FINDING OF NO SIGNIFICANT IMPACT
FOR THE CHROMIUM PLUME CONTROL INTERIM MEASURE AND PLUME-CENTER CHARACTERIZATION, LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO

AGENCY: U.S. Department of Energy (DOE) Environmental Management, Los Alamos Field Office (EM-LA)

ACTION: Finding of No Significant Impact (FONSI)

SUMMARY: DOE EM-LA completed the *Final Environmental Assessment* (EA) *for the Chromium Plume Control Interim Measure and Plume-Center Characterization, Los Alamos National Laboratory, Los Alamos, New Mexico* (DOE/EA-2005). Based on analyses in the EA, DOE EM-LA determined that its proposed action—conducting an interim measure to control migration of a plume of chromium-contaminated groundwater and conducting field-scale studies to further characterize the plume center—would not result in any significant adverse impacts. A detailed description of the proposed action and no action alternative, together with a discussion of the associated environmental consequences, are in the EA, which is incorporated by reference. In issuing this finding, DOE EM-LA commits to the mitigation measures described in the corresponding Mitigation Action Plan (MAP), included as an attachment to this FONSI. In accordance with Executive Order 11988 and DOE's Compliance with Floodplain and Wetland Environmental Review Requirements (codified at 10 Code of Federal Regulations [CFR] 1022), DOE EM-LA is also issuing a Floodplain Statement of Findings, attached to this FONSI.

BACKGROUND: Los Alamos National Laboratory (LANL) is a multidisciplinary research facility, owned by DOE and managed and operated by Los Alamos Nuclear Security, LLC (LANS), located in north-central New Mexico approximately 60 miles northeast of Albuquerque and 20 miles northwest of Santa Fe, within the incorporated County of Los Alamos and Santa Fe County. Groundwater sampling data from monitoring wells at LANL indicate the presence of chromium contamination in the regional aquifer resulting from historical use (1956–1972) of potassium dichromate, a corrosion inhibitor, in cooling-tower water that was discharged to an outfall as part of operational maintenance activities. Concentrations of chromium within the groundwater plume beneath Mortandad Canyon exceed the New Mexico groundwater standard of 50 parts per billion (ppb) near the property boundary between LANL and the Pueblo de San Ildefonso and are as high as 1,000 ppb in the plume center. Recent groundwater monitoring well data show increasing chromium concentrations on the plume edges (sidegradient and downgradient), which is indicative of plume migration. In accordance with the Compliance Order on Consent (Consent Order) with the New Mexico Environment Department, DOE EM-LA and LANS are required to assess, identify, clean up, and otherwise address contamination at LANL.

PURPOSE AND NEED: The purpose and need for DOE EM-LA's action is to limit downgradient migration of the chromium plume edge in the regional aquifer. Recent data indicate that, in the absence of any action, plume migration will continue toward the boundary LANL shares with Pueblo de San Ildefonso. DOE EM-LA therefore needs to employ a measure

that can be quickly operational with rapid effect on plume migration. DOE EM-LA also needs to evaluate the effectiveness and feasibility of implementing a final remedy for the chromium plume by conducting field-scale studies to further characterize the plume center.

DESCRIPTION OF THE PROPOSED ACTION: DOE EM-LA's proposed action is to conduct an interim measure to control migration of a plume of chromium-contaminated groundwater beneath Mortandad Canyon within the boundary of LANL. DOE EM-LA also proposes to conduct field-scale studies to further characterize the plume center to evaluate the effectiveness and feasibility of implementing a final remedy. These actions rely on using existing infrastructure in Mortandad Canyon as a result of ongoing investigations of the chromium plume as well as installing new infrastructure. Existing infrastructure includes a groundwater extraction well; monitoring wells; piezometers; a water treatment system with portable storage tanks, storage basins, and associated connecting pipelines; unpaved access roads; power lines; and an irrigation system for land application of treated water. New infrastructure would include installation of additional groundwater extraction wells; injection wells (for gravity-fed injection of treated water); well pads and infrastructure to support installation and operation of the wells; shallow alluvial piezometers (within Sandia Canyon); spray irrigation/evaporation system covering an area of approximately 50 acres, potentially supplemented by mechanical evaporators; buried piping; unpaved access roads; and power lines.

During the proposed action, groundwater extraction would occur at up to three extraction wells, in addition to small volumes periodically extracted at monitoring wells. The total annual groundwater extraction volume would be up to 230 million gallons (707 acre-feet) during the approximate 8-year duration of the project. This water would be treated to ensure that all constituents meet New Mexico Environment Department Ground Water Quality Bureau permit requirements before injection into the aquifer through the injection wells, land application using the spray irrigation/evaporation system or water trucks along unpaved access roads, or possibly mechanical evaporation. In the event that injection is not feasible, an option to the proposed action is that all treated water be dispositioned through land application and/or mechanical evaporators. In this event, the annual amount of groundwater extracted would be reduced accordingly.

ALTERNATIVES CONSIDERED: In addition to the proposed action, DOE EM-LA considered the no action alternative as required under the *National Environmental Policy Act* (NEPA). Under the no action alternative, DOE EM-LA would continue to perform activities under the Consent Order but would not install any new extraction or injection wells or related infrastructure to address chromium plume migration nor evaluate potential long-term actions to fully remediate the chromium plume.

ENVIRONMENTAL CONSEQUENCES: The EA evaluates the effects of the proposed action and no action alternative related to land use, geology and soils, water resources, air quality, ecological resources, cultural resources, utilities and infrastructure, traffic and transportation, hazardous materials and waste generation, noise, visual resources, human health and worker safety, and environmental justice.

