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Floodplain Assessment for the Los Alamos Canyon Omega Bridge Repairs Project

Los Alamos National Laboratory

Los Alamos
NATIONAL LABORATORY

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
AOC	Area of Concern
CGP	Construction General Permit
CFR	Code of Federal Regulations
CoC	Certificate of Completion
DOE	(U.S.) Department of Energy
EO	Executive Order
EPA	(U.S.) Environmental Protection Agency
LANL	Los Alamos National Laboratory
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
SWMU	Solid Waste Management Unit
RCRA	Resource Conservation and Recovery Act
TA	Technical Area

INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the U.S. Department of Energy (DOE), is proposing permanent maintenance access to Omega Bridge at Los Alamos National Laboratory (LANL) at Technical Area 43 (TA-43; Figure 1). This floodplain assessment was prepared in accordance with DOE regulations set forth in Title 10 Code of Federal Regulations (CFR), Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements (CFR 2003). The proposed project would re-designate temporary access installed by the Omega Bridge maintenance project across the Los Alamos Canyon floodplain to permanent access for all future bridge maintenance activities. Project activities within the Los Alamos Canyon 100-year floodplain include two gravel/base course access roads and temporary laydowns.

The 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 published this floodplain assessment for a 15-day public review and comment period. Please provide comments on this floodplain assessment to Karen Armijo at

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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 reevaluate 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.

