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Docket Number:	15-AFC-02
Project Title:	Mission Rock Energy Center
TN #:	207151-3
Document Title:	1.0 Introduction
Description:	N/A
Filer:	Sabrina Savala
Organization:	Mission Rock Energy Center, LLLC
Submitter Role:	Applicant
Submission Date:	12/30/2015 3:48:08 PM
Docketed Date:	12/30/2015

SECTION 1

Introduction

Mission Rock Energy Center, LLC (Mission Rock) proposes to construct, own, and operate an electrical generating plant in Ventura County, California. The Mission Rock Energy Center (MREC) will be a natural gas-fired, simple-cycle combustion turbine electrical generating facility rated at a nominal generating capacity of 275 megawatts (MW), co-located with battery units for the storage of electricity that can deliver an additional 25 MW. The MREC will also be fitted with a clutch system so that it can provide voltage support by operating as a synchronized condenser. Figure 1.1-1 provides an architectural rendering of the MREC.

1.1 Project Objectives

The MREC's primary objective is to combine dispatchable, operationally flexible, and efficient energy generation with state-of-the-art energy storage technology, to meet the need for new local capacity in the Moorpark Subarea of the Big Creek/Ventura local reliability area of Southern California Edison's (SCE's) service territory.

Operationally flexible resources are increasingly necessary to assist with the integration of intermittent renewable resources, such as solar and wind facilities, for grid operation. Additionally, peaking capacity is needed to respond to increases in the local demand for electricity that typically occur in the afternoons of summer days. MREC will provide real-time energy and voltage support to the grid. MREC will have the ability to start and achieve full operational capacity in 10 minutes, and will have black-start capability, allowing the facility to come online and support the grid to recover from a complete outage.

The same energy storage system that provides MREC with black start capability will also provide an additional 25 MW/100 MW hours (MWh) of flexible, preferred resource capacity to the grid. The energy storage system will be used to store energy during times of over-generation, which may be caused by intermittent renewable generation, and delivered back to the grid when needed.

MREC will provide a resource to balance the variability of renewable resources, to satisfy peak energy and capacity needs during high load events, and to support the electrical grid during outages of transmission lines and other generating facilities. CAISO has identified a near-term need for new power facilities that can support easily dispatchable and flexible system operation. MREC's objectives are consistent with this need as follows:

- Safely construct and operate a 275-MW, natural gas-fired, simple-cycle generating facility to meet SCE's growing need for local capacity due to the pending retirement of once-through cooling plants in the Moorpark subarea of the Big Creek/Ventura local reliability area of Southern California
- Site the MREC as near as possible to an SCE substation with available transmission capacity to serve the Moorpark Subarea.
- Site the MREC in an existing industrial area on a brownfield site, to minimize environmental impacts.

1.2 Project Location

The MREC will be located in unincorporated Ventura County, west of the City of Santa Paula, at 1025 Mission Rock Road (Figure 1.2-1). The MREC site is a 9.79-acre parcel that is currently used for recreational vehicle and boat storage, and which is paved with asphalt-concrete. The site is located in an industrial park, an area that is zoned General Industrial (Ventura County M-3, with minimum lot size of 10,000 square feet). Adjacent land uses include the Granite Construction Company asphaltic concrete plant and asphalt recycling facility, an automobile dismantling facility, vehicle storage for crushed cars,

auto repair and salvage yards, and agricultural production (Figures 1.2-2). Access to the site from Santa Paula to the northeast or Ventura to the southwest is via State Route (SR) 126, also called the Santa Paula Freeway or Orchard Farm Road. Local access is through the South Briggs Road exit from SR-126 and from there to South Pinkerton Road, Mission Rock Road, and Shell Road.

The Assessor's Parcel Number is 090-0-190-165. Appendix 1A contains the Alta Survey. A list of the owners of property within 1,000 feet of the MREC and 500 feet of the linears is provided under separate cover.

