DOCKETED

Docket Number:	15-AFC-02
Project Title:	Mission Rock Energy Center
TN #:	207151-24
Document Title:	6.0 Alternatives
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 6

Alternatives

This section discusses alternatives to Mission Rock's proposed MREC. These include the "no project" alternative, power plant site alternatives, linear facility route alternatives, technology alternatives, and water supply alternatives. This discussion focuses on alternatives that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the potential impacts.

The CEQA requires consideration of "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (14 CCR 15126.6[a]).

Thus, the focus of an alternatives analysis should be on alternatives that "could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects" (14 CCR 15126.6[c]). The CEQA Guidelines further provide that "among the factors that may be used to eliminate alternatives from detailed consideration in an EIR are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts."

The Energy Facilities Siting Regulations (Title 20, CCR, Appendix B) guidelines titled *Information Requirements for an Application* require:

> *A discussion of the range of reasonable alternatives to the project, including the no project alternative… which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and an evaluation of the comparative merits of the alternatives.*

The data adequacy regulations also require:

> *A discussion of the applicant's site selection criteria, any alternative sites considered for the project and the reasons why the applicant chose the proposed site.*

A range of reasonable alternatives are identified and evaluated in this section, including the "no project" alternative (that is, not developing a new power generation facility), alternative site locations for constructing and operating the MREC, alternative project design features (including linear routes and water supply source), and various technology alternatives. This section also describes the site selection criteria used in determining the proposed location of the MREC.

6.1 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. The same energy storage system that provides MREC with black start capability will also provide an additional 25 MW/100 MW hours 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.

Operationally flexible resources are increasingly needed 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. The MREC is expected to run intermittently and provide real-time energy and voltage support to the grid. The MREC will have the ability to start and achieve full capacity in 10 minutes. The MREC will have black start capability provided by the energy storage system, which allows the facility to come online and support the grid to recover from a complete outage.

The same energy storage battery system that provides the MREC with black start capability will also provide an additional 25 MW/100 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 thus 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. The CAISO has identified a near-term need for new power facilities that can support easily dispatchable and flexible system operation. The MREC's objectives are consistent with this need as follows:

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

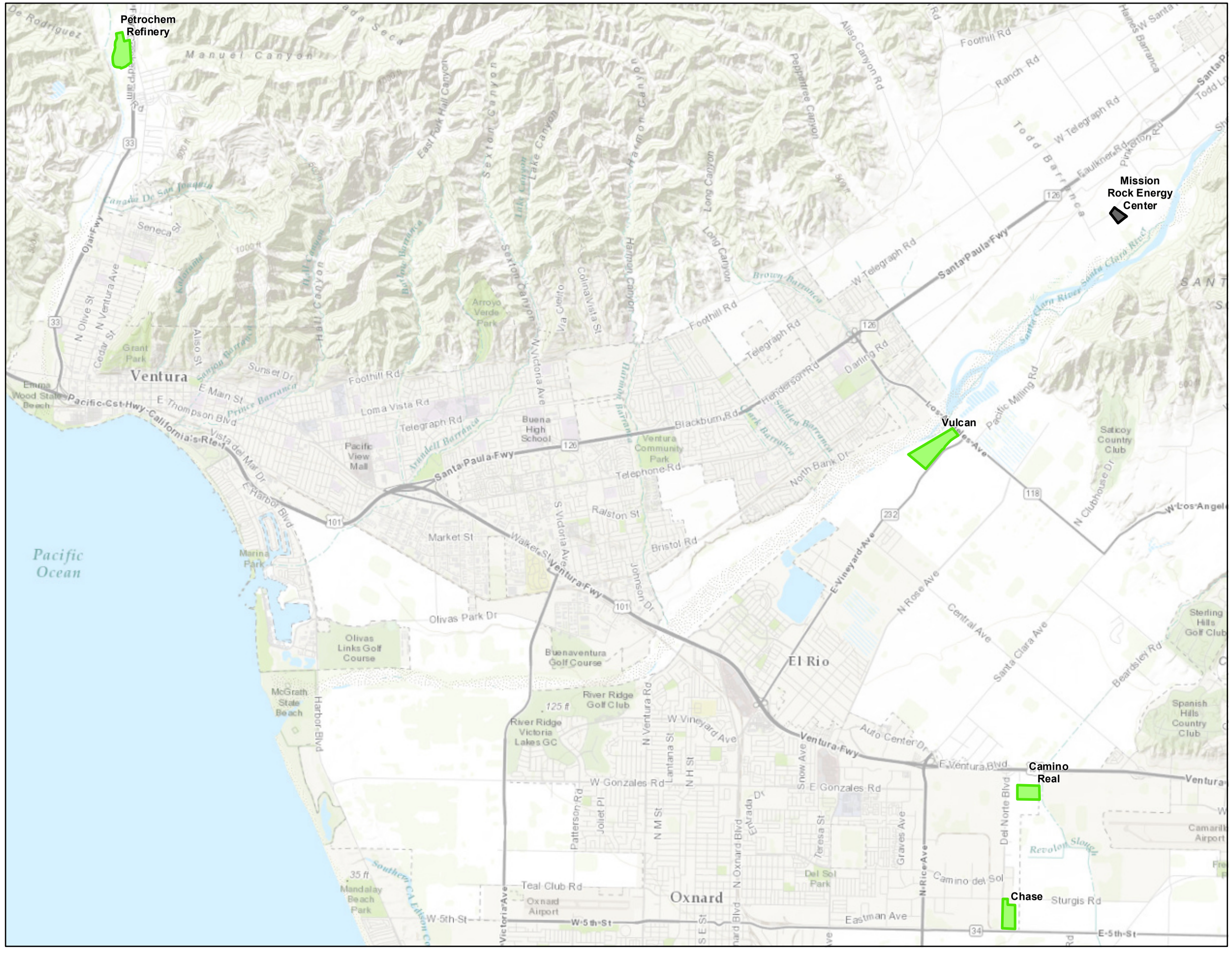
6.2 The "No Project" Alternative

If the project were not constructed, Mission Rock's basic project objectives would not be met, and the grid reliability, environmental, and policy benefits that this highly dispatchable and flexible peaking project offers would not be realized. MREC's wide range of operational capabilities offers crucial flexible capacity to support electrical system stability and reliability during periods of low wind and solar output and grid instability. Enhanced stability of the electrical grid will also allow for further integration of renewable resources, providing the state with a path forward towards achieving the 50 percent Renewables Portfolio Standard mandate set forth in Senate Bill 350. Further, the no project alternative does not meet California's environmental policy goals of encouraging development and deployment of preferred resources, such as the energy storage features of the MREC.

