SECTION 1.0

Introduction

Rice Solar Energy, LLC, (RSE) a wholly owned subsidiary of SolarReserve, LLC, proposes to construct, own, and operate the Rice Solar Energy Project (RSEP or project). The RSEP will be a solar generating facility located on a privately owned site in unincorporated eastern Riverside County, California. The project will be capable of producing approximately 450,000 megawatt hours (MWh) of renewable energy annually, with a nominal net generating capacity of 150 megawatts (MW).

The facility will use concentrating solar power (CSP) technology, with a central receiver tower and an integrated thermal storage system. The RSEP's technology generates power from sunlight by focusing energy from a field of sun-tracking mirrors called heliostats onto a central receiver. Liquid salt[1], which has viscosity and appearance similar to water when melted, is circulated through tubes in the receiver, collecting the energy gathered from the sun. The heated salt is then routed to an insulated storage tank where it can be stored with minimal energy losses. When electricity is to be generated, the hot salt is routed to heat exchangers (or steam generation system). The steam is then used to generate electricity in a conventional steam turbine cycle. After exiting the steam generation system, the salt is sent to the cold salt thermal storage tank and the cycle is repeated. The salt storage technology was demonstrated successfully at the U.S. Department of Energy-sponsored 10-MW *Solar Two* project near Barstow, California, in the 1990s.

This unique CSP technology offers several important benefits. Because liquid salt has highly efficient heat transfer and storage properties, it is used as the heat transfer medium in the cycle. Natural gas heating is therefore not required for startup or for operating stability during routine cloud cover. Second, the stored energy in the salt can be extracted upon demand and produce electricity even when there is no sunlight. Finally, the output from the RSEP will produce a stable electricity supply, compensating for potential impacts on the electricity grid from other intermittent energy sources having less predictable operating characteristics.

The solar facility will have the following key elements:

- a large circular field of mirrors (heliostats) that reflect the sun's energy onto a central receiver tower
- a conventional steam turbine generator to produce electricity
- insulated tanks to store the hot and cold liquid salt heat transfer fluid
- an air-cooled condenser (ACC) to eliminate water consumption for cooling the steam turbine exhaust

[1] The salt is a mixture of sodium nitrate, a common ingredient in fertilizer, and potassium nitrate, a fertilizer and food additive. These mineral products will be mixed onsite as received directly from mines in solid crystallized form and used without additives or further processing other than mixing and heating.

- linear facilities including a 10.0-mile-long generator tie-line together with 4.6 miles of parallel access road and a separate, 1-mile extension to connect with the existing low-voltage power distribution network
- an onsite transformer and switchyard and a new interconnection substation for tie-in to the existing transmission line
- ancillary items such as tanks, transformers, heat exchangers, and buildings

The RSEP will be located in an unincorporated area of eastern Riverside County, California, (Figures 1.0-1 and 1.0-2). Land surrounding the project site consists mostly of undeveloped open desert that is owned by the federal government and managed by the U.S. Bureau of Land Management (BLM).