The environmental effects of the proposed action on resources evaluated would be small to negligible. Effects by resource area are as follows:

- **Land use**—Activities would take place within the LANL boundary in an area of active groundwater investigation; activities would be compatible with existing land uses.
- **Geology and soils**—Installation and operation of extraction and injection wells would have minimal to negligible effects to geology. Small effects to soil profiles would occur from soil disturbance associated with grading.
- **Groundwater**—Nearby Los Alamos County water-supply wells draw water from the regional aquifer. Pumping from proposed extraction wells would result in temporary increases in drawdown of up to 6.4 feet at County wells in the Pajarito Mesa wellfield. This drawdown would likely not affect the economic or physical characteristics of the wells. Water injected into the aquifer through injection wells, land-applied, or evaporated would meet NMED Ground Water Quality Bureau permit standards; activities under the proposed action would not increase the flow of contaminants into groundwater.
- **Surface water**—Stormwater runoff from activities would be controlled through best management practices; effects on surface-water quality or quantity would be minimal.
- **Air quality**—Activities would produce criteria-pollutant, hazardous air-pollutant, and/or greenhouse-gas emissions from earth-moving activities (dust), use of equipment (exhaust), and operation of mechanical evaporators (particulate matter). Effects on air quality would be small to negligible.
- **Ecological resources**—A portion of the activity area lies within buffer habitat for the Mexican spotted owl. Potential effects to the Mexican spotted owl from direct disturbance, noise, or treated-water disposition would be avoided through annual biological surveys to ensure the project area is not occupied or nest locations are farther than 1,300 feet from project activities and restricting activities, such as land application within the buffer area, from March 1 to August 31. Activities under the proposed action are not likely to affect the Mexican spotted owl, migratory birds, other sensitive species, or floodplain/riparian habitat.
- **Cultural resources**—Historic properties would be avoided during proposed action activities, including construction, maintenance, and land application of treated water. Road improvements would be used to minimize the risk of impacts to archaeological sites from road use and maintenance. Stormwater runoff control measures would be employed to minimize erosion.
- **Utilities and infrastructure**—Electricity to operate project infrastructure would be supplied from existing power lines; impacts to electrical infrastructure would be small. The potable water supply and existing water-supply infrastructure would accommodate project use; effects on water infrastructure would be negligible. Unpaved access roads to new well pads would be constructed and measures would be taken to construct and/or

maintain roads in a manner protective of archaeological sites; effects on road infrastructure would be small.

- **Traffic and transportation**—Only small amounts of traffic would be generated by proposed action activities; effects on traffic would be negligible.
- **Hazardous materials and waste generation**—Small quantities of construction debris, approximately 30 gallons per year of hazardous waste, and approximately 50,000 gallons of treated water annually from maintenance at each injection well would be generated. All waste would be handled in accordance with LANL's waste management procedures. Impacts to on-site waste operations or off-site disposal facilities would be small.
- **Noise**—Heavy equipment would be used during some project activities; noise generated would be confined to locations near the project area and effects would be small.
- **Visual resources**—There would be no substantial dominant visual change as observed at sensitive viewer locations, no substantial change in visibility caused by predicted air-pollutant emissions, no conflict with visual standards identified by a Federal land management agency, and no long-term dominant visual interruption of unique viewsheds; impacts to visual resources would be small.
- **Human health and worker safety**—Access to the project area is restricted and noise-generating activities and air emissions would be unlikely to affect members of the public at the nearest publicly accessible points. Effects on human health would be negligible. Applicable safety and health training and monitoring, personal protective equipment, and work-site hazard controls would be required for workers; activities would not be expected to have any adverse health effects on workers.
- **Environmental justice**—Pueblo de San Ildefonso residents would be considered a minority population for purposes of identifying environmental justice concerns. Because the proposed action would reduce risks to human health and welfare in the region by removing contaminants from the environment and containing the off-site migration of groundwater contamination onto Pueblo de San Ildefonso lands, and the proposed action has no other significant environmental impacts, the proposed action would not result in disproportionately high and adverse effects to residents of the Pueblo.

Implementation of specific resource mitigation commitments, as identified in the EA, Floodplain Assessment, and MAP, lessen the potential for adverse environmental effects. The attached MAP serves as a management document that explains how the mitigation measures identified in the EA will be planned and implemented through both construction and operational phases of the project. Specifically, the MAP describes existing programs, plans, and controls that will be applied during the course of the project, and lists other measures that will be employed to reduce the potential of project-specific effects identified in the EA, such as those related to visual resources, cultural resources and traditional cultural properties (including potential impacts to the Pueblo de San Ildefonso), biological resources, floodplains, land use, and surface water.

Under the no action alternative, chromium contamination will continue to migrate in the predominant direction of groundwater flow. The plume will likely migrate onto Pueblo de San Ildefonso lands.

DRAFT EA REVIEW AND COMMENT: In accordance with 10 CFR 1021.301 (Agency review and public participation), DOE EM-LA provided written notification of the determination to prepare this EA on June 19, 2015, to Jemez Pueblo, Pueblo de Cochiti, Pueblo de San Ildefonso, Santa Clara Pueblo, the State of New Mexico, and Los Alamos County. In accordance with 10 CFR 1021.301(d), DOE EM-LA provided the State and tribes with an opportunity to review and comment on the Draft EA. The public comment period for the Draft EA began September 23, 2015 and ended on November 13, 2015. DOE EM-LA sent e-mails to governments (including tribal governments), organizations, and individuals from DOE's stakeholders list. Additionally, a newspaper announcement was published in the *Journal North* on September 25, 2015. The EA was made available at the DOE NEPA website (http://energy.gov/nepa/nepa-documents/environmental-assessments-ea). A public information meeting was held on September 30, 2015, at the Cities of Gold Conference Center, Pojoaque, New Mexico.