The no project alternative could result in greater fuel consumption, air pollution, and other environmental impacts in the state because older, less efficient plants with higher air emissions would continue to generate power instead of being replaced with cleaner, more efficient plants, such as MREC. Therefore, because the no project alternative would not satisfactorily meet the project objectives specified above, the no project alternative was rejected in favor of the proposed project.

6.3 Power Plant Site Alternatives

Several alternative site locations were assessed during initial screening for the MREC. This initial screening identified the MREC site and three alternatives. The alternative sites are shown in Figure 6.3-1. Although each of the alternative sites could feasibly attain most of the project's basic objectives, the MREC site clearly became the preferred alternative for a variety of reasons, including minimizing the



VICINITY MAP

LEGEND

- Project Site
- Altnerative Sites

N

0 0.5 1
Miles

Figure 6.3-1
Alternative Sites
Mission Rock Energy Center
Ventura County, California

ch2m

required construction of transmission, gas supply, and water supply linear features, and minimizing the project's environmental impacts. The key screening criteria used to select the MREC site and alternative sites included the following:

- Location within SCE's service territory
- Ability to gain site control
- Availability of sufficient land area
- Proximity to existing transmission and distribution lines and to an existing substation with transmission capacity
- Location near a source of water supply of sufficient quantity and quality
- Consistency and compatibility with the Ventura County zoning ordinances and existing land uses
- The ability to avoid or minimize potentially significant impacts on the environment

6.3.1 Proposed Project Site

The MREC site is located in unincorporated Ventura County, west of the City of Santa Paula, at 1025 Mission Rock Road. The MREC site is a 9.79-acre parcel currently used for recreational vehicle and boat storage which is almost entirely paved with asphalt-concrete. The MREC site is located in the Santa Clara River Valley within an industrial park, an area zoned General Industrial (Ventura County M-3, with minimum lot size of 10,000 square feet) that is known as the Mission Rock Area. Adjacent land uses include the Granite Construction Company asphaltic concrete plant and asphalt recycling facility, several automobile dismantling facilities, vehicle storage for crushed cars, auto repair and salvage yards, an oil and gas well and processing equipment, and agricultural production.

MREC will interconnect to the SCE Santa Clara Substation via a new 6.6-mile, 230-kV transmission line located approximately 4.5 miles west of the MREC site, as described in Section 3.0, Electrical Transmission. The natural gas line interconnection for the proposed power plant entails constructing approximately 2.4 miles of new 16-inch pipeline directly southwest from the project site to the point of interconnection with SoCalGas's high-pressure natural gas transmission lines 404/406. More information regarding the natural gas supply can be found in Section 4.0, Natural Gas Supply.

Service water will be provided from a new 1.7-mile-long pipeline connecting to the Limoneira Company's recycled water pipeline southwest of the MREC site. Process wastewater will be discharged to an existing pipe in Shell Road, adjacent to the MREC site, for disposal by Green Compass.

The MREC site meets the project objectives well. It is a brownfield site with relatively easy access to the Santa Clara Substation at 230 kV, is zoned appropriately for heavy industry, has an available recycled water supply, and would not conflict with sensitive land uses or receptors.

6.3.2 Alternative 1: Chase Site

The Chase site is a rectangular 25-acre parcel located within the City of Oxnard, 7.4 miles south of the MREC project site. The site is bounded by Sturgis Road to the north, South Del Norte Boulevard to the west, agricultural fields to the east, and East Fifth Street (SR-34) to the south. The parcel's eastern and southern boundaries are at the Oxnard city limit. Southwest of the parcel are agricultural uses within the City of Oxnard Planning Area of Interest in unincorporated Ventura County. South and southeast of the parcel are an oil well utility yard and several oil wells.

Light industrial uses within the McInnis Ranch Business Park are located to the north and northwest. A recycling center is located to the west. Approximately half of the Chase site is in agricultural use (plant nursery) and half is occupied by a cement batch plant and storage/light industrial yard. The General Plan

land use designation of the property is Light Industry and the zoning designation is Light Manufacturing/Planned development.

There are five substations in Ventura County with 230 kV capacity. Two of these (Mandalay and Ormond Beach) serve existing generating stations and so would not be likely to have capacity to carry significant additional load. Reaching the Casitas substation would involve obtaining right-of-way through dense urban areas and over mountains. This leaves the Moorpark and Santa Clara Substations as potential interconnection locations.

A generator tie-line running to SCE's Moorpark Substation would need to be more than 15 miles long (direct distance is approximately 14 miles), depending on the routing. For example, one 18-mile-long route to the Moorpark substation would run to the southeast of the parcel, avoiding densely developed areas in Camarillo to an existing transmission corridor that connects Moorpark Substation with the Ormond Beach Power Plant. A second routing of 15 miles or more would run northeast from the parcel running through agricultural areas to the north of Camarillo.

A generator tie-line routing to the Santa Clara substation avoiding the urban areas of Ventura would be approximately 12 miles long.

This site would interconnect with SoCalGas's high pressure gas transmission line via a new 0.9-mile-long pipeline west to the existing line in South Rice Avenue.

Tertiary-treated, recycled water is likely available for this site through the City of Oxnard's Advanced Water Purification Facility (AWPF). This facility was recently completed (2012) through an initial phase to produce 6.25 million gallons per day (mgd) of recycled water and the City has plans to increase production to 25 mgd (Vorissis, 2013), so it is likely that the facility would have capacity to serve the project. The AWPF is located near Oxnard's southern boundary and a recycled water pipeline from that location could follow a number of routes. Direct distance to the Chase site is 4.8 miles, but the most direct routing using the existing rail and street grid, would be approximately 7.3 miles.

