1.0 PURPOSE AND NEED

Southern California Edison Company (SCE) proposes to construct the Banducci 66/12 kilovolt (kV) Substation and associated distribution, subtransmission, and telecommunication facilities (Proposed Project) to add capacity to meet forecasted electrical demands, maintain system reliability, resolve anticipated service delivery voltage problems, and enhance operational flexibility in the unincorporated Cummings Valley area of Kern County. Figure 1.1 Proposed Project Location shows the location of the Proposed Project in relation to the larger regional area.

The Proposed Project is planned to be operational by June 2016, and would include the following major components:

- Construction of a new Banducci 66/12 kV Substation. Banducci Substation would be an unstaffed, automated, 56.0 megavolt-ampere (MVA), low-profile substation with a potential capacity of 112 MVA at final build out. The proposed 66/12 kV distribution substation would be located on an approximately 6.3 acre parcel in the unincorporated Cummings Valley area of Kern County.

- Construction of two new 66 kV subtransmission line segments that would loop the existing Correction-Cummings-Kern River 1 66 kV Subtransmission Line: one that would enter and one that would exit the proposed Banducci Substation creating the new Banducci-Kern River 1 66 kV Subtransmission Line and the new Banducci-Correction-Cummings 66 kV Subtransmission Line.

- Construction of three new underground 12 kV distribution getaways.

- Installation of telecommunications facilities to connect the proposed Banducci Substation to SCE's existing telecommunications system.

1.1 Project Purpose

Under the Federal Energy Regulatory Commission (FERC), North American Electric Reliability Corporation (NERC), Western Electricity Coordinating Council (WECC), and California Public Utilities Commission (CPUC) rules, guidelines and regulations, SCE has the responsibility to ensure that electrical transmission, subtransmission, and distribution systems have sufficient capacity to maintain safe, reliable, and adequate service to customers. To ensure the availability of safe and reliable electric service, SCE has established a set of standards and criteria by which it determines when new projects are needed. The safety and reliability of the systems must be maintained under normal conditions when all facilities are in service, and also maintained under abnormal conditions when facilities are out of service due to equipment or line failures, maintenance outages, or outages that cannot be predicted or controlled which are caused by weather, earthquakes, traffic accidents, and other unforeseeable events.

Environmental Intelligence. 1 August 2011. Q:\SCE\Banducci\05_GIS_Data\maps_figures_tables\workspace\Ex01_1_Proposed_Project_Location_v03_EI09_20111221.mxd

Legend

- Proposed Project Location
- Proposed Banducci Substation
- Proposed Project
- CA Correctional Institution
- Freeway / Major Highway
- Major Road / Minor Highway

N W E S

0 5 10 20 Miles

Figure 1.1: Proposed Project Location

Proposed Banducci Substation Project

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SCE utilizes a multi-step planning process to ensure that the development of appropriate facilities is undertaken in time to meet reliability concerns and electrical demand. The planning process begins with the development of a peak demand forecast for each substation. Peak demand forecasts are developed using historical data and trends in population data, urbanization data, and meteorological data. SCE has implemented a number of Demand Side Management (DSM) programs in its service territory. The resulting energy efficiency and conservation measures are implicit in historical load data, which is used by SCE to update annual forecasts. Usually, such measures have a greater impact on total annual energy consumption than to the peak demand forecast, because peak demand represents the single highest peak usage event in a year. SCE forecasts peak demand under both normal and 1-in-10 year temperature conditions. Because electrical systems have certain loading limits, technical engineering studies are then conducted to determine whether the forecasted peak demand can be accommodated on the existing transmission, subtransmission, and distribution systems. When projections indicate that these limits will be exceeded within an appropriate planning horizon, a project is proposed to keep the electrical system within designed loading limits. In addition to considering the operating limits of a single substation, SCE evaluates the feasibility to transfer load from that single substation to adjacent substations in the system. This process has identified the need for the Proposed Project as described in the next section.

