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Date: October 30, 2009
Refer To: ENV-RRO: 09-077

Mr. George Rael
Assistant Manager for Environmental Operations
National Nuclear Security Administration
Los Alamos Site Office, MS A316

SUBJECT: 2008 SITE-WIDE ENVIRONMENTAL IMPACT STATEMENT MITIGATION ACTION PLAN 2009 ANNUAL REPORT

Dear Mr. Rael,

Enclosed for your review and acceptance the 2009 Mitigation Action Plan Annual Report (MAPAR) for the 2008 Site-Wide Environmental Impact Statement (SWEIS). This fulfills the 2009 annual reporting requirements for the MAP (Prime Contract No. DE-AC52-06-NA25396).

The Los Alamos National Security, LLC (LANS) SWEIS Project Office has compiled data from across the institution. This is the first MAPAR for the 2008 SWEIS and provides information regarding **Fiscal Year (FY) 2009** progress on mitigation action commitments. The MAPAR is organized in a manner consistent with the monthly MAP status reports and reflects progress towards completing mitigation action commitments associated with LANL operations selected in the September 2008 and July 2009 Records of Decision.

Please do not hesitate to call me at 667-2276 or Jennifer Nisengard (667-7912) with any questions.

Sincerely,

John S. Isaacson
SWEIS Project Manager

Mr. George Rael *30 October 2009*
ENV-RRO: 09-077
PG/mw, jn
Enclosure A

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Enclosure A
2008 Site-Wide Environmental Impact Statement Mitigation Action Plan 2009 Annual Report

(ENV-RRO 09-077)

LA-UR-09-06935

Approved for public release; distribution is unlimited.

Title:	2008 Site-Wide Environmental Impact Statement Mitigation Action Plan 2009 Annual Report
Author(s):	Nisengard, Jennifer E. Isaacson, John S.
Intended for:	Report to the Department of Energy/National Nuclear Security Administration Los Alamos Site Office

Form 836 (7/06)

1.0 EXECUTIVE SUMMARY:

The first Record of Decision (ROD) for the 2008 Site-Wide Environmental Impact Statement (SWEIS) was published in September 2008. In January 2009, the Mitigation Action Plan (MAP) for the SWEIS was finalized. The MAP includes outstanding 1999 SWEIS MAP commitments, all continuing mitigations from NEPA decisions made since the 1999 SWEIS, and those made in the September 2008 and June 2009 SWEIS RODs. The second SWEIS ROD was published in the Federal Register on June 26, 2009 and the Department of Energy/National Nuclear Security Administration (DOE/NNSA) Los Alamos Site Office (LASO) issued a MAP Addendum in August 2009. The Addendum includes the Science and Engineering Complex and a list of projects in the second ROD.

This is the first MAP Annual Report (MAPAR) for the 2008 SWEIS and provides information regarding **Fiscal Year (FY) 2009** progress on mitigation action commitments specified and detailed in the MAP. The MAPAR is a snapshot/rollup of FY 2009 work associated with mitigation action commitments for projects and programs selected in the two ROD issued for this SWEIS. The MAP is organized in a manner consistent with the monthly MAP status reports. Appendix I, is the 2008 SWEIS MAP tracking log, which provides a brief snapshot of accomplishments, Appendix II is a copy of the MAP, Appendix III is the Trails MAPAR, Appendix IV is the FY 2008 Special Environmental Analysis (SEA) MAPAR for Historic Buildings, and Appendix V is the FY 2009 SEA MAPAR for Historic Buildings, and Appendix VI is the SEA MAPAR for archaeological resources.

2.0 MITIGATION ACTION COMMITMENTS:

2.1 Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) MAP: (Fresquez 2009)

The 2008 DARHT MAPAR was transmitted to LASO on May 19, 2009. All sample media (soil, sediments, vegetation, small mammals, bees and birds) from within and around the DARHT facility were collected, analyzed, tabulated and reported in the DARHT MAPAR and October 2009 Environmental Surveillance Report (LA-14407-ENV). Overall, the concentrations of all radionuclides, Target analyte list (TAL) elements, and polychlorinated biphenyl (PCBs) in all biotic and abiotic media sampled upgradient of the Los Alamos Canyon Weir and Pueblo Canyon Flood Retention Structure were mostly below screening levels and/or ecological screening levels and do not pose a potential unacceptable dose from radionuclides or risk from chemicals to humans (sediment) or to the biota sampled.

2.2 Trails MAP: (Pava 2009), Attachment III.

2.3 Special Environmental Assessment MAP: (Fresquez, McGehee, Masse, and Hansen 2009), Attachments IV, V, and VI.

2.3.1 Waste and Environmental Services: Collected samples of sediment, native grasses and forbs (unwashed), and deer mice (*Peromyscus sp.*) in the areas upgradient of the Los Alamos Canyon Weir and the Pajarito Canyon Flood Retention Structure. Native understory vegetation is monitored because it is the primary food source of biota and field mice are monitored because they have the smallest home range of the mammals.

Samples were analyzed for some or all of the following constituents: radionuclides, TAL elements (mostly metals), high explosives (HEs), semi-volatile organic compounds (SVOCs), and PCBs. Paragon Analytics, Inc. processed and analyzed the sediment, vegetation, and field mice (whole body) samples for radionuclides and TAL elements as well as for HE,

SVOCs, and PCBs in sediments. The form of PCBs analyzed in sediment were mixtures (or "formulations") of individual PCBs (congeners) called Aroclors. Specifically, Aroclors 1016, 1221, 1232, 1242, 1248, 1254, and 1260 were analyzed in sediment. Vista Analytical Laboratory, Inc., analyzed the field mice for individual PCB congeners. Overall, the concentrations of all radionuclides, TAL elements, and PCBs in all biotic and abiotic media sampled upgradient of the Los Alamos Canyon Weir and Pueblo Canyon Flood Retention Structure were mostly below screening levels and/or ecological screening levels and do not pose a potential unacceptable dose from radionuclides or risk from chemicals to humans (sediment) or to the biota sampled. Detailed results were reported in the October 1, 2009 Environmental Surveillance Report for 2008.

2.4 Flood Retention Structure: (Erickson 2009)

Annual requirement action completed in April 2009.

2.5 Radioactive Liquid Waste Treatment Facility/Outfall Reduction Initiative: (Pava 2009)

This mitigation stems from the commitments made in the 2008 SWEIS related to outfall reduction. The Radioactive Liquid Waste Treatment Facility Replacement Project is an FY 2010 line item, which will replace the existing treatment capability at TA-50; the scope includes constructing a zero liquid discharge capability. A biological assessment for zero liquid discharge, to address intended reductions in effluent into Sandia Canyon, has been budgeted and will be conducted when decisions relating to all discharge reductions are made in 2009.

2.6 Off-site Source Recovery Project (OSRP): (Pearson 2009)

The LANL OSRP has no plans to accept cobalt, iridium or cesium sealed sources on site. If this approach changes in the future, then mitigations will be implemented to reduce the risk of accidents. Currently, none of these sources come to LANL. **This mitigation is on-hold until conditions change and these sealed sources are processed at LANL.**

2.7 Air Emissions: (Fuehne 2009)

LANL's radioactive stack emissions monitoring program continues. The Laboratory conducts continuous monitoring programs at 26 stacks and tracks operations from over 50 other minor stacks. ENV partners with the Waste and Environmental Services to perform ambient air measurements around the Laboratory as well. LANL anticipates off-site dose impacts to be less than 10 percent of the applicable standard for 2008, continuing a trend of low emissions. New sources will come on-line in the future, including the Chemistry and Metallurgy Research Replacement (CMRR) Radiological Laboratory/Utility/Office Building (RLUOB) and the Material Disposal Area-B cleanup operation.

2.8 Wildland Fire Management Plan: (L'Esperance 2009)

The 2009 Wildland Fire Plan was accepted and implemented. To reduce the risk of wildland fire, the Laboratory sent its final high activity legacy transuranic waste shipment to the Waste Isolation Pilot Plant (WIPP). This activity also closed the commitment to the Defense Nuclear Facilities Safety Board and disposal of the highest-risk transuranic (TRU) waste stored at Area G. Two-hundred and eighty-two high activity drums were shipped to WIPP (*Currents*, January 2009). Shipments of legacy waste to WIPP are on-going, as is D&D of the TA-54 domes.

2.9 SWEIS Biological Assessment: (Hansen 2009)

Planned construction of the grade-control structures in DP and Pueblo Canyons by Environmental Programs will improve riparian/wetland habitat in these canyons, encouraging the presence of additional water resources. Some limited progress was made on inventorying additional riparian areas during 2009. Hiking trails near Mortandad Canyon were closed to pedestrians during the 2009 Mexican spotted owl-breeding season (see trails update). Annual Mexican spotted owl surveys were completed in all suitable habitats during 2009. The site-wide ecorisk update was completed in 2009 (see BRMP update).

2.10 Biological Resources Management Plan (BRMP): (Gonzales, Hansen 2009)

- The *Site-Wide Application of ECORSK.9 to Four Receptor Species at the Los Alamos National Laboratory* (LA-UR-09-02833) was completed in FY 2009 by Gilbert Gonzales, Patricia Gallegos, Anthony Gallegos, and Kathryn Bennett.
- The Biological Resources Team implemented physical road closures of protected threatened and endangered species habitats on LANL property for the first time in 2009.
- Biological Resources staff member Charles Hathcock and personnel from the New Mexico Department of Game and Fish conducted a field assessment of potential New Mexico Meadow Jumping Mouse habitat on LANL lands in June 2009.

2.11 Cultural Resources Management Plan (CRMP): (McGehee 2009)

Beginning work continued for Phase I of the Gun Site Restoration Project, which included the participation of personnel from both ENV-EAQ and Transformation Disposition. In addition the following work was completed by the Cultural Resource Team (CRT) in FY 2009:

- Reviews of proposed activities and document work being done to support square foot reduction, D&D projects, the CMR HRWC Project, environmental restoration and consent order activities and other LANL undertakings affecting historic properties.
- An assessment report of Nake'muu was submitted to LASO.
- Discussions concerning an inadvertent discovery at TA-36 were undertaken with representatives of San Ildefonso Pueblo.
- Fencing of the 11 unfenced archaeological sites along LANL fire roads.
- Submit ion of eligibility assessment reports to LASO for a site situated within the footprint of the CMRR, a pueblo roomblock site at TA-49, and for sites at TA-18.
- Planning of IFCS FOD commitment to conducting long-term surveillance and maintenance of inactive historic buildings under their control.

2.12 Energy Conservation: (Erickson, Nisengard, Pyle 2009)

Policy Document 910 and the FY 2009 Executable Energy Management Plan (EMP), implementing DOE Order 430.2B, are being executed. A draft FY 2010 executable EMP was endorsed by the Environmental Management System (EMS) Steering Committee in July 2009, sent to LASO for review in August 2009, and returned with comments in September 2009.

2.12.1 Electrical:

- The FY 2009 metering plan was implemented, meters are installed as necessary to quantify and evaluate electrical consumption (all metering to be completed by 2012). The powerline from the Norton substation to STA is on-hold.
- LANL purchased 14,000 MWhr of Renewable Energy Credits for FY 2009.

- ENV-RRO is working with AD Business Services to streamline the purchase and/or lease of *Energy Star* electronics when available. 10 CFR 436, *Federal Energy Management and Planning Programs*, was published in March 2009.
- The CMRR RULOB will be LANL's first Leadership in Energy and Environmental Design (LEED) certified building.

2.12.2 Purchasing:

ASM activities designed to support affirmative procurement initiatives. The Request for Proposal (RFP) for these procurement actions already contain the requirement for EPEAT and Energy Star products and reporting as described above.

- The primary method for procuring goods is through the Oracle iProcurement Blanket Order Agreements (BOAs). BOAs are pre-established pricing agreements for a defined scope of goods and services available for direct use by Laboratory employees. BOAs are accessed through supplier maintained websites where employees create and fill electronic shopping carts selecting from a catalog of pre-priced items. In FY 2009, Laboratory employees used this system to conduct approximately 100,000 transactions, equaling close to $40M dollars.
- There are three primary BOAs for computers, related hardware and peripherals. They are for Dell, Apple and HP products. The Laboratory projects a combined annual spending for all three agreements at over $25M. All three agreements have the following contractual requirement:
  Affirmative Procurement: LANS, LLC is required to subcontract with firms that can assist the Laboratory in reducing environmental hazards, conserve environmental resources, minimize life-cycle costs and liability of DOE programs, and maximize operational capability through procurement of environmentally preferable products. As a component of its computer acquisition strategy, the Laboratory must report its compliance with Electronic Product Environmental Assessment Tool (EPEAT) and Energy Star procurement activity. For information about EPEAT and Energy Star please reference the url below: http://www.epeat.net/Criteria.aspx#criteriatable as a component of the annual subcontractor performance review, the Subcontractor shall provide annual certification to LANS regarding the total dollar value of Laboratory purchases spent on the EPEAT and Energy Star designated products.
- LANS, LLC is in the process of developing several new agreements where this contract clause will also be included. These upcoming agreements include: SUN servers and hardware and Xerox and Canon multi-function copier leases and maintenance.
- LANS has also recently established an iProcurement BOA with Performance Maintenance, Inc. (PMI) for the supply of industrial products, primarily cleaning supplies. This agreement has the following contractual language:
  LANS is required to subcontract with firms that can assist the Laboratory in reducing environmental hazards, conserve environmental resources, minimize life-cycle costs and liability of DOE programs, and maximize operational capability through procurement of environmentally preferable products. Environmental Protection Agency (EPA) recommended cleaning products and paper products can be found at: http://www.epa.gov/epp/pubs/products/cleaning.htm. Cleaning products shall meet the environmental attributes listed on the EPA website to the greatest extent practicable, unless otherwise noted in this Statement of Work.

As a component of the annual subcontractor performance review, the Subcontractor shall provide annual certification to LANS regarding the total dollar value spent on the EPA designated products and the total dollar value spent on non-EPA designated products when EPA designated were available.

- Individual websites hosted by BOA suppliers also provide information to the shopper to facilitate the purchase of environmentally preferable products.
- Subcontractors will buy their own products required for the performance of their subcontract's scope of work. For example, LANL's janitorial/custodian services procures their own products for use in Laboratory facilities. In this case, the subcontract's scope of work specifically states "...all supplies, expendable or otherwise shall comply with the Laboratory Environmental Management System, Laboratory Environmental Policy, and Executive and DOE Orders used in the performance of the work requirements of this subcontract." In addition, the subcontract also states that the "Subcontractor shall be responsible to implement a *Buy Green* or *Affirmative Procurement* program for all cleaning supplies and consumables." Finally, the *Buy Green* initiative and activities are discussed at weekly meetings with the subcontractor to reinforce environmental stewardship requirements.
- Much of the Laboratory's procurement activity is initiated by the 1100 authorized Deployed Purchasing Representatives (DPRs) from across the Laboratory. The DPRs create purchase requisitions for processing by ASM and make purchases directly through iProcurement or with an approved P-Card. A DPR must participate in annual training. The mandatory DPR training includes instruction on affirmative procurement topics.

2.12.3 Natural Gas:

- The FY 2009 metering plan was implemented and meters are being installed as necessary to quantify and evaluate natural gas consumption at LANL.

2.12.4 Water:

- Expansion of the Sanitary Effluent Reclamation Facility is planned and awaiting an Environmental Assessment (LASO will contract) and funding decisions.

2.13 Pollution Prevention: (Gallagher 2009)

The Pollution Prevention (P^2) Program received a "good" rating on waste generation in FY 2009. Transuranic, hazardous, sanitary waste generation and sanitary waste recycling improved over the FY 2008 performance. Mixed low-level waste (MLLW) and low-level waste (LLW) generation increased from the FY 2008 baseline. The P^2 Program has been conducting outreach and awareness to encourage environmentally preferable purchasing; however the procurement system does not track environmentally preferable purchasing so performance in this area cannot be accurately reported. The Laboratory met or exceeded the 95 percent EPEAT rating for computers and monitor purchases in FY 2009.

The P^2 Program funded 27 waste reduction projects in FY 2009 addressing all major waste streams. A pilot project using a polyvinyl alcohol-based anti-contamination clothing was implemented at TA-53 and they are now using this material exclusively. This alternative Personal Protective Equipment (PPE) is a patented process that reduces LLW from this source by 99 percent. The P^2 Program also funded further deployment of LED lights in radiological areas

to reduce MLLW. The LED lights have no Resource Conservation and Recovery Act components and last ten times longer than fluorescent lights, resulting in significant reductions in waste and cost savings from reduced maintenance requirements.

The P^2 Program received eight NNSA awards in FY 2009 including five Environmental Stewardship awards and three Best in Class awards. The Laboratory's EMS received the DOE's Environmental Sustainability award, the highest environmental award granted by the DOE.

The Laboratory also completed several Generator Set-Aside Funds projects in FY 2009 including the PPE pilot project; the purchase of an acetonitrile recycling system; the purchase of additional *Green is Clean* bins and an ear protection dispensing unit, which reduces packaging waste; and procurement of additional LED lights for radiological areas.

A working group has been convened to look at efficiency improvement in the delivery of refrigeration services.

2.14 Clean Fill: (Ladino 2009)

During excavation of the CMRR RULOB, project managers working with Los Alamos County and the Permits and Requirements Identification (PR-ID) Program Manager organized onsite the reuse of clean fill resulting from construction excavations. The clean fill from these excavations was used to build the base of new parking areas across the street from the project site, to cap the Los Alamos County landfill, and to fill in areas of the County's Bypass Road project.

2.15 Traffic: (Nisengard 2009)

In response to the EMP and the EMS's Traffic and Commuting survey, the Council published the results from the survey on the LANL website. LANL's parking policy is being revisited to accommodate overnight parking for commuters. Alternative transportation was encouraged in FY 2009 through posters, LINKS, Enviro-grams, LANL Today announcements, and the Earth Day Week April Atomic City Transit contest. Recommendations from a multi-directorate Performance Improvement Project regarding the LANL Fleet are being implemented site-wide.

2.16 Integrated Land Management Planning: (Isaacson, Bare 2009)

In April 2009, the Integrated Land Management Planning (ILMP) project was established to prepare a comprehensive analysis of development constraints and opportunities across the Laboratory. Essentially this effort is an expanded follow-on to a smaller study conducted in 2006, which focused on potential land transfers. In August 2009, the team completed the pear-wise matrix criteria for mission development land use.

The ILMP project will analyze the entire Laboratory for opportunities and constraints to three future land use scenarios: mission development, environmental stewardship, and potential land transfer. The project was chartered jointly between the Associate Director for Environment, Safety, Health and Quality (ADESHQ) and the Associate Director for Project Management and Site Services (ADPMSS) with the following objectives to be completed over a three-year period (FY 2009-FY 2011):

- Establish criteria for developmental opportunities and constraints.
- Develop weighting and ranking protocols for analyzing criteria; socialize with LANL programs and management.