6.3.3 Alternative 2: Vulcan Site

The Vulcan site is a 55.2-acre parcel located just south of the Santa Clara River in an unincorporated area of Ventura, south of the community of Saticoy. The parcel is currently occupied by a Vulcan Materials construction aggregates facility named Saticoy Recycled, at 6029 Vineyard Avenue. The site is bound by the Santa Clara River floodplain on the northwest, SR-118 (Los Angeles Avenue) to the northeast, SR-232 (East Vineyard Avenue) to the southeast, and an agricultural property to the southwest. Surrounding land uses are mostly agricultural to the south and east and suburban residential to the north and west. To the northeast is another construction aggregate business. The parcel's General Plan land use designation is Open Space and the zoning designation is Open Space.

A power plant at this site could connect with the SoCalGas's high pressure gas transmission line in Los Angeles Avenue, adjacent to the parcel. A generator tie-line running to SCE's Santa Clara Substation would be approximately 5.3 miles long.

The best option to obtain service water for the Vulcan site would be to connect with the Limoneira Company recycled water pipeline at the same location planned for the MREC project at the Mission Rock site. This would require a pipeline 1.7 miles long. Alternatively, service water could be obtained from the Ventura Water Reclamation Facility or the Oxnard AWPF, depending on availability. The Ventura facility is 7.2 miles west of the Vulcan site, and a pipeline route would be more than 8 miles. Direct distance to the Oxnard facility is 9.2 miles.

6.3.4 Alternative 3: Camino Real

The Camino Real site is a 27-acre parcel located within the Oxnard city limit. The site is currently in agricultural row-crop use (strawberries). The parcel is bordered on the east by the Edison Canal, and on

the other three sides by agricultural fields. The southern and eastern boundaries of the parcel are also City of Oxnard boundaries. North Del Norte Boulevard is 700 feet to the west and Camino Avenue is 800 feet to the north and serves as a frontage road to U.S. Highway 101. An SCE 115-kV transmission line traverses the site diagonally, from the center of the northern boundary of the parcel, to its southwestern corner.

Surrounding uses are agricultural for at least one half-mile, except for the small business park the Camino Real Industrial Plaza, approximately 250 feet north of the northern boundary. Uses in the business park include a health care outlet, an industrial hose supplier, a power machinery outlet, and church.

The General Plan land use designation of the property is Light Industry and the zoning designation is Light Manufacturing/Planned development.

A generator tie-line running to SCE's Moorpark Substation from the Camino Real site would be approximately 15 miles long. A routing to the Santa Clara substation avoiding the urban areas of Ventura would be approximately 10.4 miles long.

This site would interconnect with SoCaGas's high pressure gas transmission line via a new 1.1-mile-long pipeline west to the existing line in North Rice Avenue.

Tertiary treated, recycled water is likely available for this site through the City of Ventura's Water Reclamation Facility, which is located approximately 9 miles west of the Camino Real site. A pipeline route to Limoneira Company's recycled water pipeline would be approximately 6.6 miles long.

6.3.5 Alternative 4: Petrochem Refinery

The USA Petroleum/Petrochem Refinery site (Petrochem site) is a 98-acre parcel located along State Route 33 at Crooked Palm Drive, north of Ventura. The site is a former fertilizer plant and oil refinery that has been shut down since 1984. The property is bordered by open space to the north and south, the Ventura River Trail/Ojai Valley Trail bicycle and pedestrian path and Ventura River to the west and, across State Route 33, residential and agricultural uses to the east. Some of the former refinery equipment has been removed and some remains, and the owner is under a regulatory requirement to remove the remainder of the equipment.

The General Plan Land Use Designation is Existing Community/Urban Reserve and the zoning designation is M3 – General Industrial.

A generator tie-line to the Santa Clara Substation would be 7.2 or more miles long, depending on routing. A generator tie-line to the Casitas Substation would be about 3.5 miles long. A SoCalGas high-pressure gas distribution line is available immediately to the east of the site. Obtaining recycled water from the City of Ventura Water Treatment facility, if it were available, would require an 8.5-mile-long pipeline.

6.4 Comparative Evaluation of Alternative Sites

In the discussion that follows, the sites are compared in terms of each of the 16 topic areas required in the AFC. The following topics are of particular interest:

- **Land Use Compatibility—**Is the parcel zoned appropriately for industrial use and compatible with local land use policies?
- **Routing and Length of Linear Facilities—**Can linear facilities be routed to the site along existing transmission lines, pipelines, and roads? Will linear facilities be significantly shorter for a given site?
- **Visual Resources—**Are there significant differences between the sites in their potential for impact on significant or protected viewsheds?

- **Biological Resources—**Would there be significant impacts on wetlands or threatened or endangered species?
- **Noise—**Is the site sufficiently near a sensitive receptor area such that it would be difficult to mitigate potential noise impacts below the level of significance?
- **Use of Previously Disturbed Areas—**Has the site been previously disturbed? Does the site minimize the need for clearing vegetation and otherwise present low potential for impact on biological and cultural resources?

6.4.1 Project Development Constraints

As indicated in the introductory descriptions of each of the alternative sites, the basic needs of power plant siting for land and access to electrical transmission, gas supply, and water are met with the MREC using a relatively short generator tie-line and gas and water supply pipelines.

The Chase site would require a generator tie-line of 12 to 18 miles, depending on the route and destination chosen, assuming a tie-line that connects to either the Moorpark or Santa Clara substation. This site would require a process water pipeline of approximately 7.3 miles. These distances are significantly longer than those required for the MREC site. The gas supply line to the Chase site would be 0.9 miles, somewhat shorter than for MREC.

The Vulcan site would require offsite linears to connect to gas, transmission, and water equivalent to or shorter than those required for the MREC site. A generator tie-line route to the Santa Clara Substation would be approximately 5.3 miles long, a process water supply line to Limoneira Company's recycled water supply pipeline would be 1.7 miles long, and natural gas is available at high pressure adjacent to the site in Los Angeles Avenue.

The Camino Real site would require a generator tie-line of 12 to 15 miles, and a water supply line of 6 to 9 miles. The distance to a high pressure natural gas line from this site is 1.1 miles.