1.2 Project Need

The Electrical Needs Area is located within the Antelope-Bailey 66 kV System and is bounded by Woodford-Tehachapi Road to the east, El Camino Drive to the north, Pacific Gas & Electric (PG&E) service territory to the west, and High Gun Drive to the south. The Electrical Needs Area, as well as the Substation Study Area, are shown on Figure 1.2: Electrical Needs Area and Substation Study Area. The Electrical Needs Area has been defined as the area where customers are currently served from Cummings Substation by three existing 12 kV distribution circuits. This substation is interconnected to the 66 kV system with Monolith 66/12 kV Substation to the east and Correction 66/12 kV Substation, which is a customer dedicated substation, to the west. Cummings Substation currently serves the Electrical Needs Area's approximately 7,250 metered customers. However, Cummings Substation cannot accommodate the anticipated load growth in this area beyond 2016. Therefore, the Proposed Project is needed to serve increased electrical demand in the Electrical Needs Area. In addition, the Proposed Project is needed to address reliability and operational flexibility issues in the Electrical Needs Area.

Keene
Bear Valley Springs
Golden Hills
Stallion Springs
Tehachapi
Monolith
Deertrail
Starland
Paramount
Jacaranda
Lower Valley
Sheeptrail
Cumberland
Comanche Point
Woodford Tehachapi
Woodford-Tehachapi Rd
Tehachapi Valley
Curry
Highline
Cheyenne
Dennison
Tehachapi-Willow Springs
Oak Creek
Proposed Banducci Substation
Banducci Rd
CA Correctional Institution
Cummings Substation
Monolith Substation
58
202
CUMMINGS VALLEY RD
BAILEY RD
SCHATZ RD
BEAR VALLEY RD
ROWE AV
ROBERTS AV
JENNA ST
HAVEN LN
KELSO DR
HARNESS DR
ASSAULT DR
HIDDEN OAKS DR
SPINKLE ST
GIRAUDO RD
EDWARD ST
SECRETARIAT RD
PEGASUS ST
BAUMBACH AV
TRACK VIEW DR
SASSA RD
CHANAC RD
PELLISER RD
HIGHLINE RD
ROBBY RD
DALE RD
BANDUCCI RD
SARIDA AV
RONNIE AV
OLD RANCH RD
ST ANDREWS DR
SILKY PL
MANOWAR DR
CHURCHILL ST
BRAEBURN PL
STALLION SPRINGS DR
SPYGLASS DR
HIALEAH DR
BOWIE ST
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Environmental Intelligence. 8/15/2012. Q:\SCE\Banducci\05_GIS_Data\maps_figures_tables\workspace\Ex01_2_Electrical_Needs_Study_Area_v02_EI10_20120815.mxd.

Legend

- Proposed Banducci Substation
- Existing SCE Substation
- Banducci Electrical Needs Area
- Existing Subtransmission Lines
- Freeway / Major Highway
- Major Road / Minor Highway
- Substation Study Area
- CA Correctional Institution

Figure 1.2: Electrical Needs Area and Substation Study Area

Proposed Banducci Substation Project

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1.2.1 Substation Capacity and Need

The existing Cummings 66/12 kV Substation, which currently serves the Electrical Needs Area, is connected to the Antelope-Bailey 66 kV System through a network of 66 kV subtransmission lines. The substation has a set of three single phase transformers that reduces voltage from 66 kV to 12 kV, with a total capacity of 24.4 MVA. There is a spare single phase transformer onsite that can be energized in less than 24 hours if one of the three single phase transformers fails. However, energizing this spare transformer would not provide any additional capacity to meet the projected need. Three existing 12 kV distribution circuits exit Cummings Substation to serve load within the Electrical Needs Area.

