CHAPTER 6.0
MITIGATION MEASURES

The regulations promulgated by the Council on Environmental Quality (CEQ) to implement the procedural provisions of NEPA (42 United States Code [U.S.C.] §4321) require that an EIS include a discussion of appropriate mitigation measures (40 Code of Federal Regulations [CFR] 1502.14[f]; 40 CFR 1502.16[h]). The term "mitigation" includes the following:

- Avoiding an impact by not taking an action or parts of an action
- Minimizing impacts by limiting the degree of magnitude of an action and its implementation
- Rectifying an impact by repairing, rehabilitating, or restoring the affected environment
- Reducing or eliminating the impact by preservation and maintenance operations during the life of the action
- Compensating for the impact by replacing or providing substitute resources or environments (40 CFR 1508.20)

This chapter describes mitigation measures that are built into the alternatives analyzed and those additional measures that will be considered by DOE to further mitigate the adverse impacts identified in chapter 5. These measures address the range of potential impacts of continuing to operate LANL (including those areas where the lack of information regarding resources or mechanisms for impact to resources results in substantial uncertainty in impact analyses). The mitigation measures built into the alternatives analyzed (section 6.1) are of two types: (1) existing programs and controls (including regulations, policies, contractual requirements, and administrative procedures); and (2) specific measures built into the alternatives that serve to minimize the effects of activities under the alternatives. The existing programs and controls are too numerous to list here; but a general description is provided, as well as the role of existing programs in operating LANL and pertinent examples of how these mitigate adverse impacts.

Additional mitigation measures that could further reduce the adverse impacts identified in chapter 5 are discussed in section 6.2. The description of these measures in this chapter does not constitute a commitment to undertake any of these measures. Any such commitments would be reflected in the Record of Decision (ROD) following this SWEIS, with a more detailed description and implementation plan in a Mitigation Action Plan following the ROD.

6.1 MITIGATION MEASURES INCLUDED IN THE SWEIS ALTERNATIVES

6.1.1 Existing Programs and Controls

The activities undertaken at LANL are performed within the constraints of applicable regulations, applicable DOE orders, contractual requirements, and approved policies and procedures. The laws and regulations applicable to federal facilities are discussed in chapter 7; many of these requirements are established with the intent of protecting human health and the environment. It is assumed that these or similar regulatory controls will be in place for the next 10 years. These regulations, when complied with, mitigate the potential adverse impacts of operations to the public, the worker, and the environment. For example, the *Clean Air Act* (CAA) (42 U.S.C. §7401) regulates air emissions and the *Clean Water Act* (33 U.S.C. §1251) regulates liquid effluent discharges in a manner designed to protect

human health and reduce the adverse environmental effects of routine operations.

In addition to the regulations applicable to LANL, chapter 7 also discusses other requirements (including DOE orders and external standards and regulations that would not otherwise apply to federal facilities) that apply to operations at LANL through the contract between DOE and the University of California (UC). As discussed in chapter 7, these requirements are established and enforced through contractual mechanisms. As with the regulations that apply to LANL, it is assumed that these or similar controls will be in place for the next 10 years. These requirements also mitigate the potential for adverse impacts. For example, the application of DOE design standards results in more robust facility designs for modern nuclear facilities, which reduces the potential for catastrophic releases from such facilities in the event of earthquakes, high winds, or other natural phenomena. Similarly, the application of occupational safety and health regulations in 29 CFR 1900, and other standards promulgated by the American National Standards Institute (ANSI), the U.S. Department of Defense (DoD), and DOE, as well as the use of other life safety and fire safety codes and manuals, limit worker exposures to workplace hazards, which reduces the potential for adverse worker health effects.