The Petrochem site would require a generator tie line of more than 7 miles to the Santa Clara substation or a 3.5-mile-long generator tie line to the Casitas substation. Natural gas is available adjacent to the site. Recycled water is likely available from the City of Ventura, via an 8.5-mile-long pipeline route.

6.4.2 Air Quality

The plant's configuration and operation would be essentially the same from an air quality perspective at each location. These sites are all in the same air district (VCAPCD) and offsets acquired by MREC would be equally appropriate for each site. The type and quantity of air emissions from the alternative sites would be identical. The impacts on the human population and the environment may differ slightly because of the location of residences and other human uses in the project vicinity. The MREC site is located 941 feet from the nearest residence, but there are only a handful of residences within 1 mile of the site. The Chase site also has few residences within 1 mile as it is surrounded by agricultural and industrial uses including oil fields. The Vulcan site is approximately 2,200 feet from the nearest residence, but this residence is part of a suburban neighborhood of Ventura/Saticoy, and there is a large number of residences with 1 mile of the Vulcan site, on the order of several hundred. The Camino Real site is approximately 1,600 feet to the nearest residence, an isolated farmstead, and is 0.4 miles from dense residential development. A medical facility, considered a sensitive land use because of the potential concentration of elderly people and those with medical conditions, is very close to this site at approximately 250 feet from its northern boundary. The Petrochem site is 500 feet or less from several isolated residences and 800 feet or less from two large areas of dense residential development.

6.4.3 Biological Resources

Special-status species recorded, or potentially occurring in the region, are generally the same for all sites. Four of the five are currently developed sites that would not destroy or damage wildlife habitat, although the Chase site has agricultural and open lot areas that could be used by wildlife. The Camino Real site is in agriculture. The MREC site is entirely paved and the Vulcan site is occupied by aggregate storage piles and processing equipment. In terms of adjacent habitat, the MREC and Vulcan sites are similar in that they are near to the Santa Clara River floodplain, and important wildlife habitat area and corridor. The Petrochem site is adjacent to the Ventura River riparian corridor and floodplain.

Generator tie-line routes for each site include mostly developed or agricultural areas and some undeveloped area that is hilly, grazing land, covered in chaparral or coastal sage scrub. One of the Chase site generator tie-line options that would interconnect with the Moorpark Substation would involve more than 8 miles of routes in undeveloped areas, with resulting impacts to natural habitats. An alternate route would mostly avoid these areas. The Petrochem generator tie-line route to the Santa Clara substation would also cross undeveloped areas. Each of the sites could involve construction across and through coastal sage scrub and riparian habitats, but would not have a permanent surface footprint in these areas (other than transmission tower bases).

Generally speaking, the largest potential for impacts to biological resources appears to be the potential for construction and operation to disrupt the nesting of listed birds in the Santa Clara and Ventura River floodways, such as the least Bell's vireo and Southwest willow flycatcher. This potential impact applies to the MREC, Vulcan, and Petrochem sites, but not the Chase or Camino Real sites, which are not located adjacent to a floodplain. The Chase and Petrochem sites currently provide habitat for the burrowing owl, however, unlike the other sites.

6.4.4 Cultural Resources

There are no known significant cultural resources at the MREC site. Resources of the other three sites are unknown. The MREC, Vulcan, and Petrochem sites have moderate to high sensitivity because of their location adjacent to the Santa Clara River. Sensitivity of the Chase and Camino Real sites are somewhat less as they are located in the Oxnard Plain and not near key drainages or other landforms that would be attractive to prehistoric settlement. The MREC, Vulcan, and Camino Real site generator tie-line routes that extend to the Santa Clara substation would run through a locally designated (Ventura County) historical district, the Santa Clara Valley of Ventura County Historic District. Although this district has been found to meet the criteria for listing in the NRHP, it has not been formally listed in the register. Properties that contribute to the district include agricultural parcels, mostly in orchard and row crops, and farmsteads and utility structures building between 1860 and 1945. The district includes several thousand acres of contributing parcels and 220 contributing buildings and encompasses most of the Santa Clara Valley between Santa Paula and Saticoy/Ventura. The potential effects of the generator tie-line routes from the Vulcan and Camino Real sites on the district have not been determined, but it is reasonable to assume that the lines would be able to avoid direct effects to the contributing properties.

6.4.5 Geological Resources and Hazards

There are no significant differences in terms of geological hazards present at each site. The Vulcan site is designated by county zoning overlay as a Mineral Resource Protection area, as it serves as a source of construction aggregates.

6.4.6 Hazardous Materials Handling

There would be no significant difference between the site locations in terms of hazardous materials handling. The uses of hazardous materials would be the same for any of the sites.

6.4.7 Land Use and Agriculture

The three sites are all located within Ventura County. The MREC, Vulcan, and Petrochem sites are in unincorporated areas and the Chase and Camino Real sites are within the City of Oxnard. The General Plan land use designation, zoning designation, and current land use of the sites are shown in Table 6.4-1.

Table 6.4-1 Land Use Designations and Uses

Site	General Plan Land Use Designation	Zoning District	Current Land Use
MREC	Mission Rock Road Existing Community	M3-General Industrial, 10,000 square feet minimum lot	RV and boat vehicle storage
Chase	Light Industry	M1-Light Manufacturing/ Planned Development	Plant nursery and cement batch plant
Vulcan	Open Space	OS – Open Space /MRP – mineral resources protection overlay, 80-acre minimum lot	Aggregate building materials processing and storage
Camino Real	Light Industry	M1-Light Manufacturing/ Planned Development	Agricultural row crops (strawberries)
Petrochem	Existing Community/Urban reserve	M3-General Industrial, 10,000 square feet minimum lot	Unused, former industrial site

MREC—The MREC zoning designation allows for power generation, although the Ventura County Zoning Ordinance table of permitted uses does not mention power generation (other than renewable sources). The zoning ordinances states:

> *The M3 Zone, as the heaviest manufacturing zone, is intended to provide for uses involving the kinds of processes, activities and elements which are specifically excluded from the M1 Zone* (Ventura County Ordinance Code, Division 8, Chapter 1, Section 8104-5.3).