The following governments, organizations, and individuals provided comments on the Draft EA: Pueblo de San Ildefonso; Santa Clara Pueblo; Communities for Clean Water and Communities for Clean Water Youth Council; Concerned Citizens for Nuclear Safety and Robert H. Gilkeson, jointly; Nuclear Watch New Mexico; and Stephen G. Schmelling. Comments received were considered and changes made to the EA, as appropriate. Each of the commenters was notified of Final EA availability and links for downloading the Final EA and associated documents.

DETERMINATION: Based on the information in the EA, as summarized here, DOE EM-LA has determined that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA (42 *United States Code* 4321 et seq.). Therefore, an EIS will not be prepared and DOE is issuing this FONSI for the proposed action.

Douglas E Hintze Date 16 December 2015

Douglas E. Hintze
Field Manager
Environmental Management Los Alamos Field Office

FOR FURTHER INFORMATION CONTACT: For further information on this EA, contact M. Lee Bishop, Document Manager, U.S. Department of Energy, Office of Environmental Management, Los Alamos Field Office (EM-LA), 3747 W. Jemez Road, MS-A316, Los Alamos NM 87544; e-mail CRProjectEA@em.doe.gov.
For further information on the DOE NEPA process, contact Carol M. Borgstrom, Director, Office of NEPA Policy and Compliance, U.S. Department of Energy, 100 Independence Avenue, SW, Washington DC 20585; telephone (202) 586-4600 or (800) 472-2756; e-mail askNEPA@hq.doe.gov.

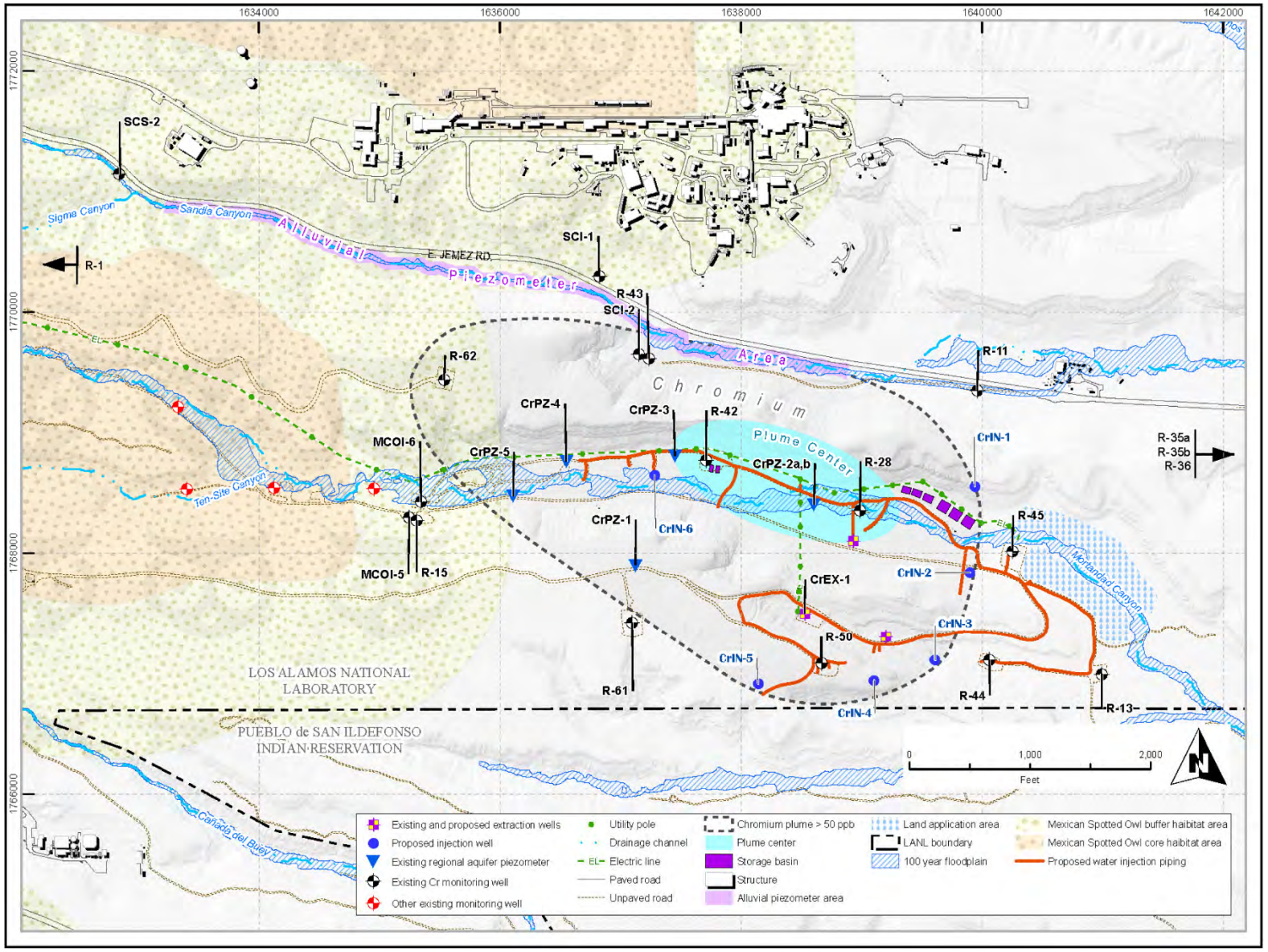

Figure 1. Locations of 100-year floodplain, water courses, and project infrastructure

