FILED

JUL 11 2012

INYO CO. CLERK
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BY: DEPUTY

Notice of Exemption

Appendix E

To: ☒ Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

☒ County Clerk
County of Inyo
P.O. Drawer F, 168 North Edwards Street
Independence, CA 93526

From: (Public Agency) City of Los Angeles Department of Water and Power
300 Mandich Street
Bishop, CA, 93514

Project Title: Caltech Long Wavelength Array Project

Project Location - Specific: Northeast of Big Pine, CA; See Attached

Project Location - City: NA **Project Location - County:** Inyo

Description of Nature, Purpose, and Beneficiaries of Project:
See Attached

Name of Public Agency Approving Project: City of Los Angeles Department of Water and Power

Name of Person or Agency Carrying Out Project: California Institute of Technology, Dr. Gregg Hallinan

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: CEQA Guidelines, Information Collection, Section 15306
- ☐ Statutory Exemptions. State code number:

Reasons why project is exempt: The proposed project involves data collection and would not result in significant impacts or disturbance to any environmental resources.

Lead Agency Contact Person: Paula Hubbard Area Code/Telephone/Extension: (760) 872-1104

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: [signature] Date: 7-11-12 Title: Ass. Stat Agriculture Manager

☑ Signed by Lead Agency Date received for filing at OPR:

☐ Signed by Applicant

Revised October 1989

12-00022

1.0 LOCATION OF PROPOSED CALTECH LONG WAVELENGTH ARRAY

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 the addition of a long wavelength radio telescope array consisting of a series of numerous small antennas deployed in a circular pattern to the north of the existing OVRO telescopes (Figure 2). This proposed project, the Long Wavelength Array (LWA) (project), would also include placement of an electronics storage unit, cable trenching, and cattle exclusion fencing. The proposed project, if approved, would be funded by Caltech funds.

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 currently has 10 buildings on site including offices, control centers, machine shops, a lunch facility and a dormitory. On average, there are approximately 30 full time employees (FTE) 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 half 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. A 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 project is to build a Long Wavelength Array (LWA) at the Owens Valley site to study the early development of the Universe. By studying residual radiation produced during the "Dark Ages" of the Universe (approximately 13.2 billion years ago) during

a transition period when the first stars, galaxies and black holes emerged, a more complete picture of the evolution of the Universe will emerge. This instrument will also be uniquely sensitive to transient radio emissions, such as those associated with extra-solar planets.

The LWA project will use data collected by numerous small antennas and integrated by a supercomputer to study celestial low frequency radio waves. The estimated project life is three to five years. 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 unique hosting site for the project. Cost savings generated by using the existing capabilities of the OVRO are on a scale of 2,000 percent.

1.4 SCOPING

Biological and Cultural Resource surveys with associated reports were completed in April and May 2012 by TEAM Engineering & Management and Trans-Sierran Archaeological Research, respectively. These surveys were conducted over a large acreage north of the existing OVRO array to find a suitable location for the proposed project. Based on the results of these surveys, the proposed project's final location and boundaries were set to avoid any significant impacts to Biological or Cultural Resources.

In addition, other relevant parts of the CEQA checklist were evaluated in regards to the proposed project. It was determined that the proposed project would have no significant impact related to Sensitive Locations, Cumulative Impacts, Unusual Circumstance, Scenic Highway, Hazardous Waste Sites or Historic Resources as described in CEQA Article 19, Section 15306.

2.0 DESCRIPTION OF PROPOSED CALTECH LONG WAVELENGTH ARRAY

Caltech is proposing to install 261 individual antennas in a circular array. These dipole-antennas are aluminum and approximately five-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 and deployed in the field and installed within minutes. 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. A majority (256) of the antennas will be deployed in a circular pattern with diameter of approximately 250 meters. The specific location of each antenna in this circle is not fixed, and can vary by several feet in any direction to avoid plant disturbance. Five additional antennas of the same size and with the same wire receiver mesh will be located south of the circular array (Figure 4). The specific location of these five "outlier" antennas is also somewhat flexible. Cable, buried to 18-inches, will link each antenna to a main line. This line will tie into an electronics storage unit which will house the electronics required by the project. A main cable line will run south from the proposed project to the existing cable line at the OVRO, providing power and allowing for remote networking capabilities.

