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Floodplain Assessment for the Electrical Power Capacity Upgrade Project

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ACRONYMS

Acronym	Definition
AOC	Area of Concern
BLM	Bureau of Land Management
CFR	Code of Federal Regulations
DOE	(U.S.) Department of Energy
EA	Environmental Assessment
EISA	Energy Independence and Security Act
EPCU	Electrical Power Capacity Upgrade
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
RCRA	Resource Conservation and Recovery Act
STA	Southern Technical Area
SWMU	Solid Waste Management Unit
TA-71	Technical Area 71



INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the U.S. Department of Energy (DOE), is proposing new construction at Los Alamos National Laboratory (LANL). In accordance with regulations in 40 Code of Federal Regulations (CFR), Parts 1500–1508 National Environmental Policy Act (NEPA) and 10 CFR Part 1021, DOE/NNSA has prepared an environmental assessment (EA) to analyze the potential environmental impacts associated with implementation of the proposed action (DOE/EA 2024). This floodplain assessment has been prepared in accordance with DOE regulations set forth in Title 10 CFR, Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements (CFR 2003) and will be attached to the EA.

The proposed Electrical Power Capacity Upgrade (EPCU) project would provide a permanent electrical upgrade for LANL, including poles with guy and anchor wires for overhead power lines, underground duct banks, and electrical substation and switchgear upgrades. The proposed project would cross through DOE lands managed by LANL, Santa Fe National Forest, and the Bureau of Land Management (BLM) (Figure 1). This floodplain assessment addresses only the DOE segment of the proposed project. Few of the activities in this proposed project are associated with floodplains or would pass over floodplains on overhead power lines. Project activities proposed within the Sandia Canyon 100-year floodplain include one materials storage area (Figure 2). Project activities proposed within the Fence Canyon 100-year floodplain and include: (1) upgrades to the existing Technical Area 71 (TA-71) Southern Technical Area (STA) Substation, (2) a materials and equipment laydown area, (3) installation of power poles with guy wires and anchors, and (4) a section of road maintenance (Figure 3).

Title 10 CFR 1022 was promulgated to implement federal agency (e.g., DOE) requirements under Executive Order 11988, Floodplain Management (EO 1977). A floodplain is defined in 10 CFR 1022 as “the lowlands adjoining inland and coastal waters and relatively flat areas and flood prone areas of offshore islands,” and a base floodplain as “the 100-year floodplain, that is, a floodplain with a 1.0 percent chance of flooding in any given year” (CFR 2003). This floodplain assessment evaluates potential impacts to floodplain values and functions from implementation of the proposed action, identifies alternatives to the proposed action, and allows for meaningful public comment.

DOE/NNSA will publish this floodplain assessment for a 15-day public review and comment period. Please provide comments on this floodplain assessment to Karen Armijo at

Email: karen.armijo@nnsa.doe.gov

Or

Mail: U.S. Department of Energy
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After the close of the public comment period and before issuing a floodplain statement of findings, DOE/NNSA will re-evaluate the practicability of alternatives to the proposed floodplain action and the mitigating measures, taking into account all substantive comments received during the public comment period. After issuing a floodplain statement of findings, DOE/NNSA shall endeavor to allow at least 15 calendar days of public review before implementing a proposed floodplain action.