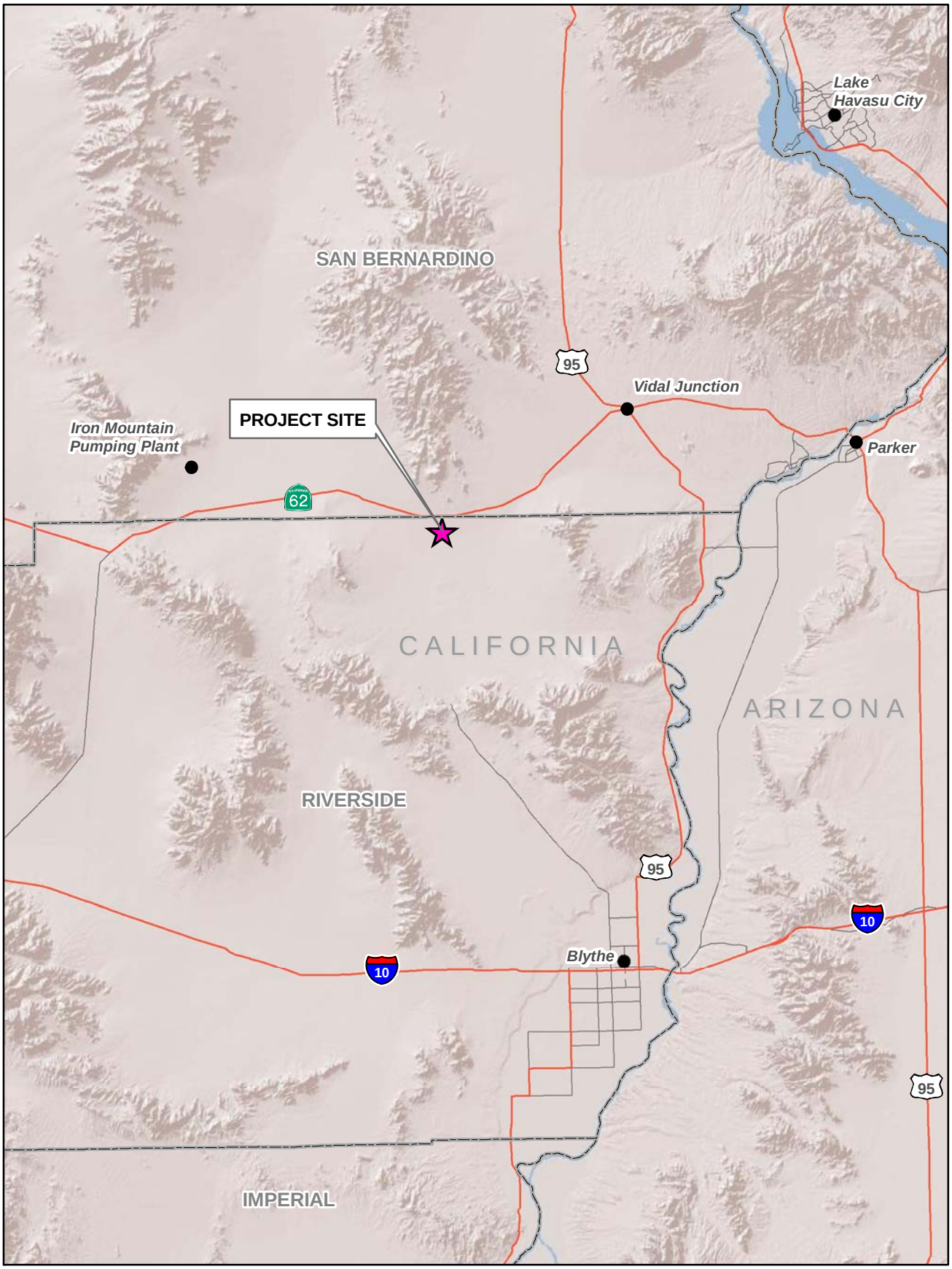
This Application for Certification (AFC) has been prepared in accordance with the California Energy Commission's (CEC) "Information Requirements for an Application" as described in Appendix B of the CEC's *Rules of Practice and Procedure, Power Plant Site Certification and Designation of Transmission Corridor Zones* (CEC 140-2008-03, July 2008).

In addition, RSE has made every attempt to avoid information gaps by reviewing data and information requests from the CEC, BLM, and state and federal resource agencies in other solar energy projects that are being evaluated at the CEC. Based on this review, we have, where practical, included information in the AFC to help streamline the processing of this application.

1.1 Project Objectives

The RSEP is being developed to provide sustainable, renewable, cost-effective energy, with energy storage for operating flexibility that contributes to the achievement of the renewable portfolio standards. Project objectives include the following:

- Generate controllable, predictable renewable power using integral thermal storage technology that:
  - captures solar energy throughout the day, through varying sunshine and even periods of dense cloud cover
  - stores thermal energy for electricity production during hours of peak electricity demand, including nighttime hours
  - generates stable power that enhances grid system stability and helps to facilitate integration of new intermittent renewable resources elsewhere
  - avoids the need for support from costly grid resources such as spinning reserves and peaking turbines
- Deliver a minimum of 450,000 MWh of cost-competitive renewable power annually
- Generator output sized to maximize energy deliveries, reliably, during high electric demand hours



LEGEND

PROJECT SITE

COUNTY BOUNDARIES

N

0 5 10

Miles

FIGURE 1.0-1
PROJECT LOCATION
RICE SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA