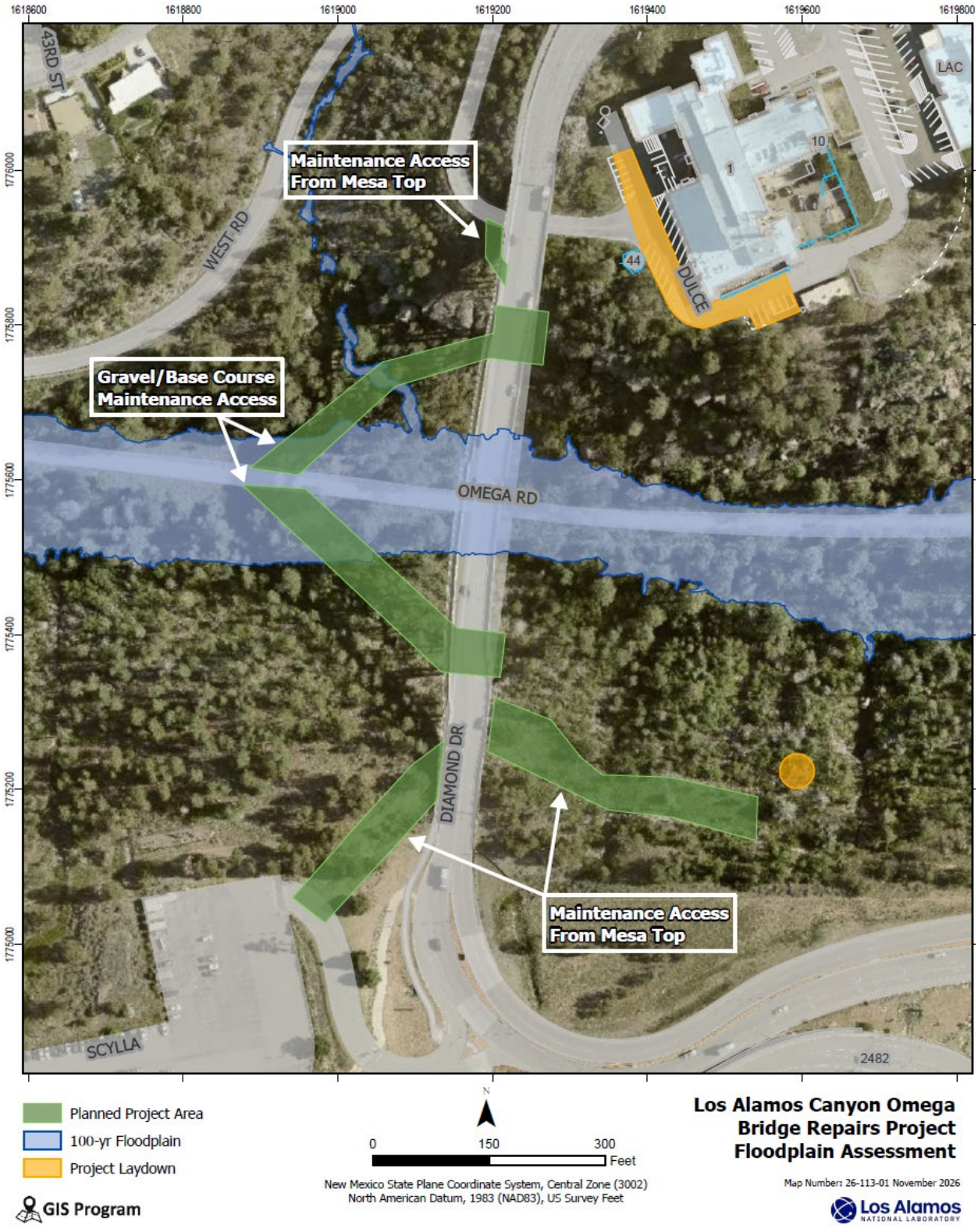


Figure 1. Omega Bridge repairs project in relation to the Los Alamos Canyon 100-year floodplain.

BACKGROUND

Omega Bridge was completed in 1951 and was the second steel arch bridge constructed in New Mexico. It is located on State Highway 502, approximately 0.2 miles northwest of the Diamond Drive and East Jemez Road intersection. The bridge was built to connect the townsite of Los Alamos to technical areas of LANL. The bridge also served to replace the winding West Road route through the canyon, which is on a steep grade and not a suitable option for large or emergency vehicles.

In the early 1990s, the bridge was rehabilitated due to the deteriorating condition of the deck and increased traffic demands. A Routine and Fracture Critical Member Inspection Report (DOE 2022) published in 2023 found areas of the Omega Bridge that needed immediate repairs. In addition, stormwater runoff has created erosion problems around the bridge supports.

The segment of the Los Alamos Canyon 100-year floodplain, which is also the base flood elevation, runs roughly west to east through the project location (Figure 1). The canyon bottom is a mixture of developed and undeveloped areas. Omega Road, a paved two-lane road, runs along the canyon bottom. Omega Bridge spans the canyon from north to south with abutments located part way up the canyon side. The upper portion of Los Alamos Canyon is characterized by ponderosa pine (*Pinus ponderosa*), mixed conifer, oak (*Quercus* sp.), and other shrubs with steep canyon cliffs and a relatively narrow canyon bottom. A narrow stream channel runs through the canyon, and water flow is ephemeral. Areas adjacent to the stream channel were disturbed by flooding after the 2011 Las Conchas Fire; however, vegetation has since been reestablished.

In early 2026, a work scope was submitted through a LANL-maintained project review tool to identify, evaluate, and resolve project-specific issues. The necessary work was classified as routine maintenance of an existing structure, per 10 CFR 1022 (CFR 2003). Potential impacts to the floodplain were evaluated, and the floodplain assessment was not recommended at the time with the caveat that the project would adhere to a set of conditions that would avoid adverse impacts to the floodplain.

However, after field work was initiated in mid-2026, the project had an unanticipated change in scope and deviated from the originally proposed and accepted work requirements, resulting in unexpected impacts to the floodplain. Two temporary gravel/base course access roads were installed across the floodplain from Omega Road to the cliff base and temporary laydowns to either side of Omega Road were in use compared to what was proposed originally. The project determined access from the canyon bottom was the safest place to access bridge abutments, piers, and foundations. Upon discovery that the additional scope had not been properly reviewed for institutional, state, and federal requirements, a field walk-down was immediately performed, including operations, project management, and environmental programs personnel. Based on the deviations and in consultation with DOE-NNSA, it was determined that a floodplain assessment was required.