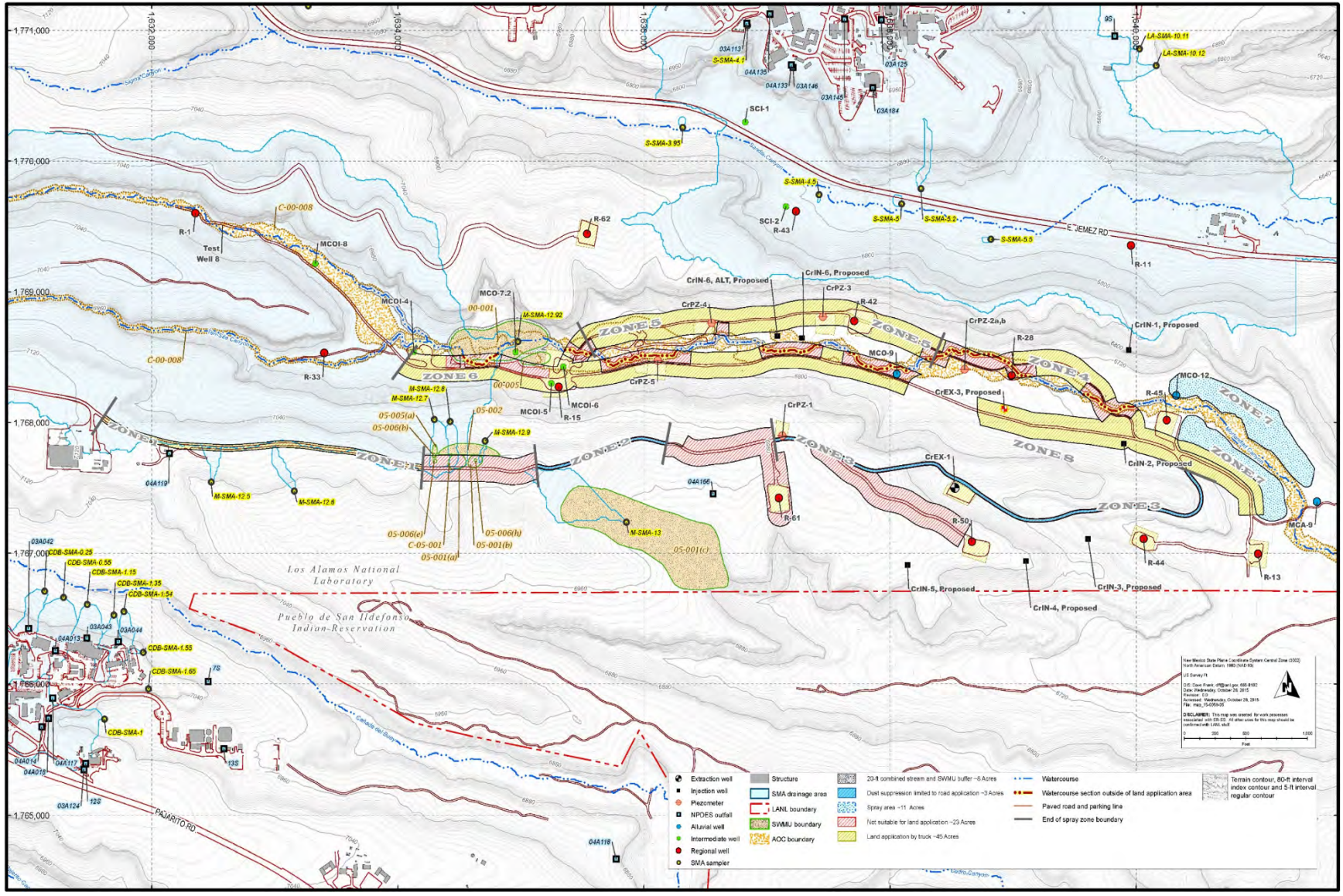

Figure 2. Locations of designated spray zones for land application of treated water

Attachment
Mitigation Action Plan

Chromium Plume Control Interim Measure and Plume-Center Characterization, Los Alamos National Laboratory, Los Alamos, New Mexico (DOE/EA-2005)

Mitigation Action Plan

U.S. Department of Energy

December 2015

Prepared by Los Alamos National Security, LLC. Environmental Stewardship Services Group, Environmental Protection Division, Associate Directorate for Environment, Safety, and Health

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FIGURE

TABLE

ACRONYMS AND TERMS

ADEP	Associate Directorate for Environmental Programs
BMP	best management practice
CGP	NPDES General Permit for Discharges from Construction Activities
CRMP	Cultural Resources Management Plan
DOE	U.S. Department of Energy
EA	environmental assessment
EM-LA	Office of Environmental Management, Los Alamos Field Office
EMS	Environmental Management System
ENV-ES	(LANS) Environmental Stewardship Services Group
EPA	Environmental Protection Agency
FONSI	finding of no significant impact
HMP	Habitat Management Plan
LANL	Los Alamos National Laboratory
LANS	Los Alamos National Security, LLC
MAP	Mitigation Action Plan
MAPAR	MAP Annual Report
NMED	New Mexico Environment Department
NPDES	National Pollutant Discharge Elimination System
SWEIS	Site-Wide Environmental Impact Statement
TA	Technical Area

1.0 EXECUTIVE SUMMARY

The United States Department of Energy (DOE) Office of Environmental Management, Los Alamos Field Office (EM-LA) has issued a finding of no significant impact (FONSI) for the environmental assessment (EA) *Chromium Plume Control Interim Measure and Plume-Center Characterization, Los Alamos National Laboratory, Los Alamos, New Mexico*, referred to in this document as the Chromium EA (DOE/EA-2005). This Mitigation Action Plan (MAP) is part of the FONSI. This proposed project addresses chromium contamination in the groundwater beneath Mortandad Canyon in Technical Area (TA) 5 at Los Alamos National Laboratory (LANL) in Los Alamos, New Mexico. Groundwater sampling data show the presence of chromium contamination in the regional aquifer resulting from historical use of potassium dichromate, a corrosion inhibitor, in non-nuclear cooling-tower water that was discharged to an outfall as part of operational maintenance activities from the 1950s through the 1970s. The DOE EM-LA proposed action implements an interim measure that would control offsite migration of the chromium groundwater plume and evaluates the feasibility of remedial actions to potentially remediate the chromium plume. Based on the analysis of potential environmental impacts presented in the Chromium EA, the proposed action will not have significant environmental impacts. This conclusion is explained in the mitigated FONSI issued with the EA.