- Identify opportunities and constraints for: future Laboratory growth and development, Environmental stewardship, potential transfer and improving economic opportunities with neighbors (e.g., Los Alamos County, San Ildefonso Pueblo).
- Prepare a comprehensive and integrated GIS analysis that will be reviewed on an annual basis and revised as necessary to provide a comprehensive analytical method for site/project planning that would become a part of the Project Review and Requirements System, integrate with and support the Laboratory's Long Range Development Plan, and improve the evaluation process in support 10 CFR 770 requirements.
- Train LANL staff in the use of the integrated analysis method.

The ultimate goal of the project is to make informed land use decisions, streamline environmental compliance, and ensure favorable outcomes, all while meeting the Laboratory's environmental stewardship responsibilities. This method offers an objective, semi-quantitative approach for evaluating constraints and opportunities for mission development and for addressing stewardship responsibilities early in the project planning process.

In addition to meeting the SWEIS MAP requirements, there are numerous benefits to be obtained from this project, and they include:

- Comprehensive understanding of the cumulative impacts of opportunities and constraints to development;
- Improved planning and siting decisions and enhanced PR-ID effectiveness;
- More accurate construction project cost and schedule forecasting;
- Reduced construction costs;
- Enhanced environmental compliance and stewardship;
- Support annual excess real property evaluations for potential transfer ;
- Improved ADPMSS-ADESH&Q collaboration and integration.

In FY 2009, the following project objectives were completed:

- A comprehensive list of criteria that impact land management decisions was developed and were identified as constraints or opportunities depending on the future land use being considered. The relevant criteria were weighted against each other in a pair-wise comparison to determine their relative importance for each land use. A severity ranking was also determined for each of the criteria.
- Subject matter experts (SMEs) from across the institution were consulted to develop the criteria and the weighting and ranking process. Socialization will continue with SMEs, programs, and management as the full analysis proceeds.
- Preliminary maps were generated for each future land use as a proof-of-concept for the process.

Proposed FY 2010 project milestones and deliverables include reviewing, revising, and finalizing scoring matrices; developing draft maps for review and socialization purposes; socializing the criteria, weighting, and ranking and resulting maps with relevant SMEs; completing analysis of the Laboratory by technical areas, or groups of areas, as is appropriate, through the application of the integrated decision analysis method, and generate associated maps; and integrating the completed maps into LANL's Long-range Development Plan.

2.17 Compliance Assurance (Terp, Wright, and Hathcock 2009)

In FY 2009, the compliance assurance team met with project personnel associated with four PR-IDs. They received a lot of helpful feedback regarding the Environmental Division's subject matter experts and the PR-ID process improvement comments. In September, the team compile a report documenting the FY 2009 work as the FY 2009 deliverable LA-UR-09-06307.

- Integrated Environmental Review (IER) is the primary LANL customer interface for environmental issues.
- Coordinates the environmental reviews required for all new and modified activities & projects using the Excavation Permitting (Ex-ID) tool and PR-ID tool.
- ENV SMEs from all ENV groups conduct these Ex-ID and PR-ID reviews.
- FY 2008 ENV reviewed over 1600 Ex-IDs and more than 120 PR-IDs.
- FY 2009 ENV reviewed approximately 550 Ex-IDs and almost 150 PR-IDs.
- Coordinates ENV Division SME support to projects' Integrated Project Teams (IPTs).
- Approximately twenty-five LANL organizations (e.g., EM&R) and projects (e.g., CMRR, Science & Engineering Complex) have had ENV Division SMEs supporting their projects over the last two years.
- Facilitates timely identification and mitigation of environmental requirements.
- Coordinating institutional effort to integrate project review tools.
- Gap Analysis of Ex-ID, JHA, and PR-ID was finalized in FY 2009.
- Coordinating Institutional effort to integrate project review tools.
- Gap Analysis of Ex-ID, JHA, and PR-ID was finalized in FY 2009.
- The Program provides Environmental Permits & Requirements outreach to multiple LANL organizations.
- More than 45 briefings have been delivered in over a year.
- LANL organizations include: Work Planners, Subcontract Technical Representatives (STRs), Deployed Environmental Generalists, ESH&Q Managers and Maintenance and Site Services Utilities & Infrastructure (MSS U&I).
- New organizations in FY 2010 may include: Environmental Programs (EP) STRs, ASM STRs, ES&H Representatives, or PR-ID customers.

2.18 Commitments to Santa Clara: (DOE/LASO)

DOE/NNSA LASO continues consultations with Santa Clara Pueblo to develop a mutually acceptable plan to address specific environmental justice and human health concerns and issues identified by the Santa Clara Pueblo during the SWEIS process. The plan will include specific tasks and timelines, and will identify the necessary resources to help ensure implementation of the plan.

Appendix I

2008 Site-Wide Environmental Impact Statement (SWEIS) Mitigation Action Plan (MAP) FY 2009 MAP Tracking Log

2008 SWEIS MAPAR Tracking FY 2009 (Green items are complete; yellow is an on-going action; red is a closed or on-hold mitigation).

Topic	Action	Mitigation Completed	Annual Requirement Completed	Responsible Party
Transition of previous LANL NEPA mitigation commitments into the 2008 SWEIS MAP				
Dual Axis Radiographic Hydrodynamic Test Facility MAP	Conduct annual Tribal tours of Nake'muu and maintenance visits.	Will be conducted in FY 2010		ENV-EAQ
	Reduce annual surveillance sampling schedule to soils and one additional medium.	Complete 2008/2009		WES
	Emissions data from contained experiments and comparisons with results from previous operations, from 2001, will be in the 2009 SWEIS Yearbook.		2008	DAHRT, HX, ENV
Trails MAP	Complete eligibility evaluations for historic trails under National Historic Preservation Act and identify additional environmental issues on trails use.			ENV-RRO/EAQ
	Evaluate and manage trails to determine appropriate closures and/or restrictions.	On-going		ENV-RRO
	Prepare cultural resources management plans for trails in TA-70 and TA-71.		July 2009, site mitigations in TAs 70 and 71 completed	ENV-EAQ/RRO
	Support the use of volunteers for selected trails maintenance projects at LANL.	On-going	Eagle Scout Project 10/2008	ENV-EAQ/RRO
Special Environmental Assessment MAP	Complete rehabilitation of cultural resources impacted by the Cerro Grande Fire	On-going	Annual site monitoring completed in July 2009	ENV-EAQ
	Monitor sediment contamination behind the Los Alamos Canyon Weir and the Pajarito Canyon FRS and report results in the ESR.	On-going	May 2009	WES
	Periodically remove sediment from the Los Alamos Canyon Weir based on sedimentation rate and contamination accumulation rate.	On-going	June 2009 Sediment removed and recontouring completed	EP-CAP/LWSP
Flood Retention Structure	Annually monitor the FRS for structural integrity and safe operations until removed.	On-going	April 2009	IFCS
	Remove portions of the FRS in accordance with DOE/EA-1408.			ADNHHO
	Recycle demolition spoils from FRS DD&D as appropriate.			ADNHHO
	Consider leaving an aboveground portion of the FRS equivalent to the dimensions of a low-head weir to retain potentially contaminated sediments on Laboratory land.			ADNHHO
	Remove aboveground portions of the steel diversion wall of FRS.			ADNHHO
	Recontour and reseed disturbed areas to protect surface water quality in Pajarito Canyon after the FRS is removed.			ADNHHO

2008 SWEIS MAPAR Tracking FY 2009 (Green items are complete; yellow is an on-going action, red is a closed or on-hold mitigation).

Topic	Action	Mitigation Completed	Annual Requirement Completed	Responsible Party
Project-Specific Mitigation Measures Analyzed in the SWEIS: Institutional Resource Management Responsibilities				
Radioactive Liquid Waste Treatment Facility/Outfall Reduction	All further actions affecting water flow volumes in Mortandad and Sandia canyons will be assessed for positive and negative impacts.	On-going		ENV
Off-site Sealed Source Recovery Project	Institute adequate controls on the quantities and methods of storing sealed sources containing cobalt-60, iridium-192, or cesium-137 to mitigate the effects of potential accidents.	Mitigation on-hold 1/2009		N Division
Air Emissions	Continue air monitoring program to comply with the Clean Air Act. ENV's EMS	On-going		ENV
	Use existing PR-ID System to assess potential air quality impacts from new or modified projects and provide BMPs to control emissions.	On-going		Projects
	Removal of contamination from MDAs and other PRSs would be conducted in a manner that protects the environment, the public, and worker health and safety.	On-going		EP/Projects
Wildland Fire Management Plan	Implement WFMP with adequately funded on-going program.	On-going	2008/2009	EO-EM
	Reduce wildfire risks by shipping legacy transuranic waste, currently stored in the TA-54 domes, to WIPP.	On-going	2008/2009	EP
SWEIS Biological Assessment	Develop and implement a wetlands/floodplains management plan.	On-going		ENV
	Evaluate ecological risks to watershed-specific T&E species and update site-wide modeling of ecological risk.	On-going	2008/2009	ENV
	Consider span bridges instead of land bridges in areas that cross canyons in T&E species habitats to reduce environmental impacts.	On-going		Projects
	Implement all reasonable and prudent measures in the SWEIS BA through the institutional project review process and implementation of the T&E species HMP.	On-going	2008/2009	Projects
Biological Resources Management Plan	Implement Biological Resources Management Plan.	On-going	2008/2009	ENV
Cultural Resources Management Plan	Implement Cultural Resources Management Plan.	On-going	2008/2009	ENV

2008 SWEIS MAPAR Tracking FY 2009 (Green items are complete; yellow is an on-going action; red is a closed or on-hold mitigation).

Topic	Action	Mitigation Completed	Annual Requirement Completed	Responsible Party
Institutional Resource Management Responsibilities continued				
Energy Conservation: Electrical	Upgrade electrical infrastructure in buildings to reduce electrical usage.	On-going		FODs, HSR, PM
	Install gas-fired combustion turbine generator and upgrade existing steam turbines.	Complete	2008/2009-turbine installed	ADNHHO
	Meter major energy user facilities and sub-meter all other facilities to quantify and evaluate electrical consumption.	On-going	2009 metering plan goals complete	ADNHHO
	Construct the portion of power line from the Norton substation to STA.	On-hold		ADNHHO
	Construct Pajarito Corridor Electric Substation at TA-50.			ADNHHO
	Implement Energy Savings Performance Contract third-party financed retrofit projects to improve building efficiencies Lab-wide.	On-going		Institutional/ADNHHO
	Purchase additional renewable wind energy.	On-going	2008, LANL purchased 14,000 MWhrs of RECs	ADNHHO
	Purchase and/or lease "Energy Star" electronics.	On-going		ASM/DPRs
	Improve new building efficiencies by integrating Leadership in Energy and Environmental Design (LEED)/Sustainable Design on line-item contracts.	On-going	CMRR will be LEED, HPBS working group is in place	PM/Engineering
Energy Conservation: Natural Gas	Meter major energy user facilities and sub-meter other facilities to quantify and evaluate natural gas consumption.	On-going (2012 deadline)	2009 metering plan goals complete	ADNHHO/ENV
	Install more efficient gas-fired combustion turbine generators and upgrade existing steam turbines to conserve power and energy.	On-going	2008/2009-turbine installed	ADNHHO
Energy Conservation: Water	Expand the SERF to increase the amount of recycled water usage and reduce water consumption.	NEPA EA regarding Sandia Wetlands required to move forward with expansion		EP/ADNHHO
Pollution Prevention (P^2)	Annually report waste reduction performance against EMS waste reduction goals.	On-going	2008	ENV
	Continue to integrate waste reduction activities into the EMS.	On-going	2008	ENV

2008 SWEIS MAPAR Tracking FY 2009 (Green items are complete; yellow is an on-going action, red is a closed or on-hold mitigation).

Topic	Action	Mitigation Completed	Annual Requirement Completed	Responsible Party
Institutional Resource Management Responsibilities continued				
Clean Fill	Use excavation and demolition spoils locally to minimize purchase or new excavations of clean fill when possible.	On-going	CMRR project 2008	Projects
	Report annually on reuse of clean fill materials from excavations and DD&D.	On-going		ENV
Traffic Mitigations	Identify possible solutions to minimize traffic issues related to DD&D, remediation, and construction projects.	On-going		Projects
	Encourage alternative transportation, including walking, car-pooling, bicycling, and public transportation.	On-going	April Atomic City Transit contest, EMS posters 2008	ENV/IP
	Improve overall Lab-wide fleet fuel efficiency.	On-going	PIP complete 2008; being implemented	ASM
	Consider plans for an alternative route off DP Mesa.	No alt. route required	N/A	TA-21 DD&D Project
	Enhancement of Existing Programs			
Site Planning	Enhance the decision support tool that offers an objective and semi-quantitative method for integrating opportunities and constraints for project planning and compliance.	On-going		IP/ENV
	Use Project Review and Requirements System in concert with the decision support tool and project site selection process to better identify potential site planning constraints early in project development.	On-going		IP/ENV
	Use the decision support tool to comply with Land Transfer Regulations (10CFR770).			ENV
Compliance Assurance	Assign a functional manager for the PR-ID process and supporting tool, ensure supporting authority and funding for effective use in project development, compliance, and site planning.	On-going		ADESHQ, ADE, ADPMSS
	Implement compliance assurance process on a sample of PR-ID projects.	On-going	LA-UR-09-06307	ENV
	Develop metrics and track results.	On-going		ENV
	Implement process improvement measures as appropriate.	On-going		ENV
Commitments to Santa Clara				
Consultations with Santa Clara Pueblo	No later than January 30, 2009, DOE/NNSA LASO shall develop, jointly with Santa Clara Pueblo, a plan to address environmental justice and human health concerns and issues identified by the Santa Clara Pueblo during the SWEIS process. The plan will include specific tasks and timelines, and identify the necessary NNSA and Pueblo resources to help ensure implementation of the plan. In consultation with Santa Clara Pueblo, LASO will update the MAP to incorporate these actions.	LASO	LASO	DOE/NNSA LASO

Appendix II

2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (DOE/EIS 0380) Mitigation Action Plan

U.S. Department of Energy
December 2008

Title: **2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (DOE/EIS 0380) Mitigation Action Plan**

U.S. Department of Energy

Date: **December 2008**

Contents

List of Acronyms

ALARA	As Low As Reasonably Achievable
BA	Biological Assessment
BMPs	best management practices
BRMP	Biological Resources Management Plan
CFR	Code of Federal Regulation
CMRR	Chemistry and Metallurgy Research Building Replacement
CRMP	Cultural Resources Management Plan
DARHT	Dual-Axis Radiographic Hydrodynamic Test Facility
DD&D	decontamination, demolition, and decommissioning
DOE	U.S. Department of Energy
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMS	Environmental Management System
ENV-RRO	Environmental Protection (Division)-Risk Reduction Office
ESA	Endangered Species Act
ESR	Environmental Surveillance Report
FONSI	Findings of No Significant Impact
FRS	Flood Retention Structure
FY	fiscal year
HMP	Habitat Management Plan
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
LANSCE	Los Alamos Neutron Science Center
LASO	Los Alamos Site Office
MAP	Mitigation Action Plan
MAPAR	MAP Annual Report
MDA	material disposal area
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
OSRP	Off-Site Source Recovery Project
PNM	Public Service Company of New Mexico
PR-ID	Project Requirements Identification
PRS	potential release site
RLWTF	Radioactive Liquid Waste Treatment Facility
ROD	Record of Decision
SEA	Special Environmental Analysis
SERF	Sanitary Effluent Recycling Facility
STA	Southern Technical Area
SWEIS	Site-Wide Environmental Impact Statement
TA	Technical Area
T&E	threatened and endangered
TAWG	Trails Assessment Working Group

U.S.C.	U.S. Code
USFWS	U.S. Fish and Wildlife Service
WFMP	Wildland Fire Management Plan
WIPP	Waste Isolation Pilot Plant
WTA	Western Technical Area

1.0 INTRODUCTION

The National Environmental Policy Act (NEPA) Implementing Procedures of the U.S. Department of Energy (DOE) (Title 10 *Code of Federal Regulations* [CFR] 1021.331) requires completion of a mitigation action plan (MAP) following each environmental impact statement (EIS) and its associated record(s) of decision (RODs) to address mitigation commitments expressed in the ROD(s). The DOE/National Nuclear Security Administration (NNSA) issued the *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory* (2008 SWEIS) (DOE 2008a, DOE/EIS-0380) in May 2008 and issued a ROD on September 19, 2008 (2008 SWEIS ROD or ROD; DOE 2008b); the ROD was published in the Federal Register (FR26SE08N) on September 26, 2008. In the ROD, NNSA decided to implement the No Action Alternative and certain elements of the Expanded Operations Alternative. It is likely that NNSA will issue other RODs regarding the continued operation of Los Alamos National Laboratory (LANL or Laboratory) based on the 2008 SWEIS.

The 2008 SWEIS identifies the environmental impacts resulting from the three analyzed alternatives (No Action, Reduced Action, and Expanded Operations) and discusses measures that NNSA considered for the mitigation or reduction of adverse effects. The SWEIS MAP is a DOE management document that explains how the mitigation measures identified in the 2008 SWEIS and ROD will be planned and implemented. The MAP will be implemented by Los Alamos National Security, LLC, (LANS), as the LANL Management and Operation Contractor for DOE. The MAP must be executed before DOE takes any action directed by a ROD. It may also be revised to meet additional requirements associated with future RODs, or to meet the objectives set out in the 2008 SWEIS.

The MAP will be made available in the appropriate DOE public reading room(s) or other locations for a reasonable time. Copies of the MAP will also be available upon written request from DOE.

1.1 Purpose of the Mitigation Action Plan

The MAP determines what mitigation measures will be implemented from the 2008 SWEIS and explains how the mitigation measures will be planned and implemented for those actions decided in the ROD. There are several different types of mitigation measures included in this MAP, which are outlined in Section 3.0. Planning and implementation of the mitigation measures, as well as reporting requirements to assure proper implementation and performance of the measures, are included in Sections 1.2 and 2.0.

Additionally, the 2008 SWEIS ROD provided commitments to Santa Clara Pueblo as part of ongoing government-to-government relations regarding the 2008 SWEIS. These commitments are outlined in Section 4.0.