LANL tools — the official management observation program, fact-finding sessions, and lessons learned sessions — were implemented by the project to determine the chain of events and to formulate ways to avoid reoccurrence of this issue. The LANL Issues Management System is used to proactively identify and analyze issues related to this project, to manage identified corrective actions, and to document effectiveness in addressing issues. One of the identified corrective actions for this project included completing a floodplain assessment. Other actions included removing materials, vehicles, and equipment from the floodplain; conducting a field walk with the general contractor and responsible staff to confirm

noncompliant items were removed and placed in the asphalt-road laydown area; and restoring disturbed areas to their approved grades and stabilizing them using appropriate erosion- and sediment-control measures.

The project immediately removed all equipment and materials staged in the temporary laydowns off of Omega Road and relocated items to laydown areas on the mesa top. All disturbed areas except the access roads were stabilized with native perennial seed and hyrdromulch per the LANL Master Seeding Specification (LANL 2021a) (Figures 2 and 3) promptly after discovery of the unanticipated floodplain impacts. The temporary access roads were stabilized with gravel/base course and any additional disturbance associated with the access roads was stabilized with native perennial seed and hydromulch (Figures 4 and 5). The project will continue to use Omega Road as access to the canyon bottom and the project site.



Figure 2. Temporary laydown area on north side of Omega Road stabilized with seed and hydromulch looking east.



Figure 3. Temporary laydown area on the south side of Omega Road stabilized with seed and hydromulch looking east.



Figure 4. Temporary access road on north side of Omega Road looking north.



Figure 5. Temporary access road on south side of Omega Road looking south.

PROJECT DESCRIPTION

A Routine and Fracture Critical Member Inspection Report (DOE 2022) published in 2023 found areas of the Omega Bridge that are in need of immediate repairs. In addition, stormwater runoff created erosion problems around the bridge supports. To address these issues, the proposed project area for maintenance activities will originate at both the north and south ends of the bridge and convene at a high elevation point west of the bridge on Omega Road (Figure 1).

The project consists of repairs to bridge abutments, piers, access, and the underside of the bridge. In addition, the project will address erosion and drainage at both ends of the bridge. Activities include constructing or improving permanent erosion control and storm water conveyances, grading and erosion mat installation, riprap, drainage structures, culvert improvements, and site restorations. Access for maintenance activities is also from the mesa top. A laydown area is located on the mesa top to the north. Equipment used would include backhoe, skid steer, and excavator. All work would follow applicable LANL engineering standards (http://engstandards.lanl.gov).

This assessment focuses on activities and impacts that have occurred and are proposed to continue in the Los Alamos Canyon 100-year floodplain. The project proposes to redesignate the existing temporary access roads (Figure 1) in the Los Alamos Canyon 100-year floodplain to permanent access for future bridge maintenance activities. Future maintenance may include activities such as rust prevention, steel painting, or structural steel work.

FLOODPLAIN IMPACTS AND MITIGATIONS

The area disturbed by the project in the floodplain with temporary laydowns and access roads is approximately 0.17 acres (7,433 square feet) in total area — 0.08 acres on the north side and 0.09 acres on the south side of Omega Road. If re-designated as permanent maintenance access, the maintenance access roads would have a long-term impact of approximately 0.03 acres (1,122 square feet) on the north side of Omega Road and approximately 0.04 acres (1547 square feet) on the south side of Omega Road. All other areas of project disturbance in the floodplain have short-term impacts and have been stabilized with native perennial seed and hydromulch.

All disturbed areas must have final stabilization to control erosion after completion of construction activities (EPA 2022). The project would stabilize any excess soil at the excavation site following guidelines in the LANL Seeding Specification (LANL 2021a) or dispose of excess soil in accordance with LANL Procedure (P) 409, *LANL Waste Management* (LANL 2022c). The project would also stabilize any additional disturbance caused by equipment traffic.