There is no specified height limit for this zone unless the property is less than 100 feet from a residential zone, which the MREC site is not.

Chase Site—The Chase site is located in the City of Oxnard's Light Industrial land use designation area and is zoned M1 (Light Manufacturing). Power generation is not among the list of permitted uses for this zone in the City's zoning code, although "Electrical transmission and distribution substations" is a permitted use. Power generation is not explicitly prohibited in this zone. It is, however, mentioned in the zoning code as a permitted use in the City's M2 (Heavy Manufacturing) zone, as "Steam electric generating stations operated by gas or fuel oil." This wording would appear to exclude simple-cycle gas-fired power plants lacking a steam turbine generator, but this may simply reflect a time period when simple-cycle peaking plants were uncommon for utility use. All developments in the M1 zone require a Special Use Permit. There is a height limit of 55 feet, which would require that a variance be granted for the project, which has a stack height of 80 feet.

Vulcan Site—The Vulcan site is currently operated as a construction aggregates processing and supply business. The site is located adjacent to the Santa Clara River floodplain and has a General Plan land use designation of Open Space and a zoning designation of Open Space with a Mineral Resources Protection overlay. This refers to the mining of sand and gravel for construction aggregates. The Ventura County code includes the following description of this zoning designation:

> The **Open Space** designation encompasses … any parcel or area of land or water which is essentially unimproved and devoted to an open-space use as defined in this section …
>
> - *Open space used for the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands not designated agricultural; areas required for recharge of groundwater basins; bays, estuaries, marshes, rivers and streams which are important for the management of commercial fisheries; and **areas containing major mineral deposits** (emphasis added), including those in short supply* (Ventura County Ordinance Code, Division 8, Chapter 1, Section 8104-5.3, emphasis added).

Power generation does not appear to be a permitted use in the Open Space zone. The use of the Vulcan parcel for a power plant may conflict with its designation as a Mineral Resource Protection area as well, although the Vulcan parcel is 55 acres in size, and could possibly accommodate both power plant and construction aggregates processing uses. In addition, under the terms of the County's Save Open Space and Agricultural Resources (SOAR) initiative, siting a power plant in Open Space zone would require a popular vote.

Camino Real Site—The Camino Real site is located in the City of Oxnard's Light Industrial land use designation area and is zoned M1 (Light Manufacturing). As stated for the Chase site, power generation is not among the list of permitted uses for this zone in the city's zoning code, although "Electrical transmission and distribution substations" is a permitted use. Also as with the Chase site, there is a height limit of 55 feet, which would require a zoning standard variance be granted for the project, which has a stack height of 80 feet.

Petrochem—The Petrochem site is also in the Ventura County M3 (General Industrial) zone. The site is more than 100 feet from a residential zone, so the height limit would not apply

Agricultural Land Conversion—The MREC site and the southern half of the Chase site are classified as urban land and the Vulcan site is classed as other land (not agricultural or urban). The northern half of the Chase site and all of the Camino Real site are classified as Farmland of Statewide importance. The Chase and Camino Real sites would therefore involve conversion of agricultural land, although within the urban limit line of the City of Oxnard and in a location planned and zoned for light industry.

6.4.8 Noise

The MREC is located approximately 940 feet from the nearest residence and approximately 1,125 feet from a second residence.

At the Chase site, the nearest residences are approximately 600 and 800 feet, respectively, from the northern boundary of the site. From the southern half of the site, the nearest residences are 995 and 1,100 feet, respectively, from the parcel. The Chase parcel covers 25 acres, thus a 10-acre project could be sited on the northern or southern half of the parcel.

Residential uses border the Vulcan parcel to the southeast with the nearest residence approximately 100 feet from the parcel boundary. This property covers 55 acres, thus it is possible the power plant could be sited within this parcel at its northern end, approximately 2,000 feet from the nearest residence. Dense suburban residential development is located across the Santa Clara River floodplain, approximately 2,000 feet to the north and west.

There is an isolated rural residence approximately 1,600 feet from the Camino Real site. A dense suburban residential area is approximately 0.4 miles to the northwest. The area is on the opposite side of the US 101 Freeway, such that the noise from the project may not contribute much to the already high ambient noise near this roadway. It is more problematic that a medical facility and church, which are noise-sensitive land uses, are located only 350 and 500 feet to the north, respectively, in the Camino

Real Industrial Plaza. Siting the facility in the southeastern corner of the parcel could help in this regard to increase the distance from the power plant equipment that produces the most noise.

The Petrochem site is close to a number of residential uses. Isolated rural residences are located across State Route 33 at distances of 380, 520, and 530 feet, respectively. Dense residential developments are located to the southeast at 800 feet and northeast at 580 feet. These close distances would be problematic, but could be mitigated to some extent by positioning the power plant on the western portion of this large parcel. Doing so could increase the possibility of land use conflicts with the recreational trail and riparian corridor to the west of the site, however.

6.4.9 Paleontology

There would be no significant difference among the sites in terms of potential effects on paleontological resources. The probability of encountering significant fossils is approximately the same at each site.

6.4.10 Public Health

As discussed in Section 6.4.2, Air Quality, the plant's configuration and operation would be essentially the same from an air quality perspective at each location. The project and the alternative sites would not likely cause significant adverse long-term health impacts (either cancer or non-cancer) from exposure to toxic emissions, regardless of the site chosen.

6.4.11 Socioeconomics

All three sites are located in Ventura County. The number of workers, construction costs, payroll, and property tax revenues would be nearly the same for the project at each site. Most of the workers would come from Ventura County and would commute daily or weekly to the plant site. Some may move temporarily to the local area during construction, thus causing site-specific impacts on schools, utilities, and emergency services. These impacts would be temporary. As discussed in Section 6.4.2, Air Quality, and Section 6.4.10, Public Health, the project and the alternative sites would not have any potentially significant human health effects.

6.4.12 Soils

Neither the use of the MREC, Vulcan, or Petrochem sites would involve the conversion of agricultural land to utility uses. The Chase (northern half) and Camino Real sites are classified as Farmland of Statewide Importance and so would involve the conversion of important farmland. Both sites are within the City of Oxnard, however, on land zoned for industrial purposes.