The Chromium EA identified potential environmental impacts resulting from implementation of the preferred alternative and discussed measures to mitigate those effects. This mitigation action plan (MAP) is a DOE EM-LA management document that explains how the mitigation measures identified in the Chromium EA will be planned and implemented.

1.1 Function of the Mitigation Action Plan

This MAP contains mitigation and monitoring commitments related to both the construction activities and operation of the proposed interim measures as approved by the New Mexico Environment Department (NMED) and to be implemented by DOE EM-LA. The commitments made in this MAP are designed to mitigate any adverse environmental effects associated with this project as they are implemented, and as direct, indirect, and cumulative impacts from these actions occur over time to the resources in Mortandad Canyon.

1.2 MAP Annual Report

Section 5.d(12)(f) of DOE Order 451.1B, *National Environmental Policy Act Compliance Program*, requires DOE EM-LA to prepare an annual report documenting actions taken in accordance with an issued MAP. After issuance, the mitigation measures committed to in this MAP will be incorporated into the overarching *2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory* (*DOE/EIS 0380*) *Mitigation Action Plan* (SWEIS MAP; DOE 2008). Annual reporting of the mitigation activities and their implementation status will be included in the SWEIS MAP Annual Report (MAPAR). In the MAPAR, DOE provides a summary of mitigation work conducted in the previous fiscal year.

The MAP commitments documented will be reviewed annually (during the preparation of the SWEIS MAPAR) to determine if the mitigation measures are effective and if mitigation measures have been completed. The MAP may be revised to address significant changes, new mitigations, or deficiencies as the project is implemented.

2.0 IMPLEMENTATION

The MAP implementation process involves DOE EM-LA, the LANS Associate Directorate for Environmental Programs (ADEP), and several other LANS organizations. DOE EM-LA and LANS are responsible for implementing the mitigation measures during all phases of project construction and operations. Relevant portions of this MAP will be included in construction contract specifications to obligate the contractor to implement the mitigation measures identified in the MAP that relate to contractor responsibilities during and after construction. The implementation process includes mitigation action management, task scoping, funding allocation, tracking, technical implementation, annual reporting, and mitigation closure.

2.1 Responsible Parties

DOE EM-LA Managers will have the overall responsibility for ensuring the adequate and timely completion of all activities associated with this MAP. ADEP representatives will be responsible for the overall work assignments, for subcontract requirements, for conducting the mitigation measures performed by LANS personnel or subcontractors, and conducting project-specific activities. This responsibility includes data collection, monitoring activities, and other actions that may be split between various LANS associate directorates. DOE EM-LA delegated the daily coordination and management of MAP activities to LANS in accordance with their Management and Operations

contract (Contract #DE-AC52-06NA25396). The LANS Environmental Protection Division's Environmental Stewardship Services Group (ENV-ES) is responsible for reporting on the MAP. ENV-ES will work with ADEP to coordinate technical issues regarding the scope and schedule of individual mitigation measures. DOE/LANS will continue to implement corrective action interim measures as directed by NMED and deemed necessary.

2.2 Mitigation Tracking

ENV-ES will maintain a log to track the scope, schedule, interim milestones, deliverables, and closure of mitigation action commitments outlined in this MAP. A copy of the tracking log will be transmitted quarterly to the DOE EM-LA *National Environmental Policy Act* Compliance Officer as part of the quarterly 2008 SWEIS MAP report. Any issues in meeting the commitments will be identified in these reports.

2.3 MAP Duration and Mitigation Closure

As individual mitigation action commitments are completed, LANS will provide formal documentation and rationale for recommending mitigation action closure to DOE EM-LA. DOE EM-LA will review the documentation and provide authorization of closure or direction for further action. Closure of mitigation actions will be reported as part of the SWEIS MAPAR.

3.0 MITIGATIONS

3.1 Existing Programs, Plans, and Controls

Activities undertaken at LANL are performed in compliance with applicable Federal and State regulations, DOE orders, and contractual requirements. DOE and LANS have policies, procedures, and programs in place to review projects for potentially adverse environmental effects. It is understood that these or similar policies and procedures will be implemented as part of the proposed action in addition to the specific mitigations identified in Section 3.2. These policies, procedures, and programs include, but are not limited to the following:

- Policies that ensure environmental requirements and issues are identified.
- Procedures that institute integrated safety management to control work.
- Policies reflected in agreements with other entities, specifically including memoranda of agreement with the Pueblo de San Ildefonso and agreements made

with the other Accord Pueblos, with protocols regarding consultations and other discussions.

- Projects, like the proposed action, 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 environmental 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; and (3) provide beneficial opportunities to avoid impacts to biological, cultural, and sensitive resources. It is understood that the proposed action will continue to comply with these policies, procedures, programs, plans, and projects. Examples include the following:

- The LANL Threatened and Endangered Species Habitat Management Plan (HMP; LANL 2015a) documents requirements to ensure the protection of Federally listed threatened and endangered species and their habitat.
- The LANL Cultural Resources Management Plan (CRMP; LANL 2006) provides the requirements for compliance with the *National Historic Preservation Act* and other relevant Federal laws and DOE orders.

