DOE/EA-2101

Final Environmental Assessment for the Proposed Construction and Operation of a Solar Photovoltaic Array at Los Alamos National Laboratory Los Alamos, New Mexico

June 2019

NNSA

Final Environmental Assessment for the Proposed Construction and Operation of a Solar Photovoltaic Array at Los Alamos National Laboratory

EXECUTIVE SUMMARY

The Department of Energy (DOE), National Nuclear Security Administration (NNSA) has prepared this Final Environmental Assessment (EA) that analyzes (a) the proposed construction and operation of a 10 megawatts (MW) ground-mounted solar photovoltaic system (PV) and associated power transmission line within an existing power transmission line corridor and (b) the No Action Alternative of not constructing the PV.

The proposed PV location is on approximately 55-plus acres of which around 50 acres are within a previously disturbed area that was used as a borrow pit at Los Alamos National Laboratory (LANL), on DOE owned property within Los Alamos County, New Mexico. In the long term, given LANL's incremental power requirement, the existing transmission infrastructure will not have sufficient capacity to meet projected power demands. NNSA requires a reliable, efficient, diversified, and sustainable electrical supply to support programs and activities conducted in LANL facilities essential to the maintaining the nation's nuclear deterrent and to meet on-site renewable energy goals. Baseload on-site power generation would be able to increase on-site LANL electrical power generation with efficient and sustainable electrical power capability and resilience.

The chosen PV array location was one of 10 areas that met the selection criteria but was the only site that had been previously disturbed by other activities (i.e., borrow site), as all other potential locations were greenfield sites. There are two power line corridors under consideration and each follows existing utility rights-of-way.

The potential direct, indirect, and cumulative effects of the Proposed Action and the No Action Alternatives were analyzed using a sliding-scale approach to impacts analysis that is consistent with DOE's *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*. The primary impact from the proposed action would be the result of land conversion resulting in loss of habitat and potential PV array attractiveness to birds. PV arrays have been postulated to attract birds and their insect prey as a result of glare and polarized light reflected off solar panels. However, to date there are relatively few systematic empirical research studies that have analyzed the attraction and impacts of PV facilities on birds. In consideration of the lack of data regarding PV structure effects on birds and the potential for development of other PV sites at LANL, a Mitigation Action Plan has been developed that would be implemented prior to construction and conducted for a minimum 10 year study period. This study would add to the limited body of literature on these types of bird effects. There is one archaeological site located within the proposed project area that been determined as eligible for the National Register of Historic Places. The project would exclude this archaeological site area from any construction or ground disturbing activities, implement the LANL's Cultural Resources Management Plan, and the Programmatic Agreement used by DOE/NNSA for compliance with the National Historic Preservation Act; thus, avoiding any adverse impacts to the archaeological site. All other resource areas, with implementation of best management practices and preparation

and adherence to a *Storm Water Pollution Prevention Plan*, were found to have no or minor environmental impacts associated with the proposed action.

The draft EA was available for a 30 day review and comment period from April 8 to May 7 via distribution to the same recipients that received the notification letter that NNSA was preparing an EA; placed in the LANL Public Reading Room, located at 94 Cities of Gold Road, Pojoaque, New Mexico; distributed to over 8,000 recipients on the LANL GovDelivery listserve; and posted on the DOE National Environmental Policy Act (NEPA) website: http://energy.gov/nepa/nepa-documents/environmental-assessments-ea. Comments were received from the State of New Mexico Environment Department that provided a review of the proposed project with web links to their programs and reminders of permitting requirements, a company interested in bidding on the installation of the solar panels, and a statement of project support from a private citizen.

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ACRONYMS AND TERMS

Acronym or Term	Definition
AC	Alternating [Electrical] Current
AEI	Areas of Environmental Interest
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
DC	Direct [Electrical] Current
DOE	United States Department of Energy
EA	Environmental Assessment
EM	Office of Environmental Management
EO	Executive Order
FY	Fiscal Year
kV	Kilovolts
LA	Los Alamos
LANL	Los Alamos National Laboratory
LASA	Los Alamos Service Area
N3B	N3B-Los Alamos
NEPA	National Environmental Policy Act of 1969
NL	Norton Line
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
NREL	DOE National Renewable Energy Laboratory
MASCWG	Multiagency Avian-Solar Collaborative Working Group
MW	Megawatts

Acronym or Term	Definition
MVA	Mega Volt Ampere
NPDES	National Pollution Discharge Elimination System
PNM	Public Service Company of New Mexico
PPA	Solar Power Purchase Agreement
PV	Solar Photovoltaic System
RL	Reeves Line
SOL	System Operating Limit
TA	Technical Area
U.S.	United States
WTA	West Testing Area

1.0 INTRODUCTION

The U.S. Department of Energy (DOE), National Nuclear Security Administration (NNSA) Los Alamos Field Office prepared this Final Environmental Assessment (EA) to evaluate and disclose the potential environmental consequences from the proposed construction and operation of a 10 megawatts (MW) ground-mounted solar photovoltaic system (PV) and erection of the associated power transmission line within an existing power transmission line corridor. The proposed PV location is on approximately 55-plus acres of which around 50 acres are within a previously disturbed[1] area that was used as a borrow pit[2] primarily in the northwest corner of Technical Area (TA)-16 with a minor inclusion of TA-8 at the Los Alamos National Laboratory (LANL), on DOE owned property within Los Alamos County, New Mexico. The PV array and power transmission line would be designed, constructed, and operated to increase on-site electrical power generation and provide for efficient and sustainable electrical power capability and resilience.

LANL is a multidisciplinary, multipurpose research institution located in north-central New Mexico approximately 60 miles north-northeast of Albuquerque and about 25 miles northwest of Santa Fe. LANL covers an area of about 40 square miles (Figure 1-1), predominately within Los Alamos County with some overlap into Santa Fe County.

The DOE LANL Field Offices include the NNSA and the Office of Environmental Management (EM). NNSA's primary mission is its national security responsibilities, which include the design, qualification, certification, and assessment of nuclear weapons. Additionally, LANL, as one of the largest science and technology institutes in the world, conducts multidisciplinary research in fields such as space exploration, renewable energy, medicine, nanotechnology, and supercomputing (NNSA 2018). Under contract to NNSA, Triad National Security LLC, a management partnership comprising Battelle Memorial Institute, the Regents of the University of California, and the Regents of Texas A&M University, manages and operates LANL.

EM's LANL mission is to complete the cleanup of legacy contamination and waste resulting from nuclear weapons development and government-sponsored nuclear research. EM has contracted with N3B-Los Alamos (N3B) a company created by Stoller Newport News Nuclear and BWXT Technical Services Group to assist EM in fulfilling its LANL mission.

[1] DOE NEPA implementing regulations define "previously disturbed" as land that has been changed such that its functioning ecological processes have been and remain altered by human activity. The phrase encompasses areas that have been transformed from natural cover to nonnative species or a managed state, including, but not limited to, utility and electric power transmission corridors and rights-of-way, and other areas where active utilities and currently used roads are readily available. (10 CFR §1021.410)

[2] An area designated for excavation to supply geologic resources, such as rock, sand, gravel, or soil, to be used elsewhere for fill materials.

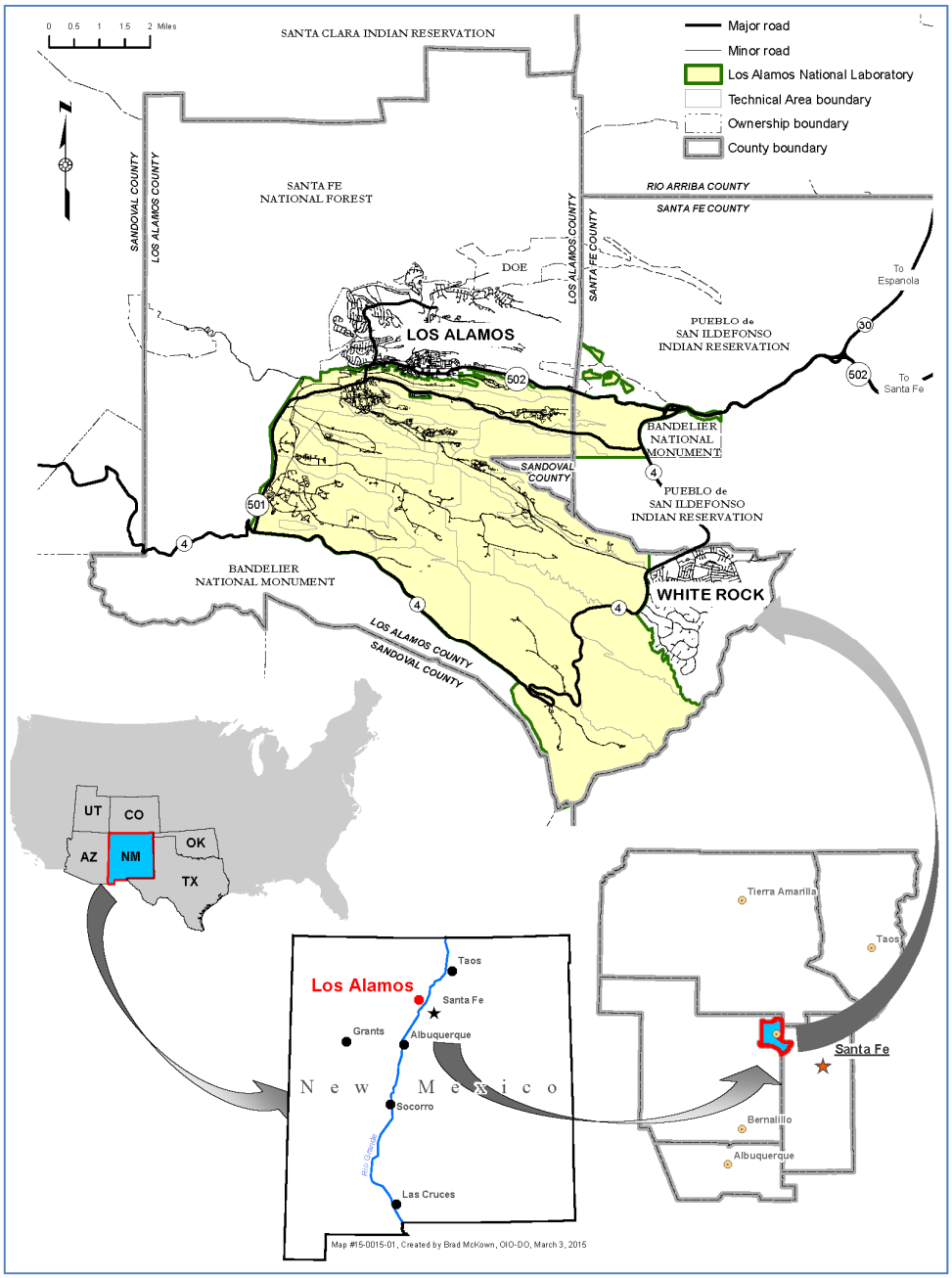

Figure 1–1: Los Alamos National Laboratory Location (DOE 2017)

LANL operations are conducted within numerous facilities located in 47 designated technical areas (TAs) including TA-00, which consists of leased space within the Los Alamos town site, White Rock, and TA-57 at Fenton Hill (LANL 2018). Approximately 2,000 structures, totaling approximately eight million square feet, house LANL operations and activities. About half the square footage is used as laboratory or production space and the remainder for administration and offices, storage, service, and other purposes. Most of LANL is undeveloped grassland, shrubland, woodland, and forest that serve to provide a buffer for security and safety and space

for future expansion (DOE 2017). The socioeconomic region of influence for LANL is primarily the four-county area of Los Alamos, Rio Arriba, Sandoval, and Santa Fe counties. The majority of LANL employees reside in this four-county area. The two primary residential areas contiguous with LANL are the Los Alamos town site and the White Rock residential area. These two residential areas are home to about 18,738 people. As of calendar year 2018 approximately 12,075 people worked at LANL, of whom a little less than half reside within the county.