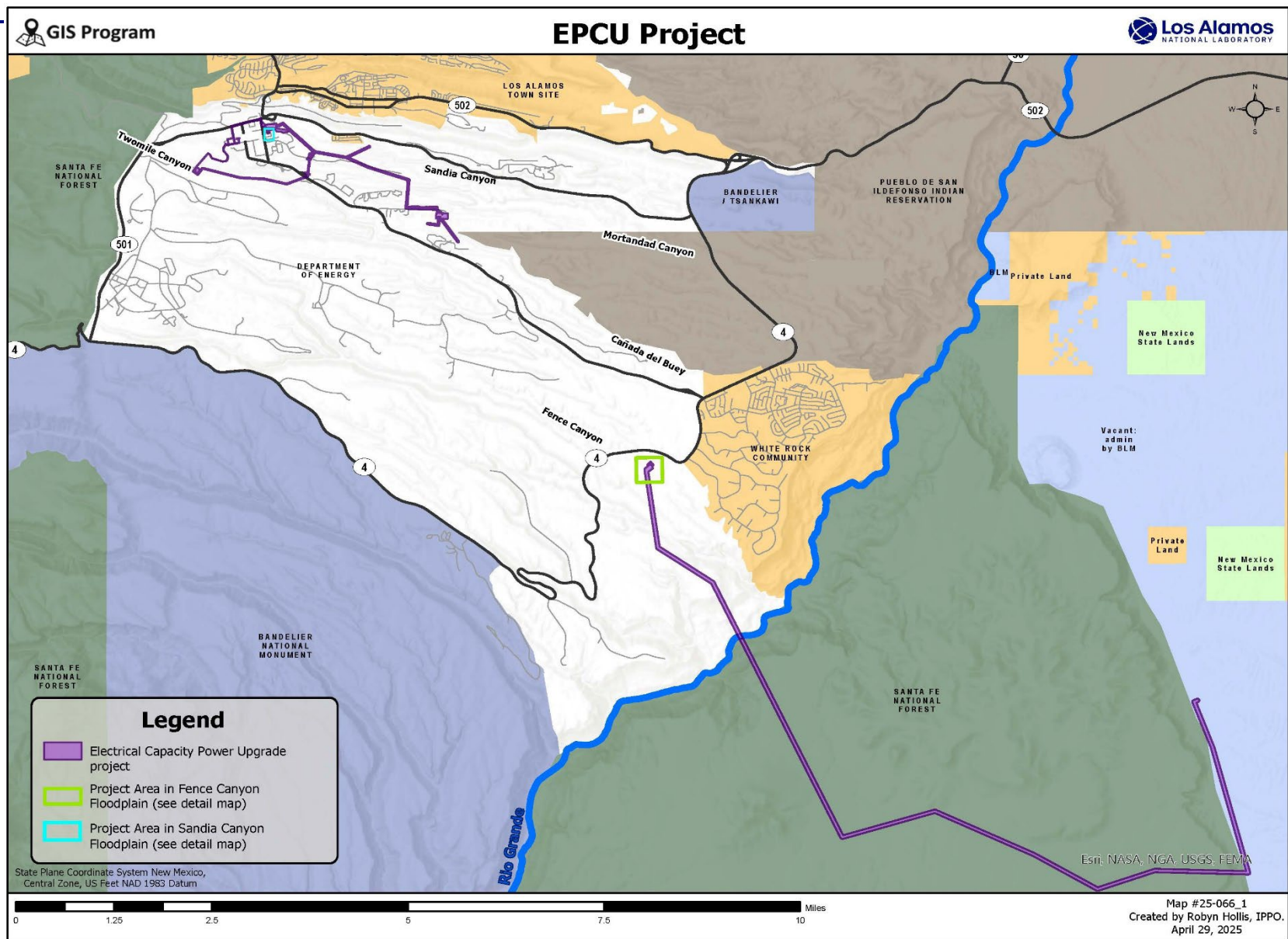


Figure 1. Location of proposed EPCU project.