1.3 Project Elements

Figure 1.1-3 shows the MREC location and linear facilities. The main project elements, including linear facilities and construction laydown areas are as follows:

- Five GE Energy LM6000 PG combustion turbine generators (CTGs) (or equivalent) equipped with selective catalytic reduction (SCR) air emissions control equipment and associated support equipment for nitrogen oxides (NO_x) and carbon monoxide (CO) control. There is room on the site for a sixth LM6000 CTG if needed in the future.
- Lithium-ion and/or flow batteries in enclosed systems. Approximately 20 enclosures will house lithium-ion or flow batteries with nominal capacity of 25 MW or 100 MWh.
- Interconnection to SCE's Santa Clara Substation via a new 6.6-mile, 230-kV transmission line that runs west-southwest from MREC site to the SCE substation.
- Natural gas pipeline connection via 2.4 miles of new 16-inch-diameter pipe that will run southwest from the MREC site along Shell Road and the Southern Pacific Railroad right-of-way to interconnect with Southern California Gas Company's (SoCalGas's) existing high-pressure natural gas transmission pipeline (Line 404/406).
- A new 1.7-mile-long pipeline will bring treated recycled water from the Limoneira water treatment facility.
- Industrial wastewater consisting of reverse osmosis (RO) system reject and cooling tower blowdown from the chiller system will be discharged through Green Compass Environmental Solutions, Inc.'s to an existing pipeline in Shell Road, adjacent to the MREC site.
- Temporary construction facilities will include a 2.89-acre worker parking and laydown area immediately north of the MREC site.