This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969; Council on Environmental Quality *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act (40 Code of Federal Regulations [CFR] 1500-1508)*; and DOE *National Environmental Policy Act Implementing Procedures* (10 CFR Part 1021).

An EA is a planning and decision-making tool that serves to inform the decision-maker and the public of the potential environmental consequences of the proposed action and alternatives to determine if NNSA will require preparation of an Environmental Impact Statement or issue a Finding of No Significant Impact and proceed with the selected course of action.

DOE NEPA implementing regulations list NEPA categorical exclusions germane to installation and operations of a PV system, which are as follows:

> ***B3.9 Projects to reduce emissions and waste generation***
>
> *Projects to reduce emissions and waste generation at existing fossil or alternative fuel combustion or utilization facilities, provided that these projects would not have the potential to cause a significant increase in the quantity or rate of air emissions. For this category of actions, "fuel" includes, but is not limited to, coal, oil, natural gas, hydrogen, syngas, and biomass; but "fuel" does not include nuclear fuel. Covered actions include, but are not limited to:*
>
> *(a) Test treatment of the throughput product (solid, liquid, or gas) generated at an existing and fully operational fuel combustion or utilization facility;*
>
> *(b) Addition or replacement of equipment for reduction or control of sulfur dioxide, oxides of nitrogen, or other regulated substances that requires only minor modification to the existing structures at an existing fuel combustion or utilization facility, for which the existing use remains essentially unchanged;*
>
> *(c) Addition or replacement of equipment for reduction or control of sulfur dioxide, oxides of nitrogen, or other regulated substances that involves no permanent change in the quantity or quality of fuel burned or used and involves no permanent change in the capacity factor of the fuel combustion or utilization facility; and*
>
> *(d) Addition or modification of equipment for capture and control of carbon dioxide or other regulated substances, provided that adequate infrastructure is in place to manage such substances.*
>
> ***B5.1 Actions to conserve energy or water***
>
> *(a) Actions to conserve energy or water, demonstrate potential energy or water conservation, and promote energy efficiency that would not have the potential to cause*

significant changes in the indoor or outdoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, manufacturers, and designers), organizations (such as utilities), and governments (such as state, local, and tribal). Covered actions include, but are not limited to weatherization (such as insulation and replacing windows and doors); programmed lowering of thermostat settings; placement of timers on hot water heaters; installation or replacement of energy efficient lighting, low-flow plumbing fixtures (such as faucets, toilets, and showerheads), heating, ventilation, and air conditioning systems, and appliances; installation of drip-irrigation systems; improvements in generator efficiency and appliance efficiency ratings; efficiency improvements for vehicles and transportation (such as fleet changeout); power storage (such as flywheels and batteries, generally less than 10 megawatt equivalent); transportation management systems (such as traffic signal control systems, car navigation, speed cameras, and automatic plate number recognition); development of energy-efficient manufacturing, industrial, or building practices; and small-scale energy efficiency and conservation research and development and small-scale pilot projects. Covered actions include building renovations or new structures, provided that they occur in a previously disturbed or developed area. Covered actions could involve commercial, residential, agricultural, academic, institutional, or industrial sectors. Covered actions do not include rulemakings, standard-settings, or proposed DOE legislation, except for those actions listed in B5.1(b) of this appendix.

(b) Covered actions include rulemakings that establish energy conservation standards for consumer products and industrial equipment, provided that the actions would not: (1) Have the potential to cause a significant change in manufacturing infrastructure (such as construction of new manufacturing plants with considerable associated ground disturbance); (2) involve significant unresolved conflicts concerning alternative uses of available resources (such as rare or limited raw materials); (3) have the potential to result in a significant increase in the disposal of materials posing significant risks to human health and the environment (such as RCRA hazardous wastes); or (4) have the potential to cause a significant increase in energy consumption in a state or region.

B5.16 Solar photovoltaic systems

The installation, modification, operation, and removal of commercially available solar photovoltaic systems located on a building or other structure (such as rooftop, parking lot or facility, and mounted to signage, lighting, gates, or fences), or if located on land, generally comprising less than 10 acres within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

While categorical exclusions B3.9 and B5.1 are applicable, categorical exclusion B5.16 is not, as the proposed action would require a minimum land area of 50 acres. Thus, the proposed construction and operation of a PV array does not meet the categorical exclusion B5.16 criterion of less than 10 acres. Therefore, preparation of an Environmental Assessment is required.

1.1 Scope of the Environmental Assessment

This Final EA evaluates two alternatives:

1. Proposed Action Alternative: This Alternative considers use of DOE LANL land for construction, operation, and maintenance of a solar PV project on a previously developed borrow site that is no longer in use and construction of a new power line within an existing power line corridor, and
2. No Action Alternative: No action means the proposed action would not take place. The environmental effects resulting from taking no action is compared with the effects of the construction and operation of a PV system and associated infrastructure within LANL.

Decommissioning of the PV system is not addressed in this EA as the effective operational lifecycle is approximately 25–30 years. It would be speculative to define or anticipate the decommission requirements within this timeframe.

1.2 Background

Power Pool: In 1985 Los Alamos County and LANL formed a unique Power Pool arrangement including import-power infrastructure from the Public Service Company of New Mexico (PNM) system (referred to as the import capability) and the internal transmission infrastructure that transmits and delivers imported and/or onsite generated power (LANL 2017). The Power Pool is the product of the Electric Energy and Power Coordination Agreement between the Los Alamos County Department of Public Utilities and the DOE through the NNSA. The Power Pool purchases, sells, and schedules the power requirements for Los Alamos County and LANL. The Power Pool owns up to 88.5 MW of generation resources (depending on the time of year) and purchases up to 20 MW of power per year. (LA County 2014)

LANL obtains its electricity from the Los Alamos Power Pool. Peak loads occur on summer afternoons, with a peak of approximately 70.2 MW for LANL plus 20.9 MW for Los Alamos County, totaling 91.1 MW. Minimum loads occur in the spring and fall, when the weather is mild. Loads always peak mid to late afternoon and match solar resources well. There is a slight reduction in demand on weekends and a slight variation from month to month, but in general the demand profile is very consistent from day to day and month to month. (NREL 2015)

Electrical Power Transmission Capacity: There are two 115 kilovolt (kV) transmission lines that import power from the PNM system into Los Alamos County and LANL. Ownership of one of the transmission lines (Norton Line-NL) is split between PNM and LANL, with operations coordinated between both parties; the second line, Reeves line (RL), is owned and operated by PNM. The RL and NL transmission lines have a system operating limit (SOL) of 131 megavolt ampere (MVA) and 116 MVA in summer and 167 MVA and 142 MVA in winter, respectively, and in 2014 were loaded at 77% and 68% of capacity under a single 115 kV transmission line operating condition (LA County 2014). The Norton Line has a rated import capacity of 116 MVA in summer and 142 MVA in winter, and the Reeves Line has a rated import capacity of

131 MVA in summer and 143 MVA in winter[3]. During the years 2012 - 2015, power demands have ranged from 84 to 88 MW, with single source import capacity limited by the lower NL rating of 116 MVA.

LANL owns seven 115 kV transmission lines within the DOE laboratory area and operates them in a looped configuration to link its four substations and one switching station. The 23.5 miles of transmission lines are patrolled and maintained annually. All transmission rights-of-way are within DOE property, readily accessible, and could be repaired fairly quickly in the event of a major problem (LA County 2014).

Load growth at LANL has been relatively flat and predictable over the past five years. However, significant new electrical demand resulting from supercomputing upgrades and other operations could increase LANL's required power load to the point where it would exceed the current 116 MVA SOL limit of the two existing import lines. In the next five to ten years, a high-performance computing platform upgrade, coupled with other high profile program missions, are expected to increase overall power demand for LANL. This additional demand could double current electrical usage (LANL 2017). Based on these projections, the Los Alamos Power Pool load will exceed the Norton Line SOL in the summer months of July 2021 and the Reeves Line SOL will be reached by July 2024 (LANL 2017).

Currently, the 115 kV transmission infrastructure has sufficient capacity to serve baseload requirements for the entire Los Alamos Service Area (LASA), which includes LANL (LANL 2017). On average, there is an additional 30 MW available for growth before the current SOL is reached (LANL 2017). Although the RL and the NL, are adequate and provide full redundancy, if one of the lines is out of service, there may be circumstances in the near future that will require the existing system to shed load. This condition would result in blackout or brownout periods at certain facilities or substations. In the long term, given LANL's incremental projected supercomputing loads, the existing transmission infrastructure will not have sufficient capacity to meet the projected power demands, and baseload on-site power generation will have to be installed or the two transmission lines updated and/or additional import lines. Regardless of load growth, the Power Pool often experiences a shortfall in generation on a typical day. This energy is purchased outside of the Power Pool at relatively high prices. The Power Pool does not have sufficient generation sources to fully serve its load (LANL/LA County 2008). As a consequence, it purchases power to fill the gap, whether on or off peak (LANL 2017). Traditional power generation, e.g., coal fired power plants, are not capable of reacting quickly to changing needs, talking hours or days to reach full operating potential. Gas turbines can react fairly quickly, but only if the LANL steam plant is not already producing at full rated generating capacity. Hydro generation, while being a resource to help with power generation requirements, is generally scheduled to meet reservoir requirements or provide for downstream water demands, including fish, wildlife, and other environmental mitigation requirements (DOE 2017). Use of an on-site LANL PV array could meet an increasing or decreasing electricity demand quickly, over a short period of time by providing the ability to start and stop multiple times per day. PV systems work very well in the sunny Los Alamos climate, where the average annual solar resource is about 5.4

[3] PNM defines winter to be December, January and February. The remainder of the year is considered summer.

kilowatts/meter^2/day (NREL 2015). Renewable power solar electric power provides the most power at peak sunlight, which is normally coincident with peak electric load on most utility systems (2008 LANL and LA County). LANL power requirements always peak mid to late afternoon, matching the time solar resources are most available.

Renewable Energy Resources: In 2007, DOE National Renewable Energy Laboratory (NREL) Office of Energy Efficiency and Renewable Energy personnel surveyed LANL to determine the feasibility of incorporating renewable energy sources into the Los Alamos County and LANL Power Pool. On-site PV generation for daily peak shaving was found to be technically feasible and perhaps economically attractive. Local electrical power generation from wind was not feasible due to lack of local wind resources, and other renewable energy sources (e.g., biomass, geothermal, and fuel cells) were found to be commercially impractical due to technical constraints, lack of proven technologies, and/or better options (LANL 2016 and NREL 2015).