Short-Term Impacts and Mitigations

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 authorizations, such as U.S. Army Corps of Engineers permit requirements and Clean Water Act permit requirements. The tool aids in identifying potential impacts to the natural and built environment from the proposed project.

Subject matter experts identified and reviewed the following requirements to avoid potential impacts:

- The project does not propose work in any wetlands within or surrounding 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 (CGP) 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 (EPA 2022). 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 CGP to control erosion after completion of construction activities. Any required vegetation stabilization will use the LANL Seeding Specification (LANL 2021a) 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.

- The project would not be subject to additional requirements regarding the Energy Independence and Security Act, Section 438 (PLAW 2007). No additional impervious surfaces or modification to stormwater flow paths are proposed.
- 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.
  - Heavy equipment must not be used within a watercourse, especially if conditions are too wet to prevent damage to the soil structure.
  - SWMU 00-017 consists of inactive industrial waste lines. The lines in the canyon bottom and associated manholes were removed before 1985 (LANL 2021b).
- Based on LANL surveys and procedures, the southeastern area of the project overlaps with one historic resource. Project activity must avoid impacts to the resource. No other impacts are expected to occur to cultural resources. The project must work with LANL Cultural Recourse staff and follow the LANL procedure for inadvertent discoveries (LANL 2019).
- Based on LANL surveys and procedures, the project is located in an endangered species habitat. The project activities are not expected to add additional disturbance to what was originally disturbed from the bridge construction and maintenance activities before the species was federally listed. The project must coordinate with LANL Biological staff to avoid habitat loss.
- The project will involve minimal disturbance of Areas of Concern[1] (AOCs) and Solid Waste Management Units[2] (SWMUs) that intersect or are adjacent to project work areas in the floodplain. Contaminants of potential concern are summarized in Table 1. Existing sampling data can be viewed by the public in the Intellus website (http://www.intellusnm.com).
  - Los Alamos Canyon AOC C-00-006 occupies the same footprint as the Los Alamos Canyon 100-year floodplain from Omega Bridge to the confluence with Pueblo Canyon, as delineated in 2003 (LANL 2005). This area represents the extent to which post-Lab aged sediments and contaminants could have been deposited and therefore is used to delineate the extent of the AOC.
  - AOC C-00-044 consists of surface contamination resulting from the historical use of lead-based paint on the Omega Bridge. This AOC was issued a Certificate of Completion (CoC) without controls by NMED on September 2, 2021 (NMED 2021).

[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.

– SWMU 00-017 consists of inactive industrial waste lines. The lines in the canyon bottom and associated manholes were removed before 1985 (LANL 2021b).

– AOC 00-035(a) consists of a surface disposal site discovered during the 1991 upgrading of Omega Bridge. In 2005, the EPA affirmed its concurrence with a No Further Action (NFA) approval of 00-035(a) in a letter to the NMED (EPA 2005).

Table 1. AOCs and SWMUs potentially impacted by project activities in the floodplain.

AOC/SWMU	Description	Contaminants of Potential Concern
AOC C-00-006	Los Alamos Canyon system	Organic Chemicals, Inorganic Chemicals, Radionuclides, PCBs
AOC C-00-044	Soil contamination	Lead - *CoC without Controls*
SWMU 00-017	Inactive industrial waste lines	Radionuclides
AOC 00-035(a)	Surface disposal	Polynuclear Aromatic Hydrocarbons - *NFA*

Excavation is part of the erosion control work scope; however, no excavation is planned in AOCs or SWMUs. Soil is not expected to be removed from the AOCs or SWMUs as a result of maintenance or erosion control activities. The project must coordinate with LANL Consent Order staff prior to any excavations in an AOC or SWMU. If any soil is excavated from an AOC or SWMU, it must be managed on site, returned to the point of origin, and stabilized in place. If any soil is removed from the site, it must be managed, characterized, and disposed of in accordance with P409, *LANL Waste Management* (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 the floodplain.
- Heavy equipment would not be used within the floodplain, especially if conditions are too wet to prevent damage to the soil structure.
- Equipment would be refueled at least 100 feet from the Ancho Canyon floodplain.

