste management program (as are other waste types), then disposed of offsite at permitted commercial facilities. Removal of waste containers from the BSL-3 would occur only after the exteriors of the containers were wiped off with disinfectants. This step would only be conducted by the authorized BSL-3 laboratory technicians and researchers. Waste containers would then be moved to the satellite storage area for proper storage and disposal (LANL 1999c, 1999g, and 2000c). The effectiveness of disinfecting and autoclaving would be periodically tested.

Chemical disinfectants would be used to disinfect portions of the laboratories that are not readily accessible, such as the ductwork. These disinfectants would be in a gas form as appropriate for the respective chemical. The space to be disinfected would be sealed, personnel would be excluded and the gas would remain in the space for several hours before release to the environment. This procedure would be conducted by a certified technician using a standard protocol. The quantities of chemicals used would be well below the reportable quantities for both the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 300) and the Emergency Planning and Community

Right-to-Know Act (EPCRA) (40 CFR 350). For example, if paraformaldehyde is used, the CERCLA reportable quantity is 1000 lb. and for the vapor phase produced, formaldehyde, it is 100 lb. The EPCRA reportable threshold for formaldehyde is 10,000 lb. Formaldehyde is also listed as a Hazardous Air Pollutant (HAP) under the Clean Air Act Amendments. HAP's are limited to 10 tons per yr individually. Formaldehyde is also a volatile organic compound (VOC). Other disinfectants being considered for use in disinfecting the BSL-3 laboratories are ethylene oxide and hydrogen peroxide. Quantities used annually would not exceed reportable quantity volumes for any chemical disinfectant used by the BSL-3 facility. Decontamination of the facility would include the use of chemical disinfectants, as discussed in the previous paragraph. This would allow the facility to be decontaminated, decommissioned, and demolished using standard construction practices. The resulting waste could be disposed of at the Los Alamos County Landfill or its replacement facility.

### 2.1.3 BSL-3 Facility Decommissioning and Decontamination

The ultimate decommissioning or decontamination of the BSL-3 facility would be considered and a separate NEPA review would be conducted when the facility is no longer needed. It is estimated that the operational design life of the proposed building would be at least 30 years.

## 2.2 ALTERNATIVE ACTION TO INSTALL PREFABRICATED FACILITY UNITS (PREFABRICATION ALTERNATIVE)

The NNSA may choose to purchase and install ready-assembled prefabricated BSL-3 and BSL-2 modular units, which could be placed together with a modular units made up of offices, lavatories and other rooms required to form a new BSL-3 facility. No permanent on-site constructed facility, as described in the Proposed Action, would be built. Such a facility would be about the same size as the permanent on-site constructed facility described in the Proposed Action. These commercially available modular units would be nearly ready for occupancy when delivered to LANL. The units would be transported from their construction site by truck and delivered to LANL and could be operable within several months from the time of purchase.

As a general initiative, NNSA is pursuing the construction of permanent buildings in preference to temporary structures at LANL because the long-term cost savings associated with operating permanent on-site constructed buildings, combined with their longer expected useful life, makes this a more fiscally prudent action. Additionally, NNSA is encouraging the placement of new facilities away from forest interface areas at LANL and encouraging the construction of permanent facilities over the use of transportables or modular buildings in the wake of the Cerro Grande Fire. Permanent facilities can be constructed to house larger numbers of personnel and operations in structures that are readily defensible from wildfire, which is an important feature for the LANL site. The construction of new facilities with modular buildings is therefore inconsistent with the LANL Comprehensive Site Plan 2000 (CSP) planning principles (LANL 2000b), which calls for "Upgrade facilities by replacing temporary, outmoded and substandard facilities with new, permanent or renovated facilities as appropriate." This alternative, while not a preferred method of construction at LANL, would meet the DOE's need to act quickly.

The requirements for the installation of a prefabricated modular BSL-3 facility at any of the three optional LANL facility sites (described in Section 2.1) would be the same as required for the on-site construction of the Proposed Action's permanent building. The same amount of land would require disturbance and utilities would be installed in the same manner as for the Proposed Action. The same construction standards would apply to the construction of the modular units. Concrete footings or a pad may be constructed at the site, depending upon the selected construction design requirements. Delivery of the modular units to LANL would likely require transportation by several trucks over a distance of no greater than 2,500 miles each way. This is roughly comparable to the number of miles of transport required to deliver building materials to LANL from in-state suppliers in order to build the Proposed Action's on-site constructed facility. Once delivered to the chosen facility site, a large crane would be required to remove each modular unit from the delivering truck and place it upon the previously prepared ground, concrete footings or pad. After all the modular laboratory units and the office units were installed, and all required finishing construction work was performed, the facility would be operated in the same manner as identified for the Proposed Action in Section 2.1. Construction time frame and time of installation completion for the modular units would be about the same as for the proposed action. Operation could commence about 12 months after the modular units were ordered.