1.2 MAP Monitoring and Reporting

1.2.1 SWEIS Yearbook

To measure the accuracy of the 1999 *Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory* (1999 SWEIS) (DOE 1999a, DOE/EIS-0238) impact analysis, the DOE/NNSA Los Alamos Site Office (LASO) and LANS implemented a program to compare actual operational data with the environmental impacts identified in the 1999 SWEIS. These comparisons are published in an annual SWEIS Yearbook. The yearbooks provide data that could be used to develop an impact analysis for future EISs developed for the Laboratory. This MAP requires continuation of the SWEIS yearbooks for implementation of the 2008 SWEIS and ROD. The 2008 SWEIS will be implemented over about a five-year period and the SWEIS yearbooks will provide NNSA with data to facilitate the production of a new SWEIS if deemed necessary. The SWEIS yearbooks will be prepared by LANS for LASO review and approval through the LASO NEPA Compliance Officer and be made available to the public.

1.2.2 MAP Annual Report

Section 5.d(11)(f) of DOE Order 451.1B, *NEPA Compliance Program*, requires LASO to prepare an annual report outlining accomplishment taken in accordance with an issued MAP. The first MAP Annual Report (MAPAR) for the 2008 SWEIS will be published in fiscal year (FY) 2010 and will report actions taken to address the mitigation identified in the 1999 SWEIS and the 2008 SWEIS MAP and other MAPs issued during FY 2008 or 2009. The MAPAR will be submitted as an appendix to the SWEIS Yearbook, or other annual reporting documet with DOE approval (such as the annual Environmental Surveillance Report [ESR]).

2.0 IMPLEMENTATION

The MAP implementation process involves LASO and several LANL organizations. The implementation process includes mitigation action management (task scoping and funding allocation), tracking, technical implementation, annual reporting, and mitigation action closure.

2.1 Roles and Responsibilities

LASO is responsible for implementing and tracking the mitigations in the MAP. The daily coordination and management of MAP activities have been delegated by LASO to LANS in accordance with their Management and Operations contract (Contract #DE-AC52-06NA25396). The LANS responsible office for the implementation of the MAP is the Environmental Protection Division's Risk Reduction Office (ENV-RRO). The ENV-RRO coordinates technical issues regarding the scope and schedule of individual mitigation measures of the MAP with other divisions within LANS. These projects and activities have been assigned to LANL organizations that have primary institutional responsibility for operations that the mitigation actions address.

2.2 Mitigation Tracking

LANS will maintain a log to track the scope, schedule, interim milestones, deliverables, and closure of mitigation measures outlined in this MAP. A copy of the tracking log will be transmitted to the LASO NEPA Compliance Officer monthly. Any issues in meeting the commitments should be identified when LANS transmits the log to LASO.

2.3 MAP Review and Revision

This MAP will be reviewed annually after issuance of the SWEIS yearbook(s) to determine if the mitigation measures identified in the 2008 SWEIS are effective. The MAP may be revised to address any deficiencies.

Additionally, the MAP will be reviewed after each new ROD is issued to determine if new mitigation measures are required or if mitigation measures previously identified need to be revised.

2.4 MAP Duration and Mitigation Closure

The duration for specific mitigation measures will be identified in the MAP tracking log prepared by LANS. As currently scheduled, the implementation of the MAP and all associated mitigation actions will be completed at the end of calendar year 2013, or until directed by LASO. As individual projects and activities that address specific mitigation measures are completed, LANS will provide formal documentation and rationale for recommending mitigation action closure in their monthly reports. LASO will review the documentation and provide authorization of closure or direction for further action. Final closure of mitigation actions authorized by LASO will be reported in the MAPAR.

3.0 MITIGATION

This section outlines the mitigation measures required to implement the 2008 SWEIS. There are several different types of mitigation measures included in the 2008 SWEIS.

The 2008 SWEIS included a review of existing programs, plans, and controls built into the operations at LANL that function as mitigation measures. These measures will continue to be implemented as part of the MAP and are outlined in Section 3.1.

Specific mitigation measures were outlined in the 2008 SWEIS alternatives. These mitigation measures are outlined in Section 3.2, and are further defined in additional measures adopted in this MAP to mitigate the impacts of continuing to operate LANL, as outlined in the ROD. Additional mitigation measures presented in this MAP are of four types and are based on the mitigation measures incorporated in the SWEIS alternatives:

(1) Continuing mitigation commitments established by the earlier 1999 SWEIS MAP and mitigation commitments that reflect NEPA decisions that have occurred since the issuance of the 1999 SWEIS ROD (DOE 1999b) (Section 3.3).

(2) Detailed mitigation measures for specific projects analyzed in the 2008 SWEIS and included in the ROD intended to minimize the identified environmental impacts (Section 3.4).
(3) Institutional resource management responsibilities, including Laboratory-wide commitments and mitigation (Section 3.5).
(4) Enhancement of existing programs that will improve operational efficiency and minimize future potential impacts from LANL operations (Section 3.6).

3.1 Existing Programs, Plans, and Controls

Activities undertaken at LANL are performed in compliance with applicable regulations, DOE Orders, and contractual requirements. Many laws and regulations pertaining to operating Federal facilities are in place to protect human health and the environment. It is understood that these or similar regulatory controls will continue to be in place. Operating in compliance with these requirements mitigates the potentially adverse impacts of operations to the public, workers, and the environment.

Contractual mechanisms between DOE and LANS, include regulations and requirements applicable to LANL operations. These regulations and requirements also mitigate the potential for adverse impacts. For example, the application of DOE design standards results in facility designs for modern nuclear facilities that reduce the potential for catastrophic releases from these facilities in the event of earthquakes, high winds, or other natural phenomena. Application of occupational safety and health regulations (29 CFR 1900, et seq.), and other standards promulgated by the American National Standards Institute, the U.S. Department of Defense, and DOE, as well as the use of other life safety and fire safety codes and manuals, limit worker exposures to workplace hazards, thus reducing potential adverse worker health effects.

DOE, NNSA, LASO, and LANS have instituted policies, procedures, and programs applicable to work conducted at LANL to mitigate potentially adverse effects of operations. It is understood that these or similar policies and procedures will continue as described in the 2008 SWEIS. These policies, procedures, and programs include, but are not limited to the following:

- Policies that ensure environmental requirements and issues are identified and reviewed early in the planning process.
- Procedures that institute integrated safety management to control work.
- 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 accords with the four Pueblos located nearest to LANL), with protocols regarding consultations and other discussions regarding LANL activities.
- 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, work is stopped, as soon as stoppage can be accomplished safely, until work plans and authorizations can be modified in consideration of the new information.
- Programs and projects at LANL to increase the level of knowledge regarding the

environment around LANL, the health of LANL workers, the health of the public, and the effects of LANL operations on these elements, as well as to avoid or reduce impacts and to remediate contamination from previous LANL activities.

There are also policies, procedures, programs, plans, and projects in place at LANL to (1) reduce potentially adverse impacts by providing a heightened understanding of the resources that could be impacted; (2) avoid impacts where mechanisms for impacts to specific resources are known and avoidable; (3) provide early identification of impacts to enable stoppage or mitigation of the impacts; (4) reduce ongoing impacts; and (5) provide beneficial management opportunities to avoid impacts to natural, cultural, and sensitive resources. It is understood that such activities will continue at LANL. Examples of these include the following:

- LANL implementing policy and procedure (IPP 400.1; LANL 2007a) requires an environmental review for all new and modified work at LANL.
- The Environmental Surveillance and Compliance Program monitors permit and environmental management requirements. This program includes evaluations of samples from various environmental media for radioactive materials and other hazardous materials both locally and regionally. The data generated under this program are collected routinely, reported annually to the public in the ESR, and analyzed to determine regulatory compliance and environmental trends over time.
- The Threatened and Endangered Species Habitat Management Plan (HMP) (LANL 1998; LA-UR-98-4800) provides for long-range planning information for future LANL projects and protects the habitats of federally listed species.
- The Cultural Resources Management Plan (CRMP) (LANL 2004a; LA-UR-04-8964) has undergone public review and is implemented through a programmatic agreement between DOE, the New Mexico State Historic Preservation Office, and the Advisory Council on Historic Preservation. The CRMP is discussed below.
- Waste minimization and pollution prevention efforts at LANL are coordinated by the Pollution Prevention Program, which works to reduce wastes generated and, to some extent, effluents and emissions from facilities.
- Studies of public and worker health in and around LANL have been conducted (some by DOE and some by other agencies) to assess both human health in the region and the potential for adverse human health effects due to LANL operations.
- The Health, Safety, and Radiation Protection Program is based on the As Low As Reasonably Achievable (ALARA) (10 CFR 835) principle for minimizing radiation doses and releases of radioactive materials by employing all reasonable methods. ALARA is a regulatory requirement of DOE radiation safety programs. The Health, Safety, and Radiation Protection Program addresses possible impacts resulting from working with chemicals and biohazardous materials.
- The Groundwater Stewardship Program assesses current groundwater conditions to monitor and protect groundwater through the integration of multiple plans and reports, including an Integrated Facility-Wide Groundwater Monitoring Plan and the ESR.
- The Safeguards and Security Program restricts unauthorized access to areas of LANL that have a high potential for impacts to human health and the environment. Such access restrictions limit the potential for intentional or inadvertent actions that could result in environmental or human health effects.

- LANL's Emergency Management and Response Program effectively combines Federal and local emergency response capabilities and provides planning, preparedness, and response capabilities that can aid in containing and remediating the effects of accidents or adverse operational impacts.
- LANL's Fire Protection Program ensures that personnel and property are adequately protected against fire or related incidents, including fire protection and life safety.
- An Interagency Wildfire Management Team coordinates activities related to reducing regional wildland fire danger. On site, LANL is implementing actions around individual facilities that have moderate or higher vulnerability to wildfire.
- The LANL Environmental Restoration Project (which includes decontamination, demolition, and decommissioning [DD&D] activities) assesses and remediates contaminated sites that either were, or still are, under LANL control. The Environmental Restoration 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. Contaminant risks at LANL are largely mitigated by actions of this project. The Environmental Restoration Project and Environmental Surveillance and Compliance Program collectively identify contaminant problems at LANL, and upon implementation of the Biological Resources Management Plan (BRMP) (LANL 2007b, LA-UR-07-2595), contaminant monitoring will be complete.

In addition, the 2007 *Update of the Probabilistic Seismic Hazard Analysis and Development of Seismic Design Ground Motions at the Los Alamos National Laboratory* (LANL 2007c; LA-UR-07-3965) provides new information about seismic risks at LANL, which may change how hazardous materials are stored, operations are conducted, and facilities are constructed or renovated. NNSA is conducting a systematic review of LANL structures and operations in light of this information. This review will identify any necessary changes to address the new seismic information. NNSA will implement the necessary changes to LANL facilities and operations based on the review's recommendations.

The MAP is also aligned with the LANL Environmental Management System (EMS) and supports existing projects and operations established to meet the five EMS objectives: ensure environmental compliance; reduce waste generation; energy and fuel conservation; disposition of excess items, equipment, chemicals, documents and materials; and achieve zero liquid discharge by 2013. Many of the mitigation actions discussed in this MAP will be included in one or more of the annual EMS Action Plans. However, many of the mitigation actions are multiple year projects that will be tracked in the MAPAR.

3.2 MITIGATION MEASURES FROM 2008 SWEIS ALTERNATIVES

Several specific mitigation measures are included in the 2008 SWEIS alternatives. Unless otherwise noted below, the analyses in this section assume that the following measures would be implemented. Detailed descriptions of mitigation measures are provided in subsequent sections and section numbers are identified in bold at the end of each description.

- NNSA intends to implement actions necessary to comply with the New Mexico Environment Department (NMED) Compliance Order on Consent (Consent Order)

(NMED 2005); however, specific actions have not been selected. Removal of contamination from material disposal areas (MDAs) and other potential release sites (PRSs), if necessary, would be conducted in a manner that protects the environment and public and worker health and safety. Removal of waste from some large MDAs may require use of temporary containment structures to limit possible releases of contaminated material to the environment to levels within applicable standards and ALARA principles. The MDAs where use of containment structures or equivalent measures may be required for safe removal operations include MDAs A, B, T, AB, and G (Expanded Operations Alternative – MDA Removal Option; **Section 3.5.1**).

- Nonradioactive air emissions, such as from construction equipment would be controlled by proper maintenance of equipment (**Section 3.5.1**).
- Noise impacts on sensitive wildlife species during MDA remediation, DD&D, and construction activities will be mitigated by planning activities outside of the breeding season for sensitive species if any sensitive species' habitat is identified in the area and if the habitat is occupied or the status is uncertain. If appropriate, other protective measures could be employed, such as hand digging (**Sections 3.5.4 and 3.5.5**).
- Radiological air emissions will be monitored and tracked to maintain the annual dose to the public from Los Alamos Neutron Science Center (LANSCE) emissions under the administrative limit (**Section 3.5.1**).
- Actions will be taken to mitigate the risks of a wildfire on waste storage domes in Technical Area (TA) 54. In 2000, the Cerro Grande Fire burned a heavily forested canyon area to within about 0.75 miles (1.2 kilometers) of the waste storage domes in TA-54, but none were burned and there were no radiological releases from domes. Additional fuel reduction has been conducted since the Cerro Grande Fire to further decrease the potential for a waste storage dome fire occurring as a result of a site wildfire. This includes fuel reduction activities to the vegetation surrounding the TA-54 area and within the domes themselves (for example, wooden pallets have been replaced with metal pallets). LANS will continue its wildfire management activities (for example, forest thinning) and further reduce risks by shipping legacy transuranic waste, currently stored in the domes, to the Waste Isolation Pilot Plant (WIPP) (**Section 3.5.2**).
- Expanded sealed source program procedures will ensure adequate controls on the quantities and methods of storing sealed sources containing cobalt-60, iridium-192, or cesium-137 to mitigate the effects of potential accidents. If an accident were to occur, this would reduce the potential direct gamma radiation streaming dose that could compromise the shielding around these gamma-emitting radioisotopes (**Section 3.4.2**).
- Los Alamos County has recently initiated activities aimed at developing a 40-year water plan to address water service needs, balance the uses of water resources, and make recommendations for a water conservation program tailored to meet specific water supply customer needs in the county, including LANL. Only the Expanded Operations Alternative, which was not selected in the ROD, is projected to have water demands that would approach the available water rights from the regional aquifer. Los Alamos County's plans to use up to 391 million gallons (1,500 million liters) of water per year from the San Juan-Chama Transmountain Diversion Project as early as 2010 would alleviate any potential shortfall between future demand and current groundwater rights. LANL's water use would be mitigated somewhat by the use of recycled water from the Sanitary Effluent Recycle Facility (SERF) for cooling water (**Section 3.5.6.3**).

- Ongoing upgrades are being made to the electrical power transmission and distribution system, including construction of a third transmission line to allow import of additional power into the Los Alamos Power Pool and to support a higher electric peak load beyond 2006. An environmental assessment (EA) titled *Environmental Assessment for the Installation and Operation of Combustion Turbine Generators at Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE 2002a; DOE/EA-1430) was prepared and a Finding of No Significant Impact (FONSI) was issued in December 2002 for a project to install two new (20-megawatt) gas-fired combustion turbine generators and to upgrade the existing steam turbines at the TA-3 Co-generation Complex. As discussed in the EA, upgrades and installation of one new combustion turbine generator were scheduled to be completed in 2006. While DOE currently has no timeframe for installing a second combustion turbine generator, its installation in the future would add 20 megawatts (equivalent to 175,200 megawatt-hours) of electrical power generating capacity at LANL (**Section 3.5.6.1**).
- Particulate matter (fugitive dust) emissions from exposed soil and roadways during construction activities will be controlled using routine dust suppression watering as appropriate. As necessary, air pollutant emissions from construction activities and MDA remediation activities would be controlled using standard construction emissions controls. Application of eco-safe chemical stabilizers to exposed areas and administrative controls such as planning, scheduling, and use of special equipment could further reduce emissions under all of the alternatives (**Section 3.5.1**).
- Use of containment vessels for high explosives testing under all of the alternatives could further reduce air pollutant emissions, such as beryllium and depleted uranium, from this activity (**Section 3.3.1**).
- There is a possibility for an increase in truck traffic into and out of LANL over the next several years related to construction, waste shipments, and decontamination and demolition activities. Additional traffic studies should be undertaken to determine if activities under consideration in the 2008 SWEIS would increase traffic to unacceptable levels and to identify possible solutions in the event such problems are identified (**Section 3.5.8**).
- Traffic and noise impacts on residents of the Royal Crest Mobile Home Park and Los Alamos Town Center due to increased truck traffic could be mitigated by scheduling activities for off-peak hours, rerouting truck traffic, using multiple shifts, using alternative entries and exits, and, in the case of TA-21 remediation and DD&D, possible construction of a bridge or another road off of DP Mesa to allow alternate routing of traffic. Stockpiling bulk materials on the sites during off-peak hours also could be considered to avoid frequent trips during peak hours (**Section 3.5.8**).
- To alleviate concerns associated with additional employees commuting to LANL from areas such as Rio Arriba and Santa Fe counties, expansion of the park-and-ride bus service, currently offered from Española and Santa Fe, may be needed (**Section 3.5.8**).

3.3 Transition of Previous LANL NEPA Mitigation Commitments into the 2008 SWEIS MAP

This section provides an overview of continuing mitigation commitments remaining to be implemented from the 1999 SWEIS MAP and mitigation commitments resulting from projects initiated after the issuance of the 1999 SWEIS ROD. These NEPA mitigation commitments will be transitioned into the 2008 SWEIS MAP reporting process.

3.3.1 Dual-Axis Radiographic Hydrodynamic Test Facility Final Environmental Impact Statement

Objective
Update the Dual-Axis Radiographic Hydrodynamic Test (DARHT) facility MAP (DOE 1996) requirements to reflect current transition to fully contained experiments and close mitigation actions that have been completed.

Context
DARHT began its operations in 2001and the mitigation actions associated with construction of the facility have been completed. The HMP has been developed and implemented, closing the DARHT MAP requirement. A long-term monitoring program was conducted to assess the impact of DARHT operations on Nake'muu (the only documented standing-wall Ancestral Pueblo site on the Pajarito Plateau). The results of the monitoring program have established that the gradual deterioration of the Nake'muu Pueblo is the result of natural causes and not the result of DARHT operations (LANL 2004b; LA-UR-03-7364 and LANL 2006a; LA-CP-06-0926). Therefore, the MAP requirement to monitor Nake'muu has been satisfied and closed.

The 2006 DARHT MAPAR (LANL 2006b; LA-UR-06-5971) recommends reevaluation of the environmental monitoring strategies at DARHT as experiments transition from open shots to shots conducted in steel-walled containment vessels. This change will significantly reduce releases of contaminants into the environment. Trend analysis of contaminant concentrations in the environment demonstrates that during the period when uncontained experiments were conducted at DARHT, contaminant levels were largely static. Increases were observed for uranium-238 and beryllium, and several contaminants have exceeded baseline levels at times, but have always been below the risk screening levels. Since the explosive tests will be mostly contained in steel-walled vessels beginning in 2008, sampling frequency can be reduced, keeping abreast of the contaminants that have consistently exceeded baseline (preoperation) levels.