The mitigations associated with the proposed action will be aligned with the LANL Environmental Management System (EMS). Mitigations and best management practices (BMPs) implemented as part of the proposed action will be included in one or more organization's EMS Action Plans. BMPs include, but are not limited to the following:

- Nonradioactive air emissions (e.g., from construction equipment) would be controlled by proper maintenance of equipment.
- Noise impacts on the Mexican Spotted Owl during construction, drilling, and pumping activities will be mitigated by following requirements in the HMP.
- Particulate matter (fugitive dust) emissions from exposed soil and roadways during construction activities will be controlled using routine dust suppression watering and stabilization of disturbed soil as appropriate.
- Air emissions that result from operations, construction, demolition, and remediation activities will be controlled. In accordance with 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. The annual Title V Permit requires adherence to all air quality requirements to ensure that appropriate controls, permits, and operational procedures are in place and projects are reviewed for air quality regulation applicability prior to initiation of work.

3.2 Project-Specific Potential Environmental Effects

The impact analysis provided in the Chromium EA indicates that potential beneficial or adverse environmental effects of the proposed action and any environmental restoration actions would be minimal under normal conditions. The Chromium EA description of alternatives and the analysis of environmental effects, includes mitigations to prevent potential adverse environmental effects resulting directly, indirectly, or cumulatively from implementing the proposed action. The proposed action is to be undertaken in Mortandad Canyon, an undeveloped area that does not contain LANL buildings/facilities (Figure 1). This area is adjacent to the Pueblo de San Ildefonso Sacred Area and contains many important cultural resources. Efforts to eliminate or reduce any impacts associated with the proposed action will be implemented by DOE EM-LA and LANS.

Possible adverse environmental effects on biological or cultural resources present in and near the Chromium Project in Mortandad Canyon include:

- potential effects associated with visual and noise impacts
- potential effects on cultural resources or Traditional Cultural Properties located in or near the project or environmental restoration work sites;
- potential effects on Mexican Spotted Owls and their habitat;
- potential effects on migratory birds protected by the *Migratory Bird Treaty Act*;
- potential effects on other wildlife and game animal use of the canyon area;
- potential effects on the 100-year floodplain and associated vegetation;
- potential effects on land use; and/or
- potential effects on surface water, watercourses, etc.

3.3 Mitigations Associated with Potential Visual and Noise Impacts

Potential noise and light impacts to the Mexican Spotted Owl will be mitigated during construction, drilling, and pumping activities by planning activities outside the breeding season, preferentially selecting equipment with lower noise levels, and using noise barriers where appropriate. All lighting will be directed away from the canyon or habitat areas. Infrastructure should be painted so that it blends in with the landscape more effectively to minimize potential visual impacts.