Decontamination and either demolition, removal, or reuse of the modular facility would likely occur sooner than necessary for the facility described in the Proposed Action, as the useful life of modular units would not be as long as for that of a permanent on-site constructed facility. The estimated useful life span of the modular facility would be a minimum of 20 years as compared to the approximate minimum useful life span of about 30 years for a permanent on-site constructed building. After decontamination (which could include disinfection) the modular units could be disassembled and disposed of through the existing LANL program for excess government property. This would ultimately require that the facility's modular components be moved offsite from LANL. Alternately, the units could be demolished and disposed of in a solid waste landfill either at LANL or offsite. Another alternative would be the reuse of the facility, either in whole or in part by other LANL users. Additional NEPA compliance review would be required when the decontamination and further actions were ripe for decision.

### 2.3 ALTERNATIVE ACTION TO INSTALL AND OPERATE A PREFABRICATED BSL-3 LABORATORY UNIT AND CONSTRUCT AND OPERATE A PERMANENT ON-SITE CONSTRUCTED BSL-3 FACILITY (PARTIAL PREFABRICATION/BUILD ALTERNATIVE)

The NNSA may choose to purchase, install and operate a ready-assembled, prefabricated BSL-3 laboratory modular unit as a stand-alone facility while constructing a permanent building onsite to house a BSL-3 facility as described by the Proposed Action. This would be a hybrid alternative to the Proposed Action and the Prefabrication Alternative, as it would involve elements of both. The Partial Prefabrication/Build Alternative would require the delivery and installation of a small (less than 1,000-square-foot) modular unit equipped to function as a stand-alone BSL-3 laboratory at one of the optional construction sites (described in Section 2.1) or at a similar LANL site where utility services were already available at TAs 54 and 16. The delivery, installation, and operation of this facility would proceed at about one-third the scale of activities for modular units described for the Prefabrication Alternative, with the exception of the installation of utilities. The same construction standards would apply to the construction of the modular unit. The installation of utilities would be required at both the stand-alone modular BSL-3 facility site and the site where the permanent on-site BSL-3 facility was constructed and would involve similar trenching and other installation as described for the Proposed Action. The small modular facility would require the support of existing LANL BSL-2 laboratories and office spaces for some of the operational activities required. From the time of ordering to the point of operation, the modular BSL-3 unit would require about 6 months or less. It is anticipated that the modular BSL-3 facility would be operated for about 12 to 18 months while the construction of the permanent on-site BSL-3 facility was undertaken over a 12 month period as identified for the proposed action. Upon the completion of the permanent facility and the initiation of its operation, the small modular BSL-3 facility would be decontaminated and decommissioned or reused. It would likely be disposed of through the LANL program for excess government property and remove off-site from LANL. It may be reused to provide additional LANL laboratory work at a BSL-2 or lower level, or for other laboratory-type work, yet unlikely at this time. Additional NEPA compliance review would be required when the decontamination and disposal or reuse of the modular unit was ripe for decision.

As a general initiative, NNSA is pursuing the construction of permanent buildings in preference to temporary structures at LANL because the long-term cost savings associated with operating permanent on-site constructed buildings, combined with their longer expected useful life, makes this a more fiscally prudent action. Additionally, NNSA is encouraging the placement of new facilities away from forest interface areas at LANL and encouraging the construction of permanent facilities over the use of transportables or modular buildings in the wake of the Cerro Grande Fire. Permanent facilities can be constructed to house larger numbers of personnel and operations in structures that are readily defensible from wildfire, which is an important feature for the LANL site. The construction of new facilities with modular buildings is, therefore, inconsistent with the LANL CSP 2000 planning principles (LANL 2000b) which call for "Upgrade facilities by replacing temporary, outmoded and substandard facilities with new, permanent or renovated facilities as appropriate." This alternative, while not a preferred method of construction at LANL, would meet the DOE's need to act quickly.

### 2.4 NO ACTION ALTERNATIVE

The No Action Alternative provides a description of what would occur if the Proposed Action were not implemented to compare with the potential effects of the Proposed Action.