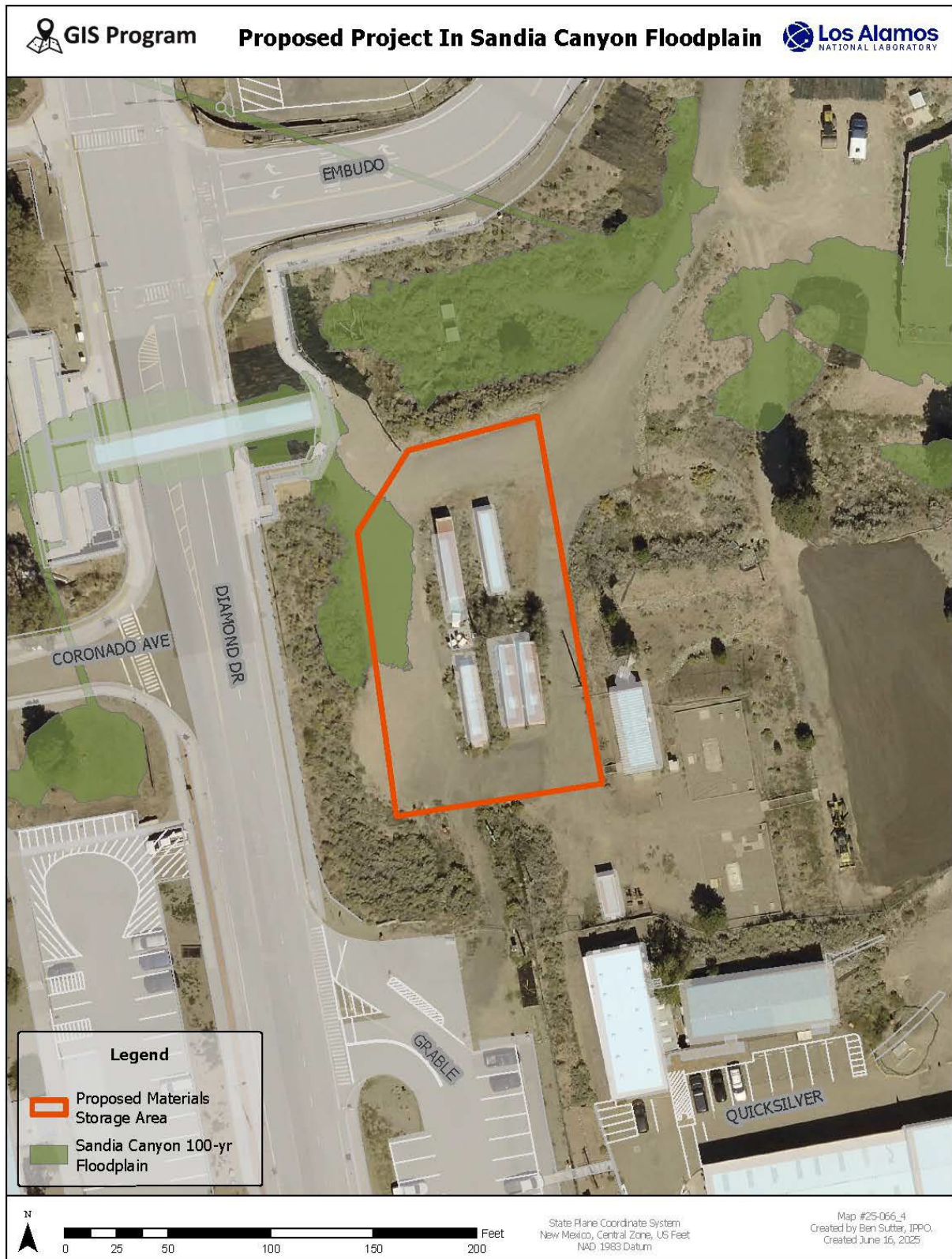


Figure 2. Proposed EPCU project materials storage area in the Sandia Canyon 100-year floodplain