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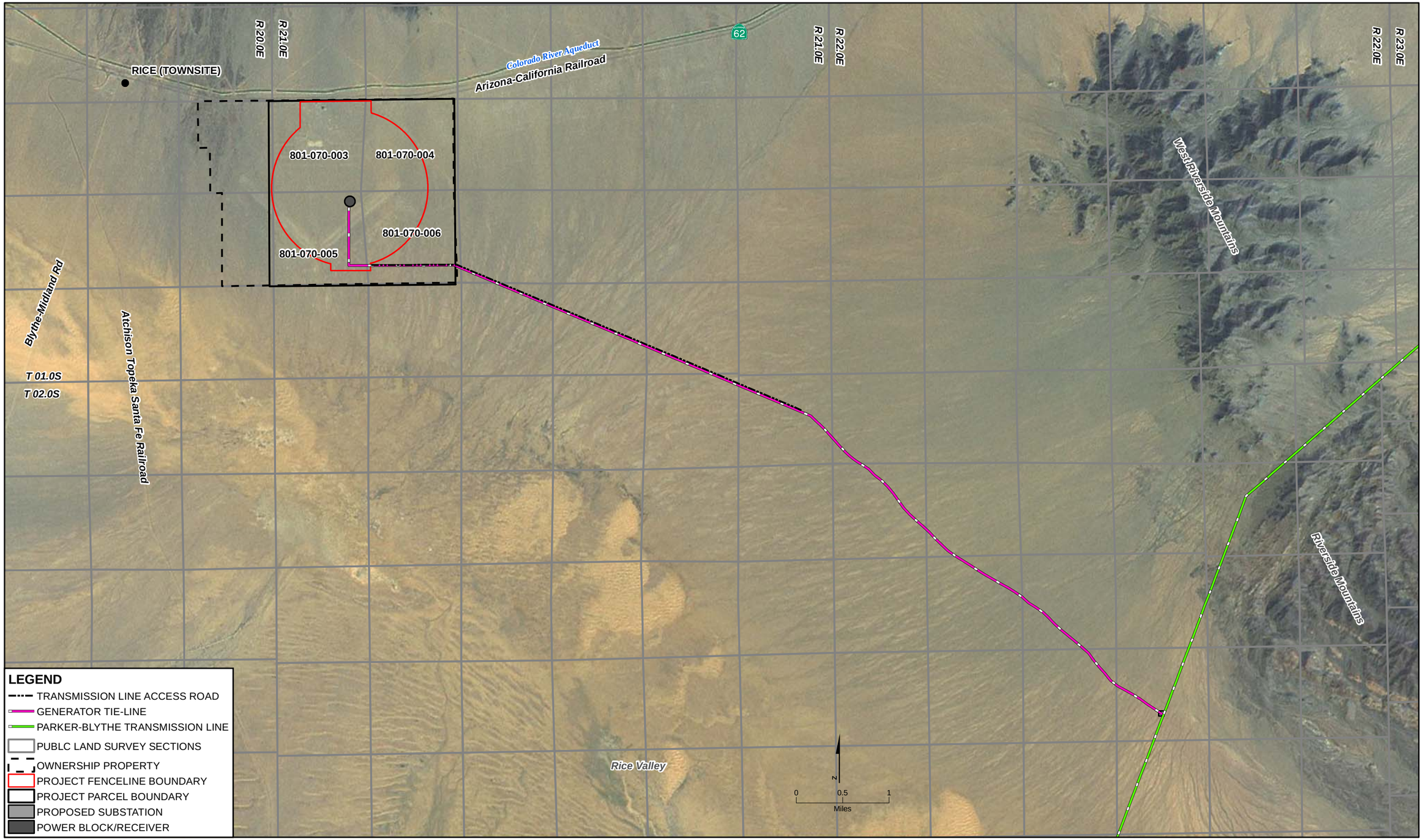

FIGURE 1.0-2
SITE LOCATION
RICE SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA

This map was compiled from various scale source data and maps and is intended for use as only an approximate representation of actual locations.