Both the existing OVRO antennas and proposed LWA antennas are passive radio-wave receptors. The proposed array receives and monitors radio waves; it does not produce emissions.

Work on the proposed project would take place within an area of less than 15 acres. The actual size of project-related disturbance is estimated to be less than three acres. This new disturbance will be related to the installation of the 261 radio-wave antennas with associated receiver mesh, direct burial cable trenching required to link antennas to the existing OVRO power and communication grid, and construction of a cattle exclusion fence around the antennas.

Implementation of the proposed project would occur over a two-to-three month period, with the LWA project operational by the end of 2012. Construction activities on the proposed project, if approved, would commence after August 31, 2012.

2.1 CONSTRUCTION

The 261 project antennas would be constructed either off-site or at existing OVRO facilities. These antennas are stationary with no motorized parts. Caltech personnel would transport these antennas to the proposed LWA site on existing roads using small pickup-sized trucks. The antennas would be deployed in the field using an existing road. This existing road will be the main transportation, trenching and fencing route into the center of the circular array. The light weight antennas can be transported and installed by manual labor. A 10-foot by 10-foot wire mesh receiver will be laid on the ground beneath each antenna. This mesh can be deployed over existing smaller vegetation. The specific location of each antenna within the circular array is not fixed and can be moved several feet in any direction to minimize ground disturbance. However, based on project area surveys, in some areas of the circular array some larger brush may need to be removed to accommodate this mesh.

The trenches for project-related power and optical fiber cables will be dug to approximately 18 inches below ground surface by a walk-behind or tractor-mounted trencher. These trenches will average 6-8 inches in width. The walk-behind trencher has an approximate three foot wheel base. The tractor-mounted trencher has an approximate four foot wheel base. The trenching routes will have flexibility in path, and care will be taken to avoid unnecessary plant disturbance. The total amount of trenching for the proposed project is estimated to be 24,000 feet with approximately 75 percent of the trenching occurring within the circular array. Cable for the five outlier antennas and to link the circular array to the existing OVRO cable line will account for the remainder of the trenching. Trenching will be routed along existing roads wherever feasible.

A modified shipping container, approximately 20-feet by 8-feet by 8-feet in size, will serve as an electrical component storage unit, and would be emplaced on an existing tract of disturbed land (old road) south of the LWA. This unit will be placed directly on the ground surface with no foundation. A delivery truck will drive on existing roads to deploy the storage unit.

A cattle-exclusion fence will be installed around the perimeter of the circular array and also around each of the five outlier antenna. The fence for the main array will be barbed wire with T posts. The fencing for the five outliers will be vinyl with fence posts dug every 5-10 feet. These fence posts will be anchored in two-to-three foot deep holes. The holes will be dug by a mechanical auger attached to a utility truck. A fence installation and maintenance route will be created around the circular array, and short spur routes will be created from the existing roads to each of the five outlying antennas for fence installation.

Other than the spur road into the center of the circular array and the fence routes along the perimeter of the circular array, the proposed project will make no improvements to the existing road system at the OVRO. The spur road and fence routes may require minor upkeep (re-grading, brush removal) during project construction and implementation.

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

- Installation of antennas poles, wire mesh bases, and antennas
- Trenching and installation of communications cable
- Emplacement of the electrical storage unit
- Construction of cattle exclusion fencing

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

2.2 SCHEDULE

Construction for the proposed project is expected to occur over two to four months, commencing after August 31, 2012. The proposed project would not alter any existing buildings or telescopes on site. No habitable structures are associated with the proposed project.

2.3 OPERATIONS

During the proposed project's operational phase, daily observations and radio-wave emission data will be collected by the 261, non-motorized project 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 full time employees (FTE) would be required for the proposed project. The current Caltech staffing level at the OVRO is approximately 30 FTE. Minor upkeep of the antennas, access road, and the cattle exclusion fence is expected during the implementation phase using existing Caltech staff.