In 2015 NREL updated the original economic 2008 analysis for four of the nine PV ground-mount locations identified in their 2008 feasibility study with current electricity costs, incentives, and photovoltaic installed costs. The four ground-mount locations were identified as being the best candidates from a siting and environmental perspective (LANL 2016 and NREL 2015).

A solar power purchase agreement (PPA) is a financial agreement in which a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little or no cost to the customer. A NREL report (NREL 2015) concluded that in such an agreement the first year price for the proposed single axis tracking system would be very close to the estimated 2018 electric grid-purchased rate, with the PPA assumed to escalate at the same 2.65% rate as the electric grid. This indicates that PV system electricity would be very competitive with grid-purchased electricity (LANL 2016 and NREL 2015).

Sustainable Energy Requirements, Guidelines and Considerations: The Energy Policy Act of 2005, required Federal agencies, to the extent "economically feasible and technically practicable," to purchase power produced from renewable sources. The requirement for federal renewables use, as a share of total federal electric energy use, started at 3.0% for Fiscal Year (FY) 2007, rose to 5.0% for FY 2010, and then reached 7.5% for 2013 and all subsequent years.

In December 2013, President Obama signed a Presidential Memorandum entitled "Federal Leadership on Energy Management" that requires that 20% of the total amount of electric energy consumed by federal agencies be from renewable sources by facilities by FY 2020 and each FY thereafter. The renewable energy consumption target is to be achieved by (1) installing agency-funded renewable energy on-site at federal facilities or (2) contracting for energy that includes the installation of a renewable energy project on-site at a federal facility.

Executive Order (EO) 13834, *Efficient Federal Operations,* signed on May 17, 2018, directs Federal agencies to manage their buildings, vehicles, and overall operations to optimize energy and environmental performance, reduce waste, and cut costs in a manner that increases efficiency, optimizes performance, eliminates unnecessary use of resources, and protects the environment. Goals of this EO include achieving and maintaining annual reductions in building energy use, implementation of energy efficiency measures to reduce costs, and meeting statutory requirements relating to the consumption of renewable energy and electricity.

The commercial electric power industry which encompasses the generation, transmission, distribution, and sale of electric power to the general public and businesses is the largest withdrawer of freshwater in the nation. The dominant use of water in the electric power sector is for power plant cooling. On the other hand, renewable energy generation—and in particular, non-thermal photovoltaic and wind technologies—require little to no water use for operations. The comparatively small water requirements of PV systems during operation make it an effective electricity generating technology in arid areas or in times of drought.

- Solar – 20 gallons used per kilowatt
- Natural Gas – 405 gallons used per kilowatt
- Nuclear – 575 gallons used per kilowatt
- Coal – 790 gallons used per kilowatt

(SELC 2017)

In the face of global climate change, PV solar power generation is largely carbon- and pollution-free. Greenhouse gas emissions compared to fossil energy sources are quite low (NREL 2015a) even when considering all life-cycle stages from upstream materials requirements to operations and decommissioning (LBNL/NREL 2016). For example, solar generation produces less than one twentieth of the emissions of coal generation (SELC 2017). Health benefits are also realized due to far less generation of deleterious air pollutants such as fine particulates, sulfur dioxide, and nitrogen oxides (LBNL/NREL 2016).

1.3 Purpose and Need

NNSA requires a reliable, efficient, diversified and sustainable electrical supply to support programs and activities conducted in LANL facilities, essential to maintaining the nation's nuclear deterrent and to meet on-site renewable energy goals with an overarching goal of reducing greenhouse gases. Environmental management adherence with EO 13834, *Efficient Federal Operations* and DOE Order 436.1 *Departmental Sustainability*, includes installing renewable energy on-site and reducing DOE's carbon footprint and greenhouse gas emissions.

1.4 Public Involvement

On June 18, 2018, in accordance with 10 CFR 1021.301, Agency review and public participation, DOE/NNSA provided a notification letter that NNSA was preparing an Environmental Assessment for the Construction and Operation of a Solar Photovoltaic Array at Los Alamos National Laboratory, Los Alamos, New Mexico. The notification letter was sent to the Northern New Mexico Citizen's Advisory Board and the following governments:

Pueblo de Cochiti	City of Espanola
Pueblo of Jemez	City of Santa Fe
Pueblo de San Ildefonso	Los Alamos County

Pueblo of Santa Clara	New Mexico Environment Department

To this letter, one response was received, from the Director of Policy for the New Mexico Environment Department. See Appendix A.

The draft EA was available for a 30 day review and comment period from April 8 to May 7 via distribution to the same recipients that received the notification letter that NNSA was preparing an EA; placed in the LANL Public Reading Room, located at 94 Cities of Gold Road, Pojoaque, New Mexico; distributed to over 8,000 recipients on the LANL GovDelivery listserve; and posted on the DOE National Environmental Policy Act (NEPA) website: http://energy.gov/nepa/nepa-documents/environmental-assessments-ea.

Comments were received on the draft EA from the State of New Mexico Environment Department that provided a review of the proposed project with web links to their programs and reminders of permitting requirements, a company interested in bidding on the installation of the solar panels, and a statement of project support from a private citizen.

2.0 DESCRIPTION OF THE PROPOSED ACTION

2.1 Proposed Action

During the 2007 NREL energy feasibility survey, nine potential ground-mount PV field sites were identified that could provide space for an array of photovoltaic panels sufficient to generate 10 MW and electrical equipment components producing 17,000–23,000 MW hours per year. In general, solar plants occupy between 5 and 10 acres per megawatt of alternating current capacity and between 3 and 4 acres per annual gigawatt-hour of generation (ANL and NREL 2015). Upon completion of the NREL analysis, 4 sites with the most potential for a photovoltaic array were selected for further study. In 2017, six additional sites were identified and added by the LANL sustainability group as potential locations for the photovoltaic array.

These 10 potential sites were winnowed down to one location utilizing a ranking matrix. Specifically important were that the PV panels be located to receive the maximum available unobstructed sunlight per day; a minimum of 50 acres of relatively flat topography; no or minimal obstruction or interference with adjacent property uses; and close proximity to existing electrical grid with sufficient capacity. Other criteria included safety and security considerations, ease of access, minimal effect to cultural and historical sites, no chemical and radiological site contamination, and minimizing potential impacts to natural resources including federally protected species under the Endangered Species Act.

Under consideration is a power purchase agreement where the developer, under contract to NNSA, constructs, operates and maintains the PV system. In exchange, NNSA agrees to purchase the PV generated power. These power purchase payments repay the developer over the contract term estimated between 20 to 30 years of the projected PV lifespan. A construction start date is anticipated for the summer of 2022 with the PV system coming online in the summer of 2023.

The proposed 55-plus acre location is at the northwest corner of TA-16 with a minor inclusion of TA-8 adjacent to and east of West Jemez Road and west of and adjacent to Anchor Ranch Road (See Figure 2-1 and Figure 2-8). Approximately 50 acres was used as a soils borrow pit. Available, if required, and adjacent just south of the proposed location, is an additional 5.4 acres. The chosen site was the only location that met the selection criteria and which had been previously and substantially disturbed by other activities (i.e., borrow site); all others were greenfield sites (Figures 2-2, 2-3, 2-4, 2-5, and 2-6).

The proposed PV site's southern boundary abuts the Cañon de Valle watershed enhancement project boundaries (Figure 2-7). The goal of the Cañon de Valle watershed enhancement project is to slow stormwater runoff, thereby allowing for additional infiltration and to reduce peak stormwater flow downstream. Water from past storm events has flooded the area proposed for the PV site. Implementation of Cañon de Valle watershed enhancement project, which was evaluated and given categorical exclusion on September 20, 2017 (DOE 2017b), will serve to protect the PV infrastructure from future flood events.

There are four 13.8 kV distribution lines near these lots, which have a total available capacity of approximately 15 mega volt-ampere (MVA) (Pro2Serve 2018). The proposed PV site is located approximately 1.3 miles southwest from the point of interconnection at the West Testing Area (WTA) substation, which has enough capacity to accommodate a 10 MW PV array. Various routes exist for interconnection from the PV array to the WTA substation; these range from 1.6 miles to 2.37 miles.

The PV system would include photovoltaic panels, racking, electrical junction boxes, wiring, direct current (DC) to alternating current (AC) inverters, transformers, and associated electrical distribution systems to a substation[4]. There would be approximately 450 tracking panels about 3 feet x 6.5 feet and 1.5 inches in width, configured to prevent self-shading. Depending upon the most cost-effective option, the panels would be ground-mounted fixed tilt, single axis tracking rotating from east to west, or dual axis tracking from both east to west and north to south[5] (Pro2Serve 2018).

[4] Electrical substations are the interface between parts of the distribution grid and transmission systems. An electrical substation is the part of a power system in which the voltage is transformed from high to low or low to high for transmission, distribution, transformation, and switching. They are also equipped with circuit breakers to protect the distribution system, and can be used to control the flow of current in various directions. They also smooth and filter voltage fluctuations from an increased load.

[5] A fixed-tilt system retains the panels in one permanent position and orientation, while solar tracker systems automatically adjust the positions of the PV array so that the PV modules consistently "track" the sun throughout the day. Compared to a fixed-tilt PV array, single- or dual-axis tracking systems will increase the energy production by 15-30% for the same size array. Single-axis trackers cost less than dual-axis, and potentially offer more reliability and a longer lifespan as they have fewer moving parts but have a lower energy capture efficiency.