Aerial Image © Google Earth 5/1/2015 Annotation © CH2M 2015

Figure 1.1-1.
Architectural Rendering
Mission Rock Energy Center

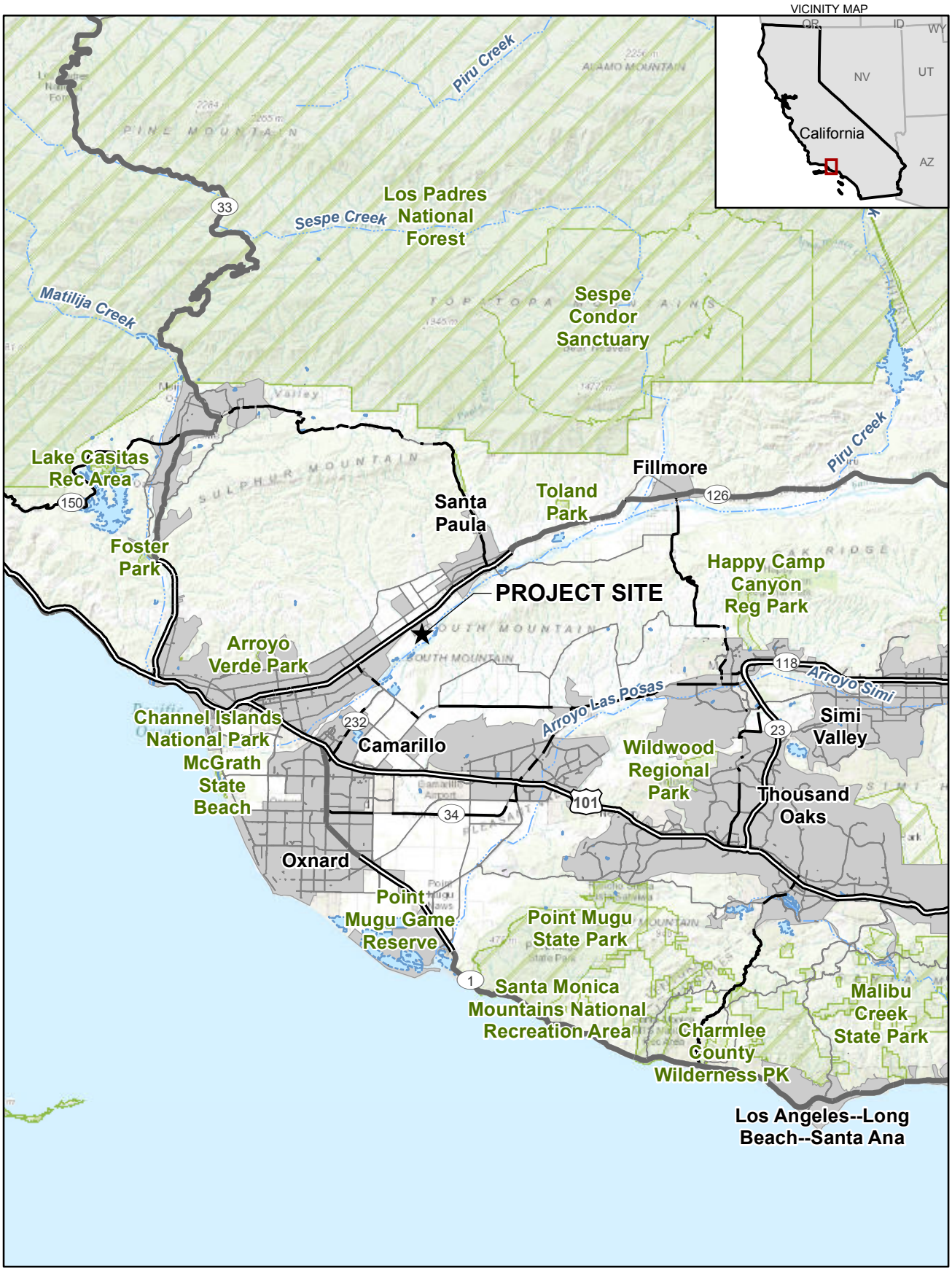
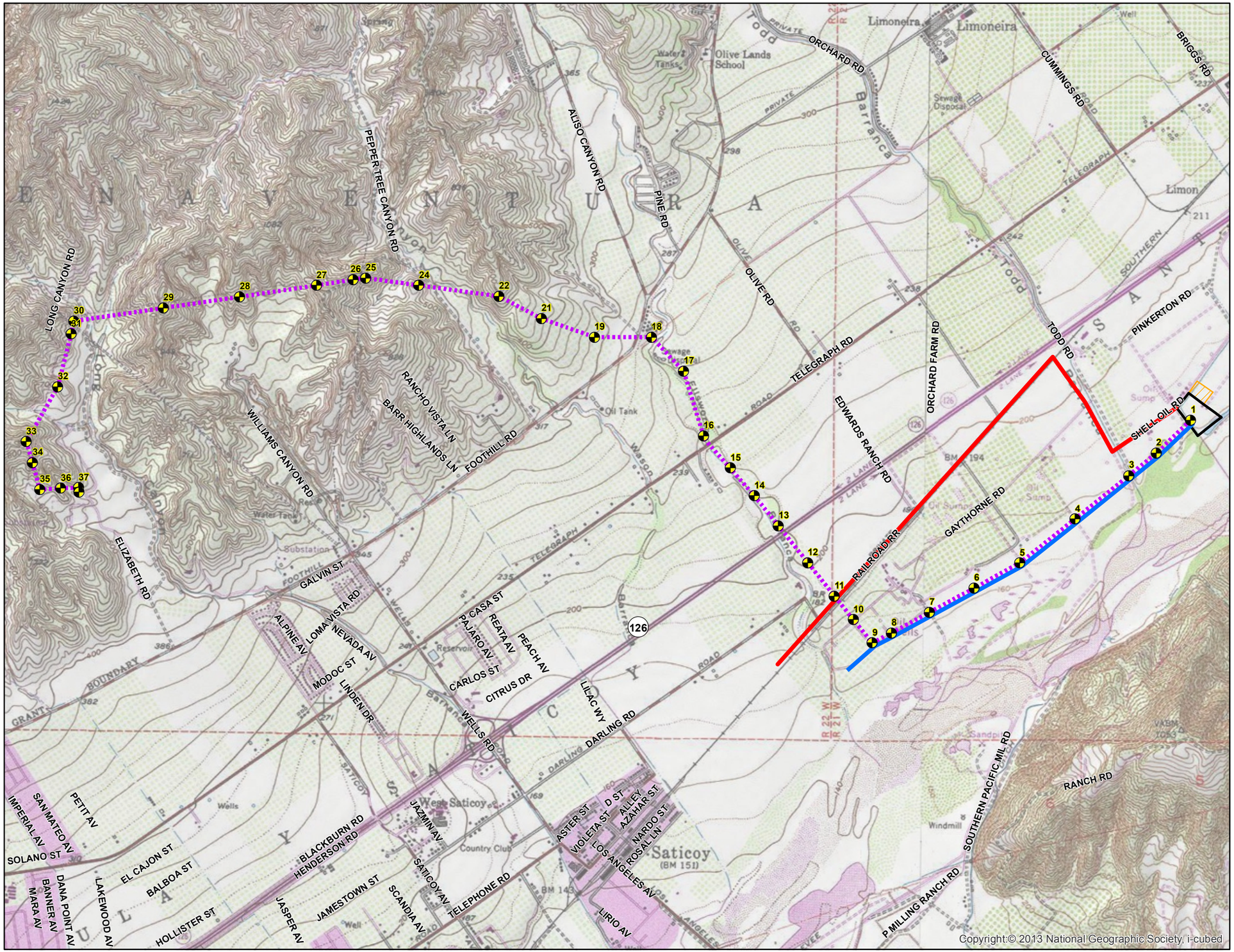