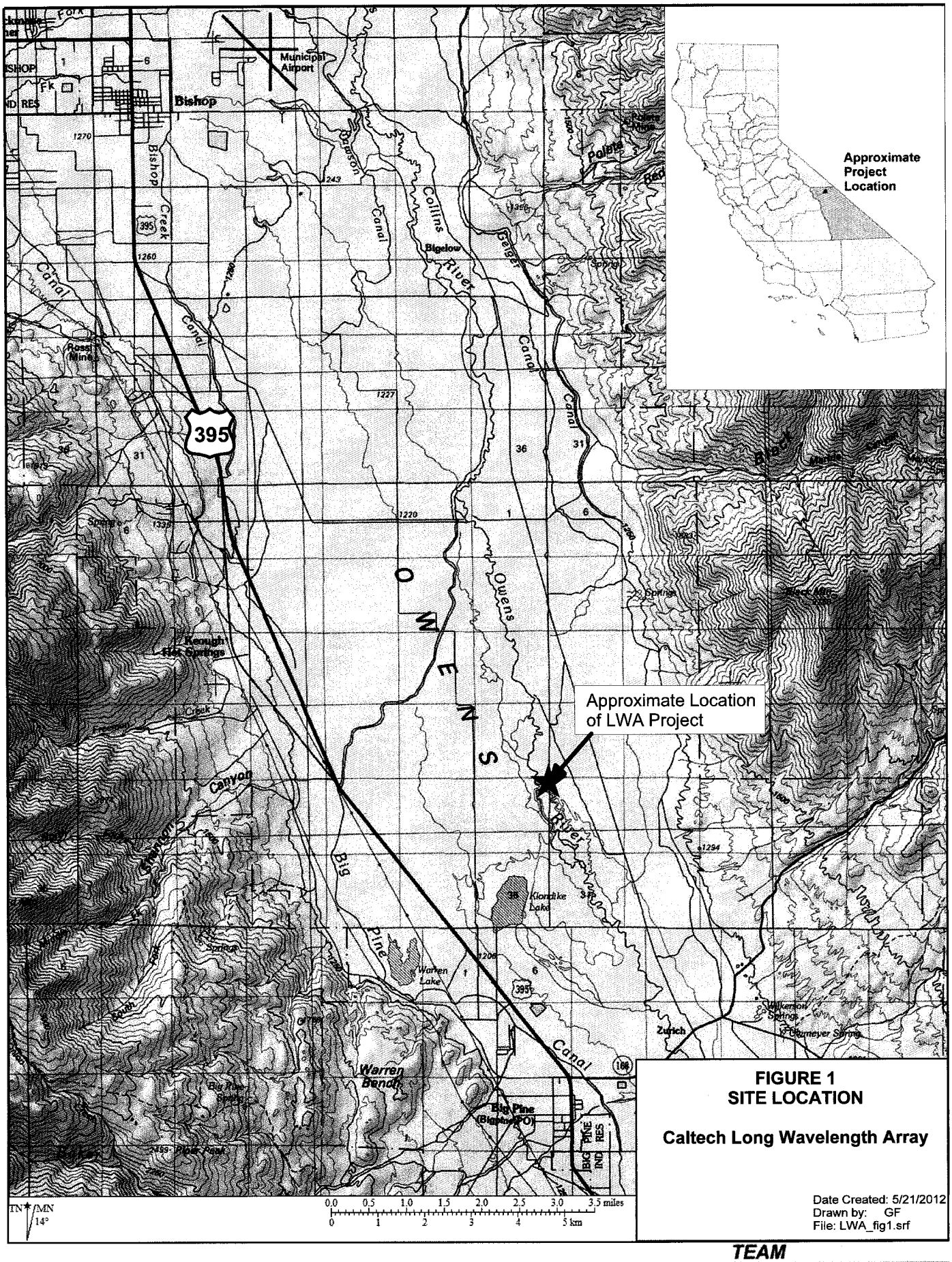


FIGURE 1
SITE LOCATION

Caltech Long Wavelength Array

Date Created: 5/21/2012
Drawn by: GF
File: LWA_fig1.srf

TEAM
ENGINEERING & MANAGEMENT, INC.
Bishop • Mammoth Lakes

12-00022

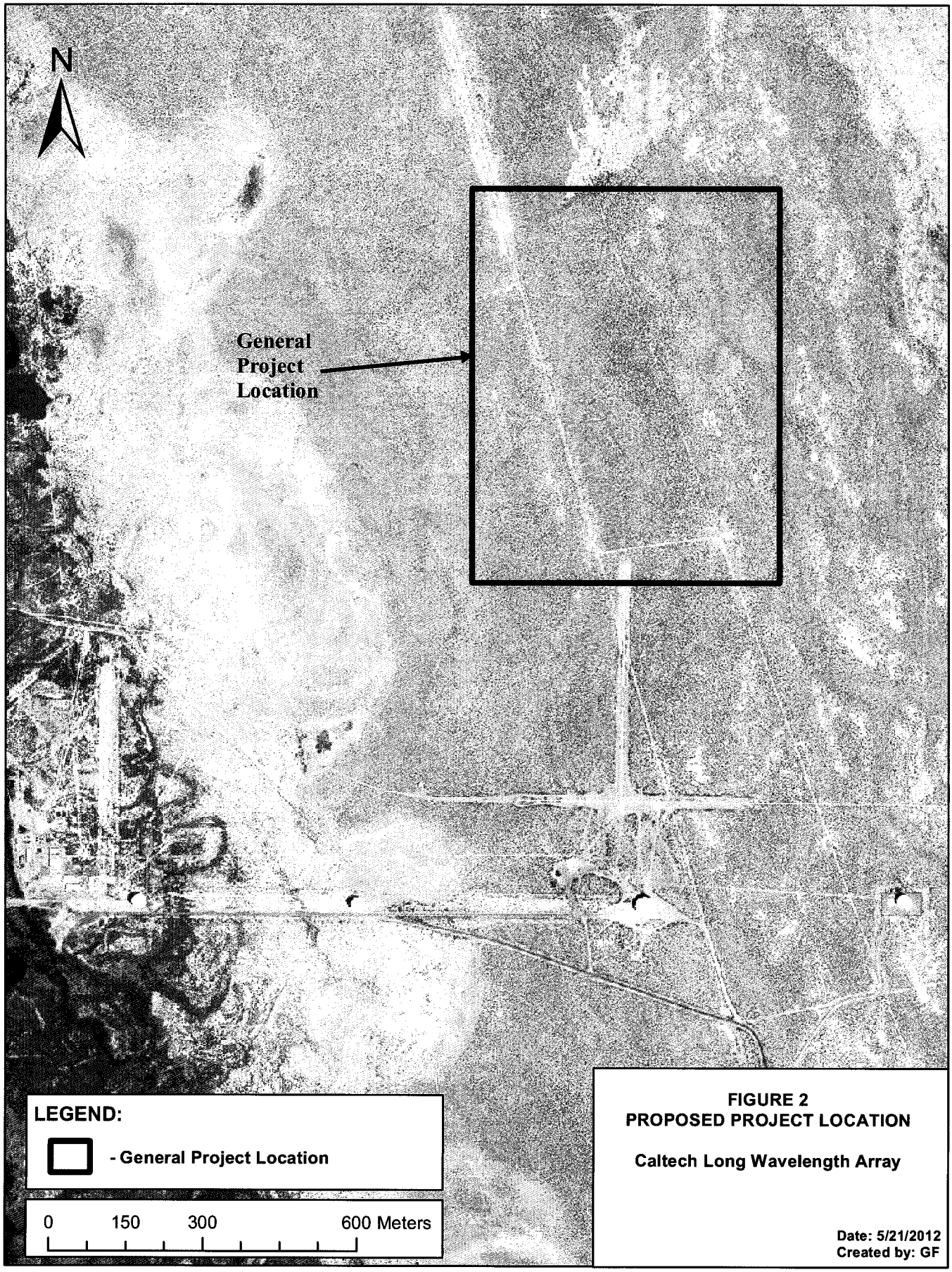


FIGURE 2
PROPOSED PROJECT LOCATION

Caltech Long Wavelength Array

Date: 5/21/2012
Created by: GF

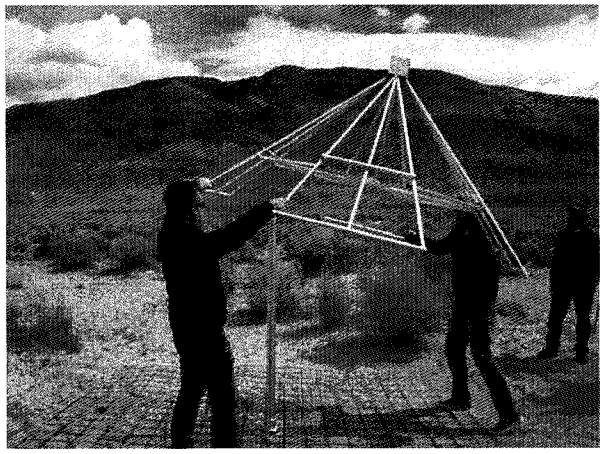