It must be considered even when the Proposed Action is specifically required by legislation or court order (10 CFR 1021.321[c]). Under the No Action Alternative, NNSA would not construct or operate the BSL-3 facility. In this event, NNSA would continue to have their BSL-3 laboratory needs met by existing or new BLS-3 laboratories located offsite from LANL. It is expected that while the LANL workload would grow, no new workers would be hired within the Biological Science Division at LANL since the program would likely stagnate without growth potential. There would continue to be certain NNSA national security mission needs that could not be met in a timely fashion, or that may not be able to be met at all. The No Action Alternative would not meet NNSA's identified purpose and need for action.

## 2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER ANALYSIS

Additional alternatives were considered but have been dismissed from detailed analysis in this document. These alternatives are discussed individually in Sections 2.3.1 through 2.3.5.

### 2.5.1 Use and Upgrade of an Existing Building at LANL to House a BSL-3 Facility

The alternative of upgrading an existing building or portion of a building structure at LANL to house a BSL-3 facility was considered for three different sites. A review of available space was made at LANL and "…no existing facilities were found that were appropriate for modification given the requirements of the BSL-3. The BSL-3 requires very special ventilation requirements and the mission on most existing buildings is not consistent with the work that is to be done in the BSL-3 Lab. The cost of upgrading existing facilities to the extent required for the BSL-3 would likely be as much or more than building a new facility even if an acceptable facility was found (PC 2001e)." The environmental effects of renovation-construction would be increased over new construction due to the amounts of waste construction debris likely to be generated that would require disposal at LANL or offsite. The environmental effects of operating a BSL-3 facility would likely be the same or very similar in either case of remodeling or building a new facility.

Discussions with CDC personnel (see Chapter 6) indicate that their experience with upgrading and retrofitting existing facilities leaves much to be desired both from the cost and end result. The biggest issues appear to be from HVAC retrofits and pest control. It is CDC's opinion (PC 2001a, 2001b) that their combined short- and long-term costs of modification and maintenance for existing structures tend to exceed the projected costs for new facilities and poses greater health risk. Their collective recommendation is to construct a new dedicated facility. Consequently, this alternative, while meeting the purpose and need for NNSA's action was dismissed from further consideration in this EA.

### 2.5.2 Construction and Operation of the Proposed BSL-3 Facility at More Remote LANL Locations or Within the Research Park at LANL

Construction of the proposed BSL-3 facility at locations more remote from public residences than the TA-3 area was considered. Available locations at LANL were identified that met the required construction requirements, including the close proximity of necessary utilities; however, there were other problems such as traffic concerns and greater vulnerability to wildfire. The environmental effect of construction and operation of a BSL-3 facility at these sites would be very similar to or greater than the Proposed Action. The potential site locations further from public residential populations offered no discernible advantages environmentally, and locating the facility at greater distances from the scientists that would use the facility who would be located at or near TA-3 would offer the disadvantage of added costs and environmental effects. This alternative was dismissed from further consideration in this NEPA analysis although it would meet the Agency's purpose and need for action.

The Research Park is an approximately 60-acre (24-hectare) tract of land located in TA-3 at LANL that has been leased by DOE to the Economic Development Corporation. The leased land would be used to establish a research park with facilities for a wide range of companies to work in the same geographic location and benefit from a well-planned environment suited to business needs. The intent of the lease is to assist Los Alamos County toward self-sufficiency by providing other options for offsetting the elimination of DOE annual assistance payments. This alternative is not considered viable since it would (1) require retrofitting of an existing structure (see discussion in Section 2.3.3); (2) would place operations in a less secure surrounding with regards to national security; and (3) would not meet public access and information-sharing requirements of the lease. This alternative for the BSL-3 facility was not considered further in the NEPA analysis.

### 2.5.3 Construction and Operation of the BSL-3 Facility at Another National Security Laboratory

The NNSA supports three national security laboratories: LANL, the Sandia National Laboratories at Albuquerque, New Mexico (SNL/NM) and Livermore, California (SNL/CA), and Lawrence Livermore National Laboratory (LLNL), at Livermore, California. Construction and operation of the BSL-3 facility at either SNL or LLNL to the exclusion of LANL was considered, as it is possible to construct such a facility at any of the national security laboratories at approximately the same cost and schedule. This alternative would not meet the purpose and need for NNSA's action to conduct future BSL-3 level work at LANL in support of its national NNSA security-and-science assigned mission responsibilities, however. Having a BSL-3 laboratory prepare samples offsite at either of the distant facilities for LANL experiments would require the samples to be shipped to LANL or in the case of SNL, they could be couriered to LANL (both SNL and LLNL are located at least 100 miles from LANL).