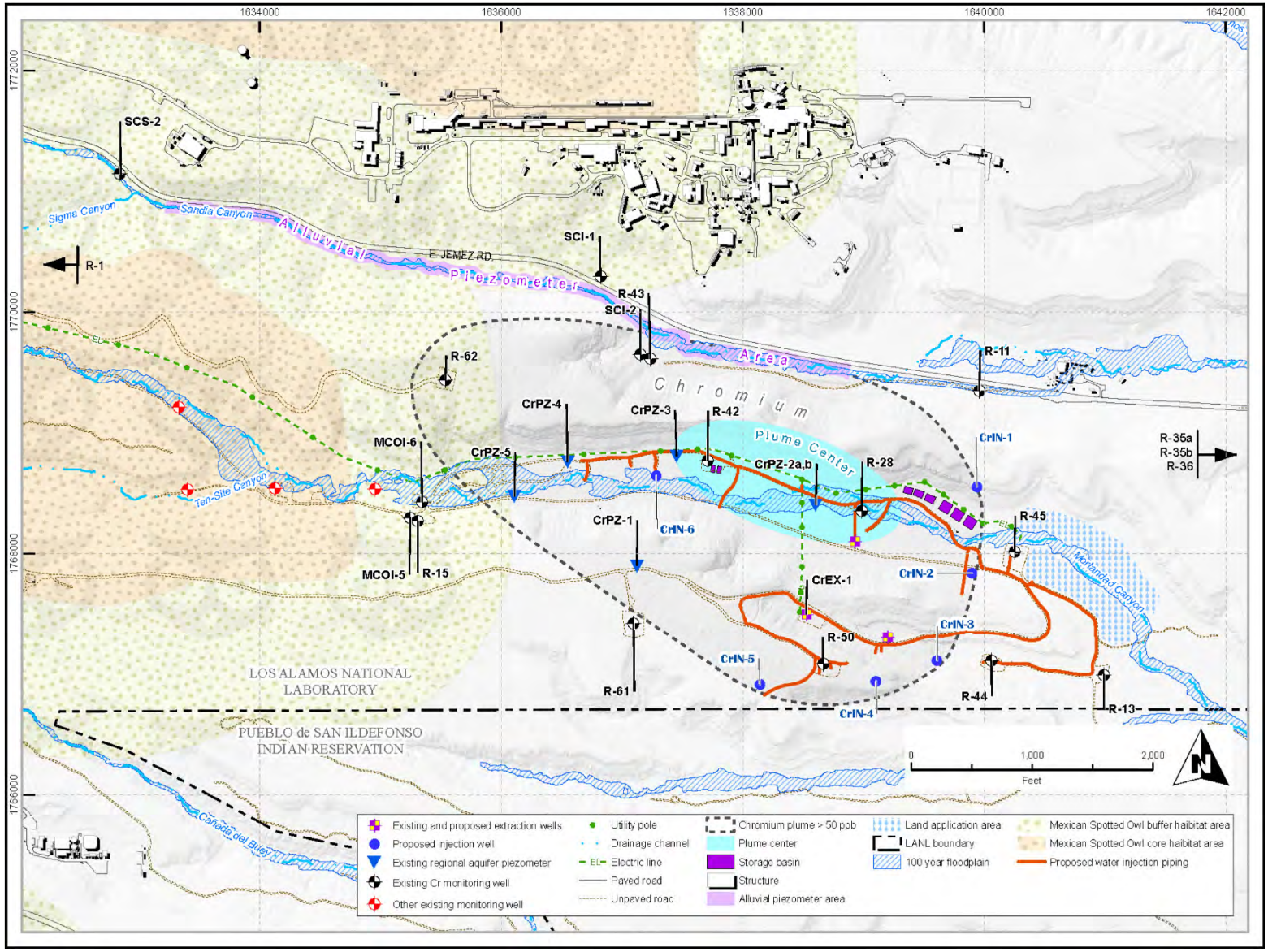

Figure 1. Location of proposed action

3.4 Mitigations Associated with Potential Cultural Resource and Traditional Cultural Properties Impacts

The proposed action will comply with the LANL CRMP and project activities will be planned and sited to avoid impacts to cultural resources. ENV-ES cultural resources staff will monitor vegetation removal and construction activities and cultural resources will be marked for avoidance. If needed, erosion control measures will be implemented at archaeological sites near proposed well pads or pipelines to manage changes in erosional patterns resulting from vegetation clearing and/or construction. Actions associated with perceived impacts to the Pueblo de San Ildefonso will be coordinated with the Pueblo. DOE will continue to engage in proactive government to government consultations with the Pueblo de San Ildefonso and any work will be aligned with the established protocols between the Pueblo and DOE.

Land applied treated water will not be sprayed within the boundaries of archaeological sites, even those that are bisected by existing roads. Road maintenance within the boundaries of cultural resources will be limited and cultural resources staff will monitor all road maintenance activities.

3.4.1 Mitigations associated with other potential cultural resource impacts identified by the Pueblo de San Ildefonso

Drilling work and other construction activities along the boundary will be scheduled to the extent practicable so as not to occur during elk and deer hunting and breeding and calving seasons to avoid conflicts with hunts on the adjacent Pueblo de San Ildefonso Sacred Area property. Additionally, these activities, to the extent practicable, will be scheduled so as not to occur during ceremonial activities on the adjacent Pueblo de San Ildefonso Sacred Area property.

3.5 Mitigations Associated with Potential Biological Resource Impacts

In areas adjacent to or within buffer and core habitat for the Mexican Spotted Owl, workers will be required to comply with the restrictions outlined in the LANL HMP to comply with the *Endangered Species Act*. Work associated with the proposed action will also comply with the annual noise and tree cutting restrictions imposed by the HMP and the EA for Wildfire Reduction and Forest Health Improvement (DOE 2000).

While not directly associated with this project, a multi-year study monitoring avifauna in four different habitat types at LANL was initiated in 2011. The study uses standard

point count methodology to record avian abundance and diversity along transects at the study sites each summer and winter. The Sandia wetlands is one of the habitat areas that has been surveyed since 2011. Multi-year studies provide long-term trend data that can be compared with regional and national trends in bird populations. They also can be correlated to changes in the natural environment at LANL.

Additionally, a bird banding station was established in the Sandia wetlands. The data collection project follows the Monitoring Avian Productivity and Survivorship Protocol in 2014. This protocol monitors population parameters such as survival, vital rates, and immigration and emigration of birds to the area. Data from this project will be used as a metric for avian health in the wetlands at LANL. The project will be continuing until 2024 and may include a reference site in Mortandad Canyon to compare results to.

3.6 Mitigations Associated with Potential Floodplain Impacts

Required BMPs for work in floodplains detailed in the floodplain assessment (LANL 2015b) will be implemented during all project activities. These protection standards will minimize short-term negative impacts and include:

- Support structures (e.g., personnel trailers, storage tanks, or permanent laydown yards) will not be installed within the floodplain.
- The project will not locate permanent equipment staging areas within the floodplain.
- The project will refuel equipment at least 100 feet from any drainage, including dry arroyos.
- The project will not store hazardous materials, chemicals, fuels, and oils within the floodplain.
- Revegetation of areas following soil disturbances using an appropriate native perennial seed mix or plants.
- Removal of all trash and debris (e.g., construction material) from the floodplain after completion.
- Implementation of erosion and sediment control measures during construction.

3.7 Mitigations Associated with Potential Land Use Impacts

As infrastructure is installed, well pad footprints will be limited to the smallest size necessary, minimizing the land use impacts from the proposed action. As infrastructure

is downsized or no longer needed, revegetation with native perennial vegetation will contribute to the restoration of the area.

3.8 Mitigations Associated with potential effects surface water, watercourses, etc.

Requirements of the EPA regulated National Pollutant Discharge Elimination System (NPDES) General Permit for Discharges from Construction Activities (CGP) will be implemented to minimize the discharge of potential pollutants to watercourses. This includes:

- implementation of storm water management and sediment and erosion controls specified in construction project Storm Water Pollution Prevention Plans;
- site inspections conducted weekly and following storm events producing 0.25 inches of precipitation;
- proper management of construction activity materials, equipment and waste;
- implementation of controls to manage runoff velocity and sediment yield from disturbed areas to pre-development values; and
- stabilization of disturbed areas with native perennial vegetation of other permanent features.

Required BMPs for work under the 1793 discharge permit will be implemented as well. These protection standards will minimize short-term negative impacts and include:

- land application sites cannot be located in a watercourse;
- land application cannot result in runoff to a watercourse;
- land application cannot create ponds or pools;
- land application must be conducted in a manner that maximizes infiltration and evaporation;
- land application is restricted to daylight hours and for a maximum of 10 hours per day;
- land application must be supervised at all times; and
- land application is prohibited while precipitation is occurring.