DOE and LANL also have instituted policies and procedures that apply to work conducted at LANL that mitigate the potential adverse effects of operations; it is assumed that these or similar policies and procedures will continue over the next 10 years. These are numerous and include, but are not limited to:

- Procedures that control work conducted at LANL (to ensure that work conducted is planned and reviewed, funded, within the applicable regulations and requirements, within the range of risks accepted by DOE and UC, and is otherwise authorized)
- Policies regarding the knowledge, skills, and abilities of personnel assigned to perform hazardous work (including required training)
- Policies reflected in agreements with other entities (such as the Accords with the four Pueblos located nearest to LANL) that establish policies and protocols regarding consultations and other discussions regarding LANL activities
- Policies and procedures regarding the stoppage and restart of work where unexpected hazards or resources are identified (for example, the policies regarding recovery of information from archaeological sites uncovered by excavation)

Work controls reduce potential impacts by ensuring that work conducted is within the range of activities that have been studied for potential environmental and human health effects. Policies regarding the knowledge, skills, and abilities of personnel conducting work at LANL reduce potential impacts by ensuring that only personnel with an appropriate understanding of the work and its potential hazards may undertake that work (which minimizes the potential for adverse human health and environmental effects from inadvertent actions due to a lack of this understanding). Policies for consultations and discussions with other entities mitigate effects by providing an opportunity to avoid or change actions that could cause an adverse impact. For example, consultation with Pueblos could identify the potential to impact traditional cultural properties (TCPs) prior to implementing a construction project or operations and could identify alternative siting or operational approaches that would avoid the impact. Policies and procedures regarding the stoppage and restart of work are similar in effect to work controls; when unexpected situations occur that impose unexpected hazards or reveal unexpected resources (e.g., cultural resources), work is stopped (as soon as this can be done

safely) until work plans and authorizations can be modified in consideration of the newly uncovered information. This reduces potential impacts in a manner similar to work controls, as discussed above.

DOE also has established programs and projects at LANL to increase the level of knowledge regarding the environment around LANL, health of LANL workers, health of the public around LANL, and the effects of LANL operations on these, as well as to avoid or reduce impacts and remediate contamination from previous LANL activities. These programs and projects reduce potential adverse impacts by providing for heightened understanding of the resources that could be impacted; avoidance of some impacts (where mechanisms for impact to specific resources are known and avoidable); early identification of impacts (which can enable stoppage or mitigation of the impacts); reduction of ongoing impacts; or providing for beneficial management opportunities for natural, cultural, and sensitive resources, where appropriate. It is assumed that such activities will continue for the next 10 years. Examples of these programs and projects are:

- The Environmental Surveillance and Compliance Program at LANL monitors LANL for permit and environmental management requirements. This program also includes evaluation of samples from various environmental media for radioactive materials and other hazardous materials locally and regionally (chapter 4, page 4–1). The data generated under this program are collected routinely and publicly reported at least annually, and these data are analyzed to determine regulatory compliance and to determine environmental trends over long periods of time.
- The Threatened and Endangered Species Habitat Management Plan is intended to provide long-range planning information for future LANL projects, and protect habitat at LANL for these species (section 4.5.1.6).
- A Natural Resource Management Plan is being developed (in various stages) at LANL to determine existing conditions of natural resources in the area (including expanded biomonitoring) and to recommend management measures that will restore, sustain, and enhance the biological quality and ecosystem integrity at LANL (section 4.5.1.6).
- Studies of public and worker health in and around LANL have been conducted (some by DOE and some by other agencies) to assess human health in the region and to assess the potential for adverse human health effects due to LANL operations (section 4.6).
- LANL is also implementing a Groundwater Protection Management Program Plan (GWPMPP) to assess current groundwater conditions and monitor and protect groundwater. A *Resource Conservation and Recovery Act* (RCRA) Hydrogeologic Workplan is also being implemented to supplement and verify existing information on the environmental setting at LANL and to collect analytical data on groundwater contamination (sections 4.3.2.1 and 4.3.2.2).
- The Safeguards and Security Program restricts unauthorized access to areas of LANL with high potential for impact to human health and the environment. Such access restrictions aid in limiting the potential for intentional or inadvertent actions that could result in environmental or human health effects (section 4.9.2.2).
- Emergency management and response capabilities at LANL provide for planning, preparedness, and response capabilities that can aid in containing and remediating the effects of accidents or adverse operational impacts (section 4.6.3.1).
- LANL's Fire Protection Program ensures that personnel and property are adequately

protected against fire or related incidents, including fire protection and life safety (section 4.6.3.3).