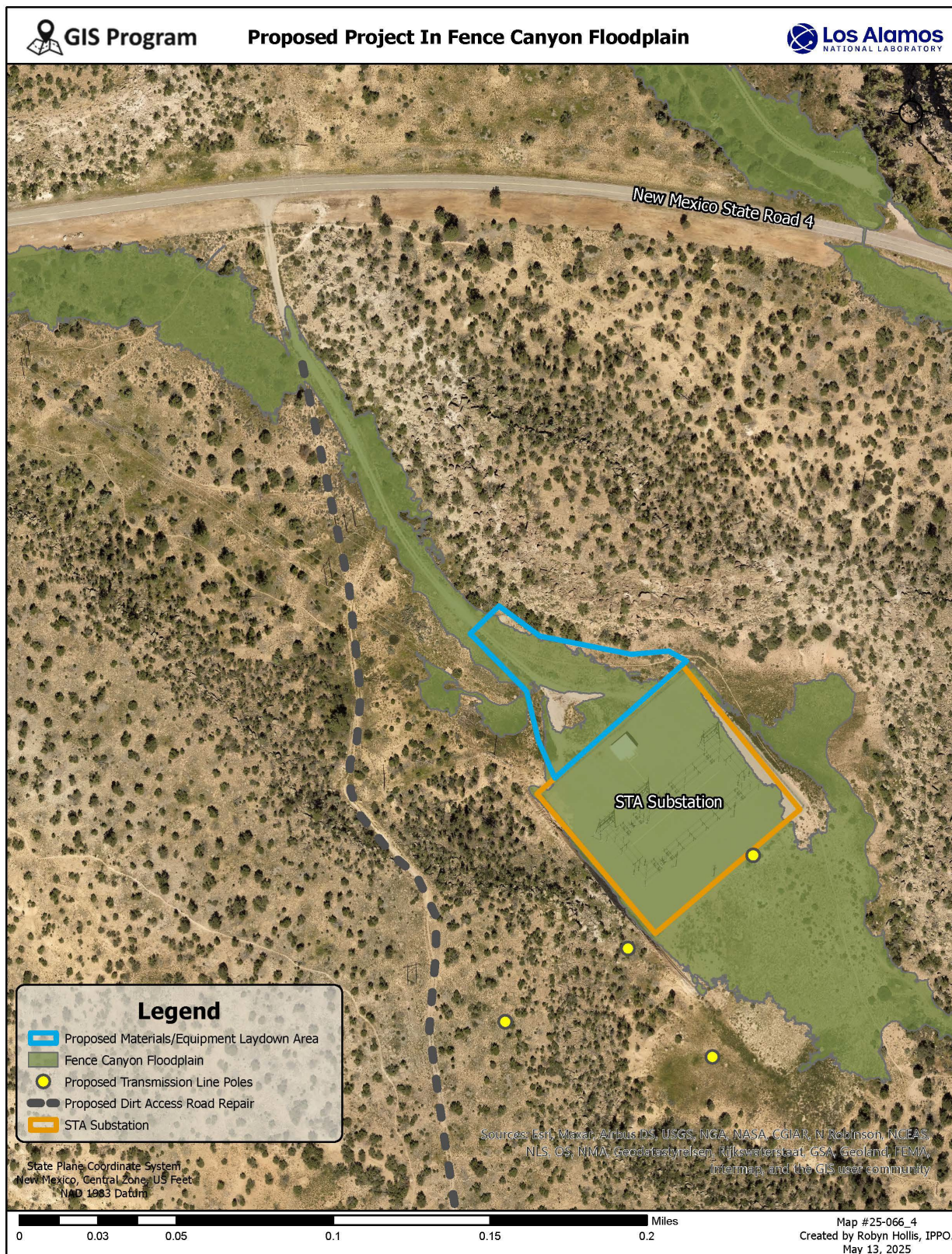


Figure 3. Proposed EPCU project elements in the Fence Canyon 100-year floodplain.

BACKGROUND

The DOE/NNSA is proposing to upgrade the electrical power supply system for LANL because LANL requires a reliable and redundant electrical power supply to support mission programs. Key facilities and associated programmatic operations supported by LANL's electrical infrastructure require adequate and reliable electrical power to fulfill their missions. Based on numerous studies conducted by and on behalf of DOE/NNSA and Los Alamos County, electrical power supply forecasts indicate that LANL's electrical power demand will exceed current import capacity from the Public Service Company of New Mexico system by 2027 (Global 2017).