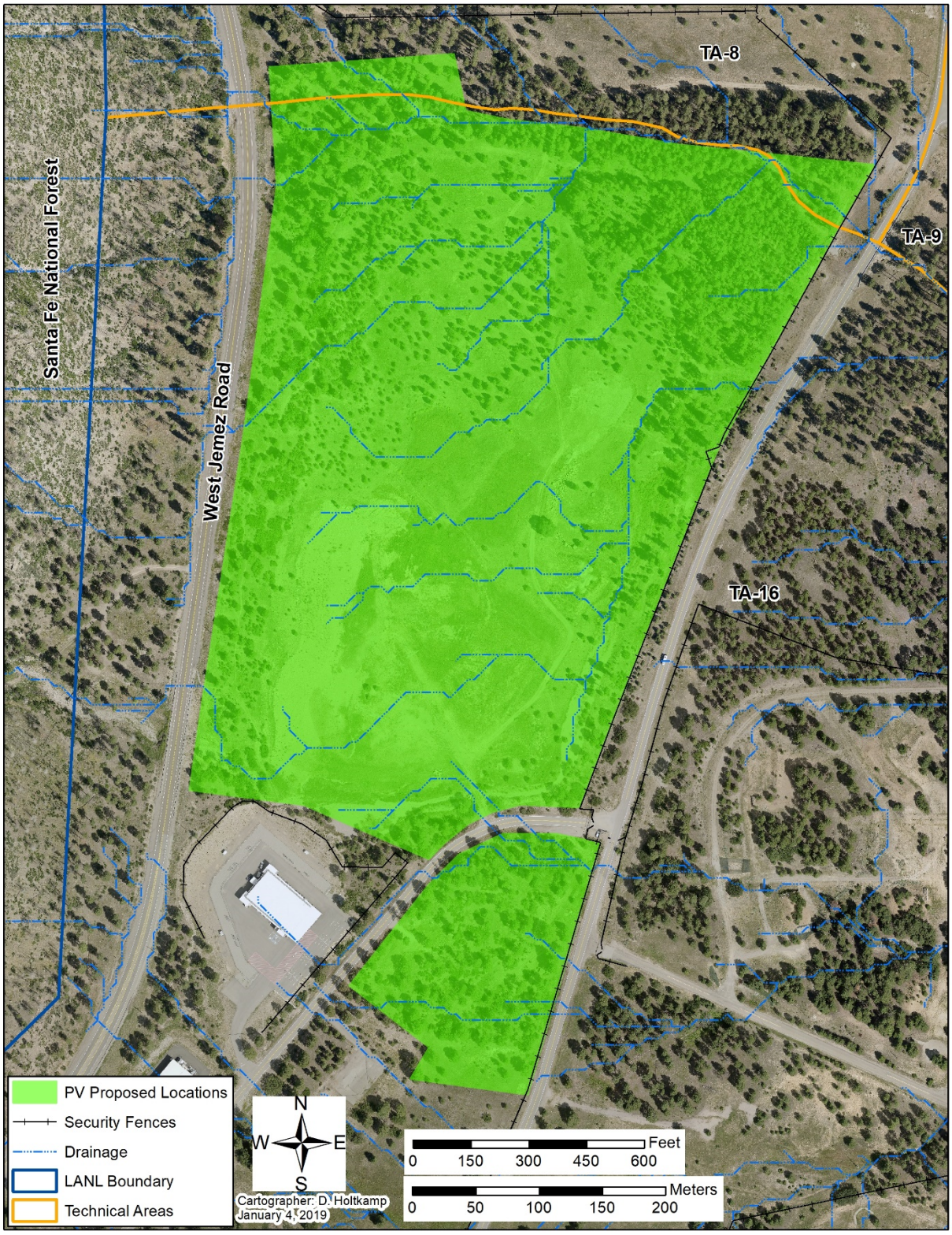

Figure 2-1: Proposed PV System Site Locations.

Figure 2-2: PV Array Southern Boundary that Abuts the Cañon de Valle Watershed Enhancement Project Boundary.

Figure 2-3: PV Array Site Location looking west toward West Jemez Road.

Figure 2-4: PV Array Site View to the Northwest.

Figure 2-5: PV Array Site North Facing View.

Figure 2-6: Vegetation Characteristic at the Potential 5 Additional Acres Available for the PV Array.

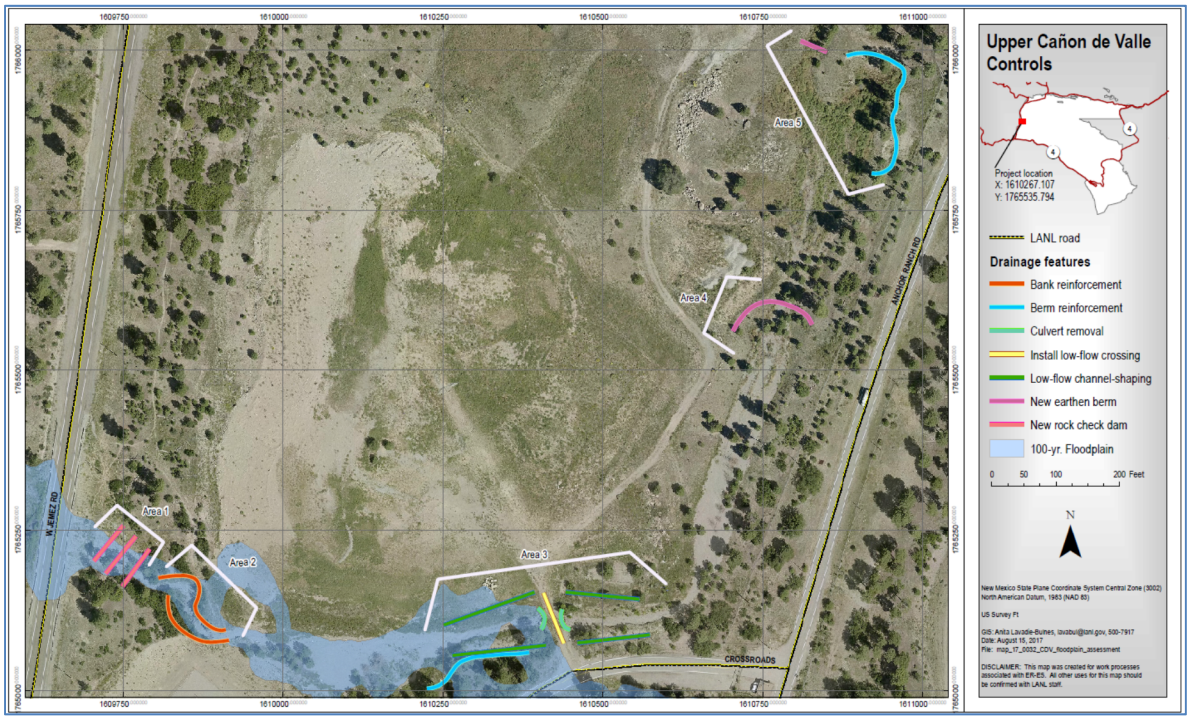

Figure 2-7: Cañon de Valle Watershed Enhancement Project

Figure 2-8: PV Array Site Preparation Potential Tree and Shrub Grubbing Areas.

The panels would be assembled on a foundation structure of ground-driven piles and secured by a racking structure attached to the piles (Pro2Serve 2018). Mounting system design would meet applicable local building code requirements with respect to snow, wind, and earthquake factors. Above ground, if a solar tracking system is selected, a motorized drive assembly would rotate the panels (Pro2Serve 2018). Energy generated from the modules would be delivered to inverter equipment where the DC current would be converted to AC current. Low-voltage output (typically between 300 to 600 volts) from the inverters would then be transmitted to a series of step-up distribution transformers. The transformer feeders, carrying medium voltage, would then be collected in metal-clad switchgear for transmission to the local electric grid (Pro2Serve 2018).

Site preparation would require tree and shrub grubbing (Figure 2-8) and leveling and grading in keeping with the natural terrain. Shrubs and trees would be chipped and spread onsite for dust control. Site preparation is expected to be a balanced cut and fill; thus, no importation or export of soils would be required. Construction time would be approximately 5 months.

Post construction, the PV array would be fenced to provide security and to reduce potential wildlife damage by keeping out large ungulates (e.g., deer and elk) and carnivores (e.g., bears). Routine maintenance, equipment monitoring, and as-needed repairs and equipment replacement to ensure proper operation of the PV array would include vegetation control, snow removal, and solar panel washing. Solar panels would be cleaned when efficiency and energy production are diminished. Depending on distribution and quantity of rainfall throughout year, solar panel washing would probably occur 1–3 times per year using onsite hydrants or tanker trucks. Solar panel washing would use either municipal water or a water-based NNSA-approved washing fluid. Vegetation adjacent to and under the PV panels would be maintained at 12 inches or less via mechanical and/or chemical control. Any herbicide application would be in accordance with applicable existing LANL procedures compliant with federal and state regulations.

The proposed PV site is located approximately 1.3 miles southwest from the point of interconnection at the WTA substation, which has enough capacity to accommodate a 10 MW PV array.

Two power line routes with power poles support the existing 13.8 kV distribution lines for interconnection from the PV array to the WTA substation.

Three options were originally considered for routing the PV power line to the WTA substation:

1. Attach the new PV array output line to the existing power poles.
2. Install new power poles and attach the PV array output line to them.
3. Install the new PV output line in underground duct bank.

However, for cost and technical considerations (e.g., the poles are too congested for an additional circuit) the only viable option for either route would be to install new power poles adjacent to the existing power poles from the PV site to the WTA Substation (Pro2Serve 2018).

Figure 2-9 shows two feasible PV routes paths, West Route and East Route, for a 13.8 kV line that would run from the proposed PV site to the WTA Substation. The westerly route is approximately 2.37 miles long and runs northward along W. Jemez Road mostly outside of the LANL security fences. The West Route is part of a more extensive distribution system that

(Google Earth)

Figure 2-9: Power Line Routing Options (TA-3 Substation not shown).
Option 1: West Route (blue line) for an approximate distance of 2.37 miles
Option 2: East Route (red line) for an approximate distance of 1.6 miles

continues on past the Anchor Ranch Road intersection branch terminating at the WTA and TA-3 substations. The East Route is approximately 1.6 miles long and flows northeastward along Anchor Ranch Road to the WTA terminus. Most of this route is inside of the security fences.

Each route would require some remedial work, such as brush clearing and filling of washouts prior to installation of the new power poles. During construction and maintenance of the new power poles, additional security and traffic control procedures may be required due to adjacent roadways and security fences. Routing will be determined after technical, cost-effective, and security analyses are performed.

2.2 No Action Alternative

The No Action Alternative is not to construct a PV array and associated power transmission line. The consequences of the No Action Alternative serves as a baseline, enabling decisionmakers to compare the magnitude of environmental effects of the Proposed Action alternative (CEQ 1981).

2.3 Alternatives Eliminated from Detailed Study

NNSA considered the following alternatives were considered but not carried forward for detailed analysis as they did not meet the reasonable screening factors for fulling NNSA's purpose and need for action.

Renewable Power Generation Resources

Concentrating solar power: Concentrating solar power was found to be too much of a technical challenge to install near the TA-3 Steam Plant due to the hilly terrain and limited acreage (2008 LANL and LA County Feasibility Study).

Wind Generation: Generating electricity with local wind resources at a LANL site or anywhere within Los Alamos County is not feasible due to insufficient wind resources.

Geothermal: Geothermal hot rock steam generation is attractive, but a locally appropriate location has not identified and the technology required to harness this resource is not commercially proven.

Fuel Cells: Molten-carbonate fuel cells are high-temperature fuel cells that operate at temperatures of 600 °C and above. However, the installation and maintenance and would be cost prohibitive.

Therefore, NNSA has determined that solar PV represents the best renewable energy option when compared with other renewable energy options (e.g., wind, biomass, geothermal, fuel cells). Therefore, the NNSA has eliminated other renewable energy sources from detailed analysis in this EA.

Alternative PV Sites

Building Rooftop PV Installation: While LANL has numerous buildings that could be utilized for rooftop installation of solar arrays, this method of deployment would require extensive modifications to roof structures to support the weight of the arrays, and use of rooftops would require that energy generated be directed through existing meters on the buildings, or that a subgrid system with numerous electric junctures be established to allow generated energy to enter the existing power grid. A diffuse sub-grid system would create substantial difficulties

coexisting with LANL's utility systems. Additionally, it would require major construction issues trying to install the required infrastructure around LANL's underground utility systems (electric, steam, sanitary, storm, water, communications, etc.).