- Pollution Prevention and Waste Minimization Programs at LANL reduce the wastes generated and to some extent the effluents and emissions from facilities (section 2.1.2.1).
- Water and Energy Conservation Programs at LANL are intended to reduce use of these resources, which should assist in mitigating the effects of water withdrawal and electrical consumption that occasionally exceed supply.
- The Environmental Restoration (ER) Project at LANL (which includes decontamination and decommissioning [D&D]) was established to assess and remediate contaminated sites that either were or still are under LANL control (section 2.1.2.5). The ER Project serves an important role in reducing the potential for future impacts to human health and the environment due to legacy contaminants in the environment. It is assumed that the current mitigation practices used in remediation actions will continue to be used (section 2.1.2.5).
- Electric power reliability is an issue under all alternatives due to the limited supply lines and the age of the distribution system equipment, as well as the limits of the on-site supplemental power supply (section 4.9.2.1). DOE is evaluating a proposed action that would bring a third power line (from the Norton substation) to LANL (chapter 1, section 1.6.3.1).

While this list is not all-inclusive, it does reflect the importance of these programs in mitigating the potential adverse impacts of operating LANL.

6.1.2 Specific Mitigation Measures Incorporated in the SWEIS Alternatives

Several specific mitigation measures are included in the SWEIS alternatives. Unless otherwise noted below, the analyses in chapter 5 assume that these measures are implemented. These specific measures are:

- *Development and Use of a Dedicated Transportation Corridor Between TA–55 and TA–3 (TA–55 and TA–3, Expanded Operations Alternative, section 3.2.1, section 5.3.10, and volume II, part II)*. The proposed transportation corridor is included in the Expanded Operations Alternative to mitigate the on-site transportation risk and inconvenience to the public (due to road closures) that would be attributed to the increase in transportation between TA–55 and the Chemistry and Metallurgy Research (CMR) Building under this alternative. The analysis in the Expanded Operations Alternative is very conservative because it includes the impacts of constructing the road and impacts of transport on existing roads. If the road is not constructed, the transportation risk would be that analyzed in section 5.3.10 for on-site shipments. The impacts attributable to constructing the road (see volume II, part II and section 5.3.5) would not be incurred. If the road is built and used, the impacts due to road construction would be the same as those analyzed, and the on-site transportation risk would be reduced because shipments between TA–55 and the CMR Building would no longer routinely use public roads. This measure would not be implemented under the Preferred Alternative.
- *The Santa Fe Relief Route (All LANL Facilities, All Alternatives, sections 5.1.10, 5.2.10, 5.3.10, 5.4.10, 5.5.10, and appendix F)*. DOE has made the agreed upon contributions to construction of this route and continues to work with state and

local governments to ensure its completion. This route is expected to be available for use in 1998. The transportation impact analyses in this SWEIS address impacts for use of existing routes as well as use of the relief route.

- *CMR Building Upgrades (CMR Building at TA–3, All Alternatives, section 3.1.3).* DOE is working to upgrade the CMR Building to maintain existing capabilities and improve safety features, and completion of these upgrades is presumed in the impact analyses.
- *Planned Maintenance and Refurbishment Activities (e.g., Plutonium Facility at TA–55 and Sigma at TA–3, All Alternatives, sections 2.1.2.3, 3.1.1, and 3.1.5).* It is assumed that DOE maintenance of existing facilities in use at LANL will continue in a manner that maintains or improves (reduces) the level of risk associated with facility operations.
- *Radioactive Liquid Waste Treatment Upgrades (TA–50, All Alternatives, sections 3.1.14, 4.3, 5.1.3, 5.2.3, 5.3.3, 5.4.3, and 5.5.3).* It is assumed that the planned treatment upgrades to TA–50 will proceed, resulting in improved quality of effluent from this facility.
- *Effluent Reduction Activities (All LANL Facilities, All Alternatives, sections 4.3, 5.1.3, 5.2.3, 5.3.3, 5.4.3, and 5.5.3).* It is expected that activities to reduce the number of outfalls and the total effluent from these outfalls will continue, as presented in section 4.3.
- *Phased Containment for Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility (One of the High Explosives [HE] Firing Sites, All Alternatives, section 3.1.10).* Implementation of the phased containment approach, as described in the DARHT Final EIS (DOE 1995) and ROD (60 *Federal Register* [FR] 53588) is assumed in the SWEIS impact analyses.
- *Design of the Long-Pulse Spallation Source (LPSS) (TA–53, Expanded Operations and Greener Alternatives, section 3.2.11).* The air emissions associated with operations in this proposed experimental facility are dominated by the "activation" of air in the path of the proton beam. The design of the facility is to include evacuation (removal) of much of the air in the beam path as well as a short enough beam path to limit the emissions from this operation so that it contributes, at most, 1 millirem per year to the facility and site-wide maximally exposed individual (MEI).