The proposed EPCU project would construct a three-phase, overhead, 115 kV electrical power transmission line approximately 14 miles long (Figure 1). This transmission line would originate on BLM property (Figure 1), cross BLM-administered lands, cross National Forest Service lands, and span White Rock Canyon to DOE/NNSA-managed lands at LANL. Once the transmission line reaches DOE lands, the proposed project would include installation of approximately 8 miles of overhead electrical transmission lines, underground duct banks, upgrades of existing substations and stitching stations, new interties, and installation of new substations. Additional project elements include laydown areas and sections of access road maintenance. This floodplain assessment addresses only project actions within the boundaries of DOE lands.

The LANL 100-year floodplains are within canyon bottoms that run roughly northwest to southeast and their associated side drainages. The canyon bottoms are a mixture of developed and undeveloped areas. Developed areas include paved and dirt roads, structures, and utilities. Undeveloped areas include native vegetation such as that found in mixed conifer, ponderosa pine, and piñon pine–juniper plant communities. This assessment focuses on activities proposed to occur in or near the LANL 100-year floodplains.

PROJECT DESCRIPTION

Few of the activities in this proposed project would be associated with floodplains or would pass over floodplains. Overhead transmission lines would cross LANL floodplains at Twomile Canyon, Sandia Canyon, Los Alamos Canyon, Ten Site Canyon, Water Canyon, and Cañada del Buey. Transmission lines would be hung from poles on either side of each canyon and pulled across the canyon. A helicopter would be used to string overhead lines across the Rio Grande, across Mortandad Canyon at LANL, and across other areas with limited access. A helicopter would also be used for material and supply delivery to minimize ground disturbance where needed. Little to no impact is expected to be associated with these proposed activities.

The proposed project area in Sandia Canyon is in LANL Technical Area (TA) 3 east of Diamond Drive. Proposed activities in the Sandia Canyon 100-year floodplain include one materials storage area that would be accessed from Embudo Road (Figures 2 and 4). The total area is approximately 0.38 acre and paved with asphalt. Project materials such as poles and equipment parts would be temporarily stored at this area for use during construction.

The proposed project area in Fence Canyon is located south of New Mexico State Road 4 and is accessed from an existing dirt road (Figure 3). Proposed activities in the Fence Canyon 100-year floodplain include: (1) upgrades to the existing Technical Area 71 (TA-71) Southern Technical Area (STA)



Figure 4. Proposed TA-3 material storage area at looking north to the Sandia Canyon floodplain.

Substation, (2) a materials and equipment laydown area, (3) installation of power poles with guy wires and anchors, and (4) a section of road maintenance.

Expansion of the existing TA-71 STA Substation footprint would not be required (Figure 5). The station is located on approximately 2.3 acres of previously disturbed and graveled area with permanently installed electrical equipment. The substation would be upgraded by replacing some aboveground equipment with new aboveground equipment. The new transmission line could require replacement of a concrete pad to secure the equipment to.

The project proposes to use approximately 1 acre on the northwest side of the TA-71 STA Substation (Figure 5) for a laydown area, which would be used for materials storage (parts, poles, etc.) and equipment (vehicles, skid steer, etc.).

A former dirt access road on the west side of the TA-71 STA Substation (Figure 6) would be used to facilitate construction vehicle access from the substation to transmission lines and poles on the mesa top. This former road branches from the canyon bottom access road within the floodplain. These roads have not been maintained for several years and could require repair.

The project proposes to install three new poles with guy wires and anchors for transmission lines on the south side of the TA-71 STA Substation. The installation area would be accessed from the substation.



Figure 5. STA Substation and proposed laydown area in Fence Canyon looking southeast.



Figure 6. Proposed access road improvement area in Fence Canyon floodplain looking southeast.

FLOODPLAIN IMPACTS AND MITIGATIONS

Little to no short-term or long-term impacts are associated with activities to hang proposed transmission lines across Twomile Canyon, Mortandad Canyon, Sandia Canyon, Los Alamos Canyon, Ten Site Canyon, Water Canyon, and Cañada del Buey.

Short-Term Impacts and Mitigations

The proposed project footprint of the materials storage area in the Sandia Canyon floodplain would be approximately 0.04 acre. The area is paved with asphalt and would require no additional disturbance or post-project stabilization. Stored materials would be managed with physical (e.g., covers) and administrative (e.g., housekeeping) best management practices to reduce potential pollutant exposure to stormwater. Materials storage would be temporary during project construction and use would cease at the end of the project.

