Print Form

2020100110

Notice of Exemption

Appendix E

To: Office of Planning and Research
P.O. Box 3044, Room 113
Sacramento, CA 95812-3044

County Clerk
County of: Inyo
P.O. Drawer F
Independence, CA 93526

From: (Public Agency): Los Angeles Department of Water and Power
111 N. Hope Street, Room 1044
Los Angeles, CA 90012
(Address)

Project Title: California Institute of Technology - Owens Valley Radio Observatory Long Wavelength Array and Deep Synoptic Array Expansion Project

Project Applicant: Los Angeles Department of Water and Power (LADWP)

Project Location - Specific:
The Owens Valley Radio Observatory is located in Inyo County, California, about 4.5 miles north of Big Pine and est of the Owens River at approximately 3,950 feet above sea level.

Project Location - City: N/A Project Location - County: Inyo

Description of Nature, Purpose and Beneficiaries of Project:
Please see attachment.

Name of Public Agency Approving Project: LADWP

Name of Person or Agency Carrying Out Project: LADWP

Exempt Status: **(check one):**

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☐ Emergency Project (Sec. 21080(b)(4); 15269(b)(c));
- ☒ Categorical Exemption. State type and section number: 15304 Minor Alterations to Land
- ☐ Statutory Exemptions. State code number: _____

Reasons why project is exempt:
Section 15304 - Class 4 consists of minor public or private alterations to land, water, and/or vegetation which do not involve the removal of healthy, mature, scenic trees except for forestry and agricultural purposes. Examples include (f) minor trenching and backfilling where the surface is restored.

Lead Agency Contact Person: Jane Hauptman Area Code/Telephone/Extension: (213) 367 - 0968

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a Notice of Exemption been filed by the public agency approving the project? ☐ Yes ☐ No

Signature: Jane Hauptman for Charles C. Holloway Date: 10/05/2020 Title: Manager of Environmental Planning and Assessment

☒ Signed by Lead Agency ☐ Signed by Applicant

Authority cited: Sections 21083 and 21110, Public Resources Code.
Reference: Sections 21108, 21152, and 21152.1, Public Resources Code.

Date Received for filing at OPR: _____

Governor's Office of Planning & Research

Oct 07 2020

STATE CLEARINGHOUSE

Revised 2011

CALIFORNIA INSTITUTE OF TECHNOLOGY – OWENS VALLEY RADIO OBSERVATORY

LONG WAVELENGTH ARRAY AND DEEP SYNOPTIC ARRAY EXPANSION PROJECTS

SUMMARY

The California Institute of Technology (Caltech) proposes to expand the Long Wavelength Array (LWA) and the Deep Synoptic Array (DSA) at the Owens Valley Radio Observatory (OVRO), in Inyo County north of Big Pine, California. Established for scientific research purposes in the 1950s, the OVRO operates under a lease from the Los Angeles Department of Water and Power. Caltech's proposed projects would expand the capabilities and resolution of existing LWA and DSA configurations by adding approximately 64 LWA antennas and 15 DSA dishes.

Installation of the antennas would entail minimal ground disturbance. LWA antennas are small and lightweight enough to be transported from existing roads to the installation site by hand. Each antenna would be installed on a 4-inch-diameter post driven into the ground approximately 3 feet. PVC pipes laid atop the ground would protect the antennas from cattle grazing. The DSA antenna design also minimizes ground-disturbing impacts. The antennas are commercial, lightweight, off the shelf satellite dishes and are thus very small by comparison to the large structures already on site. DSA antennas will not require concrete for installation, instead making use of three steel posts driven into the ground.

For both the LWA and the DSA antennas, the primary ground disturbance would be associated with the installation of fiber optic and copper power cables to link the antennas to existing data collection stations. Cable would be placed in trenches 18 inches deep and 12 to 18 inches wide.

As detailed below, biological and cultural resource surveys have been completed of the areas of potential effect, and the antenna and trench placements have been designed to avoid impacting biological or cultural resources.