Differences in soil erosion would be inconsequential, given proper use of BMPs during construction and operation.

6.4.13 Traffic and Transportation

None of the sites are underserved by transportation facilities. Therefore, the construction and operations traffic and transportation considerations are not a major consideration in evaluating or comparing the sites.

6.4.14 Visual Resources

The potential for visual resource impacts associated with each site varies depending on the relative visibility of the sites from roads and residences and the length and potential visibility of any new transmission lines that the power plant would require. Visual impacts are also a function of the surrounding facilities.

The MREC will be visible from within the Mission Rock Industrial area. It will also be visible from SR-126, which has a relatively high volume of traffic, but at a distance of approximately half a mile, will not be prominent in the view. There are few residential or recreational viewers near the site. Four residences are within or near the industrial area, but they are non-conforming uses in this area and their views of the MREC site are blocked by high fences that surround the individual businesses in the industrial park. There is open space in the Santa Clara River floodplain area to the southeast. Much of this area is owned by TNC and is managed for conservation, not recreation. Although guided tours are held a few times a year, the number of viewers is low and the MREC would be barely visible over the tops of the existing row of trees where there is a line of sight from the floodplain trails.

The Chase site is located relatively near rural residences along Sturgis Road and East Fifth Street, but these are few in number. The nearest densely developed residential area is 1.6 miles away and, at this distance, the facility would not be dominant in the viewshed. Surrounding uses include light industrial and warehousing.

The project at the Vulcan site would be somewhat prominent in views from residential areas. Dense suburban residential areas in Ventura are located approximately 2,100 feet to the northwest. Siting the CTGs and stacks on the property would not reduce this distance, though siting further north on the property would increase the distance to the nearest residences and apartment complexes. Siting further north would also shorten the distance to another set of receptors, travelers on State Route 118/232 (Los Angeles Avenue) as they enter or exit the Saticoy area of Ventura. There are also rural residences in the parcel adjacent to the south. Recreational viewers would include users of the linear park between the Santa Clara River floodplain and the residential areas, which begins approximately 3,600 feet from the nearest part of the Vulcan parcel. These are considered sensitive viewers.

The Camino Real site is located relatively near rural residences along West Ventura Road. The nearest densely developed residential area is the community of Nyeland Acres, approximately 2,200 feet to the northwest. The project facilities would be visible from the US 101 frontage road by residents leaving the community in this direction, but the facility would not be dominant in the viewshed at this distance and there would be some blockage by the elevated freeway overpass. Users of the Camino Real Industrial Plaza would have a relatively unobstructed view of the facility, from 250 to 750 feet away, but a business park/industrial park is not considered a sensitive land use from a visual resources point of view.

The Petrochem site is located on the floodplain of a relatively narrow canyon of the Ventura River in a location where viewshed quality is relatively high. A power generation facility at this site would be very visible from SR-33, which is the main artery from Ventura north to the Ojai area, from isolated residences and dense residential communities to the east of the site, and to users of the Ventura River/Ojai Valley bicycle/pedestrian trail, which runs adjacent to and borders the site to the west. In this setting, the power plant could potentially have an adverse impact to visual resources, from the point of view of residential and recreational viewers, who are considered sensitive viewing populations. If a power plant at this site were to interconnect with the Casitas substation, the route would extend north along the Ventura River riparian corridor and would likely raise objections in terms of visual resources impacts.

6.4.15 Water Resources

Similar to the proposed MREC site, each alternative site would require the same amount of water for process use, fire protection, and potable water uses (such as drinking water and safety showers). As stated above, tertiary treated water would likely be available at the Chase site through a relatively long (7.3 mile) pipeline and recycled water would be available at the Vulcan site from the same source as proposed for the MREC site, through a relatively short (1.7 mile) pipeline, and at the Camino Real site via a 6.6 mile pipeline to the same source as MREC. For the Petrochem site, an 8.5-mile-long pipeline would be necessary.

6.4.16 Waste Management

The same quantity of waste will be generated at the proposed site as at all alternative sites. The environmental impact of waste disposal would not differ significantly among the alternative sites.

6.4.17 Summary and Comparison

Although each of the alternative sites is feasible and could likely meet most of the basic project objectives, the MREC site is the preferred alternative for a variety of reasons.

The Chase site would be a suitable site except that it is not clear whether the City of Oxnard would agree that power generation is a permitted use in the Light Manufacturing zoning district. If not, a rezone would be required. Also, the distance necessary for a generator tie-line from the Chase site to the nearest 230 kV-capable substation would be an obstacle for this site because feasibility of routing is uncertain, and a long routing may be cost prohibitive.

The Vulcan site is also a brownfield site, and would not require long linears. However, the Open Space zoning and Mineral Resource Protection zoning overlay would clearly not permit a power plant to be sited there without both zoning and overlay changes. In addition, this site is located relatively near (0.5 mile) dense suburban residential areas and the project as viewed from the linear park along the Santa Clara River might be considered to cause a significant visual impact.

The Camino Real site is a greenfield site, but is in an area zoned for industry. As with the Chase site, the Camino Real site is zoned for light industry and it is not clear from the Oxnard zoning ordinance whether or not power generation is a permitted use in this zone. This site is near to sensitive uses, including a medical center and church in one direction, and is surrounded by agricultural areas in the other three directions.

The Petrochem site is a brownfield site, and is in an area zoned for industry and would require relatively long linears. This site is very near to dense residential developments and a regional recreational trail. In addition, the site and surrounding area have been the focus of previous unsuccessful development efforts. Since there appears to be no consensus as to the type of development preferred, if any, the success of a power generating facility development at this location seemed unlikely.

Taken all together, the MREC site best meets the basic project objectives without resulting in any adverse environmental impacts as compared to the other sites. Table 6.4-2 compares the MREC and alternative sites in light of the key project objectives and environmental factors.