Figure 1.2-1
Regional Location
Mission Rock Energy Center
Ventura County, California



VICINITY MAP

LEGEND

- Project Site
- Laydown Area
- Tower
- Natural Gas Pipeline Route
- Generator Tie-Line
- Process Water Supply Line

N

0 1,000 2,000
Feet

Figure 1.2-2
Project Location
Mission Rock Energy Center
Ventura County, California

1.4 Project Benefits

The MREC will provide the following key environmental and economic benefits.

- **Key Project for Integrating Renewables:** The MREC will provide peaking power, energy storage, rapid start, and synchronous condenser voltage support services that are essential to integrate intermittent renewable energy sources into the electrical grid.
- **Local Reliability Support in the SCE Moorpark Subarea:** As aging coastal plants using once-through cooling retire, MREC will provide much-needed generation for local reliability in SCE's Moorpark Subarea. This area has been specifically identified by the CAISO as needing local reliability generation and ancillary grid services.
- **Minimized Land Use Impacts:** The MREC is sited on a brownfield site within an industrial park that is currently paved and used for vehicle storage. The site is zoned General Industrial (M3). There are no schools, residential areas, parks or recreational areas, or other sensitive land uses surrounding the site. The project is consistent with the applicable local land uses and land use plans.
- **Substantial Property Tax Revenue to Ventura County:** The MREC is expected to generate approximately $3,500,000 in property tax per year of which approximately $460,000 will go to the Briggs Elementary School, approximately $380,000 will go to the Santa Paula High School, and approximately $530,000 will go to the Ventura County General Fund.
- **Numerous Construction Jobs:** The MREC will provide for a peak of approximately 146 construction jobs over a 23-month construction and commissioning period.
- **Local Job Creation and Local Economic Benefits:** The MREC will have 15 full-time employees, all of whom will reside in the local area. The MREC will not significantly impact local housing, educational, or emergency response resources. In addition to the direct employment benefit, MREC will require and use the services of local or regional firms for major maintenance and overhauls, plant supplies, and other support services throughout the life of the MREC.
- **Recycled Water Usage:** Recycled water is used exclusively for NO_x control and power augmentation in the gas turbines. Potable water is only used for domestic purposes and secondary fire suppression.
- **No Significant Air Quality Impacts:** The MREC will use Best Available Control Technology (BACT) to reduce air emissions to minimal levels, and will provide air mitigation and improvements with the Ventura County Air Pollution Control District (VAPCD) to ensure there are no significant air quality impacts from MREC.
- **No Significant Visual and Noise Impacts:** The MREC will be located in an industrial zone, immediately surrounded by other industrial uses such as asphalt recycling and auto dismantling facilities.