The proposed project footprint in the Fence Canyon floodplain would be no more than approximately 3.5 acres. The maximum total short-term disturbance in the Fence Canyon 100-year floodplain would be approximately 2 acres. The area described includes space for substation upgrades, a laydown area, new transmission line poles, and improvements to a dirt access road.

Equipment upgrades to the TA-71 STA Substation are expected to have little to no additional impact on the Fence Canyon 100-year floodplain than is caused by existing equipment and structures. Excavation for the concrete pad would be approximately 6 feet wide by 10 feet long by 6 inches deep. Excavated material would remain within the substation footprint and be stabilized with gravel.

The proposed 1-acre laydown area could require some leveling for safety when moving materials with heavy equipment. Some areas may be lightly graded with a skid steer. In accordance with the LANL seeding specification (LANL 2021), all disturbed areas would receive final stabilization at the conclusion of the project. Any required vegetation stabilization will use the LANL seeding specification seed mix.

The dirt access road from the canyon bottom to the mesa top has not been maintained for several years and could require maintenance to enable safe access of construction equipment. Sections of the road could require grading, filling, and re-establishment of road drainage features, such as roadside swales and water bars. The area in the Fence Canyon floodplain that could require maintenance comprises approximately 600 square feet. The existing road width would not be expanded. Disturbed areas would be stabilized with base course.

Installation of the proposed three new poles with guy wires and anchors for transmission lines would be accomplished using a Digger Derrick-type truck with an auger and rubber tires. Additional equipment used could include hand tools, a vacuum potholer, a backhoe, and a mini excavator. The installation area would be accessed from the substation. For pole installation, each excavated hole would be augered no deeper than 9 feet below ground surface and approximately 42 inches in diameter. After pole placement, excavated soil would be backfilled into the hole and compacted around the pole base. Any excess soil would be stabilized at the excavation site following guidelines in the LANL seeding specification (LANL 2021) or disposed of in accordance with P409, *LANL Waste Management* (LANL 2022). Any additional disturbance caused by equipment traffic would also be stabilized.

LANL subject matter experts use a LANL-maintained project review tool to identify, evaluate, and resolve project-specific issues, such as the presence of underground utilities; contaminated soils, spills and leaks; soil disturbance and stabilization; threatened and endangered species habitat; floodplains or wetlands; and to ensure regulatory agency authorization, such as permit requirements of the U.S. Army Corps of Engineers and the Clean Water Act. The tool aids with identifying potential impacts to the natural and built environments from the proposed project. Subject matter experts identified and reviewed the following requirements to avoid potential direct and indirect impacts:

- The project does not propose work in any wetlands within LANL property; no wetlands impacts are expected.
- The total proposed area of project disturbance will be larger than 1 acre; therefore, National Pollution Discharge Elimination System Construction General Permit coverage is required. The project is required to use industry standard stormwater controls to contain excavated materials and all other potential pollutants within worksite limits and away from potential stormwater flow (LANL 2025). These controls—installed and maintained in accordance with manufacturer guidance—include temporary materials (silt fence, etc.) to reduce erosion and sediment transport, manage run-on and runoff, contain excavated materials, and keep potential pollutants within the work site limits and away from potential stormwater flow during construction. The project is required to use appropriate, industry standard, best management practices such as procedures that include waste management and spill prevention. All disturbed areas must have final stabilization in accordance with the LANL seeding specification (LANL 2021) to control erosion after completion of construction activities. Any required vegetation stabilization will use the LANL seeding specification seed mix, which contains native perennial grasses, forbs, and shrubs. Native species selection benefits local animal species, helps suppress weeds, and restore natural habitats, thus ensuring long-term ecological stability.
- Based on project scope and project design drawings, the proposed project would be subject to additional requirements regarding the Energy Independence and Security Act (EISA), Section 438 (PLAW 2007). Section 438 of the EISA requires newly developed or redeveloped projects at federal facilities with a footprint greater than 5,000 square feet to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the area, which includes stormwater rate, duration, and volume. This requirement is accomplished mainly through installation of permanent, low-impact development stormwater controls. Design criteria and guidance for these controls are specified within the LANL Engineering Standards Manual and Master Specifications. Impacts are expected to be mitigated and minimized by ensuring that the project coordinates with LANL Stormwater personnel to design appropriate controls for each project area.
- In accordance with U.S. Army Corps of Engineers regulations, a Clean Water Act Section 404 dredge-and-fill permit or New Mexico State Section 401 Water Quality Certification would not be required for this project (Federal Register 2023) if the project adheres to the following conditions:
 - Project activities must not temporarily stage vegetation, soil, or equipment within a watercourse.
 - Activities must not push soil into a watercourse.
 - If vegetation is removed or masticated, it must not be left in a watercourse.