This alternative would almost be the same as the No Action Alternative with the exception being that work could be done under more precise quality assurance procedures and with the necessary national security requirements needed. However, it would not allow the work to be performed as fast as may be needed in all cases. Rapid, accurate reference or verification of strains improves containment of infection through early and effective medical intervention potentially limiting the progress of illness for those exposed to pathogens. LANL has qualified and experienced personnel and a sophisticated existing biological infrastructure. Placing the BSL-3 laboratory at another NNSA laboratory would require significant duplication of this capability. Work at each of the national laboratories is expected to complement rather than be duplicated at each of three national laboratories. While these other facilities may consider the construction and operation of a BSL-3 facility in the future, the operation of these laboratories would be directed toward meeting their individual mission work requirements and would not be identical to that performed by the other laboratories in the NNSA complex. Therefore, the alternative to constructing a BSL-3 facility at either of two other national security laboratories is not considered further in this EA analysis as it does not meet NNSA's purpose and need for agency action at LANL.

## 2.6 Related Actions

UC at LANL, as required by DOE in 1997, conceived a draft LANL comprehensive site plan that included the revitalization of TA-3, along with other portions of LANL's technical areas. The draft comprehensive site plan was issued by UC on January 31, 2000 for stakeholder and public review (LANL 2000b). As conceived in 1999, the LANL draft comprehensive site plan would have required a level of funding that is not currently planned by NNSA and Congress in order to be realized in its entirety; an attempt to seek third party financing for site plan implementation was not successful. In January 2001, NNSA requested that UC at LANL, along with other NNSA site facility contractors, revise their facility comprehensive site plans according to new guidance for aligning the site planning process with budget formulation and execution, starting with the Fiscal Year (FY) 2003 budget planning. Consequently, UC submitted the new LANL 10-Year Comprehensive Site Plan to NNSA in October 2001. After NNSA approval is obtained, the plan would be issued to LANL stakeholders. As directed by NNSA, this 10-Year Comprehensive Site Plan will be revised annually to support the budget request for the following budget year. Given the nature of the 10-Year Comprehensive Site Plan as a constantly evolving tool for site planning and budgeting purposes, regulatory compliance strategies will not be developed for implementation as a whole. Review of each proposal would be made to ensue the project's overall consistency with the general LANL site planning process. To that end, the Proposed Action under consideration in this EA has been reviewed and found to be consistent with the LANL site planning process.

Construction activities are being considered, or, in some cases, are already underway within the general TA-3 location at LANL and would be ongoing or nearing completion in the same timeframe as the proposed BSL-3 facility. Currently being proposed for construction at TA-3 are new replacement structures for the existing Building 3-43 (known locally as the "main administration building"). This construction action was considered in a separate EA issued this year along with a Finding of No Significant Impact (DOE 2001d). The relationship of the new structures to the Proposed Action being analyzed in this document is one of general location and general construction timeframe only, the two proposals are independent of each other in all other aspects. The anticipated timeframe for construction is from 2002 to 2005. Currently under construction for the replacement structures for Building TA-3-43 is the Strategic Computing Complex (SCC) building along the south end of TA-3 near the Proposed Action's Option B site. Completion of this structure is expected in late 2001, which is slightly in advance of the possible construction for the proposed BSL-3 facility should NNSA decide to implement the Proposed Action. Next to the SCC, construction is underway for the new Non-Proliferation and International Security Center (NISC). The anticipated completion date is late 2002. If the NNSA decides to implement the Proposed Action analyzed in this document, construction of the BSL-3 facility could overlap with the final stages of construction on the NISC. In separate EAs and FONSIs issued in December 1998 and July 1999, respectively, DOE analyzed the construction and operation of the SCC and NISC. Other small-scale construction activities are also being planned or are underway at more-distant LANL locations that may overlap with the construction period contemplated for the Proposed Action, should NNSA implement this action. These, as well as the SCC, NISC, and the new replacement building for building 3-43, will be considered in the cumulative effects analysis contained in this document.

A new Emergency Operations Center (Center) is under construction at LANL within TA-69. The Center, when completed in 2003, will serve as a state-of-the-art facility for UC staff and County of Los Alamos staff. It will house the LANL Emergency Management and Response Staff. A final EA and FONSI for the Center were issued on July 26, 2001.