Table 6.4-2 Comparison of the Proposed Site and Alternative Site Locations

Characteristic	MREC	Alternative 1 Chase	Alternative 2 Vulcan	Alternative 3 Camino Real	Alternative 4 Petrochem
Ability to gain site control	Yes	Unknown	Unknown	Unknown	Unknown
Availability of sufficient land area	Yes	Yes	Yes	Yes	Yes
Proximity to existing 230 kV substation	6.6 miles	12 miles	4.4 miles	10.5 miles	7/3.5 miles
Distance to recycled water supply source	1.8 miles	1.7 miles	2.0 miles	6.6 miles	8.5 miles
Distance to natural gas supply	2.4 miles	0.9 mile	0.1 mile	1.1 miles	0.1 mile
Land use consistent with County/City General Plans and Zoning	Yes	Unknown	No	Unknown	Yes

Table 6.4-2 Comparison of the Proposed Site and Alternative Site Locations

Characteristic	MREC	Alternative 1 Chase	Alternative 2 Vulcan	Alternative 3 Camino Real	Alternative 4 Petrochem
Proximity to nearest residence	940 feet	575 feet	100 feet	1,625 feet	380
Potential presence of Threatened and Endangered Species and Habitat	Moderate	Low	Moderate	Low	Moderate
Potential for buried archaeological resources	High	Low	High	Low	High
Potential noise impacts	Moderate	Moderate	Moderate	Moderate/High	High
Potential visual impacts	Low	Low	Moderate/High	Moderate	High
Potential soils/agricultural impacts	Low	Moderate (dependent on micro-siting)	Low	High	Low

6.5 Alternative Project Design Features

This subsection addresses alternatives to some of the MREC design features, such as the linear facility routing, interconnection location, and water supply source.

6.5.1 Alternative Linear Facility Routing

This subsection addresses alternative linear facility routing for the proposed natural gas supply pipeline, electrical transmission line, and water supply pipeline.

6.5.1.1 Natural Gas Supply Pipeline Route Alternatives

The MREC facility will connect to SoCalGas's existing high-pressure natural gas pipeline 404/406 through a new pipeline extending approximately 2.4 miles from the site extending south along Shell Road and west to the Southern Pacific Railroad tracks and then south again along the railroad right-of-way to the interconnection point. An alternative routing would be for the pipeline to exit the Mission Rock industrial area via Mission Rock and Pinkerton Roads, then turn northwest onto Briggs Road, then turn southeast onto Telegraph Road, following Telegraph Road to an intersection point at North Saticoy Avenue, for a total distance of 6.1 miles. This route requires a crossing of U.S. Highway 101. The railroad route is preferred because of the much shorter distance and much lower construction cost. This route would also avoid disrupting local traffic on Biggs and Telegraph roads during construction.

6.5.1.2 Electrical Transmission Line Route Alternatives

The facility will connect to SCE's 230-kV Santa Clara Substation via a new approximately 6.6-mile-long transmission line. The route chosen appears to be the most feasible to connect with the Santa Clara Substation. Other routes are possible, but would involve approximately the same combinations of agricultural land and undeveloped upland. More direct routes to the substation would be more than 6 miles long and would involve routing having the potential to disrupt agricultural operations, or routing along major roadways such as Foothill Road, or routings adjacent to suburban residential areas. For these reasons, the proposed route is preferred. The approach to the Santa Clara Substation from the north is necessitated by the need to connect with the substation's 230 kV bus and also to avoid crossing existing transmission lines approaching the substation.

Routing to the nearest alternative substation with 230 kV capability, the Moorpark Substation is also possible. A generator tie-line to the Moorpark Substation would run south from the MREC site and over the adjacent range of hills and from there along SR-118 to Moorpark and would be more than 14 miles long. To avoid TNC's nature preserve, which encompasses the adjacent hills, would likely require an even longer line. A route around the hills to Moorpark would extend to the southwest to SR-118 (Los Angeles Avenue) and would follow this roadway to Moorpark Substation, for a distance of 17.6 miles. This route runs mostly through agricultural areas, but passes near some developed, urban areas in Saticoy, Somis, and Moorpark.

6.5.1.3 Water Supply Pipeline Route Alternatives

The facility will connect via a new 1.7-mile water supply line from the Limoneira Company's existing recycled water pipeline which currently serves orchard irrigation. The proposed water supply line runs directly to the interconnection point across agricultural fields, and is co-located along most of the line with the route of the generator tie-line. A route co-located with the natural gas supply pipeline would also be feasible and would extend for approximately 2.2 miles to the Limoneira Company pipeline. The proposed route is the shortest and least expensive available.

6.5.2 Interconnection Alternatives

Two interconnection options near the MREC site were considered. The proposed interconnection location is SCE's 230-kV Santa Clara Substation, located approximately a direct distance of 4.4 miles west of the MREC site. Alternate interconnection options for 230 kV interconnection include the Moorpark and Casitas substations. As stated above, a routing to Moorpark would need to be 14 to 18 miles long. The Casitas Substation is an additional 8.2 miles in direct distance beyond the Santa Clara Substation, over almost entirely rugged terrain. A feasible generator tie-line route to this location from MREC would need to be more than 14 miles long.

The two remaining substations with 230-kV capability are located at existing power plants. It is assumed the substations located there are scaled to fit the input power and would not have capacity to accept additional power. One of these is the Mandalay Substation, which is approximately 11 miles direct distance from the MREC. The Ormond Beach Substation is nearly 13 miles from MREC, but a generator tie-line to that location would be a few miles longer.

Each of the alternate interconnection alternatives would thus require construction of significantly longer tie-in transmission lines, with greater potential environmental impacts based on greater length and additional terrain crossed. Therefore, the proposed interconnection at Santa Clara Substation is preferred to minimize potential environmental impacts and achieve the basic project objectives for the MREC.

6.5.3 Water Supply Source Alternatives

The MREC has incorporated cost-effective water conservation features into the project design to minimize the use of water and has arranged with Limoneira Company to purchase recycled water from its treatment plant for power plant process use.

Alternatively, recycled water could be procured from the City of Santa Paula's Water Recycling Facility, which uses a membrane bioreactor-based design and is capable of producing 3.4 mgd (expandable to 4.2 mgd) of recycled water. Availability of this water is currently unknown. A pipeline to the city's recycled water facility would be approximately 2.5 miles long, and cross agricultural areas and the Mission Rock industrial area.