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- Minimize use of public lands by siting the project on private property that is formerly disturbed
- Produce a reliable electricity supply free of carbon emissions to help diversify California's electrical power generation portfolio

1.2 Project Location

The project is in an unincorporated area of eastern Riverside County, California, immediately south of State Route (SR) 62 at milepost 109 about 1 mile east of the junction with Blythe-Midland Road. The nearest active residence and permanent settlement is Vidal Junction, approximately 15 miles northeast, at the junction of SR 62 and U.S. Route 95. To the west, the nearest residences and permanent settlement are approximately 17 miles away at the Metropolitan Water District's (MWD) Iron Mountain Pumping Plant. The nearest town offering significant services is Parker, Arizona, approximately 32 road miles east. Blythe, California, is 40 miles south via Blythe-Midland Road. Twentynine Palms, California, is 75 miles west. In addition to SR 62, nearby infrastructure includes the Arizona-California Railroad and the Colorado River Aqueduct, both of which run east-west just north of SR 62 and just north of and within 600 feet of the northern boundary of the RSEP.

The RSEP is located within a larger, private holding that is 3,324 acres (the ownership property). This holding includes portions of Section 24 and 25, Township 1 South, Range 20 East; and all of Sections 19, 20, 29 and 30, Township 1 South, Range 21 East, San Bernardino Base and Meridian. There are six assessor's parcel numbers (APNs) that make up the ownership property: 801-042-004, 801-062-012, 801-070-003, 801-070-004, 801-100-005, and 801-100-006.

Within this ownership property, the RSEP is sited within a new square-shaped parcel (the project parcel) that will be created by merging what are currently four different assessor's parcels, each of them a discrete section (square mile) of land, resulting in a single 2,560-acre parcel. These are Township 1 South, Range 20 East, Sections 19, 20, 29, and 30. The four parcels are APNs 801-070-003, 801-070-004, 801-100-005, and 801-100-006.

Within the project parcel will be the administration buildings area, heliostat field with power block, and evaporation pond areas (collectively, the project site or facility site), totaling 1,410 acres, which will be surrounded by a security fence. Areas outside of the facility site but within the project parcel will not be fenced or developed as part of the RSEP. Maps of these parcels are attached as Appendix 1A.

The project site is located in a very sparsely settled portion of the Sonoran Desert. A small crossroads settlement known as Rice was once located just west of the project area, at the junction of SR 62 and the Blythe-Midland Road, but it was abandoned and only ruins of former structures remain.

The RSEP project site was used during World War II as Rice Army Airfield, a part of the army's Desert Training Center/California-Arizona Maneuver Area (DTC/CAMA). The Rice Army Airfield and adjacent Camp Rice were part of a three-state ad hoc training environment established to acclimatize troops to desert warfare between 1942 and 1944 and

involved infantry, artillery, and air support forces. The DTC/CAMA consisted of more than fourteen widely separate encampments or bivouac facilities and large maneuver and training areas surrounding the camps. After World War II, the military disposed of the airfield, transferred it to the county and later sold it into private ownership. Rice Airfield was operated privately until it was abandoned between 1954 and 1958.

The RSEP generator tie-line will follow a 10.0-mile path from the project site to an intercept point along the existing Western Area Power Administration (Western) Parker-Blythe transmission line, southeast of the project site. A new interconnection substation of approximately 300 feet by 400 feet (less than 3 acres) will be constructed at the tie-in point for the new circuit breakers that will accommodate the RSEP. The generator tie-line will cross land owned by the federal government and managed by the U.S. Bureau of Land Management as well as two small private parcels. The tie-in line will follow an existing dirt road for 5.4 miles and will require construction of 4.6 miles of a new single-lane, dirt access road. Separately, a short 1-mile span will be constructed to extend the existing low-voltage power distribution network to the project site to supply ancillary facilities.

RSE has applied for a right-of-way grant for the portion of the generator tie-line that crosses public land and has also filed for an interconnection study with Western. Involvement by both BLM and Western will trigger compliance with the National Environmental Policy Act as part of the environmental assessments performed for the project. A list of the property owners located within 1,000 feet of the proposed site and 500 feet of the tie-line is attached as Appendix 1B.

Figure 1.2-1 is an architectural rendering depicting the proposed project. Figure 1.2-2 is a photograph showing the project site in its current condition (as of AFC submission).

1.3 Project Owner

The RSEP will be owned and operated by RSE, a wholly owned subsidiary of SolarReserve, LLC, a Delaware limited liability company with its principal place of business in Santa Monica, California.

1.4 Persons Who Prepared the AFC

Persons with primary responsibility for the preparation of each section of this AFC are listed in Appendix 1C.