3.9 Mitigation Summary

The BMPs and mitigation activities discussed above are summarized in Table 1 and address all phases of the project, from planning and design, construction, and operation

as appropriate. Some mitigation activities are applicable to more than one phase of the project, and tasks associated with each activity may be implemented in an iterative fashion over time at the discretion of the responsible parties.

DOE EM-LA may initiate certain mitigation measures or required permitting actions in advance of the project or environmental restoration action measures, as appropriate. As project activities progress from planning to construction, operations, and closeout activities, additional laws and mitigation measures may be triggered during any phase of the work. Examples include cultural resources encountered during ground disturbing activities, if Federally protected threatened or endangered species move into the work site area, or if species become listed for protection and must, therefore, be taken into consideration.

DOE EM-LA recognizes the obligation to comply with all Federal laws and other requirements although they may not specifically be referenced in Table 1.

Table 1. Affected Environment and Mitigation Actions

Affected Environment	Mitigation Actions	Purpose	Responsible Party	Status
Threatened and endangered species habitat	All requirements in the LANL HMP will be implemented for all aspects of the project. These requirements may include, timing restrictions on noise producing activities during the Mexican Spotted Owl breeding season, tree removal restrictions, and lighting requirements. Surveys for the Mexican Spotted Owl in Mortandad and surrounding canyons will be implemented annually.	The Federal law, the *Endangered Species Act*, prohibits disturbance of Federally listed species and their habitats. This mitigation and on-going Mexican Spotted Owl surveys are required by the LANL HMP.	LANS, DOE EM-LA	Open
Migratory birds	Site-specific requirements for migratory bird protections will be detailed in the LANS integrated review tool. On-going migratory bird research in Sandia Canyon will be continued under the MAP to continue monitoring for changes in bird diversity.	The Federal law, the *Migratory Bird Treaty Act*, prohibits killing migratory birds and their nestlings and eggs. This mitigation will minimize impacts to migratory birds and continued research will monitor for impacts to migratory birds from LANL operations.	LANS, DOE EM-LA	Open

Affected Environment	Mitigation Actions	Purpose	Responsible Party	Status
Game animals and other wildlife	Implement actions to improve habitat for large game and other wildlife such as Habitat improvements may include planting native vegetation to supplement food resources and installation of supplemental water sources. Drilling work and other construction activities along the boundary will be scheduled to the extent practicable so as not to occur during elk and deer hunting seasons. After soil disturbing activities have been completed, disturbed sites will be restored with re-contouring and planted with a native seed mix or native vegetation plantings. When available, native seed stock should include species identified in the "Pollinator-Friendly Best Management Practices for Federal Lands" document as directed by Secretary of Energy on October 19, 2015 regarding the Presidential Initiative on Pollinator Health.	Re-establish habitat suitable for large game and other wildlife quickly to minimize disturbance to migration and use patterns.	LANS, DOE EM-LA	Open
Surface water quality	Develop and use BMPs, and comply with the requirements of the NPDES Construction General Permit, to prevent or minimize the transport of sediment or other potential pollutants from disturbed areas during construction and implementation of the project.	Minimize impacts to the environment associated with stormwater runoff or runon and comply with the National Pollutant Discharge Elimination System (*Clean Water Act*) Construction General Permit for Stormwater Discharge.	LANS, DOE EM-LA	Open

Affected Environment	Mitigation Actions	Purpose	Responsible Party	Status
Cultural resources, *Native American Graves Protection and Repatriation Act*, and Traditional Cultural Properties	LANL CRMP provisions will be followed and may be augmented to address specific site issues as the project is implemented. If buried archeological resources, remains, or items of cultural significance are encountered during construction, site activities will cease until items are evaluated by LANS and DOE EM-LA cultural resources staff and appropriate actions are taken. If traditional cultural properties are identified during construction, site activities will cease until appropriate mitigation measures are determined through consultation with the State Historic Preservation Officer and the involved Tribal government.	Comply with Section 106 of the *National Historic Preservation Act*, which requires Federal agencies to take into account the effects Federally funded activities have on cultural and archaeological resources and traditional cultural properties and practices.	LANS, DOE EM-LA (consultation with Tribal governments and the State Historic Preservation Officer)	Open
Visual	Use directional lighting whenever possible. Infrastructure may be painted so that it blends in with the landscape more effectively.	Minimize potential visual impacts	LANS, DOE EM-LA	Open
Noise	Noise diminishing equipment will be used whenever possible.	Minimize potential noise impacts	LANS, DOE EM-LA	Open
Environmental Justice	Consult with the Pueblo de San Ildefonso to schedule drilling work and other construction activities to avoid hunting and calving seasons and conflicts with ceremonial observances on Pueblo de San Ildefonso property.	Minimize impacts to activities conducted by members of the Pueblo de San Ildefonso in the Sacred Area	DOE EM-LA consultation with Pueblo de San Ildefonso	Open

Affected Environment	Mitigation Actions	Purpose	Responsible Party	Status
Land Use	Remove all trash and debris after construction, well pad footprints will be limited to what is necessary to minimize the visual impact from the proposed action. As infrastructure is downsized or no longer needed, revegetate with native grasses and trees to contribute to restoration of the area.	Minimize permanent project footprint	LANS, DOE EM-LA	Open
Air Quality	Actively control air emissions that result from operations, construction, demolition, and remediation activities.	Comply with the *Clean Air Act* Title V site-wide permit by meeting the Environmental Protection Agency's National Ambient Air Quality.	LANS, DOE EM-LA	Open
Water	Water use is an important issue in northern New Mexico. For this project, injection (described as an aspect of the preferred alternative) could offset extraction by increasing the return rate of water back to the aquifer.	Maximize expedient return of water to the aquifer.	LANS, DOE EM-LA, NMED	Open

4.0 REFERENCES

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