Background
DOE issued the Final EIS on the DARHT Facility (DOE 1995; DOE/EIS-0228) in August 1995 and issued a ROD on October 16, 1995. The DARHT ROD states that DOE has decided to complete and operate the DARHT facility while implementing a program to conduct most tests inside steel containment vessels with containment to be phased in over 10 years (the Phased Containment Option of the Enhanced Containment Alternative). The ROD further states that DOE will develop and implement several mitigation measures to protect soils, water, and biotic and cultural resources potentially affected by the DARHT facility construction and operation. DOE also committed to taking special precautions to protect the Mexican spotted owl (*Strix*

occidentalis lucida) by preparing and implementing a Laboratory-wide HMP for all Federal threatened and endangered (T&E) species occurring throughout LANL. The DARHT MAP elaborates upon those commitments (DOE 1996).

In December 1995, LANL completed a Biological and Floodplain/Wetland Assessment for the DARHT facility as required under the Endangered Species Act (ESA) (Keller and Risberg 1995; LA-UR-95-647). The assessment includes mitigation expected to prevent any likely adverse effect to T&E species or modification to critical habitat. The mitigation measures identified in the assessment were the basis for U.S. Fish and Wildlife Service (USFWS) concurrence with a finding of "may affect, but not likely to adversely affect," and have been used as the basis for establishing mitigation commitments and action plans for potential impacts to T&E species and critical habitat as identified in the DARHT MAP. These mitigation measures, through implementation of the DARHT MAP, have established some of the guidelines under which the facility was constructed and operates to address the potential impacts.

Long-term archaeological investigations at Nake'muu have resulted in completion of the major monitoring mitigation requirements (LANL 2006a; LA-CP-06-0926). The Pueblo of San Ildefonso has been notified of the proposed completion of this requirement. However, the DARHT MAP commits to continue annual Tribal tours of Nake'muu. As DARHT experiments have transitioned to full containment, the annual surveillance sampling schedule will be reduced to include, at a minimum, soils and one additional medium (e.g., vegetation, small mammals, bees, or birds).

Mitigation Action Commitments

- Conduct annual Tribal tours of Nake'muu and maintenance visits.
- Reduce annual surveillance sampling schedule to include, at a minimum, soils and one additional medium.
- Emissions data from contained experiments and comparisons with results from the previous operations, starting in 2001, will be included in the 2009 SWEIS MAPAR to be published in FY2010.

3.3.2 Mitigation Action Plan for the Proposed Los Alamos National Laboratory Trails Management Program

Objective

Continue to implement the Trails Management Program and integrate future mitigation actions with the SWEIS MAPAR to decrease risks associated with trails use on DOE/LANL lands.

Context

Trails use at LANL has been considered one of the benefits of working and living in Los Alamos. However, there was never an explicit DOE or LANL policy or mechanism to balance recreational trails use with environmental, cultural, safety, security, and operational concerns. In 2003, DOE directed LANL to look at establishing such a program. DOE/NNSA published the *Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program* and FONSI (DOE 2003a; DOE/EA-1431) on September 2, 2003. The NNSA issued a MAP for this EA on the same date.

The public offered more than 125 comments on the draft EA and representatives from San Ildefonso and Santa Clara Pueblos participated, explaining their concerns and perspectives. The National Park Service and Los Alamos County cooperated as well.

Background
Implementation of the MAP for the LANL Trails Management Program is through individual projects, including measures for planning, repair, and construction of trails, environmental protection, safety, security, and post-project assessments. A standing Trails Assessment Working Group (TAWG) made up of LANL and other agency stakeholders was formed to carry out this program. The TAWG has met regularly since December 2003.

Mitigation Action Commitments
- Complete eligibility evaluations for historic trails under the National Historic Preservation Act and identify additional environmental issues on trails use.
- Evaluate and manage trails to determine appropriate closures and/or restrictions.
- Prepare management plans for trails in LANL TA-70 and TA-71.
- Support the use of volunteers for selected trails maintenance projects at LANL.

3.3.3 Special Environmental Analysis MAP

Objective
Continue to implement ongoing requirements of the Special Environmental Analysis (SEA) MAP (DOE/SEA-03).

Context
The SEA MAP identifies specific mitigation measures to reduce the environmental impacts of Cerro Grande Fire emergency fire suppression, soil erosion, and flood control actions. Annual monitoring has provided evidence that pre-Cerro Grande Fire hydrologic conditions have returned (see Section 3.5.2). However, certain activities identified in the SEA MAP continue.

Background
The DOE/NNSA prepared and issued the SEA in September 2000 (DOE 2000; DOE/SEA-03). The SEA describes and analyzes DOE and LANL actions taken in response to the Cerro Grande Fire. The SEA was prepared pursuant to the Council on Environmental Quality regulations implementing NEPA under emergency circumstances and DOE'S NEPA regulatory requirements by providing an analysis of the Cerro Grande Fire actions taken by NNSA and LANL from May through November 2000. The SEA identified various mitigation measures that must be implemented under the SEA MAP as an extension of the fire suppression, erosion, and flood control actions. Implementation of specific mitigation measures was assigned to LANL on December 18, 2000. Monitoring results of the mitigation effectiveness and the environmental effects of the emergency actions have been available to the public through an annual mitigation tracking report issued by DOE with support from LANL.

Mitigation Action Commitments

- Monitor biota and sediment contamination behind the Los Alamos Canyon Weir and the Pajarito Canyon Flood Retention Structure (FRS) and report results in the ESR (see Section 3.3.4 for additional information on the FRS).
- Periodically remove sediment from the Los Alamos Canyon Weir based on sedimentation rate and contamination accumulation rate.
- Complete rehabilitation of cultural resources impacted by the Cerro Grande Fire.

3.3.4 Flood and Sediment Retention Structure

Objective

Annually monitor the TA-18 FRS for safe operation until removal as discussed in the 2002 *Proposed Future Disposition of Certain Cerro Grande Fire Flood and Sediment Retention Structures at Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE 2002b; DOE/EA-1408) and to comply with previous NEPA commitments as per the 2008 SWEIS ROD.

Context

In 2001, NNSA constructed the FRS in the wake of the Cerro Grande Fire as part of its emergency response actions. Compliance with the 2008 SWEIS ROD requires the eventual removal of the FRS in Pajarito Canyon as discussed in the EA. This structure was constructed to control flooding resulting from increased water flow due to post-Cerro Grande Fire hydrologic conditions.

Background

The FRS was built to address the changes in local watershed conditions that resulted from the Cerro Grande Fire. The long-term disposition of this structure was not considered a part of the decision to undertake the construction action. The EA provides NNSA with guidance for removal of this structure and other flood control structures, once they were no longer needed to protect LANL facilities and the businesses and homes located downstream. According to the EA, the Pajarito Canyon FRS will be maintained in a safe and fully functioning condition until NNSA determines that upstream hydrologic conditions have returned to pre-fire flow regimes or the local ecosystem has recovered sufficiently to approximate pre-fire conditions. Once these conditions have been met, the FRS should be removed.

Stream flow conditions in Pajarito Canyon have substantially improved since the Cerro Grande Fire. Immediately after the fire, peak flows of greater than 1,000 cubic feet per second were recorded below the burned area. In the years since, there has been an overall decline in runoff peak flow. Peak flows of 100 cubic feet per second or less are now typical. Peak flows of this magnitude are typical for other drainages across the Pajarito Plateau (for example Los Alamos Canyon).

In addition to the decline in peak flows, there has been a decline in the total volume of runoff yielded by the burned areas following thunderstorms. Total runoff yields from the major LANL canyons that drain burned areas recovered to pre-fire levels by 2002 (Gallaher and Koch 2005; LA-LP-05-008). Additional evidence of ecosystem recovery in the Pajarito Canyon watershed is provided by Clark and Kuyumjian (2006) who indicate that the watershed has recovered to

approximate pre-Cerro Grande Fire conditions. Overall, the risk from flash flooding due to fire conditions has been substantially lowered since 2000.

Mitigation Action Commitments

- Annually monitor the FRS for structural integrity and safe operations until removed.
- Remove portions of the FRS in accordance with DOE/EA-1408.
- Recycle demolition spoils from FRS DD&D as appropriate.
- Consider leaving an aboveground portion of the FRS equivalent to the dimensions of a low-head weir to retain potentially contaminated sediments on Laboratory land.
- Remove aboveground portions of the steel diversion wall below the FRS.
- Recontour and reseed disturbed areas to protect surface water quality in Pajarito Canyon after the FRS is removed.

3.4 Project-Specific Mitigation Measures Analyzed in the SWEIS

3.4.1 Eliminate Effluent Discharge at Radioactive Liquid Waste Treatment Facility (RLWTF)

Objective

Address biological resource compliance requirements associated with eliminating effluent discharges from LANL's National Pollutant Discharge Elimination System (NPDES)-permitted RLWTF outfall.

Context

LANL has an overall goal of eliminating effluent discharges from its NPDES-permitted outfall at RLWTF as part of the institutional zero liquid discharge objective in the LANL EMS. The current and anticipated regulatory requirements for water quality standards drive this action. There are many positive benefits to be realized from eliminating discharges. However, in a semi-arid environment like Los Alamos, the elimination of effluent discharges may negatively impact wetlands, riparian habitats, the occurrence of protected or sensitive species, and prey abundance for T&E species. Wetlands and T&E species are protected under the ESA and Federal regulation 10 CFR 1022, "Compliance with Floodplain and Wetland Environmental Review Requirements."

Background

LANL's industrial effluent outfalls are regulated by the State of New Mexico under the Clean Water Act (33. U.S. Code [U.S.C.] § 1251 et seq.) and are NPDES-permitted. Since 1990, LANL has observed a trend of increasingly stringent water quality standards for effluent discharges in New Mexico as reflected in changing Conditions of State Certification of LANL's NPDES Permit and various proposed NMED and Indian Tribe water quality standards (McInnis and Rae 1994; LA-UR-94-705). LANL's long-term strategy for meeting current and future effluent discharge water quality requirements is to reduce those discharges to zero. To meet this goal, LANL is currently eliminating non-essential outfalls, consolidating essential outfalls, employing evaporation tanks, and pursuing reuse strategies.

The 2008 SWEIS considers the impacts of one major discharge elimination project at the RLWTF. Elimination of effluent was evaluated for impacts to T&E species in Biological Assessment (BA) for the 2008 SWEIS, *Biological Assessment of the Continued Operation of Los Alamos National Laboratory on Federally Listed Threatened and Endangered Species* (LANL 2006c; LA-UR-06-0679). The outcome of the consultation with the USFWS on the closure of two outfalls in Mortandad Canyon was that the closures were not likely to adversely affect T&E species. However, reasonable and prudent mitigation measures were specified in the document.

Mitigation Action Commitment

- All further actions affecting water flow volumes in the Sandia-Mortandad Canyon Area of Environmental Interest should be assessed for positive and negative impacts.

3.4.2 Expanded Operations of the Off-Site Sealed Source Recovery Project

Objective

Ensure adequate controls on the quantities and storage of recovered sealed sources.

Context

The existence of excess and unwanted sealed sources within the U.S. was identified by the Nuclear Regulatory Commission as a threat to national security. Removal of these excess sources requires transportation to safe, secure storage and disposal facilities. Sources are packaged and transported in accordance with U.S. Department of Transportation Regulation (49 CFR 173).

Background

The Low-Level Radioactive Waste Policy Amendments Act (Public Law 99-240) of 1985 assigned the DOE the responsibility for management of greater than Class C waste. DOE's response to Congress stated that management of greater than Class C wastes was not feasible due to the lack of disposal facilities in the U.S. As a solution, a management approach that included the DOE committed to collection and storage of greater than Class C waste pending development of disposal facilities. In 1999, the DOE waste management section and DOE's Albuquerque office consolidated three existing projects related to source recovery and management into the Off-Site Sealed Source Recovery Project (OSRP) and designated LANL as the DOE facility to operate the project.

The initial mission of the OSRP was collection and storage of actinide-bearing sealed sources and utilization of disposal capabilities where they existed. Following the events on September 11, 2001, the OSRP was moved from DOE to NNSA as a part of their Office of Nuclear Non-Proliferation and expanded to include additional nuclides and sealed sources considered to be a risk to national security regardless of their designation as greater than Class C.

Mitigation Action Commitment

- Institute controls on the quantities and methods of storing sealed sources containing cobalt-60, iridium-192, or cesium-137 to mitigate the effects of potential accidents.

3.5 Institutional Resource Management Responsibilities

3.5.1 Air Emissions

Objective
Control air emissions that result from operations, construction, demolition, and remediation activities at LANL.

Context
LANL is required by multiple Federal laws, DOE Orders (e.g., 430.2B, Departmental Energy, Renewable Energy, and Transportation Management), and regulations to monitor and mitigate the release of radiological and nonradiological air emissions. LANL operations can result in the release of nonradiological air pollutants that can affect the air quality of the surrounding area. According to the Clean Air Act Title V (42 U.S.C § 7661 et seq.) site-wide permit, LANL is required to meet the Environmental Protection Agency's National Ambient Air Quality Standards.

In addition, LANL will ensure institutional compliance with requirements of 40 CFR 61, Subpart H: "National Emission Standards for Hazardous Air Pollutants - Radionuclides." LANL is required to measure, analyze, and report on radioactive air emissions from Laboratory facilities according to methods in this regulation.

Background
Emissions of criteria and hazardous air pollutants from activities at LANL are subject to the limitations in the Clean Air Act Title V site-wide operating permit. In addition to these limits there are limits on visible emissions.

All applicable air quality regulations will be implemented for Laboratory activities and the Clean Air Act Title V permit. This includes estimating air emissions, identifying applicable regulations, performing and documenting ambient air assessments, preparing and submitting permit applications, supporting public participation, and responding to public comment. LANL will assess all Laboratory sources and permit conditions to support the annual Title V permit certification; all new permitted sources require a series of notifications to the NMED with an initial source test to verify that emissions limits are met.

Annual Title V Permit Certification requires adherence to all air quality requirements to ensure that appropriate controls, permits, and operational procedures are in place and modifications and new construction are reviewed for air quality regulation applicability prior to initiation of work. There are projects and/or programs identified in the 2008 SWEIS that may contribute to radiological and nonradiological air emissions. These include remediation of MDAs and other PRSs associated with the Consent Order, construction activities, and LANSCE radiological emissions.

Mitigation Action Commitments

- Continue air monitoring program to comply with the Clean Air Act, including monitoring radiological air emissions. Monitor and track LANSCE emissions to maintain the annual dose to the public under the administrative limit.
- Use existing Project Requirements Identification (PR-ID) program and other tools to assess potential air quality impacts from new or modified projects and provide best management practices (BMPs) to control emissions (e.g., maintaining construction equipment and routine watering or eco-friendly chemical stabilization to control fugitive dust).
- Removal of contamination from MDAs and other PRSs would be conducted in a manner that protects the environment, the public, and worker health and safety.
- Removal of waste from some large MDAs may require the use of temporary containment structures to limit possible releases of contaminated material to the environment to levels within applicable standards and ALARA.

3.5.2 Wildland Fire Management

Objective

Comply with the 1999 SWEIS ROD to reduce the risk of a wildfire that may adversely impact the public, workers, facilities, operations, and the environment.

Context

The DOE Wildfire Management Policy (DOE 2003b) states that DOE sites are required to have wildland fire management plans (WFMPs) in place that are consistent with the *2001 Federal Wildland Fire Management Policy and Implementing Actions* (DOE Order 450.1). In addition, "this directive will require contractors to implement a program, as appropriate, to protect site resources from wildland and operational fires as part of their Integrated Safety Management System." The guidance document for the policy (DOE Guide 450-1.4) was developed to assist programs in meeting requirements in DOE Order 450.1.

Background

The 1999 LANL SWEIS included an accident scenario from a wildfire that started on land adjacent to LANL and subsequently spread to the site. It concluded that a major fire was not only credible but also likely and could result in significant impact to the region. In response to this analysis and a pattern of regional wildfires, LANL undertook wildfire mitigation actions, which served to protect critical facilities, such as the waste storage domes at TA-54, during the Cerro Grande Fire that occurred in May 2000. After that event, LANL received emergency funding through the Cerro Grande Rehabilitation Project to mitigate any remaining wildfire hazards. Approximately 7,000 acres of forest and woodland areas were treated. However, hazard areas identified as high priority for treatment remain undone and minimal forest fuels mitigation work has been completed. A comprehensive program is needed to maintain an acceptable level of risk.

In March 2007, the DOE Office of Inspector General completed a final report on "The Department's Wildland Fire Planning and Preparation Efforts." The report states that, "Despite specific experience with the serious consequences associated with wildland fires, Los Alamos had not completed all necessary preparedness and fire mitigation activities. A number of mitigation activities had been planned, but not completed."

To fulfill the requirements of DOE Order 450.1, and address the findings of the Office of Inspector General audit, a WFMP was developed in November 2007 and has been implemented. The WFMP is a detailed course of action to carry out wildland fire management site policies and help achieve fire protection objectives.

Mitigation Action Commitments
- Implement WFMP with adequately funded ongoing program.
- Continue to further reduce wildfire risks by shipping legacy transuranic waste, currently stored in the TA-54 domes, to WIPP.

3.5.3 Environmental Justice

Objective
Engage in effective communication to provide fair and equitable treatment concerning environmental issues related to LANL operations with surrounding minority and low-income communities.

Context
Many of the public comments from surrounding communities (including nearby Pueblos) expressed concerns about the impact of LANL operations. Some who commented took exception to statements in the 2008 SWEIS that low-income and minority populations are not disproportionately impacted by LANL operations. NNSA is committed to implementing the requirements of the Executive Order on Federal Actions to Address Environmental Justice and has instituted a number of activities to ensure consideration of and participation by members of minority and low-income populations surrounding LANL and its other facilities.

Background
Some public comments, published in Volume 3 of the 2008 SWEIS, expressed concerns about the adequacy of the environmental justice analysis; some stated that the analysis did not meet the requirements of Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. This Order requires Federal agencies to identify and address disproportionately high and adverse human health or environmental impacts of Federal programs, policies, and activities on minority and low-income populations. The Order also requires agencies to ensure greater public participation in their decision-making practices.

NNSA has met the objectives of Executive Order 12898 to investigate environmental justice impacts that would be potentially high and adverse and would disproportionately affect one group over another. In response to the public comments on the Draft 2008 SWEIS, NNSA added additional discussion to address the potential for environmental justice cumulative impacts. NNSA looked at potential exposure through special pathways as part of the human health impacts analysis in the SWEIS. Even considering these special pathways, NNSA did not find disproportionately high and adverse health impacts to minority or low-income populations.