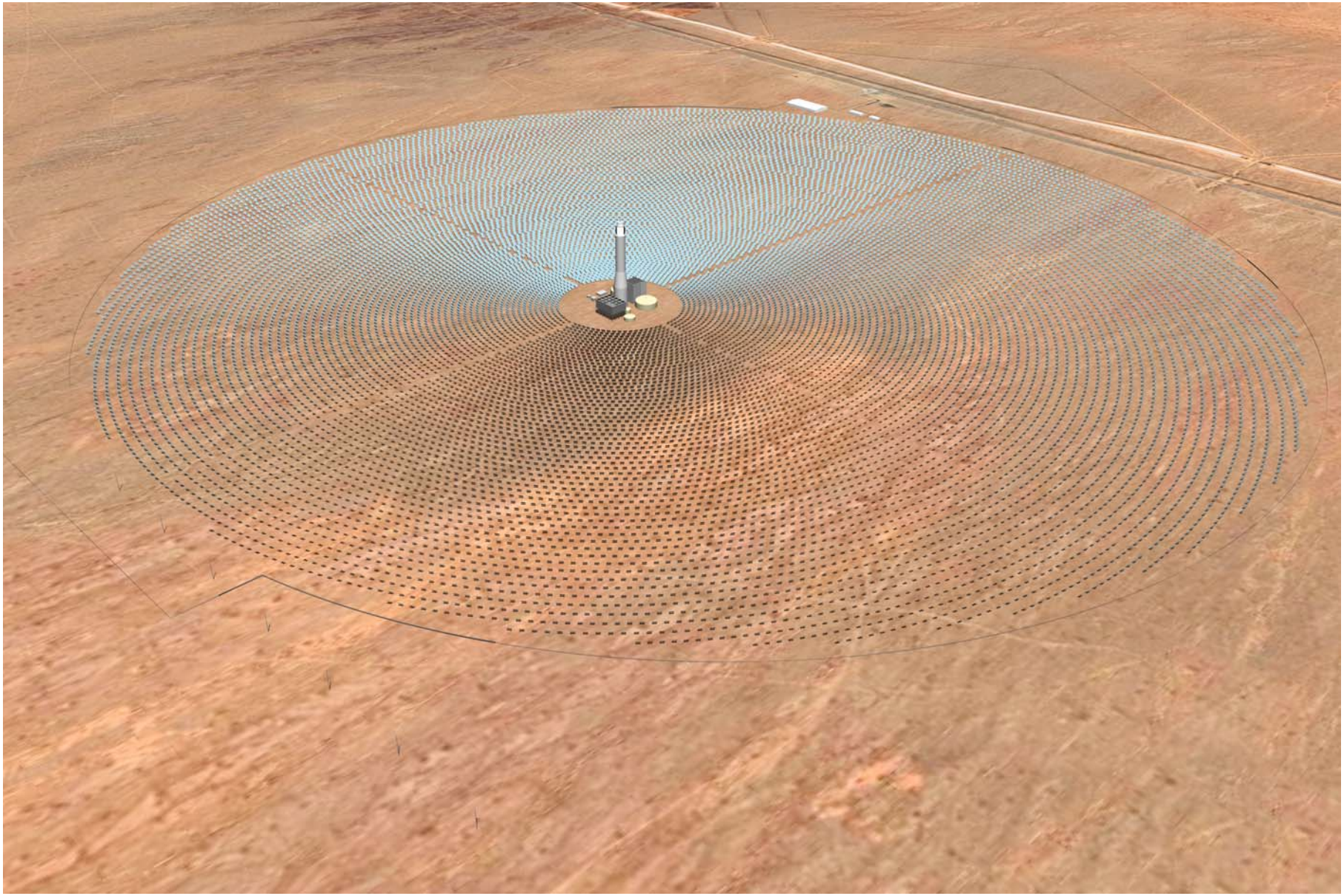

FIGURE 1.2-1
ARCHITECTURAL RENDERING
RICE SOLAR ENERGY PROJECT
RIVERSIDE COUNTY, CALIFORNIA

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View to the east across the heliostat field area.

FIGURE 1.2-2
PHOTOGRAPH OF THE EXISTING SITE
Rice Solar Energy Project
Riverside County, California