6.2 OTHER MITIGATION MEASURES CONSIDERED

In addition to those mitigation measures described in section 6.1, other feasible mitigation measures considered in the preparation of this SWEIS are presented in this section. Those specific measures are:

- *Eliminate Public Access to Part or All of LANL*. At various times DOE has considered the possibility of closing public access to part or all of the LANL site. While this is typically suggested for security reasons, such an action would also tend to reduce public health risk by removing access to on-site locations that contribute most to public health risk. While such an action could potentially reduce public health consequences, it could also substantially alter traffic patterns and loadings on the remaining public roads in the area and could have other positive and negative effects. A more detailed NEPA analysis of the potential effects of this type of action would be necessary before it could be implemented.
- *Land Transfers and Financial Assistance*. Transfers of portions of LANL land are being examined, as discussed in section 4.1.1.4. Such action would provide land resources that could be used to reduce

economic dependence on LANL and/or provide the means for growth in housing, parks, and recreational space. Thus, land transfers could mitigate the effect of changes in LANL employment and spending on the area's economy. At times, financial assistance has been provided to communities near LANL for similar reasons (community development, funding for community services, etc.). While land transfers are neither proposed or analyzed in this SWEIS, such actions could mitigate the socioeconomic impacts presented in chapter 5. On May 6, 1998, DOE published a Notice of Intent (NOI) to prepare an EIS for the Proposed Conveyance and Transfer of Certain Land Tracts in the *Federal Register* (63 FR 25022).

- *Extensive Ethnographic Study.* An extensive ethnographic study regarding the traditional and cultural practices and resources in the LANL area could increase knowledge of specific TCPs at LANL and could provide opportunities for mitigation of impacts to specific TCPs. Attempts to identify specific TCPs at LANL have encountered concerns from traditional groups because of the potential for increased risk to these resources if they are identified.
- *Develop a Cultural Resources Management Plan*. Such a plan would include studies to increase the level of knowledge regarding potential shrapnel and vibration damage to prehistoric and historic resources near firing sites, existing levels of contamination for prehistoric and historic resources and plans to avoid levels that would limit data recovery, plans for management of former nuclear weapons complex properties, and implementation of programmatic agreements with the State Historic Preservation Office(r) (SHPO).
- *Develop a Wildfire Management Plan for the LANL Site*. Such a plan would reduce the fuel loading surrounding the site and around individual facilities that have moderate or higher vulnerability to burning as a result of wildfire. The probability of an approaching wildfire encroaching upon the site can be reduced by removing and thinning vegetation on the site boundary and within the site. Ongoing efforts to reduce the vegetation at the site boundary exist that would be accelerated. The vulnerability of individual facilities depends upon the amount and height of the exterior fuel loading and its proximity to the facility (see "Evaluation of Building Fires" in volume III, appendix G, section G.5.4.4). Consideration is being given to reducing the vulnerability of individual facilities that contribute to potential public exposure. Long-term actions would be taken to reduce the fuel loads in the forested areas surrounding LANL, and a forest and land management program would be undertaken to prevent or mitigate the potential for large wildfires to occur. In the near term, mitigation actions, such as for TA–54, will be taken to ensure that the wildfire risk to this facility is reduced to low or extremely low prior to the start of the 1999 fire season.
- *Limited Power Supply.* DOE and other regional electric power users continue to work with suppliers to remedy foreseeable power supply and reliability issues. The impact analyses in this SWEIS emphasize the severity of these issues and the consequences if they are not resolved. Solutions to power supply issues are essential to mitigate the effects of power demand under all alternatives. DOE is committed to measures that will conserve energy and avoid, or at least minimize, periods of brownouts. Some of the measures being contemplated by DOE include: (1) limiting operation of large users of electricity to periods of low demand, (2) reduced operation of low-energy demonstration accelerator (LEDA) (not implement all phases of this project), and (3) contractual mechanisms to bring additional electric power to the region.

REFERENCES

DOE 1995 — *Dual Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement.* DOE/EIS-0228. U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. August 1995.

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