The LWA and DSA projects would have minimal effects on the environment and have been designed to avoid impacts to biological and cultural resources. Both projects appear to meet the requirements for a categorical exemption under PRC 15304, Minor Alterations to Land, specifically Class 4 (f) "Minor trenching and backfilling where the surface is restored."

1.0 LOCATION OF PROPOSED CALTECH LONG WAVELENGTH ARRAY EXPANSION AND THE DEEP SYNOPTIC ARRAY PROJECTS

An existing radio-telescope observatory, the Owens Valley Radio Observatory (OVRO), is located northeast of Big Pine, California on Los Angeles Department of Water and Power (LADWP) owned land in Inyo County (Figure 1). The site is leased to the California Institute of Technology (Caltech) for scientific research purposes.

Caltech is proposing two projects. One, the LWA Stage 3 Expansion, proposed to add approximately 64 small radio antennas (each less than four feet tall) to the existing Long Wavelength Array on the OVRO site. Together these antennas collect data about the longest radio wavelengths that reach the earth's surface, and search for radio emissions from planets orbiting other stars. To maximize the spatial resolution of the telescope, the antennas would be dispersed over the lease area.

The second project is to install 15 small outlying antennas as part of the Deep Synoptic Array (DSA-110) Project. Two of the antennas would be installed on existing infrastructure, and the other 13 would be spread throughout the OVRO lease area.

Each system of antennas would be connected by cables buried in trenches 12 to 18 inches wide and 18 inches deep. To minimize ground disturbance, the two systems will use the same trenches, to the extent feasible. A 6-foot-wide trenching machine would be used to install the cable. Work on the proposed project would take place within an area of around 900 acres. The actual size of project-related disturbance (for both LWA and DSA projects) is estimated to be approximately twelve (12) acres. Half of this area (6 acres) will be left to return to natural vegetation; the remaining 6 acres would serve as ATV paths. Project disturbance will be related to the installation of the antennas and cable trenching required to power and link antennas to the existing communication grid.

The proposed projects have been approved to be funded by Caltech and the National Science Foundation.

1.1 BACKGROUND

The proposed project is located on the Owens Valley floor, approximately 4.5 miles north of Big Pine and east of the Owens River at approximately 3,950 feet above sea level. The OVRO was initially constructed in the 1950s by Caltech. The OVRO includes numerous telescopes with the largest three being 40, 27, and 27 meters in diameter. The OVRO has approximately 10 buildings on site including offices, control centers, machine shops, a lunch facility, and a dormitory. On average, there are approximately 15 full and part time employees (~10 full-time equivalent [FTE] employees) on site. The number of persons on site varies due to time of year, number of active projects, and number of visiting scientists. The project is located in an area of mostly undeveloped land with alkaline shrub vegetation. Current land uses in the vicinity include operation of various radio telescopes and cattle grazing. The proposed project would not alter existing OVRO structures or telescopes.

1.2 SETTING

The proposed project lies in eastern California in the Owens Valley, a deep, north-south trending basin located between the Sierra Nevada mountain range to the west and the White Mountain range to the east. No surface water exists at the location of the proposed project. The closest surface

water is the Owens River which is approximately one-quarter mile west of the project location. The Owens River, which flows south through the valley, is a trunk stream; the Owens Valley is a closed drainage system. The valley floor is characterized as having low precipitation, abundant sunshine, frequent and highly variable winds, moderate to low humidity and high potential evapotranspiration. The majority of the land on the Owens Valley floor, including the land surrounding the proposed project, is owned either by LADWP or by the U.S. Government (Bureau of Land Management or U. S. Forest Service) and is undeveloped.

1.3 DATA COLLECTION

The purpose of the proposed LWA Stage 3 Expansion project is to increase the sensitivity of the existing LWA at the OVRO site. The LWA is used to search for radio emission from exoplanets orbiting nearby stars. Such radio emission will signal whether these planets have a magnetic field, which is a crucial ingredient for life. The array will also study the early development of the Universe and will detect the highest energy particles (cosmic-rays) in the Universe. The LWA Stage 3 Expansion project will use data collected by numerous small antennas combined by a supercomputer to study celestial low frequency radio waves.