Mitigation Action Commitments
- Continue consultations and both formal and informal public meetings.

- Improve upon and implement effective communications strategies to provide fair and equitable sharing of information about LANL operations to surrounding minority and low-income communities.

3.5.4 Reasonable and Prudent Measures from the Site-wide Biological Assessment

Objective
Implement DOE/NNSA commitments for reasonable and prudent measures to mitigate the impact of the continued operation of LANL on T&E species.

Context
During 2005, LANL prepared for DOE/NNSA the 2008 SWEIS *Biological Assessment of the Continued Operation of Los Alamos National Laboratory on Federally Listed Threatened and Endangered Species*. This BA included all projects in this SWEIS and the impacts of site-wide initiatives such as zero liquid discharge and ecological risks from contaminants. All projects evaluated received concurrence from USFWS that they may affect, but were not likely to adversely affect, threatened or endangered species contingent on LANL reasonable and prudent measures identified in the BA to mitigate the impacts of projects. The USFWS deferred an opinion on the proposed transportation bridges over Mortandad and Sandia canyons until further information is available.

Background
Under provisions of Section 7(a)(2) of the ESA, a Federal agency that permits, licenses, funds, or otherwise authorizes activities must consult with the USFWS, as appropriate, to ensure that its actions will not jeopardize the continued existence of any listed species. Reasonable and prudent measures are actions necessary to minimize the impacts of incidental take that is anticipated to result from implementing a project that the USFWS regarded as not likely to jeopardize the species or adversely modify designated critical habitat.

The DOE/NNSA LASO had LANL, as the Management and Operations Contractor, prepare a BA describing the impacts of the proposed operations on federally listed species and propose project-specific reasonable and prudent measures to prevent adverse impacts to those species for the continued operation of LANL. After review and approval of the document, LASO used the BA as their basis for a consultation with the USFWS. The reasonable and prudent measures are similar to those contained in the HMP with the exception that for projects analyzed in the BA, once the project has begun, it will be allowed to finish without delays resulting from threatened or endangered species management issues.

Mitigation Action Commitments
- Develop and implement a wetlands/floodplains management plan to address protection of wetlands, riparian areas, and springs.
- Evaluate watershed-specific ecological risk assessments for T&E species and update outdated site-wide modeling for species.
- Consider span bridges instead of land bridges in areas that cross canyons in T&E species habitats to reduce environmental impacts (land bridge proposals will require USFWS consultation under the ESA).

- Implement all reasonable and prudent measures in the BA through the institutional project review process and implementation of the T&E species HMP.

3.5.5 Managing Biological and Cultural Resources, Implementation of Management Plans

Objective
Comply with the 1999 and 2008 SWEIS RODs to establish and implement proactive and cost-effective ways to meet biological and cultural resource management goals.

Context
Federal laws associated with biological and cultural resources protection include the ESA, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, the National Historic Preservation Act, and the Native American Graves Protection and Repatriation Act. There are also state laws, Executive Orders, DOE Orders, and institutional policies for biological and cultural resource protection. Some resource management actions, that do not have Federal legal drivers, constitute BMPs for mitigating risks. NEPA, while not mandating any specific standard of protection, requires consideration of biological, natural, and cultural resources in an institution's decision-making process. Lack of such consideration can be grounds for legal action against the institution.

Background
As a very large, mission-driven, spatially and organizationally dispersed institution, LANL sometimes has difficulty in identifying and meeting biological and cultural resource compliance requirements and in setting and implementing resource management goals. This results in lost opportunities for cost-effective compliance and resource management and compliance violations.

Compliance with laws and regulations relating to biological and cultural resources is most expensive when it is done on a project-by-project basis or late in project planning or implementation. Requirements identified late in a project may result in work stoppages, change orders, and other inefficient uses of time and money, as well as suboptimal protection of resources. Proactive resource compliance requires senior management direction to prioritize biological and cultural resource protection strategies. These strategies will be included in project planning and integrated into institutional data systems used to conduct site planning. Full adoption and implementation of the BRMP and CRMP will help make the necessary information and resources available to meet compliance requirements and demonstrate BMPs by using timely and cost-efficient strategies early in planning and project implementation. In addition, effective resource management demonstrates LANL's commitment to being a good environmental citizen.

Mitigation Action Commitments
- Implement CRMP including submittal of landmark and historic district designations, endangered sites rehabilitation, and Historic Building Preservation commitments.
- Implement BRMP.

3.5.6 Energy and Fuels Conservation and Stability

3.5.6.1 Electrical

Objective
Provide energy stability and redundancy and reduce electrical power consumption in accordance with Executive Orders and DOE Orders 450.1A and 430.2B, and the EMS institutional objective for energy and fuels conservation.

Context
The 2008 SWEIS projects an increase in utility demands in Los Alamos for electricity through 2013. Peak load demands are expected to range from 56 percent to 97 percent of capacity. The major contributors to the projected increase in demand are the Los Alamos County users. However, an increase in electric demand at LANL is predicted primarily due to the increase in level of operations at the Metropolis Center. The increased operations at the Metropolis Center will require an additional 131,400 megawatt-hours of electricity annually.

Background
Electrical power for LANL is supplied through a partnership with Los Alamos County, known as the Los Alamos Power Pool, established in 1985. This 10-year contract between NNSA and Los Alamos County described how each of the entity's electric resources would be consolidated or pooled. Changes to the original agreements with the Public Service Company of New Mexico (PNM) resulted in the removal of contractual restraints on Power Pool import resources. Import capacity is limited by the physical capability of the transmission power lines. In 1998, LANL completed the conceptual design for the Electrical Infrastructure and Safety Upgrade project. The upgrade project is expected to be complete by 2013. On-site electric generating capability for the Power Pool is limited to the existing TA-03 Co-generation Complex. This complex is only capable of producing up to 20 megawatts of electric power, shared in the Power Pool under the contractual agreement. In 2002, the *Environmental Assessment for Installation and Operation of Combustion Turbine Generators at Los Alamos National Laboratory* (DOE 2002a; DOE/EA-1430) analyzed the effects of increasing the TA-03 Co-Generation Complex capability by an additional 20 megawatts for a total of 40 megawatts. DOE issued a FONSI in December of 2002.

In an effort to bring additional power to the Los Alamos region, LANL completed construction of the Western Technical Area (WTA) substation. The new substation provides LANL and the town of Los Alamos with redundant electrical power in case of a loss at the Eastern Technical Area substation or the TA-03 substation. In February 2006, the Southern Technical Area (STA) substation near White Rock was completed. A new 115-kilovolt transmission line segment from the WTA substation to the STA substation was constructed as well. In 2007, LANL initiated an electrical conservation program, purchasing 12,000 megawatt-hours of wind energy. This renewable energy resource accounts for approximately three percent of LANL's energy use. The 1999 SWEIS ROD projected annual electrical energy use to be 782,000 megawatt-hours. Since the issuance of the 1999 SWEIS ROD, LANL's electrical energy use has remained well below projected levels. In 2006, LANL's total electrical energy use was approximately 454,000 megawatt-hours.

Mitigation Action Commitments

- Upgrade electrical infrastructure in buildings to reduce electrical usage.
- Install one gas-fired combustion turbine generator and upgrade existing steam turbines.
- Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter all other facilities to quantify and evaluate electrical consumption.
- Construct the power line from the Norton substation to the STA substation.
- Construct Pajarito Corridor Electric Substation at TA-50 to serve all new projects along the Pajarito Corridor, including TA-55, Chemistry and Metallurgy Research Building Replacement (CMRR), Nuclear Materials Safeguards and Security Upgrades Project, and RLWTF.
- Implement Energy Savings Performance Contract third-party financed retrofit projects to improve building efficiencies Lab-wide with individual satellite boilers to supply steam to TA-3 buildings, including the Health Research Laboratory at TA-43.
- Purchase additional renewable wind energy.
- Purchase and/or lease "Energy Star" electronics.
- Improve new building efficiencies by integrating Leadership in Energy and Environmental Design/Sustainable Design procedures in line-item projects.

3.5.6.2 Natural Gas

Objective

Reduce natural gas consumption to conserve energy and reduce costs (DOE Order 430.2B, Institutional EMS Objective and Target).

Context

The September 2008 LANL SWEIS ROD projects increased utility demands in Los Alamos for natural gas through 2013. The major contributor to the increase in demand is the Los Alamos County users. Natural gas requirements are expected to increase up to 29 percent of capacity, which is 8.07 decatherms (229 million cubic meters) per year. Many of these actions will be included in Annual Utilities EMS Action Plans.

Background

After the issuance of the 1999 SWEIS, DOE sold 130 miles of the natural gas pipeline and metering stations to PNM. The 1999 SWEIS ROD identified the need to upgrade and modify the current gas transmission system, so in 2005 a new gas pipeline was constructed in Los Alamos Canyon. The new pipeline provided Los Alamos County and LANL with redundant reliability of natural gas supplies. DOE issued an easement to PNM to allow the construction, operation, and maintenance of the approximately 15,000-foot (4500-meter) segment of gas pipeline in Los Alamos Canyon.

The 1999 SWEIS projected LANL to require 1.84 million decatherms (52.1 million cubic meters) of natural gas per year. Approximately 98 percent of the gas used by LANL was used for heating, with the TA-03 Co-Generation Complex being the biggest user. The remainder was used for electrical production. Annual natural gas usage at LANL has remained below the level projected in the 1999 SWEIS. Demand for natural gas has not exceeded the contractually limited

capacity of 8.07 million decatherms per year. In fact, since 1999, LANL's natural gas consumption has decreased, attributable to warmer winters and replacement of older facilities with more energy efficient ones. In 2006, total natural gas consumption for LANL was approximately 1.03 million decatherms. To continue the downward trend in natural gas consumption, it is important to identify which facilities are the biggest users and seek energy efficient options to reduce consumption. Since many facilities are not metered for natural gas, identifying conservation opportunities is difficult. Metering is a critical first step towards energy conservation.

Mitigation Action Commitments

- Meter major energy user facilities with high-end "Square-D" meters (as required), and sub-meter all other facilities to quantify and evaluate natural gas consumption to enable future conservation efforts.
- Install more efficient gas-fired combustion turbine generators and upgrade existing steam turbines to conserve power and energy.

3.5.6.3 Water

Objective

Increase the use of recycled water to conserve resources and reduce costs (DOE 430.2B, Institutional EMS Objective and Target).

Context

The September 2008 LANL SWEIS ROD predicts increased utility demands in Los Alamos for water through 2013. Water requirements are expected to increase between 89 percent and 101 percent of capacity, or 759 million gallons (2.87 billion liters) per year. DOE Order 430.2B requires sites to reduce potable water use by no less than 16 percent, relative to the Department's potable water use in FY 2007 by 2015. Under the ROD, operations at LANL, combined with projected growth in the rest of Los Alamos County, could result in water consumption that approaches the county-managed rights to withdraw water from the regional aquifer. The Metropolis Center alone could require up to 51 million gallons (193 million liters) of water annually.

Background

On September 8, 1998, DOE leased its groundwater rights (5,541 acre-feet per year or 1.8 billion gallons) to Los Alamos County. This also included DOE's contractual annual right obtained in 1976 to 1,200 acre-feet per year of San Juan-Chama Transmountain Diversion Project water. In September 2001, DOE turned over the water production system and transferred 70 percent of the water rights to Los Alamos County. The Preferred Alternative in the 1999 SWEIS projected LANL's water use to be 759 million gallons per year. In 2006, LANL's water consumption was approximately 342 million gallons. Approximately 60 percent of LANL's water use has been used for cooling tower operation, which results in evaporative losses. The *Environmental Assessment for the Proposed Strategic Computing Complex, Los Alamos, New Mexico* (DOE 1998) analyzed the environmental impacts of water used in the cooling process for the computer complex. DOE issued a FONSI with the stipulation that the Nicholas C. Metropolis Center

(formerly known as the Strategic Computing Complex) must use treated sanitary wastewater from the TA-46 Sanitary Wastewater Systems Consolidation Plant.

In 2005, a new facility, the SERF, was brought on line to treat effluent from LANL's sanitary wastewater system. Due to the high amount of naturally occurring silica in northern New Mexico, wastewater from the sanitary treatment facility requires additional processing to be acceptable for further use. Once the silica is removed and filtered off as sludge, the reclaimed water is then ready to be used as cooling tower makeup water. The treated water is blended with sanitary effluent in a 2 to 1 ratio and sent to the Metropolis Center's cooling towers. After being used through four cycles, the water is discharged through a permitted outfall into Sandia Canyon. This reuse of water is projected to save approximately 21 million gallons of water per year. The SERF is expected to expand and, when fully expanded, it will recycle nearly 100 percent of the effluent from the sanitary wastewater system for use as cooling water makeup for the Power Plant, the cooling towers at the Data Communication Center, and the Metropolis Center. This is expected to result in an approximate 30 percent reduction of LANL's total water consumption and a reduction in water discharged from the site. Ultimately, LANL projects that it will recycle 60 percent of its water.

Mitigation Action Commitment

- Expand the SERF and take advantage of additional opportunities to increase the amount of recycled water usage and reduce water consumption at LANL.
- Promote and reward water conservation projects and plans that contribute to compliance with DOE Order 430.2B using the annual Pollution Prevention awards.

3.5.6.4 Pollution Prevention

Objective

Minimize impacts of operations on the environment through hazardous and radioactive waste reduction and minimization (Institutional EMS Objective and Target).

Context

LANL has established institutional hazardous and radioactive waste reduction goals as part of the EMS and in compliance with DOE Order 450.1. In addition, hazardous and mixed waste minimization is required as part of Module VIII, Section B.1, of LANL's Hazardous Waste Facility Permit (NM0890010515-1).

Background

LANL has established an institutional goal for reduction of hazardous, radioactive, and mixed waste. Pollution prevention assessments and reduction projects have been conducted at LANL since 1993 with significant reductions in hazardous, radioactive, and mixed waste. As part of EMS activities, a more systematic approach is being used to continually improve waste reduction efforts for these waste streams.

Mitigation Action Commitments

- Annually report waste reduction performance against EMS waste reduction goals.
- Continue to integrate waste reduction activities into LANL's EMS.

3.5.7 Reuse of Clean Fill Materials from Excavations and DD&D

Objective
Minimize the resource impacts from excavations required as a result of project construction and DD&D activities.

Context
Compliance with the NMED Consent Order as implemented in the September 2008 SWEIS ROD would significantly impact LANL requirements for clean fill. For example, proposed closures of MDAs would require construction of evapotranspiration covers. The capping of these MDAs at TA-54 and contaminated areas in TA-49 necessitates between 750,000 and 2,000,000 cubic yards (570,000 to 1,500,000 cubic meters) of crushed tuff through 2016 (depending on the required thickness of the covers). Up to 460,000 cubic yards (350,000 cubic meters) of additional rock, gravel, topsoil, and other bulk materials would be required for final surface and erosion controls. Excavation entails air quality, traffic, and visual resource impacts. There could be about 60 truckloads of fill a day coming from the TA-61 borrow pit over a 10-year period.

Background
For economic and feasibility reasons, clean fill would need to be produced from borrow pits and quarries in the LANL area. The only borrow pit now in use at LANL is the East Jemez Road Borrow Pit in TA-61. There would be sufficient tuff available for quarrying at the pit to provide the needed volumes of crushed tuff. Current plans call for excavating about 150 feet down and 300 feet out from the Sandia Canyon floor while leaving the forested hill facing East Jemez Road. Other sources available in the area would be required to provide materials such as soil and coarse material that could be collected from facility construction or DD&D where excess uncontaminated excavated soils may meet backfill or capping criteria. Major projects at LANL, including the CMRR project have generated substantial amounts of clean fill from excavations that is being stockpiled on land suitable for future development. Eventual deconstruction of the FRS located in Pajarito Canyon above TA-18 could be another source of material for projects along the Pajarito Corridor. Using excavated fill produced as close as possible to a project reduces hauling costs and decreases emissions from transport vehicles (trucks), enhances traffic safety, minimizes the need for additional quarrying, and preserves the landscape for future projects.

Mitigation Action Commitments
- Use excavation and demolition spoils locally to minimize purchase or new excavations of clean fill when feasible.
- Report annually on reuse of clean fill materials from excavations and DD&D.

3.5.8 Traffic Mitigation

Objective
Mitigate impacts of increased traffic resulting from LANL operations, heightened security, and environmental remediation and consider Laboratory-wide fuel efficiency and alternative fuels to meet requirements in DOE Order 430.2B.

Context

Clean up, remediation, and LANL missions, activities, and projects over the next five years will result in increased truck and construction traffic on the Pajarito Plateau. The 2008 SWEIS considers the environmental impacts of actions associated with remediation decisions that would not be made solely by DOE or NNSA. In the case of the MDAs and other PRSs, remedial actions have been decided in accordance with the Consent Order. Remediation actions will have associated support actions for which NNSA must make decisions. The remediation of MDA B at TA-21 requires construction and operation of various new temporary ancillary structures for such purposes as waste characterization, sorting, treatment, and packaging or overpacking operations; material lay-down and storage areas; and vehicle parking and equipment storage. Remediation activities at TA-21 are predicted to impact traffic patterns in and around downtown Los Alamos through 2013. Increased traffic will also likely increase the amount of fuel use on the Pajarito Plateau. DOE Order 430.2B requires that Federal facilities explore alternative fuels, encourage conservation, and optimize fuel efficiency.

Background

The September 2008 LANL SWEIS ROD projects increased traffic due to DD&D and site closure activities, including approximately 6,800 additional daily trips. This will have several impacts, including a spike in petroleum-based fuel consumption. In addition to this issue, security-driven traffic modifications have and will continue to impact peak traffic flows and congestion in and around Los Alamos. Specific projects identified in the 2008 SWEIS could create increased problems for commuters and Los Alamos County residents in specific areas. Proposed environmental remediation and DD&D activities at TA-21 represent one such project.

TA-21, Land Transfer Tract A-16, is one of the tracts identified in accordance with Public Law 105-119 for conveyance or transfer from DOE administrative control to Los Alamos County. Potential environmental impacts from contemplated reuses of TA-21 were analyzed in the *Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory, Los Alamos and Santa Fe Counties, New Mexico* (DOE 1999c). Tritium operations located at TA-21 either are slated to be moved to other locations at LANL or offsite to other Complex facilities or will be discontinued. The TA-21 buildings and structures are some of the oldest at LANL and would be difficult to retrofit for most proposed beneficial reuses. TA-21 also includes about 100,000 square feet (9,300 square meters) of highly contaminated space. Additionally, most TA-21 buildings and structures are situated atop or adjacent to PRSs, including buried distribution lines, contaminated soil, and waste disposal areas. The demolition of the buildings and structures is necessary before the PRSs can be adequately investigated and remediated. Investigation and remediation of TA-21 PRSs, if necessary, must be undertaken before the site can be conveyed, transferred, or reused.