Alternative Site Locations: The proposed PV site was screened from a larger pool of potential sites identified by NREL and LANL personnel. Selection criteria for potential sites locations included available contiguous acreage sufficient to produce 10 MW of solar power; quality of habitat; topography; public perception and line-of-sight considerations; proximity to transmission lines or substations; cultural resource effects; and cost. Some of the potential sites scored well on a portion of these criteria but were eventually dismissed because of significant challenges associated with one or more criteria. Ultimately, the most important criteria were contiguous acreage, avoidance of construction in greenfield locations to preserve habitat, minimize impacts to the human environment, and providing a cost effective location near existing power infrastructure. Other sites may be appropriate for future solar development and reevaluation should there be a need. This time delay would provide an opportunity for solar and other renewable technologies to become even more efficient.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter presents the potential direct, indirect, and cumulative effects of the Proposed Action Alternative and the No Action Alternative. The affected environment is addressed in Chapters 1 and 2 or briefly described in the resource category Proposed Action summary. Extensive information regarding the LANL environment and resources are available in the LANL *2008 Site Wide Environmental Impact Statement* (DOE 2008). The environmental consequences analysis builds upon the information provided in Chapters 1 and 2. Compliant with Council on Environmental Quality (CEQ) regulations and DOE's NEPA guidance, this EA applies a sliding-scale approach to impacts analysis consistent with DOE's *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements* (DOE 2004). Specifically more information is provided regarding the resources which have a greater potential to be impacted by the Proposed Action Alternative and the No Action Alternative while less depth and breadth of analysis is applied to resource areas having clearly no or minor environmental impacts. This approach focuses on significant environmental issues and alternatives and discusses impacts in proportion to their significance. The CEQ NEPA implementing regulations define cumulative impacts as the "impact on the environment which results from the incremental impact of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR § 1508.7). This chapter concludes with sections that describe the unavoidable adverse effects, the relationship between short-term use of resources and long-term productivity, and the irreversible or irretrievable resource commitments associated with the Proposed Action Alternative and No Action Alternative.

3.1 Air Quality

Proposed Action

During the construction phase, emissions from heavy equipment (e.g., bulldozers, excavators, trucks) would temporarily affect ambient air quality. Air emissions from construction vehicles and equipment would be minor and temporary resulting in negligible impacts to air quality. Ground disturbing activities such as site clearing; grading for the PV array foundations, and maintenance roads; and trenching for fence posts and power lines would temporarily generate fugitive dust. To minimize the effects of fugitive dust during construction, dust suppression methods would be implemented.

During the operational period, the array and system components including the power line would not result in the emission of air pollutants. The renewable energy generated by the proposed PV system would reduce dependence on energy generated from the burning of fossil fuels.

Cumulative Impacts: The release of anthropogenic greenhouse gases and their potential contribution to global warming are inherently cumulative phenomena. Reduction of greenhouse gas emissions from use of renewable energy would reduce air pollutants and greenhouse gas emissions from the burning of fossil fuels, thereby, contribute infinitesimally to slowing the rate of global climate change.

No Action Alternative

The No Action Alternative would result in a negligible, adverse impact on air quality and global climate change because of the continued generation of air pollutants and greenhouse air emissions from the combustion of fossil fuels. Therefore, the negative impacts of fossil fuel energy generation on air resources would continue with implementation of the No Action Alternative.

3.2 Geology and Soils

Proposed Action

Approximately 50 acres within the proposed PV array location were previously used as a borrow site. As such, in a majority of the area there is a disrupted soil surface with exposed mounds of dirt, gravel, and rocks interspersed with vegetation (Figures 2-2 through 2-5). The previously disturbed site would require site preparation and grading. The remaining acreage would require similar preparation but not as intensive. During construction soil erosion and sedimentation would be avoided or minimized through best management practices and compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements regarding erosion and sedimentation control. Site watering would serve to suppress wind blow dust. Post construction the site would be revegetated where practical and re-contoured for establishment of the solar panel support structures. The revegetated and re-contoured land will serve to reduce erosion and windblown dust. There would be no effect to the geology and a potential improvement to the soil surface after construction.

Under either routing option, construction of new poles and transmission wire from the PV array to the WTA Substation would take place in an existing utility corridor adjacent to roadways. There would be a route preparation required for the 30 foot right of way consisting of clearing and grubbing that would result in surface soil disturbance. The effects would be temporary as the corridor would be allowed to revegetate naturally with herbaceous vegetation.

Cumulative Impacts: No cumulative impacts have been identified.

No Action Alternative

The PV array site would not benefit from re-contouring which may serve to decrease site erosion and windblown dust.

3.3 Water Resources

Proposed Action

Solar facilities typically require no process water or cooling water. However, the panels may require periodic cleaning. Based on similar projects, an estimated 1,000 to 1,500 gallons per acre per year could be required to wash panels. However, the Los Alamos County 1 MW PV array, which has operated for over 7 years, it is structurally similar to and in the same general location as the proposed PV array. According to the County, the PV array panels are not cleaned on a regular basis due to the rain events (Pers. Com. 2018).

Surface Water: The proposed PV array location and power line corridor are not in the 100 year floodplain nor is there standing water on the site or power line corridors. Surface water quality could be affected by the construction due to increased silt load resulting from runoff during and following soil-disturbing activities. Soil disturbances associated with installation or construction activities can potentially result in adverse water quality impacts. Vegetation removal and the installation of impervious surfaces (e.g., PV panels) can alter site runoff patterns.

As a proposed construction site greater than one acre the project will be required to and file a *Notice of Intent* and follow the requirements of a *National Pollutant Discharge Elimination System Construction General Permit* and to prepare a *Storm Water Pollution Prevention Plan* specific to the proposed PV array location and power line corridor. Best management practices would be adopted that for pre and post construction prevent to the extent practicable, pollutants (primarily sediment, oil and grease, and construction materials) from entering storm water runoff. Likewise, a spill plan would also be required. The site-specific spill plan would address chemicals and any petroleum product use and storage on the work site and the actions to take in case of a spill. PV site post construction stabilization measures such as revegetation would be implemented. There are no adverse impacts to surface water resources anticipated as a result of implementation of the proposed action.

Groundwater: The proposed action is not expected to have any adverse impacts on the ground water quality in the area of potential effect. Implementation of best management practices during construction at the PV array site and power line corridors will prevent the introduction of potential pollutants from a surface incident from migrating to the ground water.

***Cumulative Impacts*:** There are no cumulative impacts expected from implementation of the proposed action.

No Action Alternative

There would be no change in existing site or power line corridor conditions.

3.4 Ecological Resources

Proposed Action

PV array construction and operation would occur within a substantially modified area. The site vegetation, previous to its use as a borrow site and effects of two major wildfires, would have been characteristic of a Ponderosa Pine (*Pinus ponderosa*) forest. The location now is an open area with a scattering of shrubs and trees along with herbaceous plants and grasses adapted to disturbed areas. There are no wetlands on the site.

Animal species are common and generally found throughout the various habitats within LANL and adjacent properties. Threatened and endangered species are identified, managed, and protected through implementation of LANL's *Threatened and Endangered Species Habitat Management Plan*. Suitable habitats for federally listed threatened and endangered species have been designated as areas of environmental interest (AEI). AEIs are geographical units at LANL that are managed for the protection of federally listed species and consist of core habitat areas and buffer areas. The purpose of the core habitat is to protect, in compliance with the Endangered Species Act, areas essential for the existence of the specific threatened or endangered species. The purpose of buffer areas is to protect core areas from undue disturbance and habitat degradation. The proposed area for the PV array and alternative power line corridors are not within core or buffer habitat areas.

During construction activities, compliance with the *Migratory Bird Treaty Act* restricts vegetation removal during the peak bird breeding season, May 15 through July 31, unless LANL biological resources staff have conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or shrub will be left in place until the nesting is complete.

The primary impact on birds from developing PV facilities at LANL is from the land conversion and loss of habitat for breeding birds. Due to recent wildfires, most of the primary forests left on the eastern slopes of the Jemez are on LANL property that Neotropical[6] migratory birds flock to each spring to breed (Hathcock 2018). Most of the PV array site has, in effect, already been converted from forest to open lands as a result of it past use as a borrow site and wildland fires effects.

PV arrays have been postulated to attract birds and their insect prey as a result of glare and polarized light reflected off solar panels. For example, insects may perceive polarized light as water bodies and are subsequently drawn to such sources which, consequently, could attract

[6] A Neotropical migratory bird is a bird that breeds in Canada and the United States and overwinters in Mexico, Central America, South America or the Caribbean islands.

foraging birds resulting in a greater risk of collision with PV structures. Similarly, utility-scale PV facilities may attract birds, waterbirds being at higher risk, through the "lake effect" whereby birds perceive the reflective surfaces of PV panels as bodies of water and collide with project structures as they attempt to land on the panels. However, to date there are relatively few systematic empirical research studies that have analyzed the attraction and impacts of PV facilities on birds (ANL and NREL 2015 & MASCWG 2016). Several state and federal agencies have formed a Multiagency Avian-Solar Collaborative Working Group (MASCWG) to identify information gaps and research priorities to better understand avian-solar interactions that will support agency decisions regarding utility-scale solar development. On November 30, 2016, MASCWG released the final Avian-Solar Science Coordination Plan. The objectives of this Plan are to identify and prioritize research on avian-solar interactions needed to better inform decisions on solar siting and permitting, and the implementation of monitoring, minimization, and mitigation measures (MASCWG 2016).

Bird mortality may result from collisions with guy wires and power lines. Collisions are most often associated with aquatic habitats, where species with high wing loading, high flight speeds, and poor maneuverability are common. Large, heavy-bodied species such as swans, pelicans, herons, and cranes are generally thought to be more susceptible to transmission line collisions than smaller, more maneuverable species (Smith and Dwyer 2016). The PV power lines, both alternative routes, do not cross waterbodies; avoid areas of high bird use (e.g., regularly used flight paths, migration corridors, and aggregation areas); are outside of core and buffer habitat; do not have topographical features that promote foraging or that are used by migrating birds for uplift (e.g., the tops of slopes); and would be in existing power line corridors. Therefore, impacts to bird populations and individuals are expect to be very low.

Mitigation Action Plan: In consideration of the lack of data regarding PV structure effects on birds and the potential for development of other PV sites on LANL; the project will conduct a long-term avian monitoring study at the proposed PV array site and adjacent habitat. The study will include preconstruction standard avian point count methodology field surveys to record species abundance and diversity. Preconstruction surveys are anticipated to include two breeding seasons. Post PV panel installation bird point count surveys will be conducted for a minimum of ten years. Additionally, carcass surveys will be conducted to monitor for birds that may impact PV panels and die. The time that a carcass persists in the area before a scavenger removes it is not known. The average carcass persistence time, if known, would drive the monitoring frequency. Before developing a carcass monitoring frequency, tests would be conducted to determine the carcass persistence rate to guide the development of future monitoring methods. This study would add to the limited body of literature on PV array effects on birds.