Potential direct effects to migratory birds and other biological resources are limited because minimal habitat has been disturbed. The Migratory Bird Treaty Act prohibits killing migratory birds, including nestlings and eggs in an active nest, which includes vegetation removal during the nesting season (May 15 through July 15). If future vegetation removal is proposed during the nesting season, LANL Biological Resources subject matter experts would conduct an onsite inspection for bird nests. Site activities would conform to requirements stipulated in the Migratory Bird Best Management Practices Source Document for Los Alamos National Laboratory (LANL 2020).

Long-Term Impacts and Mitigation

Minimal long-term impact is anticipated as a result of this project. The gravel/base course access roads are even with the surrounding ground surface in the floodplain and not expected to impede stormwater flow. LANL will continue to periodically maintain the access roads free of vegetation for personnel safety and reduction of vehicle and equipment ignition fire hazard. After high-flow events, the area within the floodplain would be monitored for erosion around the access roads. Maintenance options will be assessed

and scheduled. The erosion and drainage work is outside the floodplain but is expected to have a beneficial long-term impact by controlling stormwater flow.

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 is not expected to impact cultural resources. LANL environmental staff walked the project area in October 2026 and confirmed that the completed and proposed actions remain within the developed site. This disturbance dates to the construction of the Omega Bridge and its maintenance roads, which predates the federal listing of the sensitive species in the area. The proposed action is not expected to adversely affect protected species habitat, provided that base course material from the road does not erode into the floodplain as a result of ongoing activities. 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 the no action alternative, which was not selected.

Omega Bridge was built to connect the townsite of Los Alamos to technical areas of LANL and to replace the winding West Road route through the canyon, which is on a steep grade and not a suitable option for large vehicles. If the bridge is not repaired, it will be closed to all truck traffic. Trucks would have to be routed through the canyon.

The alternative of removing the gravel/base course and returning the access areas to vegetation was not selected. Re-designating the temporary maintenance access to permanent maintenance access creates well-defined access points and pathways. Additional impacts from future maintenance activities would be mitigated by controlling the movement of supplies and equipment across the floodplain to the established access areas. Without established access, each individual project might create a different area of disturbance and result in a larger total impact to the floodplain over time.

CONCLUSIONS

This project proposes to re-designate temporary access across the Los Alamos Canyon floodplain for current Omega Bridge maintenance work to permanent access. This would define access for all future bridge maintenance activities and reduce additional impacts that may be associated with individual projects in the floodplain. The access road locations were chosen because they are the safest access to the bridge abutments, piers, and foundations, as well as the underside of the bridge structures. Additionally, the roads are located east behind a locked gate, ensuring that they are only accessible by authorized LANL personnel. The maintenance access would result in limited and minor direct and indirect long-term impacts to the 100-year floodplain but would not result in adverse impacts to the floodplain values or functions.

The project has not changed the flood hazard rating. This proposed project has not significantly modified flow paths within the floodplain 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 take into account all substantive comments received on this floodplain assessment and reevaluate the practicability of alternatives before providing the Statement of Findings on the floodplain action.

LITERATURE CITED

CFR 2003. Title 10 Code of Federal Regulations, Part 1022, Compliance with Floodplain and Wetland Environmental Review Requirements.

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

LANL 2021b. Phase II Investigation Report for Upper Los Alamos Canyon Aggregate Area, R1, EM2021-0035. March 2021.

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 RCRA Permit, EPA and NMED RCRA Operating Permit

NMED 2021. Approval – Request for Certificates of Completion for 11 Solid Waste Management Units and 3 Areas of Concern in the Upper Los Alamos Canyon Aggregate Area, Los Alamos National Laboratory, EPA ID#NM0890010515, HWB-LANL-21-033. New Mexico Environmental Department, EMID-701616. September 2, 2021.

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