The purpose of the proposed DSA project is to study Fast Radio Bursts (FRBs), among the most enigmatic and powerful events in the cosmos. Small DSA antennas would be located across the OVRO lease area and connected by fiber optic cable so that, collectively, they would have the resolution and sensitivity of a mile-wide dish. FRBs can also be used to study the amount and distribution of matter in our universe, which will tell scientists more about the environments in which galaxies form and evolve.

The Owens Valley is a unique location for radio-wave observation due to its rural setting, benign weather, flat population growth, and, most importantly, low generation of terrestrial radio frequency interference. The OVRO, with its existing infrastructure, computer power, and networking capabilities, provides a suitable hosting site for the projects.

1.4 SCOPING

Much of the proposed project area had already been inventoried for biological and cultural resources as part of environmental studies conducted for previous projects. Biological and cultural resource surveys for the remaining project area, with associated reports, were completed in May and August 2019, and June 2019, respectively, by TEAM Engineering & Management (TEAM).

Based on the results of the biological survey, the proposed project's final location and construction schedules were set to avoid any significant impacts to biological resources. Rare plants observed during the 2019 survey were documented for avoidance during project implementation.

Together, the cultural resource surveys encompassed over 980 acres and resulted in the recording of 41 cultural resource sites, 37 of which reflect indigenous occupation of the area, three of which

are irrigation ditches that date to the nineteenth or early twentieth century, and the Owens Valley Radio Observatory facility itself.

Because the LWA project is partially funded by the National Science Foundation, the NSF took the lead in ensuring compliance with the National Historic Preservation Act (NHPA). In December 2018, Caroline Blanco, the Federal Historic Preservation Officer of the National Science Foundation, initiated consultation with the five Native American Tribes who have traditional ties to the OVRO area. Ms. Blanco sent letters to the Tribal Chairs of the Big Pine Paiute Tribe of Owens Valley, the Bishop Paiute Tribe, the Fort Independence Indian Reservation, the Lone Pine Paiute-Shoshone Reservation, and the Timbisha Shoshone Tribe, inviting each Tribe to consult about the project. She also emailed the Tribal Historic Preservation Officers (THPO) of each of the five Tribes to invite them to consult, and attached a preliminary version of the Cultural Resource Survey report. Of the five local tribes contacted, the Big Pine Paiute Tribe of Owens Valley responded with a request for formal tribal consultation.

In April 2019, Ms. Blanco connected Danelle Gutierrez, the THPO of the Big Pine Tribe, with Dr. Gregg Hallinan, who is the lead on the LWA and DSA. projects. In May, Ms. Gutierrez visited OVRO and toured the site where the antennas would be installed and had extensive discussions with the Caltech and OVRO staff about the proposed project. The following day, Ms. Gutierrez and Dr. Hallinan and a number of other tribal representatives discussed the project in detail, including how to best minimize impact on any culturally sensitive areas. A second field trip occurred on August 26, 2019, in which the TEAM archaeologist showed Big Pine Tribe representatives a sample of the archaeological sites in the project area. Participating were Ms. Gutierrez, Sally Manning, Environmental Director, and Alan Bacock, Water Program Coordinator.

Recommendations made by the Tribe and by the TEAM archaeologist were integrated into the project design, so that Ms. Blanco made a determination that the projects would have "No Adverse Effect" on historic properties. The California State Historic Preservation Officer concurred with this finding via letter dated July 11, 2019. As planned, in April 2020, Caltech revised their original trenching plan to avoid sensitive cultural resource areas, as the Tribe had requested. The new trenching plan was sent to the Big Pine Tribal Historic Preservation Officer for her review on May 20, 2020.

At the Big Pine Tribe's request, Caltech also plans to hire a tribal representative to monitor trench excavation, as an additional precaution against disturbing potential buried cultural resources that are not evident on the ground surface.