Cumulative Impacts: Land occupied by the PV array and the associated infrastructure would no longer available to support plants and animals. This is a cumulative impact with other LANL and Los Alamos County development projects that have reduced plant and animal habitat. Habitat loss or degradation is and will be further exacerbated by the effects of warming temperatures and increased climate variability as a result of global warming.

No Action Alternative

There would be no change in existing site or power line corridor conditions. Thus, there would be no effect to plants and animals or their habitat. An opportunity would be lost to advance the

understanding of bird-solar array interactions. This knowledge of which could result in better decisions regarding permit conditions, solar siting locations, and development of potential mitigation measures.

3.5 Visual Resources

Proposed Action

The proposed location, on approximately 55-plus acres in the northwest corner of the TA-16 area adjacent to the east side of West Jemez Road, would be viewable by the general public from West Jemez Road and those recreating on LANL and Santa Fe National Forest lands to the west. Visual effects are a subjective issue and depend on the perception of the interested receptor (e.g., a member of the general public, organization or business representative, recreational). There are no residential receptors in the area. The site currently consists of open lands interspersed with shrubs and trees. Upon conversion to a PV array, the change in viewshed would be noticeable to the public primarily due to site leveling, color contrast between the PV panels and the surrounding landscape and atmosphere, visual contrast between the straight line solar panel design and the natural landscape, and potential light reflection (glint and glare). The reflectivity of solar panels is comparable to still water and well below that of other common building materials such as standard glass and steel, as the panels are designed to absorb light to produce electricity. The anti-reflective coatings or treatments on glass and solar cells significantly reduce glint (i.e., a momentary flash of bright light) and glare (a continuous source of bright light) to increase a solar module's light absorption properties. Upon completion, the highest point of the PV system would be no higher than approximately 7 feet above ground level. Because the topography of the PV site directly east of West Jemez Road is relatively flat and topographically lower, the visual sensitivity of a moving receptor (automotive driver) to the solar PV system would be minor, as the reflection would occur very briefly from the side of the main direction of travel and only during certain months and times of day.

Both proposed alternative power line routes are within current transmission line corridors with exiting power poles. The eastern route would be shorter and primarily inside the existing security fence while the western route would be mainly outside the security fence and adjacent to public-use West Jemez Road. However, the viewshed of either route would not be substantially altered.

In 2013 the Federal Aviation Administration promulgated an interim policy regarding the development of solar energy facilities located on federally obligated airports. The policy addresses concerns to aviation safety from potential PV light reflection effects that could result in vision impacts to pilots and/or air traffic control facilities and compromise the safety of the air transportation system. However, solar energy systems located on an airport that is not federally-obligated or located outside the property of a federally-obligated airport are not subject to this policy. However, proponents of solar energy systems located off-airport property or on non-federally-obligated airports are strongly encouraged to consider the requirements of this policy when siting such systems (DOT 2013). The proposed action would not affect either pilots or air traffic controllers due to the distance of the Los Alamos Airport and LANL's restricted airspace that extends from the ground surface level to 12,000 feet mean sea level as defined by the Federal Aviation Administration.

Cumulative Impacts: There are no identified cumulative impacts.

No Action Alternative

There would be no impacts from the proposed action as the PV array would not be constructed no new power lines installed.

3.6 Noise

Proposed Action

The predominant noise source in the project areas consists of intermittent traffic noise associated with vehicles traveling along West Jemez Road. Construction activities would contribute temporary, short-duration increase to ambient noise level adjacent to and within the PV site and the two power line corridors alternatives. Heavy equipment such as front end loaders, graders, equipment to drive support pilings, and backhoes would be used for site preparation. Construction activities would be of relatively short duration and occur during daylight hours. There are no sensitive receptors in the area such as office buildings or residential areas.

During operation minor contributions to ambient noise levels could be generated by motors and drive systems used to tilt the array toward the sun should tracking modules be selected for the PV array. However, these mechanical drive systems tend to operate with minimal noise. The associated inverters and transformers generally emit a hum during operation. Inverters are typically encased in cabinets and are frequently located centrally on the site for practical reasons. The level of noise generated by inverters and transformers depends on several factors such as their electrical capacity and the amount of noise damping provided by their enclosures. Nevertheless, because noise levels from this equipment are typically low, noise at the site boundary would tend to be indistinguishable from background noise. Because solar facilities cannot generate at night, they produce essentially no noise during the nighttime hours.

Cumulative Impacts: On-site noise levels would be quite low and would not contribute to an increase in ambience noise levels outside the project area.

No Action Alternative

There would be no effect to ambient noise levels.

3.7 Land Tenure and Use

Proposed Action

Most of the proposed PV array location was previously used as a borrow site, which is an area designated for excavation to supply geologic resources, such as rock, sand, gravel, or soil, to be used elsewhere for fill materials. West Jemez Road is adjacent to and west of the site and Anchor Ranch Road is the eastern border and relatively free of trees. Conversion of the site to a PV array is compatible with the surrounding land use and would utilize an area previously disturbed, thus, avoiding the need to construct on land that supports a natural habitat. PV facilities typically have a lifetime of about 25 - 30 years. Construction and operation of a solar array has no to low potential for site contamination. Placement of solar panel structures would entail site leveling

that would be similar to the site topography prior to its use as a borrow site. Use of a site for a solar array is not expected to affect adjoining land use.

There would be no change in land use from the construction of new power lines from the PV array to the WTA Substation under either routing alternative.

Thus, land tenure and use would be compatible with the existing TA-16 and TA-8 environment.

Cumulative Impacts: The solar array equipment could be completely removed at the end of its life cycle and the site restored. Thus, the use of the site for a PV array is not likely to preclude future use for other purposes.

No Action Alternative

There would be no effect to current land tenure and use. The site and power line corridors would remain available for others uses (e.g., borrow site, office building or other support facilities, or for the power line corridors; additional power poles and lines).

3.8 Cultural Resources

Proposed Action

There is one archaeological site, which is a historic artifact scatter associated with the Homesteading Period of the Pajarito Plateau, located within the proposed project area. The site is determined as eligible for the National Register of Historic Places. The project would cordon off and exclude the site area from any construction or ground disturbing activities, implement the Laboratory's Cultural Resources Management Plan (LANL 2017a), and the Programmatic Agreement used by DOE/NNSA for compliance with the National Historic Preservation Act (DOE 2017a); thus, avoiding any adverse impacts to the site.

Cumulative Impacts: There are no identified cumulative impacts.

No Action Alternative

There would be no effect upon prehistoric, historic, traditional, or paleontological resources.

3.9 Socioeconomic Resources

Proposed Action

The installation of a PV systems would provide economic benefits of reducing LANL's day to day electrical power supply costs. Construction would have only small effects from spending on good and services from local businesses (e.g., stores, restaurants) and tax revenues on the local economy as construction would be of limited duration. The local labor force may or may not be used. Thus, any local economic gains related to construction would likely be minor. Similarly, operations and maintenance personnel would come from the existing LANL or contractor workforce. The proposed action would not alter population and demographic characteristics have any disproportionate impacts upon housing and employment markets. During the operational period, minor benefits to the local economy may result through the purchase of goods and services for the operation and maintenance of the PV systems.

Cumulative Impacts: No cumulative impacts have been identified.

No Action Alternative

Implementation of the No Action Alternative would not reduce LANL's electrical power purchasing costs.

3.10 Environmental Justice

Proposed Action

There are no identified disproportionately high and adverse cumulative effects human health or environmental effects on minority populations and low-income populations due to construction or operation of the PV array or power pole installation.

Cumulative Impacts: No cumulative impacts have been identified.

No Action Alternative

There are no identified disproportionately high and adverse cumulative effects human health or environmental effects on minority populations and low-income populations from implementation of the No Action Alternative.

3.11 Public Health and Worker Safety

Proposed Action

Solar facilities do not pose a threat to public health or safety risk either from construction or operation. There would be no public access to the PV array during construction. Post construction public access would be prevented through site fencing and LANL security force patrols. Power line structures and corridors do not pose a health risk to a member of as the electrical shock hazard zone is aerial and many feet above a member of the general public.

Construction and operation hazards are well understood and present no unique risks to worker personnel. All construction and operations employees and contractors would be required to adhere to the appropriate health and safety plans and emergency response plans and trained to operate under a health and safety program that meets industry and Occupational Safety and Health Administration standards and regulations.

Cumulative Impacts: There are no identified cumulative impacts.

No Action Alternative

There would be no changes to public health and worker safety conditions as the PV array would not be constructed and no new power lines installed.

3.12 Infrastructure

Proposed Action

As stated in Section 1.2, in the long term, the existing transmission infrastructure will not have the capacity to meet LANL's power demands and baseload on-site power generation will have to be installed or the transmission system expanded. Regardless of load growth, the Power Pool often experiences a shortfall in generation on a typical day. This energy is purchased outside of the Power Pool at relatively high prices. The Power Pool does not have sufficient generation sources to fully serve its load (LANL/LA County 2008). As a consequence, it purchases power to fill the gap, whether on or off peak (LANL 2017). Use of an on-site LANL PV array could meet an increasing or decreasing electricity demand quickly, over a short period of time by providing the ability to start and stop multiple times per day. Construction and operation of the PV array and associated infrastructure would be highly valuable in meeting future electrical load requirements.

With construction of the PV powerlines all other infrastructure (e.g., power grid facilities, roadways, water, etc.) is sufficient to support the proposed action activities.

Cumulative Impacts: There are no identified cumulative impacts.

No Action Alternative

Selection of the No Action Alternative would jeopardize the LANL's long-term ability to consistently and cost effectively meet daily electrical load requirements.

3.13 Waste Management

Proposed Action

The proposed action would require the disposal of vegetation waste (green waste) from clearing and grubbing the PV array site and construction waste material. If feasible, green waste generated from the site clearing activities would be mulched in place and used to control soil erosion and establish conditions for post construction site revegetation. Waste generation constituents from power line construction activities would be similar.

During the operational period, solid waste generated by the operation and maintenance of the PV system is expected to be very minimal. It would include waste associated with the repair and/or replacement of damaged PV system components and green waste associated with the clearing of vegetation around the PV systems. With a few exceptions, the equipment associated with PV systems do not pose a threat of hazardous waste. However, coolant used in inverters, mineral oil used in transformers, and vehicle antifreeze, petroleum, oils, lubricants are considered hazardous substances. Inverters, transformers and vehicles utilize closed systems, and the hazardous materials would only be spilled from accidental damage to the equipment.

There is sufficient landfill capacity and hazardous waste treatment storage and disposal facilities that would accept construction and operationally generated solid and hazardous waste.

Cumulative Impacts: Solid and hazardous waste would be additive to other LANL and Los Alamos County activities generating similar kinds of waste.

No Action Alternative

There would be no generation of solid or hazardous waste as the PV array would not be constructed and no new power lines installed.

3.14 Transportation

Proposed Action

Solar projects covered under this document are not anticipated to adversely affect local roadway networks. The material required for construction would not require the use of oversized trucks and would not require roadway closures. Construction activities and the deliveries of construction materials and equipment are not expected to result in even minor roadway congestion. Operation and maintenance of the PV array would not change the existing levels-of-service on the surrounding road network.