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- Heavy equipment must not be used within a watercourse, especially if conditions are too wet to prevent damage to the soil structure.
 - Based on LANL surveys and reviews, historical or archaeological resources are located within 100 feet of the proposed project areas. The project must work with LANL Cultural Resources personnel to route project construction activity around cultural resources. The project must follow the LANL procedure for inadvertent discoveries (LANL 2019).
 - Based on LANL surveys and reviews, the proposed project will cross Mexican spotted owl habitat. Impacts are expected to be mitigated and minimized by ensuring that the project coordinates with LANL Biological Resources personnel. The project must comply with the project-specific biological assessment requirements, noise and light protection standards, and habitat protection.
 - The proposed project would be conducted within or near several Areas of Concern¹ (AOCs) or Solid Waste Management Units² (SWMUs). The project must coordinate with LANL Consent Order personnel to identify areas before construction begins and avoid disturbance, if possible. If the project cannot avoid disturbance, any material excavated within an AOC/SWMU boundary must be managed within that boundary, returned to the point of origin, and stabilized using LANL-approved best management practices. Any material that cannot be managed on site must be managed, characterized, and disposed of in accordance with P409, *LANL Waste Management*, and associated documents (LANL 2022).

The project would avoid or minimize additional potential short-term direct and indirect floodplain impacts from release of pollutants to the floodplain and exposure to stormwater through implementation of the following best management practices:

- Hazardous materials, chemicals, fuels, and oils would not be stored within floodplains.
- Heavy equipment would not be used within a stream channel, especially if conditions are too wet to prevent damage to the soil structure.
- Equipment would be refueled at least 100 feet from floodplains.

Potential direct effects to migratory birds and other biological resources are minimal because little or no habitat would be disturbed. The Migratory Bird Treaty Act prohibits killing migratory birds, including nestlings and eggs in an active nest. Therefore, if the project requires vegetation removal during the nesting season (May 15 through July 15), LANL Biological Resources subject matter experts would conduct an onsite inspection for bird nests. Construction activities would conform to requirements stipulated in the Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory (LANL 2020).

¹ An AOC is any area that has a known or suspected release of hazardous waste or hazardous constituents that is not from an SWMU and that the Secretary of the New Mexico Environment Department (NMED) has determined could pose a current or potential threat to human health or the environment.

² An SWMU is any discernible unit at which solid waste has been placed at any time and from which NMED determines a potential risk of release of hazardous waste or hazardous waste constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste.

Long-Term Impacts and Mitigations

No long-term impacts to LANL floodplains are anticipated to result from this project. The proposed installation of equipment is limited to existing disturbed areas and an existing dirt access road.

Project personnel may perform periodic maintenance checks of the TA-71 STA Substation, electrical equipment, and transmission lines using methods that do not disturb the soil. Flow paths within the floodplain would have little to no modification from pre-project conditions to post-project conditions. Poles and equipment within the Fence Canyon floodplain would be monitored after high-flow events in case debris becomes entrapped on structures. If this occurs, maintenance options would be assessed and scheduled.