2.0 DESCRIPTION OF PROPOSED CALTECH PROJECTS

2.1 CONSTRUCTION - LONG WAVELENGTH ARRAY EXPANSION

The 64 LWA Stage 3 Expansion antennas would be constructed either off-site or at existing OVRO facilities. Caltech personnel would transport these antennas to the proposed LWA Expansion sites

on existing roads where possible using small pickup-sized trucks. The LWA antennas are aluminum and approximately four-feet tall (Figure 3). The antennas are installed on a single post, diameter of four inches, driven three feet into the ground. The antennas are pre-assembled, deployed in the field, and installed within minutes using manual labor. Beneath each antenna, a 10-foot-by-10-foot wire mesh is installed as a ground screen to reflect radio waves. The mesh matrix is approximately four inches by four inches and can be draped over existing small plants and surfaces. The specific location of each antenna is not fixed and can vary by several feet in any direction to avoid plant disturbance. Cable, buried to 18-inches, will link each antenna to a main line. This line will tie into an existing electronics storage unit which houses the electronics required by the project. Both the existing and proposed LWA antennas are passive radio-wave receptors. The proposed array receives and monitors radio waves; it does not produce emissions and has no moving parts.

Work on the proposed project would take place at various locations throughout the OVRO lease area. The actual size of project-related disturbance is estimated to be approximately twelve (12) acres.

2.2 CONSTRUCTION - DEEP SYNOPTIC ARRAY (DSA)

The DSA antenna design minimizes ground disturbing impacts. The antennas are commercial, lightweight, off the shelf satellite dishes and are thus very small by comparison to the large structures already on site. Antennas will not require concrete for installation, instead making use of three steel posts driven into the ground, this design was proposed to minimize ground disturbance. Two of the antennas would be installed on existing infrastructure, and 13 would be spread throughout the OVRO lease area. The DSA antennas would be connected by a fiber optic cable, using the same trenches as the LWA antennas to the extent possible. The access routes to the new antenna may require minor upkeep (re-grading, brush removal) during project construction and implementation.

Cable, buried in trenches 18 inches deep and 12 to 18 inches wide, would link each antenna to a main line. Existing cables or trenches excavated for the LWA Expansion would be used wherever feasible. The main line would tie into an existing electronics storage unit which houses the electronics required by the project. The proposed projects would make no improvements to the existing road system at the OVRO.

Construction activities associated with the proposed projects are anticipated to include:

- Access routes for DSA antennas
- Trenching and installation of communications cable
- Installation of antennas poles and antennas

The following equipment is anticipated to be used during construction of the proposed project: utility and light trucks, trenchers, a small tractor or backhoe, a grader (for access route

maintenance), auger, mechanized hand tools, and other small tools necessary to complete the construction described above.

2.3 SCHEDULE

Construction for the proposed projects is expected to occur over an approximate twelve-month period. Construction activities on the proposed project, if approved, would commence after November 1, 2020 and are expected to be complete by October 31, 2021. As agreed upon between Caltech and the Big Pine Paiute Tribe, construction activities will be coordinated to enable tribal monitors to be present during ground-disturbing (trenching) activities.

Areas where the rare plant *Oryctes nevadensis* were identified will be monitored for and avoided during its active growth phase (April-July). If trenching activities are conducted during this period in areas where Oryctes were previously identified, a pre-construction survey will be used to determine whether avoidance measures are necessary. The proposed projects would not alter any existing buildings or telescopes on site. No habitable structures are associated with the proposed project.

2.4 OPERATIONS

During the proposed project's operational phase, radio frequency data will be collected from the antennas. Site management, oversight of daily operations, and routine maintenance will be conducted by project staff either remotely or using existing OVRO infrastructure (office buildings). During the operations phase, no additional employees would be required for the proposed project. The current Caltech staffing level at the OVRO is approximately 15 full and part-time staff (10 FTE). Minor upkeep of the antennas, access routes, and the cattle exclusion fences are expected during the implementation phase using existing Caltech staff.