Cumulative Impacts: No cumulative impacts have been identified from the proposed action or No Action Alternative.

No Action Alternative

There would be no changes current traffic conditions as the PV array would not be constructed and no new powerlines installed.

3.15 Unavoidable Adverse Impacts

Selection of any alternative would not result in the exceedance of a regulatory limit or standard (e.g., air emissions), capacity of a specific resource (e.g., water resources), or infrastructure and utilities capability to provide services (e.g., waste treatment). There would be a negligible decrease in greenhouse gas emissions under the proposed action. There are no identified unavoidable adverse impacts from the No Action Alternative.

3.16 Relationship Between Short-Term Use of Resources and Long Term Productivity

The Proposed Action or No Action Alternatives would not result in substantial change in land use or condition. Therefore, there would be no impact from the short-term use versus long-term productivity due to PV system operations. Use of renewable energy would be beneficial to the long-term.

3.17 Irreversible and Irretrievable Resource Commitments

Construction of the PV system would commit natural and man-made materials and human and fiscal resources. Under the proposed action, land used is considered an irreversible commitment

during the time period that the land is occupied by the PV array. The proposed action would require a commitment of irretrievable resources in the form of PV equipment, power line poles and wires, and other associated infrastructure.

4.0 REFERENCES

ANL and NREL 2015	A Review of Avian Monitoring and Mitigation Information at Existing Utility-Scale Solar Facilities prepared by Leroy J. Walston, Jr., Katherine E. Rollins, Karen P. Smith, and Kirk E. LaGory Environmental Science Division, Argonne National Laboratory Karin Sinclair, Craig Turchi, Tim Wendelin, and Heidi Souder National Renewable Energy Laboratory prepared for U.S. Department of Energy, SunShot Initiative and Office of Energy Efficiency & Renewable Energy. April 2015.
CEQ 1981	Council on Environmental Quality, Executive Office of the President, Memorandum to Agencies: Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations. 46 Fed. Reg. 18026 (March 23, 1981), As amended.
DOE 2004	Department of Energy, Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements, Second Edison, Office of NEPA Policy and Compliance, December 2004.
DOE 2008	Department of Energy, Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico. DOE/EIS-0380, May 2008.
DOE 2017	Department of Energy, Staff Report to the Secretary on Electricity Markets and Reliability. August 2017.
DOE 2017a	Programmatic Agreement among the U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office, the New Mexico State Historic Preservation Office and the Advisory Council on Historic Preservation Concerning Management of the Historic Properties at Los Alamos National Laboratory, Los Alamos, New Mexico. Implemented on August 2, 2017.
DOE 2017b	Department of Energy, NA-LA NEPA Compliance Officer (NCO) Compliance Form. LAN No: 17-12. Upper Cañon de Valle Watershed Enhancement Project. Categorical Exclusion. September 20, 2017.
DOT 2013	Department Of Transportation, Federal Aviation Administration. *Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports.* Federal Register / Vol. 78, No. 205 / Wednesday, October 23, 2013 / Notices. Pages 63276 – 63279. October 23, 2013.
Hathcock 2018	Los Alamos National Laboratory, Chuck Hathcock, EPC-ES. Literature review on impacts to avian species from solar energy collection and suggested mitigations. 2018
LA County 2014	Los Alamos County Department of Public Utilities, 2014 Electric Reliability Plan, Rafael De La Torre, PE, Deputy Utility Manager, Electric Distribution. November 19, 2014.

LANL/LA County 2008	Los Alamos National Laboratory, Los Alamos County Department of Public Utilities, Renewable Energy Feasibility Study. LA-UR 08-07230. November 2008.
LANL 2016	Sustainability Program: PV in Our Energy Future Power Point Presentation by Monica Witt, Los Alamos National Laboratory Sustainability Officer, October, 2016.
LANL 2017	LANL Photovoltaic Array Proposal, Sonia Ballesteros Rodriguez, Utilities & Institutional Faculties, Sustainably Program. February 2017.
LANL 2017a	A Plan for the Management of the Cultural Heritage at Los Alamos National Laboratory, New Mexico. LA-UR-15-27624, Los Alamos National Laboratory, Los Alamos, New Mexico.
LBNL/NREL 2016	Lawrence Berkeley National Laboratory and National Renewable Energy Laboratory. The Environmental and Public Health Benefits of Achieving High Penetrations of Solar Energy in the United States. Ryan Wiser, Trieu Mai, Dev Millstein, Jordan Macknick, Alberta Carpenter, Stuart Cohen, Wesley Cole, Bethany Frew and Garvin Heath. NREL/TP-6A20-65628, LBNL-1004373. May 2016.
MASCWG 2016	The Multiagency Avian-Solar Collaborative Working Group, Avian-Solar Science Coordination Plan, November. 2016.
NNSA 2018	National Nuclear Security Administration. NNSA awards Los Alamos National Laboratory Management & Operating Contract. JUNE 8, 2018. https://www.energy.gov/nnsa/articles/nnsa-awards-los-alamos-national-laboratory-management-operating-contract. Accessed February 27, 2019.
NREL 2015	National Renewable Energy Laboratory, DOE Los Alamos National Laboratory – PV Feasibility Assessment, NREL Final Report. LA-UR-16-22342. August 12, 2015.
NREL 2015a	National Renewable Energy Laboratory. *Water Impacts of High Solar PV Electricity Penetration*. Technical Report NREL/TP-6A20-63011. Jordan Macknick and Stuart Cohen *National Renewable Energy Laboratory (NREL)*. September 2015.
Pers. Com. 2018	Personal communication between Cassandra Begay, NNSA Los Alamos Field Office, General Engineer and Rafael De La Torre, Los Alamos County, Deputy Utility Manager for Electric Distribution. November 6, 2018.
Pro2Serve 2018	Professional Project Services, Inc. 10MW PV Array Feasibility Study and Economic Analysis, Revision 0, Prepared for Los Alamos National Security, LLC Los Alamos National Laboratory. Report No. 1036-001-R001. May 16, 2018. Document is not available to the public as it contains proprietary and business sensitive information.
SELC 2017	Southern Environmental Law Center. THE ENVIRONMENTAL REVIEW OF SOLAR FARMS IN THE SOUTHEAST U.S. Maximizing Benefits & Minimizing Impacts to Drive Smart, Sustainable Development of Solar Power. Southern Environmental Law Center Solar Initiative Policy Brief. March 2017.
Smith and Dwyer 2016	Jennifer A. Smith and James F. Dwyer. Avian Interactions with Renewable Energy Infrastructure: An Update. The Condor, Ornithological Applications. Volume 118, pp. 411-423, DOI: 10.1650/Condor-15-61.1. AmericanOrnithology.org. April 20, 2016.

APPENDIX A. NEW MEXICO ENVIRONMENT DEPARTMENT LETTER

Comments to NNSA on proposed Solar Photovoltaic Array at Los Alamos National Laboratory.

State of New Mexico
ENVIRONMENT DEPARTMENT

Office of the Secretary

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

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BUTCH TONGATE
Cabinet Secretary

J. C. BORREGO
Deputy Secretary

July 31, 2018

William Goodrum
NNSA Los Alamos Field Office
3747 West Jemez Road
Los Alamos, NM 87544
By email: NA-LA-_NCO@nnsa.doe.gov

Dear Mr. Goodrum,

The New Mexico Environment Department (NMED) has reviewed the scoping letter for the proposed LANL Solar Photovoltaic Array and offers the following comments:

NMED Air Quality Bureau Comments

The construction of a solar photovoltaic array at Los Alamos National Laboratory is located in Los Alamos County, which is currently in attainment of all National Ambient Air Quality Standards.

Drilling, trenching, boring, plowing or other construction activities will create increases in pollutant emissions due to combustion-related equipment usage, increased traffic, and earth excavation and movement.

Please note that this area is less than 10 miles from Bandelier National Monument. The increase in pollution, especially entrained dust, will negatively affect this Class I Area, which is one of eight sites in New Mexico covered by the Regional Haze Rule for visibility protection.
To ensure air quality standards are met, applicable local or county regulations requiring noise or dust control must be followed for the duration of this project. If none are in effect, dust control measures should be considered to minimize the release of particulates due to vehicular traffic, construction equipment and significant ground disturbances; extra care should be taken during high wind events.

All areas disturbed by construction activities resulting in significant ground disturbance within and adjacent to the project should be reclaimed to avoid long-term problems with soil erosion and fugitive dust.

All asphalt, concrete, quarrying, crushing and screening facilities contracted in conjunction with the proposed project must have current and proper air quality permits. For more information on air quality permitting and modeling requirements, please refer to 20.2.72 NMAC.
Activities identified in this proposal will temporarily increase local emissions and may impact air quality in the area and visibility at Bandelier National Monument. Negative impacts associated with construction activities will be minimized if regulations and guidelines identified here are followed. The project as proposed is not expected to affect air quality on a long-term basis.

NMED Ground Water Quality Bureau

The project is not expected to have any adverse impacts on ground water quality in the area of the potential effect. However, implementation of the project may involve the use of heavy equipment thereby leading to a possibility of contaminant releases (e.g., fuel, hydraulic fluid, etc.) associated with equipment malfunctions. The GWQB advises all parties involved in the project to be aware of notification requirements for accidental discharges contained in 20.6.2.1203 NMAC. Compliance with the notification and response requirements will further ensure the protection of ground water quality in the vicinity of the project.

A copy of the Ground and Surface Water Protection Regulations, 20.6.2 NMAC, is available at http://164.64.110.239/nmac/parts/title20/20.006.0002.pdf.

NMED Petroleum Storage Tank Bureau Comments

No Map of project area. Letter submitted mentions approximately 50 acres at Los Alamos National Laboratory.

Several confirmed release sites throughout Los Alamos. Included is a current Corrective Action Fund listing of all confirmed release sites for the Los Alamos area. The majority of the sites have a "No Further Action" Status. If further information is needed on any of the sites listed please contact PSTB.