TEAM
ENGINEERING & MANAGEMENT, INC.
Bishop and Mammoth Lakes, California

12-00022

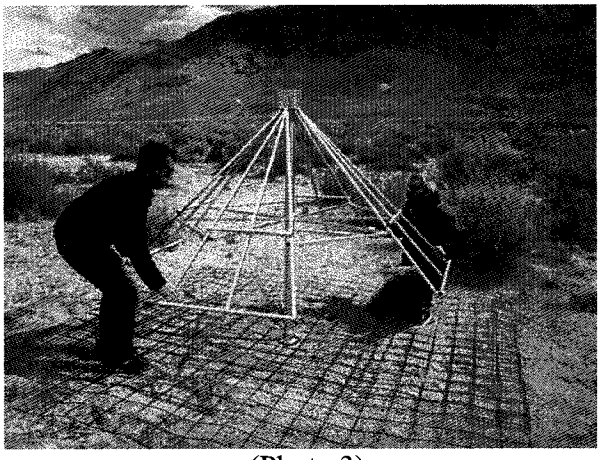
FIGURE 3
Long Wavelength Radio Antenna
Caltech Long Wavelength Array

A demonstration antenna of one of the 261 long wavelength radio antennas for the Caltech LWA was constructed and installed on a previously disturbed part of the Owens Valley Radio Observatory campus in April 2012. The following photos show the wire mesh ground screen with antenna pole installation (Photo 1), placement of the antenna on the pole (Photos 2 and 3), and the final installed antenna (Photo 4). The entire installation process took just over 5 minutes and can be completed by two people.

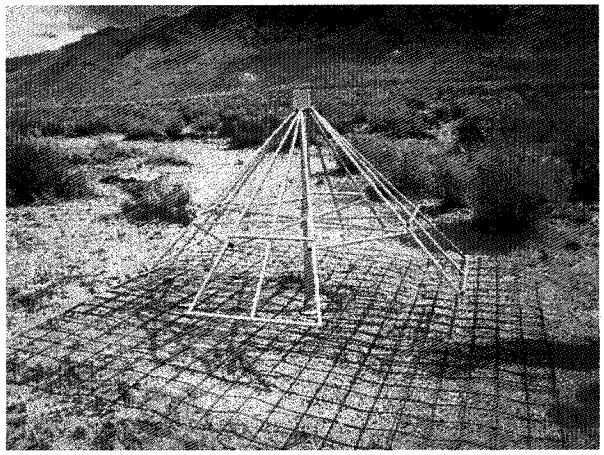
(Photo 1)



(Photo 2)



(Photo 3)



(Photo 4)