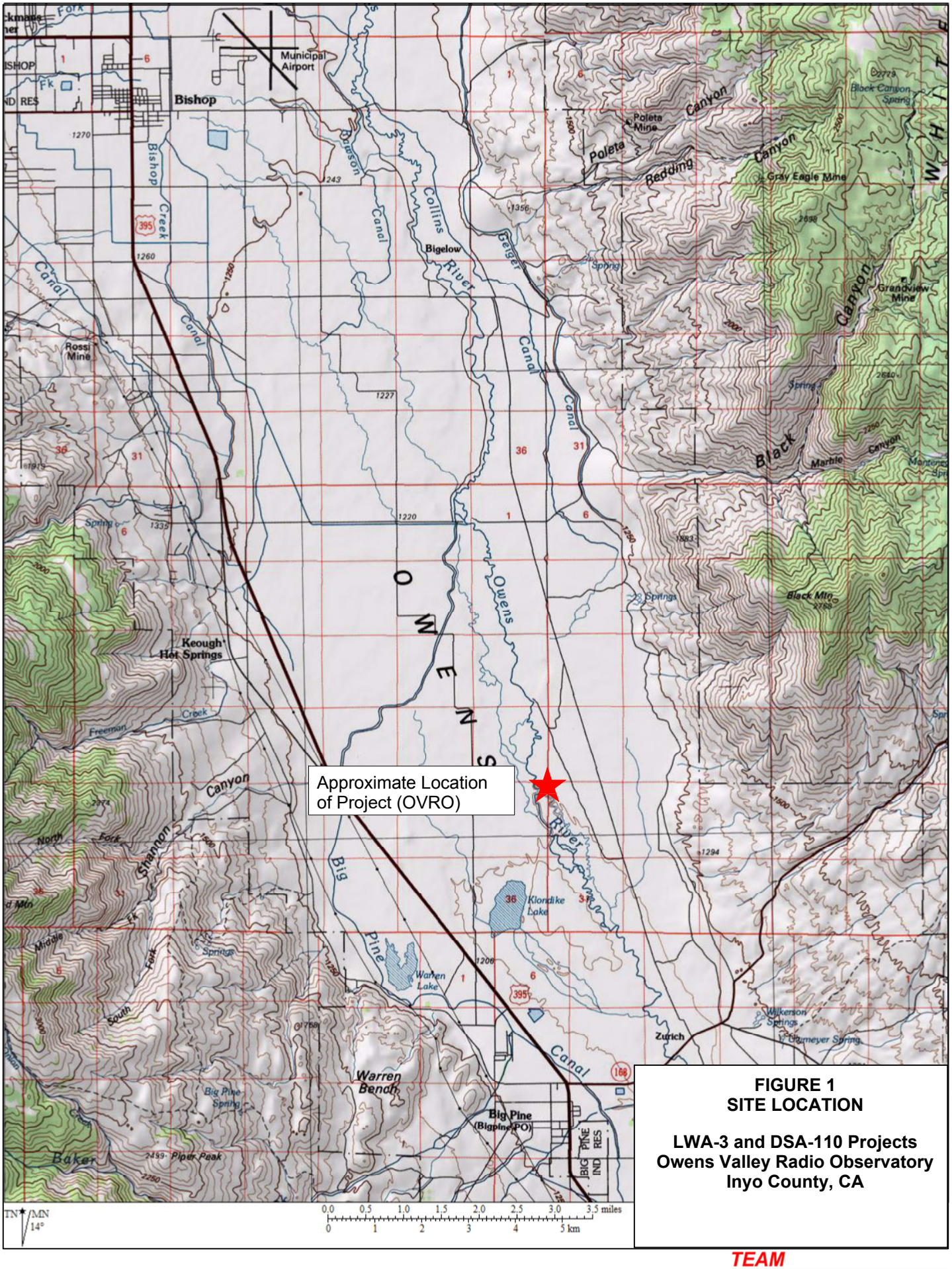
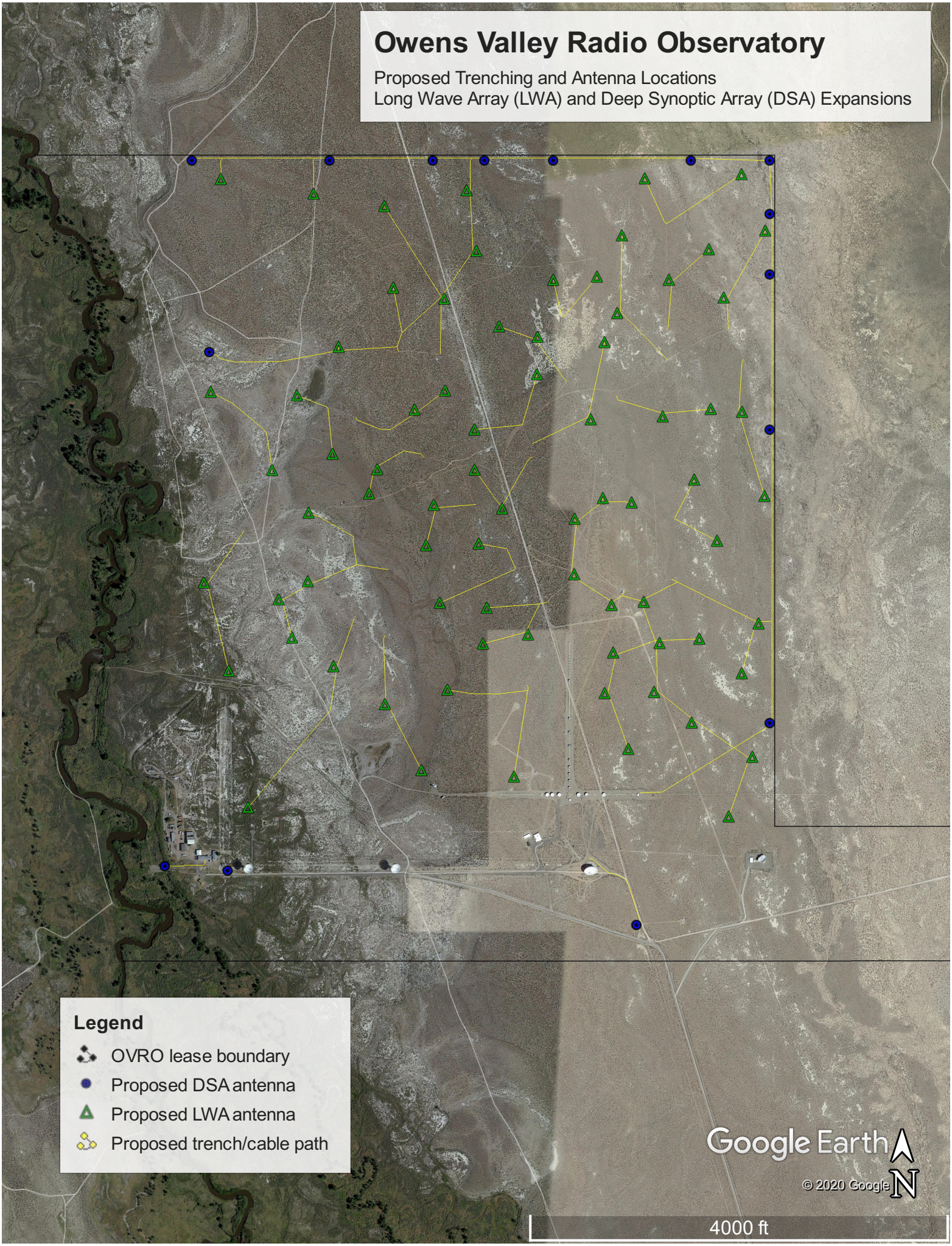


FIGURE 1
SITE LOCATION

LWA-3 and DSA-110 Projects
Owens Valley Radio Observatory
Inyo County, CA

TEAM
ENGINEERING & MANAGEMENT, INC.
Bishop · Mammoth Lakes


Owens Valley Radio Observatory
Proposed Trenching and Antenna Locations
Long Wave Array (LWA) and Deep Synoptic Array (DSA) Expansions
Legend
OVRO lease boundary
Proposed DSA antenna
Proposed LWA antenna
Proposed trench/cable path
Google Earth
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4000 ft