Mitigation Action Commitments

- Identify possible solutions (e.g., schedule activity for off-peak hours, reroute truck traffic, construct alternative roads, use multiple shifts, and use alternative entries and exits) to minimize traffic issues for Royal Crest Mobile Home Park and the Los Alamos Town Center related to DD&D, remediation, and site closure projects.

- Encourage alternative transportation, including walking, car-pooling, bicycling, and public transportation.
- Consider plans for an alternative route off DP Mesa.

3.6 Enhancement of Existing Programs

3.6.1 Integrating Environmental and Operational Constraints with Site Planning

Objective
Provide a comprehensive analysis of development opportunities and constraints for site planning to minimize environmental impacts from LANL operations and streamline regulatory compliance.

Context
Many planning decisions at LANL are made on a project-by-project basis. This approach has resulted in decisions that have required additional compliance measures often causing unexpected project delays and additional costs. An integrated analysis for site selection decisions would provide for a comprehensive assessment of development opportunities and constraints such as mission requirements, resource protection, authorization basis, institutional plans, physical security, and utilities capacity.

Background
LANL recently successfully piloted an integrated spatial analysis of land development opportunities and constraints on portions of Laboratory lands to identify properties appropriate for transfer. This integrated spatial analysis should be expanded for the purposes of site planning, resource management, and project site selection. This approach would streamline the project compliance process and support the Environmental Protection Policy (IPP 400.1, Rev. 3). Benefits of an integrated spatial analysis will include an expedited compliance process, thus reducing the probability of significant impacts and associated mitigation measures.

Mitigation Action Commitments
- Enhance the decision support tool to offer an objective and semi-quantitative method for integrating opportunities and constraints for project planning and compliance.
- Use Project Review and Requirements System in concert with the decision support tool and project site selection process to better identify potential site planning constraints early in project development.
- Use the decision support tool to comply with Land Transfer Regulations (10 CFR 770).

3.6.2 Compliance Assurance

Objective
Measure and improve implementation of compliance requirements and BMPs identified for new and modified projects in the PR-ID system, reducing costs and delays.

Context
Compliance assurance for the PR-ID system would entail selecting a 5 percent to 10 percent sample of PR-ID review documents and tracking the implementation of review requirements throughout the life of the construction/demolition project. Where necessary, the assurance process would include providing solutions to compliance requirements that prove difficult to implement. To address continuous improvement in the compliance process, metrics will be developed to track performance of the PR-ID system in reducing environmental impacts and assuring compliance with the myriad state and Federal environmental regulations that are associated with construction and demolition projects.

Background
The new IPP 400.1, Rev. 3, requires all new and modified projects to complete the PR-ID process. PR-ID assures that projects consider compliance issues, requirements, and BMPs in the planning process. The objective of this system is to allow project managers the ability to reduce environmental impacts and their associated compliance requirements. However, no quality assurance system exists to see if the identified requirements are implemented during project execution. Identified requirements include the full spectrum of environmental concerns such as waste generation and disposal, archaeological site protection, sediment control from storm water run-off, air quality, construction noise, and night light impacts on sensitive T&E species. A proactive assurance program would have avoided costly environmental problems, for example, to DARHT, the Biosafety Level-3 facility, and the historic Manhattan Project Gun Site.

Mitigation Action Commitments
- Implement compliance assurance process on a sample of PR-ID projects.
- Develop metrics and track compliance results.
- Formally assign a functional manager for the PR-ID process and support tool and ensure supporting authority and funding for effective use in project development, compliance, and site planning.
- Implement process improvement measures as appropriate.

4.0 COMMITMENTS TO SANTA CLARA PUEBLO

NNSA recognizes that the operation of LANL over the last 65 years has affected the people of neighboring communities in northern New Mexico, including Tribal communities. These effects, which vary in nature across communities, include alterations of lifestyles, community, and individual practices. While the analysis conducted by NNSA found no disproportionately high and adverse impacts to minority or low-income populations, based on comments from the Santa Clara Pueblo, the 2008 SWEIS ROD committed that:

> "...NNSA will undertake implementation of the decisions announced in this ROD in conjunction with a MAP. The MAP will be updated as the need arises to identify actions that would address specific concerns and issues raised by the Santa Clara Pueblo as well as those of other tribal entities in the area of LANL."

The SWEIS ROD also committed that:

> "...with respect to the concerns raised by the Santa Clara Pueblo, the NNSA will continue its efforts to support the Pueblo and other tribal entities in matters of human health, and will participate in various intergovernmental cooperative efforts to protect indigenous practices and locations of concerns. NNSA will conduct government-to-government consultation with the Pueblo and other tribal entities to incorporate these matters into the MAP."

To this end, no later than January 30, 2009, NNSA LASO shall develop jointly with Santa Clara Pueblo a mutually acceptable plan to address specific environmental justice and human health concerns and issues identified by the Santa Clara Pueblo during the SWEIS process. The plan will include specific tasks and timelines, and will identify the necessary NNSA and Pueblo resources to help ensure implementation of the plan.

In consultation with Santa Clara Pueblo, NNSA LASO shall then update the MAP to incorporate these actions.

5.0 REFERENCES

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10 CFR 1022, Compliance with Floodplain and Wetland Environmental Review Requirements.

29 CFR 1900 et seq., Occupational Safety and Health Regulations.

40 CFR 61, Subpart H, National Emission Standards for Hazardous Air Pollutants - Radionuclides.

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Appendix III
Trails Management Program
Mitigation Action Plan
Annual Report (Fiscal Years 2008 and 2009)

Prepared by Daniel S. Pava, National Environmental Protection Act Team/
Risk Reduction Office, Los Alamos National Laboratory
October 20, 2009

Introduction and Background

The Trails Management Program's Mitigation Action Plan Annual Report (MAPAR) has been prepared for the Department of Energy/National Nuclear Security Administration (DOE/NNSA) as part of implementing the Los Alamos National Laboratory (LANL) Trails Management Program. As per the September 2008 Record of Decision (ROD) for the 2008 Site-Wide Environmental Impact Statement (SWEIS) (DOE/EIS), this MAPAR is now part of the 2008 SWEIS MAPAR. The objective of the Trails MAP is to continue to implement the Trails Management Program and integrate future mitigations into the 2008 SWEIS MAP to decrease risks associated with trails use on DOE/LANL lands. This MAPAR reports Trails Management Program activities and actions during the period from October 2007 through September 2009. The first Trails MAPAR was submitted to DOE/NNSA in January 2006, the second was submitted in March 2007. The third MAPAR was submitted in March 2008, but only covered a portion of FY 2008, because DOE was preparing to issue the first ROD for the 2008 SWEIS.

Background: Recreational Trails Use at LANL

Recreational trails use at LANL has been considered one of the benefits of working and living in Los Alamos. However, prior to 2003, there was no DOE or LANL policy or mechanism to balance recreational trails use with environmental, cultural, safety, security, and operational concerns. In 2003, DOE directed LANL to establishing a trails management program in the *Final Environmental Assessment for the Proposed Los Alamos National Laboratory Trails Management Program* and Finding of No Significant Impact (DOE/EA-1431) on September 2, 2003. The NNSA issued a MAP on the same date. The most pertinent trails issues identified during the scoping were:

- DOE/NNSA does not have a public recreational mission established by Congress;
- The public gets conflicting messages because signs, access controls, and enforcement at LANL vary by area;
- Trespassing occurs from LANL onto adjacent lands where trail use is not permitted;
- Recreation trail use may threaten to some cultural and natural resources;
- Trail use in some areas may increase the risks of human exposure at Potential Release Sites and other operational and natural hazards. Some of the natural hazards have been magnified by the Cerro Grande Fire; and
- Security concerns are posed by the use of certain LANL trails.

The MAP for the Trails Management Program established that the Program would be implemented through individual projects, including measures for planning, repair, and construction of trails segments, environmental protection, safety, and security. A Trails Working Group was established to implement this program.

The goals of the trails management program are:

Reduce the risk of damage and injury to property, human life, and health, and sensitive natural and cultural resources from social trail use at LANL

Facilitate the establishment of a safe, viable network of linked trails across the Pajarito Plateau that traverse land holdings of various private and government entities for recreational use and for alternate transportation purposes without posing a threat to DOE and NNSA mission support work at LANL or disrupting LANL operations.

Maintain the security of LANL operations.

Respect the wishes of local Pueblos to maintain access to traditional cultural properties (TCPs) by Pueblo members while also preventing unauthorized public access to adjacent Pueblo lands and other lands identified as both religious and culturally sensitive areas to Native American communities.

Adapt trail use at LANL to changing conditions and situations in a responsive manner.

Maintain the recreational functionality of the DOE lands so that the land owned by the DOE remains open to all members of the public for non-motorized recreation, in compliance with federal laws and LANL operational constraints.

Trails Management Plan MAP FY 2008 and 2009 Accomplishments

Meetings

The Trails Working Group met eight times in FY 2008 and nine times in FY 2009. The Working Group held its 50th meeting in July 2009. Regular attendees include LANL subject-matter experts and representatives from Los Alamos County, local Pueblos, the National Park Service, (i.e., Bandelier National Monument law enforcement), and other interested individuals and stakeholders. Agendas are distributed prior to each meeting and meetings include continuing discussion and resolution of trails mitigation action commitments.

Trail Users Survey/Public Awareness

A trails user survey was published in the LANL news in June 2009. The trails survey and flyer describing the Trails Management Program was also distributed during community Earth Day celebration on April 18, 2009. More than 250 people responded to the survey and the results were tabulated to assess progress and future actions for the Trails Management Program. The most notable findings were:

- 75 percent of respondents (who identified the trails they use) said they use the wellness/fitness trails between TA-3 and TA-16;
- 52 percent of respondents (who identified the trails they use) said they use trails within or that cross Los Alamos Canyon, meaning they use trails to go to and from the townsite and LANL;
- Nearly half the respondents (who identified the trails they use) said they use the trails in TA-70 and TA-71 (Ancho, Portrillo, and Water Canyons);
- 67 percent of respondents use trails for recreation during work days, while 57 percent use trails during non-work hours.
- 45 percent use trails two or three times a week, 29 percent use them once a week, and 26 percent use them daily.

- 60 percent use the trails year-round; winter is the only season when trails use drops.
- 63 percent of respondents noted lack of maintenance and 53 percent noted the lack of signs (combined, these were the primary criticisms); lack of parking concerned 11 percent of respondents. A common sentiment among respondents was that LANL trails are a unique asset to working at the Laboratory and should not be taken for granted. Another concern is that better trails maps and timely information about trail closures is needed.

In response to concerns raised in the survey, LANL's internal and external pages for the Trails Management Program were revised to include the most current information. In addition, Environmental Assessments, Mitigation Action Plans, and other public reports and documents are available on the external website:
http://www.lanl.gov/environment/outreach/working_groups/tawg.shtml

In September 2009, a revised site-wide trails map was completed and reviewed for public distribution and use. This map will be posted to the web page. The new map depicts LANL trails that are open to the public, those with controlled access, and those that are closed to the public. It also provides use rules and notes that trails into San Ildefonso Pueblo are restricted to the public.

Five maps were posted on the LANL internal web for the Wellness Center's "Fall into Walktober" walking promotion in October 2008. The maps remain posted.

Trails Maintenance

There have been four volunteer trail maintenance work parties as a result of an Institutional Agreement, developed by the Trails Working Group, between Los Alamos National Security, LLC (LANS) and the Volunteer Task Force (VTF) in August 2007 (Figure 1).

Figure 1. Volunteers repairing and realigning trails in TA-71 during September 2009.

October 27, 2007: The first VTF event to repair the Hidden Canyon Trail in Los Alamos Canyon. The Los Alamos Monitor emphasized that the event occurred as a result of cooperation between the County and LANS.

June 7, 2008 (National Trails Day): The second VTF maintenance work party to reconstruct an 80 year-old switchback on the Deadman's Trail near the bottom of Los Alamos Canyon.

October 18, 2008: Trails at TA-71 accessible from the Pajarito Acres and New Mexico State Road 4 were rerouted to avoid three archeological sites as an Eagle Scout Project. Eagle Scouts, and members of the VTF, the County, and LANL participated. The project was intended to limit further damage to the cultural resources, protected by the National Historic Preservation Act.

September 19, 2009: Volunteer trails maintenance work party at TA-71 where trails were rerouted to avoid an Archaic period archaeological site and to limit erosion.

Signs

The Trails Working Group designed a prototype trail sign. These user-friendly signs will be placed at the trailhead and will include the trail name, a summary of trail use rules, and emergency contact information. Signs will be posted in FY 2010.

Unexploded ordnance warning signs were fabricated and posted along trailheads leading into TA-70 and TA-71 in June 2009. This action was a response to a hiker finding and removing 60mm and 80mm ordnance in Lower Ancho Canyon in December 2008. The area was used for counter-battery tests in the 1960's and 1970's. The Trails Working Group determined that signs and public education would address the situation.

Signs were designed and posted in Los Alamos Canyon in 2008 to inform hikers about the closure of the Mattie Brook Trail which leads into TA-21, the site of a major environmental remediation project, which will continue for several years.

Cultural and Biological Resources

In March 2009, the Trails Working Group considered opening the Mortandad Cave Kiva Trails to the public as part of New Mexico Heritage Preservation Month in May. The Group determined that this event would need to be delayed for logistical factors related to coordination and planning. However, a private tour for approximately 25 San Ildefonso Pueblo youth and 10 teachers occurred in April.

As part of the Trails Working Group, LANL's Cultural Resources Team (CRT) prepared the Mortandad Cavate Assessment report. The report will be used to document and understand the impacts of restricting trails use on the Mortandad Cave Kiva Trail. The LANL CRT also visited two-dozen archaeological sites in TA-70 in July 2009 to assess recommendations made in the 2005 and 2006 TA-70 and 71 trails reports. The Team selected four sites, being impacted by recreational trails use, to mitigate. Remediation activities included installation of straw waddles and relocation of downed trees limit use of trail segments and spurs with the potential to damage archeological sites. In August 2009, the Team surveyed the Duran Road Trail and prepared an assessment for the State Historic Preservation Office for trails maintenance to parts of the trail damaged by erosion. Fieldwork for the Mattie Brook trail eligibility assessment is currently underway.

LANL's Biological Resources Team initiated the closure of trails into Upper Mortandad Canyon from various technical areas along Pajarito Road to protect the Mexican Spotted Owl. The Team produced a map to identifying trails where signs will be posted annually.

Security and Safety

From February through April 2009, the Trails Working Group advised and assisted with closing of a trail segment leading to the Deadman's Crossing Trail from the Timber Ridge

condominiums into Los Alamos Canyon. The closure limits potential exposure to SWMU 01-001(f) situated near the trail. This SWMU was a former septic tank, structure, and an associated outfall dating to the Manhattan Project. The fence separating DOE property from the townsite (at Timber Ridge) had been cut by trail users, allowing for access to the trail. In 2009, the area was further remediated. Access to Deadman's Trail has been blocked in this area and signs posted at nearby trail junctions to inform the public.

FY 2010 Planning

An ongoing matter for the Trails Working Group is how to become better known as the LANS point of contact for proposed trails closures. A charter for the Trails Working Group has been drafted and will be finalized for the Director's signature in FY 2010. The Working Group will continue to implement the Trails Management Program MAP in FY 2010.

Appendix IV

Special Environmental Analysis Mitigation Action Plan
Annual Report 2009 (Fiscal Year 2008) Mitigation Action for Historic Sites

Prepared by Ellen S. McGehee, Cultural Resources Management Team, Ecology and Air Quality,
Los Alamos National Laboratory

October 26, 2009

Mitigation Action Commitment

The Special Environmental Analysis (SEA) MAP states that review, evaluation, and stabilization of historic sites within the LANL areas burned by the Cerro Grande Fire (Figure 1) and within areas prone to flooding or soil erosion will continue until post-fire storm event water flows approximate pre-fire flow rates according to modeling information and monitoring results. Ongoing consultation with the State Historic Preservation Office (SHPO) has resulted in the identification of additional sites that require such action. These sites will undergo appropriate reviews, evaluations, and stabilization as needed. Generally, mitigation measures include placement of sandbags, straw bales, jute matting, rock check dams, and other preventive measures such as clearing hazard trees.

Figure 1. TA-16-515 (radiography building) after the Cerro Grande Fire.

Homestead Era Sites (circa 1887–1942)

SEA MAPAR recommendations from FY 2007 included annual monitoring of conditions at homestead and depression era sites impacted by the Cerro Grande Fire: the Montoya Homestead, the Grant Homestead, the Gomez Homestead, the Fermin Vigil Homestead, the Montoya Brothers Homestead, Anchor Ranch, and the CCC Camp (Table 1).

Table 1. Homestead Era Sites and Locations.

Historic Property Name	Site Number	Technical Area (TA)
Fermin Vigil Homestead	LA 30638	TA-5
Montoya Homestead	LA 21334	TA-6
Artifact Scatter near Montoya Homestead	LA 131236	TA-6
Anchor Ranch (Ice House)	LA 16808	TA-8
Artifact Scatter (Homestead/MP era)	LA 89831	TA-8
Grant Homestead	LA 16807	TA-16
CCC Camp (Depression era)	LA 21369B	TA-16
Gomez Homestead	LA 86643	TA-22
Artifact Scatter	LA 89769	TA-22
Montoya Brothers Homestead	LA 30640	TA-60

In-field artifact analysis was recommended at three homestead sites (Montoya, Grant, and Gomez) and three homestead-era trash scatters (LA 131236, LA 89831, and LA 89769). Additional recommendations included evaluation of the horno structure and several rock structures at the Gomez Homestead for potential rehabilitation or repair. Because of the focus on stabilizing and interpreting fire-damaged structures at V-Site, only Anchor Ranch was revisited in FY 2008, and none of the recommended in-field artifact analysis was conducted. Fieldwork activities at Anchor Ranch included additional Global Positioning System (GPS) recording of fence lines and telephone lines located within the site boundary and site flagging for tree thinning and road repaving activities. No additional post-fire erosion was noted near the former location of the Anchor Ranch icehouse.

Manhattan Project and Cold War Era Historic Buildings and Structures (1942–1963)

Stabilization of the burned crane structure and radiography berms was recommended for summer 2008 work (Figure 2). The inherent stability of the burned structure had become a safety concern because no post-fire structural analysis had ever been conducted. Members of the LANL Cultural Resources Team and the SWEIS Project Office visited V-Site several times during FY 2008. LANL Dynamic Materials Group engineers conducted an evaluation of the burned structure and recommended concrete "refooting" work to stabilize the structure (Figure 2). The rear (south) leg of the structure, which was no longer attached to the building's foundation, was reattached in its new post-fire alignment, and a crew completed the concrete refooting work in September 2008 Figure 2). Additional recommendations for FY 2009 work include welding the intersections of the structure's major cross beams and welding loose wires and conduit in place.