This assessment also considers the impacts of the proposed actions in the floodplain on habitat conservation for existing flora and fauna, aesthetic values, and public interest. The proposed action would not impact cultural resources because none are expected to be discovered in the project area. The proposed action is not expected to remove any protected species habitat. The proposed action is not considered to negatively impact aesthetic values or public interest because the proposed project would occur in areas that are internal to LANL.

ALTERNATIVES

The alternatives available to DOE/NNSA include: (1) the no-action alternative, (2) reconductoring existing transmission lines, (3) expanding onsite power generation, and (4) new transmission line alternatives. Triad has analyzed the alternatives in more detail in the environmental assessment specifically written for the EPCU project (DOE/EA 2024).

Under the no-action alternative, a new transmission line would not be constructed on BLM, Santa Fe National Forest, or DOE property. Any potential environmental effects along the proposed transmission line route would not occur. However, LANL and Los Alamos County would not have a reliable or redundant transmission line for their respective operations. More frequent and longer-duration outages would be expected due to extensive maintenance problems with existing lines and shortages in the regional power supply. Load shedding would occur until additional power was returned to LANL for normal operations.

The alternatives of reconductoring existing transmission lines, expanding onsite power generation (e.g., small nuclear reactor, wind, solar, gas turbine), and new transmission line alternatives (e.g., alternate overhead transmission line routes, underground transmission lines) did not meet project evaluation criteria to address the need to increase electrical transmission capacity and performance. These alternatives raised concerns with social and economic impacts of power failures, increased cultural and environmental impacts, and increases in project length and cost.

CONCLUSIONS

The proposed EPCU project would provide a permanent electrical upgrade for LANL, including duct banks, poles with guy and anchor wires for overhead power lines, and electrical substation upgrades. These upgrades will ensure an adequate and reliable electrical power supply to support mission programs.

The proposed project would result in limited and minor direct and indirect impacts to 100-year floodplains on DOE lands and would not result in adverse impacts to floodplain values or functions. The proposed project also would not change the flood hazard rating. Temporary disturbance within the floodplains would cease following completion of construction activities. The proposed project would implement stormwater controls and best management practices to mitigate impacts during construction. This proposed project would not significantly modify flow paths within the floodplains from pre-project conditions to post-project conditions. No effects are anticipated to lives or property associated with floodplain modifications.

In accordance with 10 CFR 1022 (CFR 2003), DOE/NNSA will publish this floodplain assessment and initiate a 15-calendar-day public comment period. DOE/NNSA will reevaluate the practicability of alternatives to the proposed floodplain action and the mitigating measures, taking into account all substantive comments received and, before implementing the proposed action, provide the Statement of Findings on the proposed floodplain action.

LITERATURE CITED

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LANL 2021. LANL Master Specification Section 32 9219 Seeding, Rev 5. LANL Engineering Standards, <https://engstandards.lanl.gov>.

LANL 2022. P409, LANL Waste Management. As directed by the following:

New Mexico Administrative Code (NMAC), Title 20, Environmental Protection

10 CFR, Energy

40 CFR, Protection of Environment

48 CFR, Federal Acquisition Regulations System

49 CFR, Transportation

Department of Energy Acquisition Regulation (DEAR) Part 970.5223, Integration of Environment, Safety, and Health into Work Planning

DOE Order 435.1, Radioactive Waste Management
DOE M 435.1-1, Radioactive Waste Management Manual
DOE Order 414.1D, Quality Assurance
DOE Oder 458.1, Radiation Protection of the Public and the Environment
DOE Order 460.2B, Departmental Materials Transportation Management
DOE Order 474.2A, Nuclear Material Control and Accountability
LANL Institutional Resource Conservation and Recovery Act (RCRA) Permit, U.S. Environmental Protection Agency and NMED RCRA Operating Permit
LANL 2025. Stormwater Best Management Practice Manual, Los Alamos National Laboratory report LA-UR-25-21818.
PLAW 2007. Energy Independence and Security Act of 2007. Public Law Number 110-140 (2007)