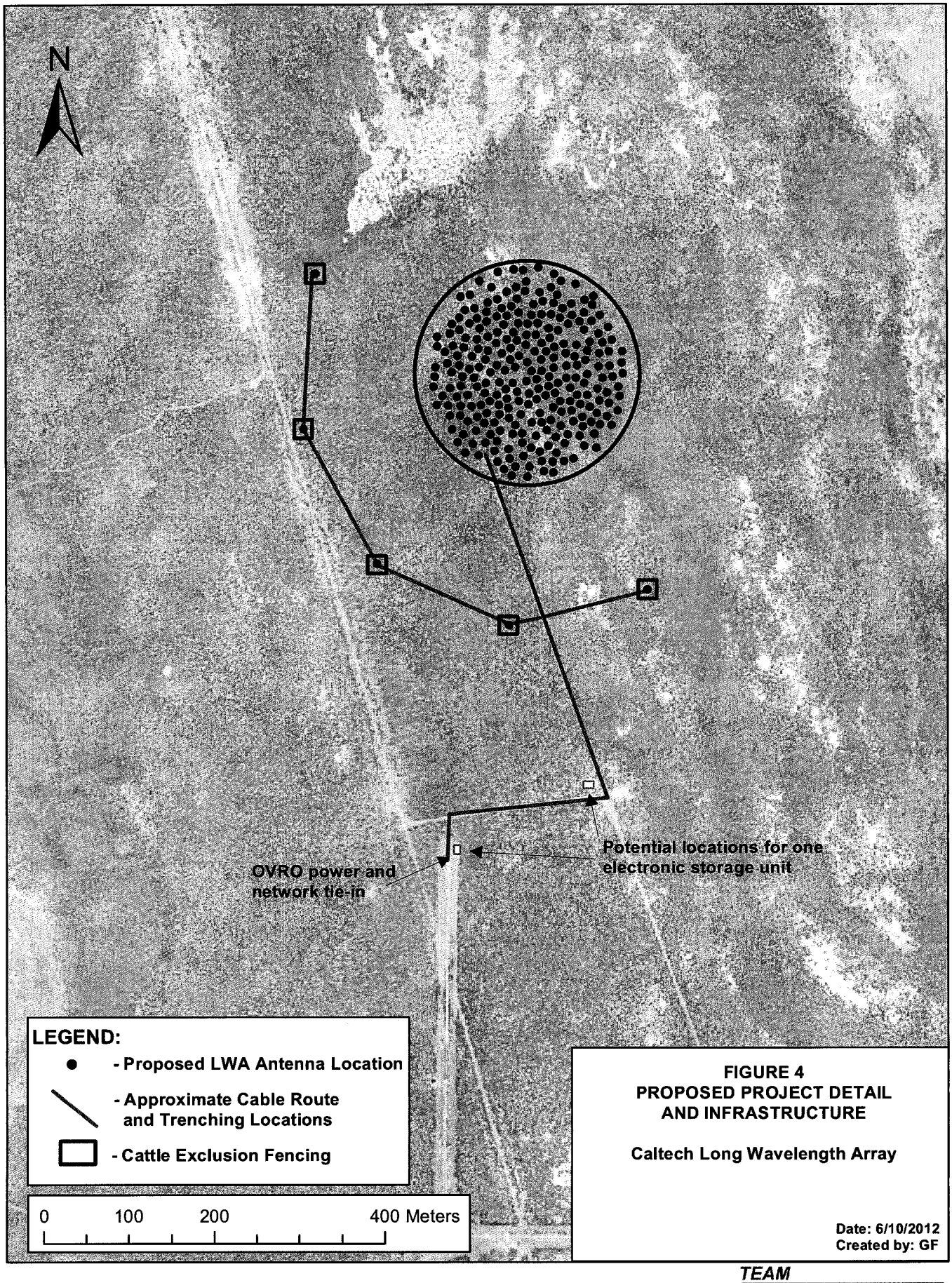


FIGURE 4
PROPOSED PROJECT DETAIL AND INFRASTRUCTURE

Caltech Long Wavelength Array

Date: 6/10/2012
Created by: GF

TEAM
ENGINEERING & MANAGEMENT, INC.
Bishop and Mammoth Lakes, California

12-00022