Release ID	Release Name	Facility ID	Facility Name	Address	City	Responsible Party	Project Manager	Compliance?	Release Status
131	LANL TA-55/15	30923	TA 55 16	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
137	TRUE VALUE	53753	LOS ALAMOS COUNTY, UNSPECIFIED	UNKNOWN	LOS ALAMOS	UNKNOWN	UNKNOWN		No Further Action, Confirmed Release
206	LANL TA64-RC73	30926	TA 64 RC 73	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
207	LANL TA3-36-3	30911	TA 3 36 3	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
323	LANL TA55-16	30923	TA 55 16	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
579	LANL TA-35	31227	TSL 188 1	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
623	LANL TA-21	30886	TA 21 155	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
689	LA AV GAS	29143	LOS ALAMOS AIRPORT	1040 AIRPORT RD NO2	LOS ALAMOS	LOS ALAMOS AV GAS INC	UNKNOWN		No Further Action, Confirmed Release
743	NMSHTD VACANT	31431	NMDOT LOS ALAMOS PATROL YARD SEASONAL	STATE RD 502	LOS ALAMOS	NEW MEXICO (STATE OF) NMDOT	UNKNOWN		Referred to US EPA
756	LANL TA-3-191	30908	TA 3 191	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
798	LANL TA-60-FUEL FARM	30991	TANK FARM 1	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
1147	GIANT STOP&GO	1355	GIANT STOP N GO 57	2372 TRINITY DR	LOS ALAMOS	WESTERN REFINING	STEVEN JETTER		No Further Action, Confirmed Release
1229	LOS ALAMOS AIRPORT	29143	LOS ALAMOS AIRPORT	1040 AIRPORT RD NO2	LOS ALAMOS	LOS ALAMOS AV GAS INC	UNKNOWN		No Further Action, Confirmed Release
1548	LANL TA-15	30875	TA 15 287	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
1561	US WEST COMM	29148	LOS ALAMOS MAIN	1907 TRINITY	LOS ALAMOS	US WEST COMMUNICATIONS	UNKNOWN		No Further Action, Confirmed Release
1609	WATERCHRIS/HILL	31554	ATOMIC CITY	400 TRINITY DR	LOS ALAMOS	UNKNOWN	PATRICK DE GRUYTER		No Further Action, Confirmed Release
1715	LANL/TA-60	30913	TA 3 MP 3	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
1859	COMMUNITY CENTER	29145	LOS ALAMOS COMMUNITY CENTER	15TH MYRTLE	LOS ALAMOS	US DEPARTMENT OF ENERGY	JIM GIBB		Referred to Hazardous Waste Bureau
1986	GIANT STOP N GO	1355	GIANT STOP N GO 57	2372 TRINITY DR	LOS ALAMOS	WESTERN REFINING	STEVEN JETTER		No Further Action, Confirmed Release
Workplans + Comments +	2002	LANL TA-55/17	30924	TA 55 17	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release

Release ID	Release Name	Facility ID	Facility Name	Address	City	Responsible Party	Project Manager	Compliance?	Release Status
2033	LANL TA-18	30884	TA 18 PL 30	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
2049	LANL TA-16/207	30878	TA 16 205	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
2235	SHANNON CORP	30562	SHANNON CORP	1240 TRINITY	LOS ALAMOS	UNKNOWN	UNKNOWN		No Further Action, Confirmed Release
2396	LANL TA-16/197	30877	TA 16 197	MAIL STOP K 498	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
2621	LANL TA-21/2	30896	TA 21 ATF 2	UNKNOWN	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		Referred to Hazardous Waste Bureau
2689	EXXON #6-2636	30147	RAS 62636	2591 TRINITY	LOS ALAMOS	EXXON CO USA	UNKNOWN		No Further Action, Confirmed Release
2796	GIANT STOP N GO #57A	31859	GIANT 380	2373 TRINITY DR	LOS ALAMOS	WESTERN REFINING	TERRY HERTEL		No Further Action, Confirmed Release
2883	LANL TA-0	29149	LOS ALAMOS NATIONAL LAB 0	TECHNICAL AREA 0	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
3218	LANL TA 3 36 1	30909	TA 3 36 1	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
3517	TA 2-1	30885	TA 2 1	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		Investigation Federal Facility
3530	TA 35-197	30918	LOS ALAMOS NATIONAL LABORATORY FMU 77	PO BOX 1663	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION,US DEPARTMENT More...	SARAH MCGRATH		No Further Action, Confirmed Release
3580	LOS ALAMOS PUBLIC SCHOOLS	29151	LOS ALAMOS SCHOOL BOARD	751 TRINITY DR	LOS ALAMOS	PALS 2000 LLC	LORENA GOERGER		No Further Action, Confirmed Release
3685	LOS ALAMOS CHEVRON	29144	KWIK LUBE LOS ALAMOS	2155 TRINITY DR	LOS ALAMOS	J PHILLIPS	SUSAN VON GONTEN		No Further Action, Confirmed Release
4563	LOS ALAMOS COUNTY LANDFILL	29146	LOS ALAMOS COUNTY LANDFILL	3701 E JEMEZ RD	LOS ALAMOS	LOS ALAMOS COUNTY	SUSAN VON GONTEN		No Further Action, Confirmed Release
4670	LOS ALAMOS NATIONAL LABORATORY TA-55 RLUOB FUEL OI	54763	LOS ALAMOS NATIONAL LABORATORY TA-55 RLUOB FUEL OI	0.06 MILES WNW OF PAJARITO ROAD	LOS ALAMOS	U.S. DEPARTMENT OF ENERGY NATIONAL NUCLEAR SECURITY ADMINISTRATION	SUSAN VON GONTEN		Cleanup, Federal Facility
4729	GIANT #380	31859	GIANT 380	2373 TRINITY DR	LOS ALAMOS	WESTERN REFINING	TERRY HERTEL		No Further Action, Confirmed Release
4732	METZGER MOBIL	29396	METZGER MOBIL	1399 DIAMOND DR	LOS ALAMOS	METZGER REALTY INC	GEORGE BEAUMONT		No Further Action, Confirmed Release

Facilities for which PSTB records show there are no longer petroleum storage tanks that we regulate and there has not been a release are not included in these comments. There are a number of reasons that there could be tanks present or a release, but the Petroleum Storage Tank Bureau does not have a record of it in our database.
For further information, please consult our online resources. Many of the records requested from the Petroleum Storage Tank Bureau are available online, and you can access them quickly yourself by following the directions below.

If you'd like a further response from this bureau, please reply with the information you find (say no information if none; say whether you found info on leaks or not; and if possible, say whether there are tanks and whether they are underground or aboveground). In addition, please use any FID's (facility identification numbers) or RID's (release identification numbers) you've found in these searches for the facilities or releases you are seeking information on, and please state specifically which records you're looking for. If you want to see all records for a facility, you're welcome to arrange a time with us to come look at the files. If you need any help using the online resources, please let me know.

Please review the lists on the webpage, https://www.env.nm.gov/ust/lists.html. Click on the Active Leaking and NFA Sites link. The first document lists NFA sites (sites for which no further action is currently required) by county and city. The third document lists active sites alphabetically by priority (the second and fourth documents are pdfs). Click on the document you need, then click Download for the option you choose in the window that opens. You can search the Active Leaking or NFA Sites spreadsheets (or any other spreadsheet) by holding down the ctrl key on your keyboard and then hitting the F key, or by going to Find & Select (all the way to the right) on the Home tab of the spreadsheet, selecting Find, and entering an address or part of an address, a name, or any information you'd like to search on and then clicking on Find Next repeatedly to find all records that fit your search. You can download the No Further Action letter for many of these records by clicking the link in the last column of the NFA spreadsheet. If the No Further Action letter is not online and you need it or any other information, let us know.

If you are looking for information about the presence of underground or aboveground storage tanks at an address, please download the All Storage Tank list, also at https://www.env.nm.gov/ust/lists.html. This lists all storage tanks in the state that fall or fell under our regulations and have been registered with us, whether they are still present or not. This

spreadsheet can be searched the same way as the above ones. If you only need to know about tanks that are currently in use or temporarily out of use, download the Active Storage Tank list.

The GoNM map link also enables you to locate quite a bit of information that will facilitate your search, including NFA letters. Not all information about each site has been uploaded there, but ***recently many site documents have been added***. Instructions for Go NM: Go to https://www.env.nm.gov/ust/lists.html. Click on the GoNM link at the bottom left of the page. Documents may download more easily if you use Internet Explorer. When you are in the GoNM Mapper, you can use the zoom slider at the upper left of the map to zoom in. Colored and white shapes represent facilities that have or had tanks and/or have been involved in a release. To find out more about a facility, click on the white i inside the blue circle at top of the screen and then click on the shape that represents that facility. When the dialog box pops up, you can click on either the Report or any link under Documents If it is a leaking site, there will usually be a link under Documents. Many No Further Action letters and other documents are accessible and downloadable this way. If you click on the icon under Report at the left of the dialogue box, there is also quite a bit of information there. If there is a triangle (like a "play" symbol on a media player) at the top right of the dialog box, click on it, and a second page of information will open.

If you have questions or need further information, please call the Petroleum Storage Tank Bureau at 505-476-4397.

NMED Solid Waste Bureau Comments

The NMED's Solid Waste Bureau (SWB) does not anticipate significant environmental impact; however, such work sometimes results in the knowing or inadvertent generation of regulated asbestos waste, as the necessary trenching or excavation has the potential to impact asbestos-containing materials (e.g., asbestos-cement siding or pipes (sewer, water or conduit). Suspect siding, pipes, fragments or soils contaminated with related fragments or fines need to be sampled and analyzed by Polarized Light Microscopy to determine if the materials contain greater than one percent (1%) asbestos. If so, the pipes, fragments and/or contaminated soils require management as regulated asbestos waste per the New Mexico Solid Waste Rules (SWR), 20.9.2 – 20.9.10 NMAC, to include proper containerization, labeling, manifesting, transport by an approved commercial hauler and disposal at a permitted solid waste facility specifically permitted to accept regulated asbestos waste. Additionally, trenching and excavation also has the potential to identify areas of buried solid waste. If more than 120 cubic yards of solid waste from any one contiguous area requires excavation, the SWB may require submission of a Waste Excavation Plan pursuant to the SWR, 20.9.2.10.A(15) NMAC.

NMED Surface Water Quality Bureau Comments

The U.S. Environmental Protection Agency (USEPA) requires National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP) coverage for storm water discharges from construction projects or common plans of development, for sites that are greater than one (1) acre.

The proposed solar photovoltaic array may be 50 acres in total surface disturbance. The owner(s) and the general contractor/operator will be required to file a Notice of Intent and follow the requirements of the CGP. CGP coverage includes the following:

A SWPPP should be prepared for the site and that appropriate Best Management Practices (BMPs) be installed and maintained both during and after construction to prevent, to the extent practicable, pollutants (primarily sediment, oil & grease and construction materials from construction sites) in

storm water runoff from entering waters of the U.S. This permit also requires that permanent stabilization measures (revegetation, paving, etc.), and permanent storm water management measures (storm water detention/retention structures, velocity dissipation devices, etc.) be implemented post construction to minimize, in the long term, pollutants in storm water runoff from entering these waters. In addition, permittees must ensure that there is no increase in sediment yield and flow velocity from the construction site (both during and after construction) compared to pre-construction, undisturbed conditions (see Subpart 10.C.1.b)

You should also be aware that EPA requires that all "operators" (see Appendix A) obtain NPDES permit coverage for construction projects. Generally, this means that at least two parties will require permit coverage. The owner/developer of this construction project who has operational control over project specifications, and the general contractor who has day-to-day operational control of those activities at the site, which are necessary to ensure compliance with the storm water pollution plan and other permit conditions, and possibly other "operators" will require appropriate NPDES permit coverage for this project.

The Construction General Permit can be found at:
https://www.epa.gov/npdes/epas-2017-construction-general-permit-cgp-and-related-documents

Thank you for providing NMED with the opportunity to review and comment on this proposed project.

Sincerely,

Michaelene Kyrala
Director of Policy
New Mexico Environment Department
Office: 505.827.2892
E-mail: michaelene.kyrala@state.nm.us

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