Figure 2. Burned crane and hoist structure; note rear leg dangling off the building foundation.

As part of the interpretation of the history of V-Site, and following guidance from the SHPO after the fire, several outdoor panels were developed chronicling the history and restoration of the site and interpreting the events of the Cerro Grande Fire and its effects to LANL's historic buildings. Panels were ordered and installed in FY 2008. Minor repairs to the earthen berm located west of building TA-16-516 (Figure 3), removal of vegetation at the site, and re-oiling the wooden gates and the section of "no-peek" fenceline (Figure 4) also occurred in FY 2008.

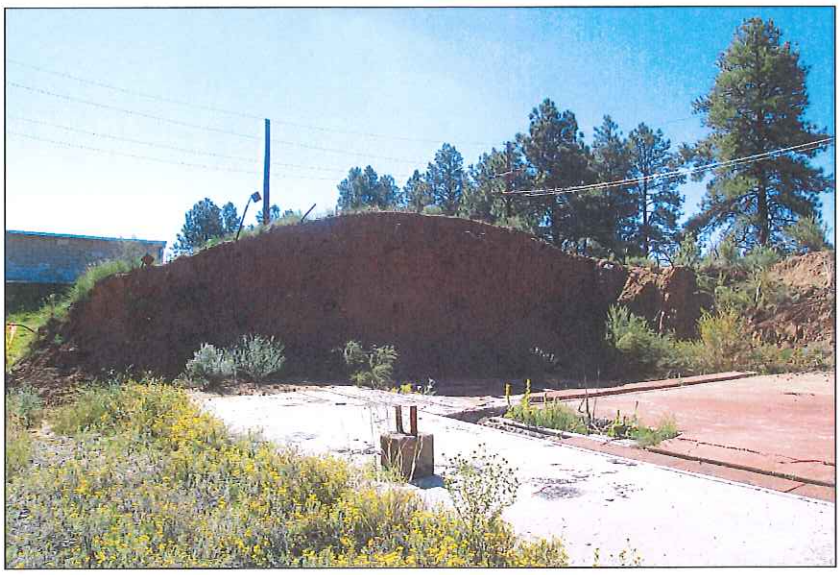

Figure 3. Exposed earthen berms at former location of radiography building.

Figure 4. Restored V-Site buildings with new gate and no-peek fence.

FY 2008 Summary of Recommendations

Annual monitoring should continue at all major homestead and depression era sites impacted by the fire because of continuing issues with post-fire erosion, tree fall damage, and artifact degradation (Table 2). The horno and rock buildings at the Gomez Homestead should be assessed for rehabilitation needs. In FY 2006, several historic artifact scatters were identified as candidates for in-field analysis because data loss was resulting from increased surface spalling and other post-fire effects to diagnostic artifacts (LA 89769, LA 89831, and LA 131236). Fieldwork was not conducted at these sites in FY 2007 or FY 2008, and these sites should be revisited during FY 2009 to reassess the need for in-field analysis. FY 2009 rehabilitation work should focus on completing the stabilization of the burned crane structure and developing a stabilization plan for the freestanding radiology berms at V-Site.

Table 2. 2008 SEA MAPAR Summary of Recommendations for Historic Sites (2009)

Historic Property Name	FY 2008 SEA MAPAR Recommendations
Fermin Vigil Homestead, LA 30638	Monitor annually.
Montoya Homestead, LA 21334	Monitor annually. Reassess need for in-field artifact analysis.
Artifact Scatter near Montoya Homestead, LA 131236	Reassess need for in-field artifact analysis recommended.
Anchor Ranch (Ice House), LA 16808	Monitor annually.
Artifact Scatter (HS/MP era), LA 89831	Reassess need for in-field artifact analysis.
Grant Homestead, LA 16807	Monitor annually. Reassess need for in-field artifact analysis.
CCC Camp (Depression era), LA 21369B	Monitor annually.
Gomez Homestead, LA 86643	Monitor annually. Assess horno and rock structures for future rehabilitation.
Artifact Scatter, LA 89769	Reassess need for in-field artifact analysis.
Montoya Brothers Homestead, LA 30640	Monitor annually.
TA-16, V Site	Monitor annually. Complete stabilization of burned crane structure and develop stabilization plan for radiography berms.

Appendix V

Special Environmental Analysis Mitigation Action Plan
Annual Report 2009 (Fiscal Year 2009) Mitigation Action for Historic Sites

Prepared by Ellen S. McGehee, Cultural Resources Management Team, Ecology and Air Quality,
Los Alamos National Laboratory
October 28, 2009

Homestead and Depression Era Sites (circa 1887–1942)

SEA MAPAR recommendations at the close of the FY 2008 field season included continued annual monitoring of conditions at the major Homestead-era sites and the Depression-era Civilian Conservation Corps (CCC) site impacted by the Cerro Grande Fire. These sites include the Montoya Homestead (LA 21334), the Grant Homestead (LA 16807), the Gomez Homestead (LA 86643), the Fermin Vigil Homestead (LA 30638), the Montoya Brothers Homestead (LA 30640), Anchor Ranch (LA 16808), and the CCC camp (LA 21369B).

Recommendations for FY 2009 fieldwork included reassessing the need for in-field artifact analysis at three Homestead-era sites (Montoya, Grant, and Gomez) and three Homestead-era trash scatters (LA 131236, LA 89831, and LA 89769). Additional recommendations included evaluating the horno structure and several rock buildings at the Gomez Homestead for potential rehabilitation or repair. Some of these recommended tasks had been identified as issues in the FY 2007 SEA MAPAR, but were not completed during the FY 2008 SEA MAP field season.

FY 2009 SEA MAP Fieldwork Summary (Homestead and Depression Era Sites)

In 2009, members of the LANL Cultural Resources Team (CRT) revisited the six Homestead-era sites and the one Depression-era site identified in the FY 2008 recommendations. The sites were photographed and any changes in condition were noted, such as continuing erosion or impacts from downed fire-burned trees. Erosion control measures put in place at the Montoya Homestead during past SEA MAP field seasons are now contributing to increased gulleying at the site (Figures 1 and 2). In addition, several fire-killed trees have fallen on historic features associated with the Depression-era CCC camp (Figure 3).

Figure 1. Failing erosion control measures at the Montoya Homestead.

Figure 2. Erosion channel.

Figure 3. Downed fire-killed tree at the CCC camp.

As part of the monitoring of the Gomez Homestead (LA 86643), CRT staff compared past photographs of the horno structure and other rock buildings with existing conditions. Furthermore, artifact scatters within the boundaries of the Montoya, Grant, and Gomez homesteads were reassessed for future in-field analysis. Continuing artifact deterioration was noted at all three sites.

CRT staff also visited the three Homestead-era trash scatters discussed in the FY 2008 recommendations (LA 89769, LA 89831, and LA 131236) and determined that in-field artifact analysis was warranted due to the continued deterioration of diagnostic artifact attributes resulting from the sites' having been burned during the Cerro Grande Fire. As part of FY 2009 SEA MAP fieldwork, systematic in-field analysis was conducted at each site (Figure 4). Updated site forms and revised eligibility determinations will be finalized as part of planned FY 2010 SEA MAP activities.

Figure 4. In-field analysis grid at LA 89831.

LA 89769 is a light historic artifact scatter located along a small north- to south-trending drainage that eventually feeds into Pajarito Canyon approximately 200 m to the south. The artifacts were scattered throughout a 610-m² area. Based on the distributions, the original site recorders grouped the associated artifacts into three distinct concentrations. Detailed in-field artifact analysis was conducted on 100 percent of the observed artifacts and tallied by artifact concentration. Area 1 contained 67 artifacts, Area 2 contained 13 artifacts, and Area 3 contained 52 artifacts. The observed artifacts included 120 cans or can fragments and 12 glass shards. Most of the cans and can fragments were highly deteriorated. Based on the overwhelming presence of sanitary seal cans, the site was probably in use toward the end of the Homestead era.

LA 89831 contains thousands of artifacts that primarily date to the 1930s. It is located on the Pajarito Plateau between Pajarito Canyon and Canyon de Valle The site is approximately 32 m south of Anchor Ranch (LA 16808) and is probably associated with that site. The artifacts are scattered throughout a 328-m² area. The LA 89831 artifact density was so high that detailed artifact analysis was only conducted on approximately 50 percent of the site area. The site area was divided into 64 grid units and detailed analysis was completed on all surface and duff-buried artifacts from 34 of these units. Artifact analysis was conducted on artifacts situated within grids that formed two north/south trending alignments running through the high-density central site area. The analyzed artifacts included thousands of cans and hundreds of glass shards. Other artifacts included a few complete bottles and a low density of other items (e.g., porcelain, earthenware, miscellaneous metal, leather, tarpaper, rubber, and faunal remains). Due to the proximity of the site to a nearby footpath, several artifacts (e.g., whole bottles) were collected to ensure that they would not be lost to looters.

LA 131236 is located 485 m west of the Montoya Homestead on Twomile Mesa. One hundred percent of all observed artifacts were documented through in-field analysis. The artifacts were scattered throughout a 225-m² area. The artifacts included 180 cans or can fragments, 41 metal artifacts, 87 glass shards, 23 earthenware or porcelain shards, and 1 shoe fragment. Based on the

overwhelming presence of sanitary seal cans and the lack of early bottle glass, the site was in use toward the end of the Pajarito Plateau Homestead era.

LA 89769 and LA 131236 are no longer thought to be eligible for inclusion in the National Register of Historic Places (Register) as their information potential has been recovered through recordation. The detailed artifact analysis will be included in updated site documentation that will be submitted to the State Historic Preservation Officer along with a request for concurrence that the sites are no longer Register eligible. LA 89831 is considered Register eligible because detailed analysis was conducted on only 50 percent of the associated artifacts and the scatter is associated with the Register-eligible Anchor Ranch site.

Manhattan Project and Cold War Era Historic Buildings and Structures (1942–1963)

Initial stabilization work at the burned crane structure at V-Site's former Radiography Building (TA-16-515) occurred in FY 2008, this work continued in FY 2009. LANL Cultural Resources staff visited V-Site many times during FY 2009, conducting tours and checking on site conditions. Stabilization work carried out in FY 2009 included welding the intersections of the crane structure's major cross beams and welding loose wires and conduit in place. Interpretive panels detailing the effects of the fire and the restoration of the two remaining buildings were installed in FY 2009 and scrub oak and other vegetation was removed (Figure 5). Continuing issues at V-Site include the deterioration of the burned pad areas east of buildings TA-16-516 and TA-16-517, the deterioration of the remaining earthen berms, the deterioration of the sump cover at former TA-16-515, and final disposition of burned artifacts currently stored on site.

Figure 5. TA-16-515 (crane structure) with interpretive panel.

FY 2009 Summary of Recommendations

Annual monitoring should continue at all major Homestead-era and Depression-era sites impacted by the fire to record ongoing issues with post-fire erosion, tree fall damage, and artifact degradation. The horno and rock buildings at the Gomez Homestead are stable and restoration work is not recommended at this time. Updated site forms and revised eligibility recommendations should be finalized for the three historic artifact scatters where in-field analysis was conducted in FY 2009. FY 2010 rehabilitation and fieldwork associated with

Homestead-era sites should include the removal of downed trees at the CCC camp, the reworking of erosion control measures at the Montoya Homestead, and the in-field analysis of artifacts located within the boundaries of the Gomez, Montoya, and Grant homesteads. FY 2010 rehabilitation work at V-Site should focus on repairs to the sump area at the former Radiography Building (TA-16-515), repairs to and stabilization plans for V-Site's earthen berms and burned concrete pads, continued vegetation removal, and the appropriate disposition and/or interpretation of burned artifacts.

Table 1. FY 2009 Recommendations for FY 2010 SEA MAP Fieldwork (Historic Sites)

Historic Property Name	TA	Recommendations
Homestead (HS) and Depression Era		
Fermin Vigil Homestead, LA 30638	TA-5	Monitor annually.
Montoya Homestead, LA 21334	TA-6	Monitor annually. Conduct in-field artifact analysis. Rework erosion control measures.
Artifact Scatter near Montoya Homestead, LA 131236	TA-6	Complete site form update and submit revised eligibility recommendation.
Anchor Ranch (Ice House), LA 16808	TA-8	Monitor annually.
Artifact Scatter (HS/MP era), LA 89831	TA-8	Complete and submit site form update.
Grant Homestead, LA 16807	TA-16	Monitor annually. Conduct in-field artifact analysis.
CCC Camp (Depression era), LA 21369B	TA-16	Monitor annually. Remove downed trees located on historic features.
Gomez Homestead, LA 86643	TA-22	Monitor annually. Conduct in-field analysis.
Artifact Scatter, LA 89769	TA-22	Complete site form update and submit revised eligibility recommendation.
Montoya Brothers Homestead, LA 30640	TA-60	Monitor annually.
Manhattan Project (MP) and Cold War (CW) Buildings and Structures		
TA-16, V-Site	TA-16	Monitor annually. Develop stabilization plans and/or repair berms and burned concrete pads, repair sump area at TA-16-515, continue vegetation removal as needed, and assess future disposition of burned artifacts.

Appendix VI

Special Environmental Analysis Mitigation Action Plan

Annual Report 2009 (Fiscal Year 2009) for Prehistoric/Ancestral Pueblo Resources

Prepared by W. Bruce Masse, Cultural Resources Team, Ecology and Air Quality,
Los Alamos National Laboratory
October 28, 2009

Mitigation Action Commitment

The Special Environmental Analysis (SEA) MAP stated that review, evaluation, and stabilization of cultural resource sites within the LANL boundary impacted the Cerro Grande Fire and within areas prone to flooding or soil erosion would continue until post-fire storm event water flow regimes approximate pre-fire flow rates according to modeling information and monitoring results. Site stabilization and/or protection measures (e.g., sandbags, straw bales, jute matting, check dams) are performed when necessary. Ongoing consultation with the State Historic Preservation Officer and local pueblos and tribes, could result in the identification of additional sites that require such action.

Background

LANL's Cultural Resources Team (CRT) is responsible for implementing the SEA MAP cultural resources monitoring commitment. The CRT conducted extensive surveys of LANL to assess the impacts from the Cerro Grande Fire on cultural resources. A report with the results of these analyses was prepared for DOE/NNSA (Nisengard et al., 2002). In 2003, a team from San Ildefonso Pueblo rehabilitated 107 archaeological sites. Rehabilitation efforts consisted of the removal of burned snags, the tree thinning, placement of straw wattles, filling stump holes, and revegetation using native grasses and shrubs. In addition, three-strand smooth wire fences were erected along and around 87 sites potentially vulnerable to fire suppression activities, including fire roads. Single sites and site clusters were fenced.

In August and September 2005, the CRT revisited 96 of the 107 rehabilitated sites (Nisengard et al., 2005). Seven of the 11 sites that were not revisited were excavated as part of the Land Conveyance and Transfer Project archaeological data recovery in Rendija Canyon. The remaining four sites (three in Rendija Canyon and one in TA-22) could not be visited due to logistical considerations. The purpose of the monitoring effort was to evaluate the success of the 2003 mitigation program and to recommend additional mitigation actions as warranted.

In FY 2006, the CRT conducted SEA MAP field checks of 32 Ancestral Pueblo sites and two Traditional Cultural Property (TCP) fences in Rendija Canyon. These sites, situated in seven TAs (5, 15, 16, 37, 49, 60, and 67) and Rendija Canyon, were identified in 2005 as requiring potential mitigation actions (Nisengard et al. 2005). These 34 locations were re-visited again in FY 2007 and FY 2008. In FY 2008, the CRT determined that rehabilitation was complete at seven of the sites and that annual monitoring was no longer required.

FY 2009 SEA MAP Site Status

In FY 2009 the CRT revisited the 25 remaining sites and two TCP fences recommended for continued monitoring in FY 2008. During a visit to LA 4602B, the CRT also visited LA 4602A (which had been recommended in FY 2008 for no further monitoring), and recommended at least one more year of monitoring and treatment for the site. As a result, 28 sites are included in this FY 2009 SEA MAP report. Fieldwork was conducted by the CRT using a two-person team from July 21 to August 4, 2009 and from September 23-24, 2009.

Figures 1 to 6 illustrate some of the post-Cerro Grande fire impacts and rehabilitation issues at the monitoring sites. Long-term impacts from the fire include continued cracking, spalling, and deterioration of masonry walls subjected to higher temperatures during the fire. There are no rehabilitation measures to stop or reverse this deterioration, and once other impacts (e.g., erosion and snags) are mitigated, these sites will be removed from the annual monitoring program.

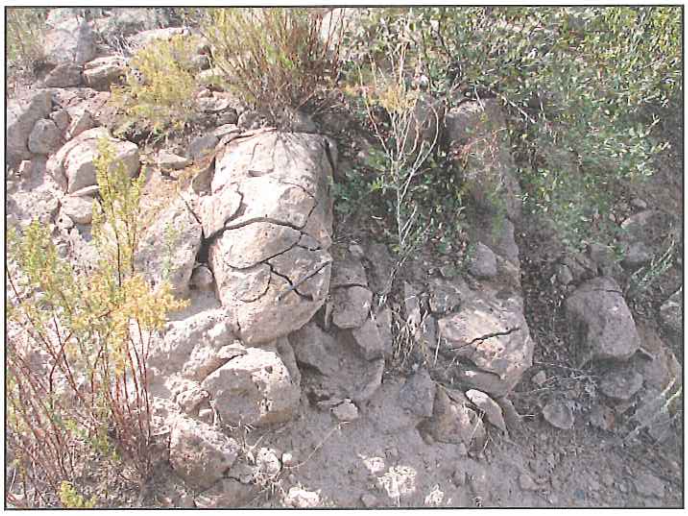

Figure 1. Masonry blocks with advanced cracking and spalling.

Rainfall during the past few years (2007-2009) has been sufficient to permit the regrowth of vegetation at many of the SEA sites where severe erosion from the fire and subsequent drought had been impacting the sites. At many sites, the vegetation has prevented erosion and annual monitoring is no longer necessary at these sites. However, several sites for various reasons have continuing erosion issues; one example of this is LA 136825, a masonry tuff block fieldhouse in TA-16 (Figure 2). Stormwater runoff has not been slowed by the slash scattered within the site area and in some cases the slash has become pedestaled as a result of erosion. Additional slash will need to be introduced into these areas and reseeding with native seed mix is recommended.