1.5 Project Operation

As a peaking power plant, the MREC will operate to fill in the gaps between supply and demand using quick start and fast ramping capabilities. The MREC is expected to operate during times of very high electrical load, renewable generation fluctuation, or incorrect forecasts, when less flexible units are unavailable or need time to start, or during emergency conditions. As California continues to add more intermittent renewable resources to the system, quick start and fast ramping generation is needed to balance supply and demand and ensure reliability. The MREC will operate responsively to meet the electrical grid's evolving demands. The MREC will be licensed and permitted to operate up to

2,500 hours per year (28.5 percent of the time) to provide flexible capacity to firm renewable power during times of peak demand.

The MREC is configured to operate as a synchronous condenser. As a synchronous condenser, MREC will provide additional voltage support to maintain balance and stabilize the grid without consuming natural gas. Clutches installed on each gas turbine allow the facility to start and convert to a non-combustion operation that does not produce electricity, but is able to provide voltage support to the local grid. The MREC would be dispatched by the California Independent System Operator (CAISO) to operate in this configuration when energy generation is not needed from the MREC, but the transmission system requires voltage support.

The MREC's energy storage system will operate to provide black start capability to the peaking facility during times of complete grid outage, but will typically operate separately from the gas turbine peaking facility. The energy storage system will provide the MREC the power to restart and stabilize the grid after an outage, and is expected to store power during times of low wholesale market prices or over-generation due to the intermittency of renewables. The stored power will later be discharged to the grid during times of peak load. The energy storage system may also operate in order to provide the grid with ancillary services, such as frequency response, voltage support and load following services.

1.6 Project Ownership

Mission Rock will construct, own, and operate the MREC. Mission Rock is wholly owned by Calpine Corporation (Calpine). Calpine has been providing clean, reliable power for more than 30 years and is capable of delivering nearly 27,000 MW of clean, reliable electricity to customers and communities in 19 United States (U.S.) and Canada. Calpine's fleet of natural gas-fired plants is among the youngest and cleanest in the country. Calpine also operates the largest single renewable geothermal power resource in the world at the Geysers in the Lake and Sonoma Counties in California. Calpine owns and operates more than 5,000 MW of combined-cycle baseload and peaking, 500 MW of simple-cycle peaking, and 700 MW of renewable power capacity in California.

Calpine has been committed to sustainability since the company's inception, operating a fleet of clean, flexible natural gas and geothermal power plants with the lowest emissions of criteria pollutants when compared to the 10 largest U.S. electricity generators. Calpine's fleet also emits fewer greenhouse gases (GHGs) per MWh generated than any other independent power producer in the nation. Calpine has distinguished itself as an environmental leader among its peers in the energy industry and has a long record of taking an active role to support state and federal initiatives to reduce air pollution and carbon emissions from power plants. Calpine was recently the lone energy producer to file an amicus curiae brief in support of the U.S. Environmental Protection Agency's (EPA's) authority to regulate GHG emissions from power plants in the case of Murray Energy, et al. v. EPA, et al. Additionally, Calpine's Russell City Energy Center, located in Hayward, California, was the nation's first power plant to receive a federal air permit that included a limit on GHG emissions.

1.7 Project Schedule

Mission Rock is filing this Application for Certification (AFC) under the California Energy Commission's (CEC) 12-month licensing process. Construction of the MREC is expected to begin in November 2018. Pre-operational testing of the power plant is expected to begin in April 2020, and full-scale commercial operation is expected to begin by September 2020.

1.8 Persons Who Prepared the AFC

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