6.6 Technology Alternatives

6.6.1 Generation Technology Alternatives

Selection of the power generation technology focused on those technologies that are optimized for peaking power generation and to use natural gas readily available from the existing distribution system. The following is a discussion of the suitability of such technologies for application to the MREC.

6.6.1.1 GE LM6000

The GE LM6000 PG combustion turbine technology was selected primarily because it is proven, reliable equipment that also provides operational flexibility. The configuration of five LM6000 PG units provides a well proven technology that is flexible in operation, efficient, cost effective, and easily dispatchable. The factors considered in selecting four LM6000 units included the following:

- High reliability/availability – The LM6000 gas generator has an overall reliability of 99.42 percent and package availability of 98.36 percent, based on GE data.
- Low equivalent forced outage rate – The LM6000 had an equivalent forced outage rate of 1.43 percent from November 2004 to July 2007.
- Mission Rock's parent company, Calpine, owns and operates a fleet of 20 LM6000s, including 15 LM6000 units in peaking service in California. Operation and maintenance advantages will accrue to the MREC by maintaining consistency with Calpine's fleet of LM6000 units.
- The LM6000 configured at 275 MW has the significant advantage of shaft redundancy. Because there will be five CTGs, the plant can ramp up to full load with minimal air emissions by successfully starting the CTGs and ramping them up to full load quickly. The units can also be shut down successively to follow reduced load.

6.6.1.2 GE LMS100

The GE LMS100 combustion turbine technology was also considered for MREC. Based on the nominal 100 MW output of these units, either 200 MW (two units) or 300 MW (three units) configurations would be feasible to achieve the desired output for MREC. Using the LMS100 turbines, however, would reduce the ability to operate at varying low loads at the optimal full-load heat rate for each unit. Partial loading of larger turbines would decrease operating efficiency and increasing emissions of GHGs per MW of generation. With the proposed LM6000 configuration, MREC will have five optimal operating points between 0 and 275 MW rather than only two or three with an LMS100 configuration. In addition, because it uses intercooler technology, the LMS100 would require significantly more water to operate, and a large cooling tower or air-cooled condenser structure.

6.6.1.3 Large Frame Industrial Turbines

Mission Rock considered choosing a large frame industrial turbine for the MREC. Several models are available in the 250 to 300 MW range with 10 or 12 minute startup times. This power output is achieved by using a single-turbine shaft, however, so that the LM6000 advantages of multiple-shaft ramping operation, shaft-redundancy, increased efficiency, and reduced GHG emissions would not be realized. Large frame industrial turbine technology is more appropriate for applications where potential future conversion to combined cycle is a consideration, than for peaking, load-following, and grid support operations. In addition, stack heights for this technology routinely approach 200 feet.

6.6.1.4 Conclusion

The GE LM6000 PG combustion turbine technology is proven, reliable, efficient, cost effective, provides operational flexibility and shaft redundancy while minimizing air emissions, GHGs, and water use. This technology clearly out-performs the others considered in meeting the project's objectives.

6.6.2 Fuel Technology Alternatives

Technologies based on fuels other than natural gas were eliminated from consideration because they do not meet the project objective of providing operationally flexible, dispatchable, quick start, and reliable power. Some of these alternative fuels have potential for additional air quality and public health impacts. Others, like certain biofuels, are not available in commercial quantities or are not available via pipeline or other reliable delivery system. Additional factors rendering alternative fuel technologies unsuitable for the proposed project are as follows:

- Biomass fuel facilities do not provide quick start capabilities and have additional environmental impacts related to air emissions and solid waste generation. Additionally, biomass facilities would require additional acreage, taller structures, and larger quantities of water.
- Coal, fuel oil, and other similar fuels emit more air pollutants and GHGs than technologies utilizing natural gas.

The availability of the natural gas resource provided by SoCalGas, as well as the environmental and operational advantages of natural gas technologies, makes natural gas the logical choice for the MREC.

6.6.3 Cooling Alternatives

MREC is a simple-cycle power plant that does not generate steam that would require a large cooling tower or air-cooled condenser. Therefore, cooling requirements are limited to CTG lubricating oil systems and inlet air cooling. The inlet cooling system and cooling material is discussed in detail in the following subsections. The remainder of this subsection will address the lubricating oil system cooling technology.

The lubricating oil system uses a fin-fan cooler to reduce the temperature of the lubricating oil. This system functions similar to an automobile radiator where the oil is passed through a "radiator" as air is passed through the cooling fins. Heat is removed from the oil and is released to the atmosphere. None of the oil is entrained in the air and no contaminants are released from a fin-fan cooler. Additionally, this type of cooling system does not use water.

6.6.4 Inlet Cooling Alternatives

The CTG inlet air cooling can be accomplished using evaporative coolers, foggers, or mechanical chillers. The evaporative cooling system and foggers use water to decrease the inlet air temperature and increase CTG efficiency and electrical generation during warm ambient conditions. An evaporative cooling system uses water evaporation to cool the inlet CTG air. Water is applied to a porous media in the CTG air inlet and as the air passes through the media, water is evaporated, which results in cooling of the air. This system is similar to a residential evaporative (swamp) cooler. A fogger system is similar in principle to the evaporative cooling system, but this system sprays a fine mist of water into the CTG air inlet to result in cooling.

Mechanical chillers use a refrigerant in cooling coils located in the CTG air inlet to cool the air. This system is similar in principle to a residential or commercial comfort cooling system. The refrigerant is reused in the system and advances in refrigerant technology result in very low leak rates for refrigerant systems. Furthermore, most refrigerants are not considered air pollutants. Typical refrigerants include anhydrous ammonia and R134a. While anhydrous ammonia systems have a higher efficiency, they require the use of gaseous phase ammonia.

Water cooling uses less parasitic load and, therefore increases the cycle efficiency, compared with mechanical chillers. Although the quantities of water needed for an LM6000 inlet air cooling system are low, a mechanical chiller system is proposed for MREC to minimize water use. The mechanical chiller will use R134a refrigerant to avoid the use and storage of anhydrous ammonia onsite.

6.7 References

City of Oxnard. 2011. *General Plan 2030. Goals & Policies*. City of Oxnard Development Services Planning Division. Adopted October 2011.