Figure 2. Largely unvegetated area subject to erosion, upslope of a masonry fieldhouse.

A continuing problem at several sites is the presence of snags that can damage the fences and masonry tuff block rubble mounds if and when they fall or in many cases, snags that have already fallen and done considerable damage to fences. Examples include damaged fences at LA 89714, a fieldhouse situated in TA -67 (Figure 3) and LA 89727, a fieldhouse in TA-16 (Figure 4). Fences repair and the removal of additional snags is required at these sites. Once snags have been removed and the fences repaired, these sites will be considered rehabilitated and can be removed from the SEA MAP annual monitoring requirement.

Figure 3. Fence damaged by snags at LA 89714.

Figure 4. Fence damaged by snags at LA 89727 .

A discovery during the 2009 SEA MAP monitoring field season was that of remnants of tuff blocks present within recently graded Fire Break 5 at LA 4697, an Ancestral Pueblo period roomblock in TA-49 (Figure 5). This discovery was made possible due to moisture retention in the tuff blocks after a recent rainstorm. Several blocks, representing the walls of five to six rooms, were visible in the fire break in a 20 meter diameter area. Pin flag probes of the area indicated that approximately 10-15 cm of intact archaeological deposits above bedrock are present. Some erosion is also impacting these remains (Figure 6). The site will be reassessed as part of the FY 2010 Fire Roads and Fire Breaks Damage Condition Assessment project.

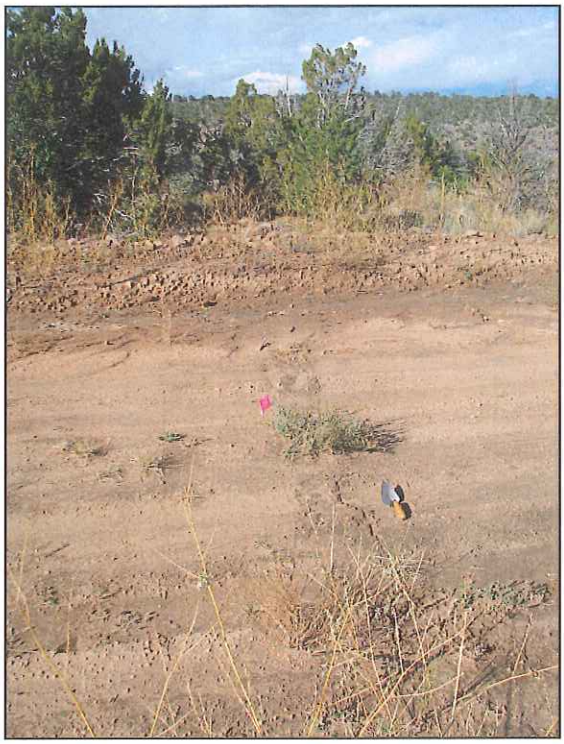

Figure 5. The pin flag and trowel mark the alignment of the tuff block masonry wall, which extends across the fire break at LA 4697. View looking to the north.

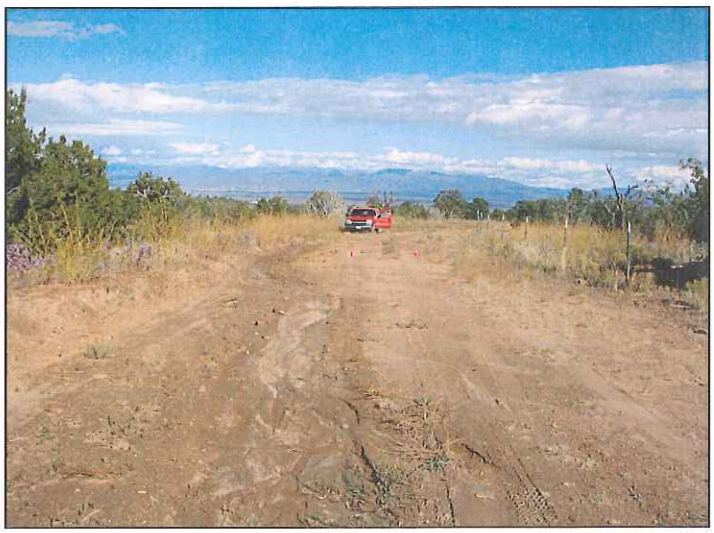

Figure 6. Pin flags mark the locations of masonry wall segments within Fire Break 5. Note erosion in the foreground and to the left (north) of the wall area. View looking to the east.

FY 2009 SEA MAP Recommendations

Table 1 summarizes the findings and recommendations of the FY 2009 SEA MAP field season. The table includes the FY 2006 recommendations and the combined FY 2007-2008 recommendations. The green cells indicate sites with ongoing issues that require continued monitoring and rehabilitation. The pink cells indicate sites that have been rehabilitated and are recommended for removal from future annual SEA MAP monitoring requirements.

Table 1. SEA MAP Prehistoric (Ancestral Pueblo) sites revisited by the CRT from FY 2006 to FY 2009. Green indicate ongoing monitoring and recommendations; the pink represent sites that have been rehabilitated and no longer require annual monitoring.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 4601B	TA-5	Perform erosion control on part of site near Puye road, using fallen trees in the area for slash. Cut and slash tree on southeast end of fence. Repair fence sections.	Repair fence section north of road. Cut, remove, and slash fallen tree on southeast corner of fence. Cut and slash snag on south fence. Slash and spread 4-5 fallen snags.	Repair damaged fence sections and t-posts and remove snags. Cut and slash 3 snags along south fence. Blading of fire road and erosion have exposed masonry blocks and wall segments. Erosion of road berms threatens intact deposits.
LA 4602A	TA-5	Continue to monitor to see if further rainfall will affect future erosion.	Rehabilitation complete. Remove from list of monitored sites.	Revisited as part of monitoring LA 4602B. Erosion still a problem at LA 4602A on mound and along old road bed. Slash and spread fallen snags, and re-seed road (ca. 1/8 acre).
LA 4602B	TA-5	Replace deteriorating wattles with new ones; cut and slash snags and fallen trees; reseed area with native seed; cut and slash fallen tree on fence east of site.	Tighten 4-5 fence sections north and south of road. Cut and slash 4-5 fallen trees. Reseed mound and surrounding area with native seed. Reseed old road and add slash to the northwest sections.	Place 1-2 wattles along east side of rubble mound, adjacent to and above the eroded area. Slash and scatter fallen snags. Reseed mound and lightly eroded area nearby (ca. 1/8 acre).
LA 89727	TA-15	Cut three snags west of the fence. Repair fence from fallen trees. Cut and slash fallen trees for erosion control.	No change from FY 2006.	Repair damaged (150-160 ft) fence. Cut and slash 6 fallen snags and scatter slash. Monitor vegetation in FY 2010.
LA 89803	TA-15	Cut and slash fallen pine on fence. Repair damaged fence posts and wires.	Repair two fence sections. Cut and slash one tree on fence and tighten fence. Cut and section one snag (large Ponderosa).	Repair damaged fence. Tighten three fence sections. Cut and slash two fallen snags. One large snag remains, 75 ft SW of SW corner.
LA 129492	TA-15	Place wattles beneath slope south of site to help erosion control.	Recheck to see if wattles and reseeding are necessary.	No treatment needed. Erosion very low and nearly stable. Monitor vegetation for erosion control for one more year.
LA 136944	TA-15	Continue to monitor. Scrub oak may be a problem in a few years.	Rehabilitation complete. Remove from list of monitored sites.	Did not revisit. Rehabilitation complete. Removed.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 204	TA-16	Monitor scrub oak and locust growth, in about 3 years, consider thinning. Monitor three closest ponderosa pines because if they die they could damage masonry. Monitor vegetation to determine need for reseeding.	No change from FY 2006.	No treatment recommended. Erosion is no longer a problem as vegetation is adequate. Three ponderosa pine trees appear fully recovered (will not become snags. Rehabilitation complete. Removed from list of monitored sites.
LA 15857	TA-16	Monitor gopher activity.	Rehabilitation complete. Remove from list of monitored sites.	Did not revisit. Rehabilitation complete. Removed from list of monitored sites.
LA 15858	TA-16	Thinning of scrub oak is recommended. Site is in a developed area, fencing is recommended for future protection.	Scrub oak is in the stage where tree thinning is considered and recommended. However, on 6/26/07, the site was placed inside a radiation hazard perimeter "TA-16 Bldg. 302 Rear. Contact Access Control 7-9192". Check with WFO Operations for status of access of site.	No treatment recommended. Site is in radiation hazard zone due to activities in nearby buildings. Although the locust and scrub oak are getting larger, they do not directly impact the masonry structure. Heavy grasses cover the site. Rehabilitation complete. Removed from the list of monitored sites.
LA 15855	TA-16	Trim scrub oak on Feature C. Monitor tree growth on Feature B. Cut and section trees that fell on cliff near petroglyph location. Identify petroglyphs.	No change from FY 2006.	Cut and slash snag and trim scrub oak in Feature C. Check fall snags by cliff face and their relationship to petroglyphs on the cliff face at this location.
LA 86651	TA-16	Cut and slash fallen trees in the area on west side of the mound. Monitor the scrub oak and consider thinning in 2-3 years.	Cut and slash small snag north-northwest of mound, and use for erosion control west and upslope of mound. Reseed approximately 1/8 acre. Thin scrub oak.	Slash nearby fallen snags, and use for erosion control on south and southwest side of mound. Reseeding not necessary.
LA 86654A	TA-16	Fill in badger hole. Monitor scrub oak growth and thin it when it becomes a serious problem. Cut down snags west of the site.	Fill in badger hole. Cut one snag west of site. Thin scrub oak.	No treatment recommended. Animal den has filled in. Snag has fallen without issue. Scrub oak is fine. Rehabilitation complete. Removed from the list of monitored sites.
LA 86657	TA-16	Monitor the growth of the scrub oak. Consider cutting scrub oak in future when it becomes a serious problem. Erosion seems now to be controlled.	Rehabilitation complete. Remove from list of monitored sites.	Did not revisit. Rehabilitation complete. Removed from list of monitored sites.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 86660	TA-16	Fencing is not recommended. Monitor power line activities to see if they impact site.	Fencing is not recommended. Powerline activities do not impact the site. Rehabilitation complete. Remove from list of monitored sites.	Did not revisit. Rehabilitation complete. Removed from list of monitored sites.
LA 122031	TA-16	Put a fence around rock features 10 m by 50 m [parallel to road (50 m) and north of the road (10 m)].	No change from FY 2006.	Erosion no longer a problem and few snags are present in the site area. Install fence along the southwestern edge of site next to road to prevent vehicles from driving over features (tire tracks observed in site boundary).
LA 136823	TA-16	Cut and slash the two snags. Monitor scrub oak and locust. Consider thinning the scrub oak and locust in 2-3 years.	No change from FY 2006.	No treatment recommended. All snags have fallen. Scrub oak and locust not a problem and erosion not a problem. Rehabilitation complete. Removed from list of monitored sites.
LA 136824	TA-16	Cut down two snags northwest and southeast of the structures. Cut and slash the fallen tree on the mound. Place slash and log barriers to the south side of the structure.	Cut two snags north-northwest and east of the structures, and use slash for erosion control. Cut and remove the fallen tree from the mound and use for slash. Reseed approximately 1/8 acre south of mound.	No treatment recommended. All snags have fallen, with snag on rubble mound is not a problem. Vegetation is adequate, not a problem. Rehabilitation complete. Removed from list of monitored sites.
LA 136825	TA-16	Cut and slash snag. Reseed south and east of the structure. Monitor barely alive trees in case they die and have the potential to damage the fence. Add wire strands to the south side of the fence.	Tighten 4 sections of fence. Install wire for south side of fence. Cut down snag and slash. Place two wattles and slash between north side of fence and road. Check to see if reseeding is necessary.	Cut nearby fallen snags and use slash for erosion control, especially upslope to the west of the structure, and to the south of the structure. Re-seed approximately ¼ acre to the south and west of structure.
LA 12655 (Nake'muu)	TA-37	Monitor walls and scrub oak. Thin scrub oak in 1-2 years. Consult with Pueblo of San Ildefonso to solicit their ideas on long-term preservation.	Several new sections of wall fall during 2006-2007 winter. Monitor walls after 2007-2008 winter. Consult with San Ildefonso and Bandelier to discuss and stabilization plan or other management strategy.	No erosion or snag problems. Need to trim scrub oak in next year or two.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 15854	TA-37	Monitor erosion and trees. Erosion control is good, no need for additional work. The Ponderosa and juniper are alive and will not fall any time soon. Recommendation is to leave trees in place instead of cutting; however, continue to monitor tree health.	Rehabilitation complete. Remove from list of monitored lists.	Did not revisit. Rehabilitation complete. Removed from list of monitored sites.
LA 4697	TA-49	Cut and slash two new fallen trees and monitor for future erosion.	Cut and slash four snags next to architecture. Monitor for future erosion.	Masonry walls are visible in fire break, with an estimated depth of cultural fill of 10-15 cm across a slight mounded area representing the original roomblock. Some erosion in fire break and berms. Area will be reassessed during 1st Qtr FY10 fire roads and fire break damage and site condition assessment. Snags and erosion inside the fence are very minor problems.
LA 89746	TA-49	Slash branches on two dead trees, but leave trees in place to protect masonry on the site.	Slash branches on two dead trees, but leave trees in place so as to protect masonry on the site.	The two snags have fallen, but still may pose a threat to the masonry rubble mound. Carefully slash and scatter branches without disturbing the mound.
LA 30461	TA-60	Excavation is NOT recommended. Site may be possibly be an Ancestral Pueblo trail shrine. Instead continue to monitor site and vegetation status. Reseed inside the perimeter site fence.	Excavation is NOT recommended. Site may an Ancestral trail shrine. Tighten two sections of fence on west side. Monitor site and vegetation status.	No treatment recommended. Two sections of fence somewhat loose but not enough to yet require tightening. Continued development around site. Rehabilitation complete. Removed from list of monitored sites.
LA 30642	TA-60	No wattles needed. Cut down snags and scatter slash. Tighten north fence.	No wattles needed. Tighten fence on west side. Section and slash fallen trees.	Well vegetated site area, with no erosion issues. Tighten western 6 sections of fence. Once this is accomplished, no other treatment should be necessary.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 89779	TA-60	Place wattles near eroding areas. Extend head of ditch to capture water to prevent south side of site from eroding. The structure mound is hidden by a large dead pinyon tree located in the mound's center. Tribal members have requested leaving the tree there to continue hiding the structure. It may be possible to trim the branches rather than cutting it down.	Place wattles and slash in and around eroding areas east and north of structure. Extend head of ditch to capture water to prevent south side of site from eroding. The structure is hidden by the large pinyon snag; tribal members have strongly suggested leaving the tree for protection. Recommend cutting and/or trimming several tree branches and thinning scrub oak.	High priority for treatment. Slash and scatter enough branches from the large splitting pinyon snag so as to reduce the weight load and prevent further damage to the masonry rubble mound. Erosion control needed to the west, north, and east sides of the rubble mound. Recommend 4-5 wattles, slash, and re-seeding to north and east (0.25 acres).
LA 137749	TA-60	Cut and slash fallen trees on fence. Repair fence sections.	Cut and slash two fallen trees. Repair two fence sections.	Remove, cut, slash, and scatter slash from two fallen snags on northeast corner of fence. Repair 2 sections of northeast corner of fence. Monitor lightening struck ponderosa pine in the southwestern corner of the fenced area in FY 2010.
LA 89714	TA-67	Monitor for future erosion. Cut down five snags: two inside the fence and three outside and west of the fence. Cut and slash fallen trees on southwest and southeast portions of fence. Repair and replace damaged fence wire. Straighten southeast portion of the fence. Cut and slash fallen trees around site.	Cut, section, and slash two large Ponderosa Pines. Cut one small snag outside of fence. Repair two fence sections.	Repair 4 sections (ca. 50 ft) of eastern fence. Repair 1 section (ca. 16 ft) of western fence. Cut and slash 4 fallen snags; use slash for erosion control. Fill in 2 stump/root holes from fallen snags.
LA 89790	TA-67	Cut and slash fallen snags on fence near northeast corner. Fill in stump hole south of mound. Remove several small snags (6-7) near fence. Tighten two bent fence sections.	Remove, cut and slash six fallen trees on fence; cut and slash three fallen trees inside fence; tighten two fence sections.	Cut and slash 7 fallen snags, and scatter slash for erosion control. Tighten 5-6 sections (70-80 ft) of fence badly bent by fallen snags, replacing fence strands as may be necessary.

Site Number	TA or Canyon	FY 2006 Recommendations	2007-2008 Recommendations	FY 2009 Recommendations
LA 21439	Rendija Canyon	Use field map with the 2006 site monitoring form to locate and fix areas where the fence is damaged. Cut and slash snags leaning on the fence. Replace damaged wattle on path. Discuss with Forest Service, and Land Conveyance and Transfer managers on how to discourage mountain bikers from coming through the site, and start a routine monitoring of the trail.	Fence repaired in September 2007. Periodic monitoring of fence. Discuss with Forest Service, Land Conveyance and Transfer managers on how to discourage mountain bikers from coming to the site, and start a routine monitoring of the trail.	Cut 8 snags to prevent falling on fence. Remove 6 fallen snags from fence, tightening the wire for 6 sections, and replacing one section with a single broken strand of wire. Re-erect 4 sections of fence purposefully flattened where trail crosses western fence boundary (wire and posts appear to be undamaged). Repair 5 sections and install gate along southern fence.
Large TCP District Fence	Rendija Canyon	Walk the entire fence line and carefully note on a field map the number of damaged fenced sections to be repaired and snags that should be cut in FY 2007.	Most of the fence was repaired in September 2007, along with the removal of snags. The west edge of the fence has not yet been repaired due to safety issues with the Sportsman's Club firing range. Repair fence and remove snags from western side of fence.	There are 4 sections of fence with single top strand broken. Cut 1 large ponderosa snag near northeastern corner. Western fences and the western half of the northern fence not visit due to gunfire overshooting the long-distance targets at the Shooting Range.
LA 85419	Rendija Canyon	Try reseeding again and add more slash.	Monitor vegetation growth.	No treatment recommend. Adequate vegetation has returned, and the slope is stable. Erosion is no longer a problem. Leave large juniper as it helps to shelter and hide the site. Rehabilitation complete. Removed from list of monitored sites.
LA 85860	Rendija Canyon	Slope soil is loose. This is an erosion threat. Try reseeding and scatter slash in these locations.	Monitor vegetation growth.	Rehabilitation complete. Removed from list of monitored lists.
LA 85870	Rendija Canyon	Monitor future vegetation growth and erosion.	Rehabilitation complete. Remove from list of monitored lists.	Did not revisit. Rehabilitation complete. Removed from list of monitored sites.

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