The peak demand and capacity data for Cummings Substation can be found in Table 1.1: Electrical Needs Area Substation Capacity and Peak Demand, which depicts historical and forecasted normal temperature condition peak demand, the 1-in-10 year heat storm peak demand, and the maximum operating limit data. Data presented in Table 1.1 is graphically represented in Figure 1.3: Substation Capacity and Electrical Needs Area Peak Demand.

Based on historical growth trends, and known residential and agricultural developments either under construction or in the planning phase, SCE projects that the 1-in-10 year heat storm peak demand in the Electrical Needs Area is forecasted to increase to 24.6 MVA in 2016. This projected electrical demand is forecasted to exceed the maximum operating limit of 24.4 MVA of the transformers currently serving the Electrical Needs Area.

In addition, in the past five years, the area has seen significant load growth of approximately 3 to 4 percent per year, with most of the growth occurring in the Bear Valley Springs and Stallion Springs communities located more than seven miles west of the existing Cummings Substation. With continued anticipated load growth in these communities, Cummings Substation will not be able to reliably serve the Bear Valley Springs and Stallion Springs communities. Therefore, the Proposed Project is needed and is proposed to be located closer to the Bear Valley Springs and Stallion Springs communities. The Proposed Project would relieve Cummings Substation by transferring the load of Bear Valley Springs and Stallion Springs from Cummings Substation to the proposed Banducci Substation. The Proposed Project would also improve electrical reliability and operational flexibility in Cummings Valley and the western part of the greater Tehachapi area.

Table 1.1 Electrical Needs Area Substation Capacity and Peak Demand

Actual	**2007**	**2008**	**2009**	**2010**	**2011**
Maximum Operating Limit (MVA)	19.5	24.4†	24.4	24.4	24.4
Historical Peak Demand (MVA)	23.6	19.8*	20.8	20.0	17.9
Temp Adjusted Peak Demand Normal Condition (MVA)	22.4	18.8	20.0	20.8	19.8
Temp Adjusted Peak Demand 1-in-10 Year Heat Storm (MVA)	23.8	20.1	21.9	22.8	21.7
Planned Capacity and Projected Demand	**2012**	**2013**	**2014**	**2015**	**2016**
Planned Maximum Operating Limit (MVA)	24.4	24.4	24.4	24.4	24.4
Projected Peak Demand Normal Conditions (MVA)	19.9	21.4	21.5	21.8	22.5
Projected Peak Demand 1-in-10 Year Heat Storm (MVA)	21.8	23.4	23.5	23.9	24.6
Planned Capacity and Projected Demand	**2017**	**2018**	**2019**	**2020**	**2021**
Planned Maximum Operating Limit (MVA)	24.4	24.4	24.4	24.4	24.4
Projected Peak Demand Normal Conditions (MVA)	23.2	24.0	24.8	25.7	26.5
Projected Peak Demand 1-in-10 Year Heat Storm (MVA)	25.5	26.3	27.2	28.1	29.1

† Added cooling fans to increase the existing transformers' maximum operating limit by 4.9 MVA

* Transferred approximately 6.6 MVA of load to Monolith 66/12 kV Substation

The amount of electrical load that can be served in the Electrical Needs Area is limited to the maximum amount of electrical power that Cummings Substation can deliver before exceeding its maximum operating limit. As shown in Table 1.1 above, historical peak demand and projected peak demand have increased since 2007. It should also be noted that these increases are over and above actual peak demand of 17.0 MVA recorded in 2003. The maximum operating limit of the transformers in the substation was 19.5 MVA until late July of 2007, while the actual peak demand in the Electrical Needs Area grew to 21.8 MVA in 2006, and 23.6 MVA in 2007. On July 25, 2006, due to higher than expected load growth in the Stallion Springs and Bear Valley Springs communities, SCE had to initially drop approximately 3.6 MVA of load which resulted in approximately four rolling power outages for approximately one hour each time. These outages affected a significant number of customers in the Bear Valley Springs community area. On July 6, 2007, SCE had to once again drop approximately 4.6 MVA of load one time for the same reason which affected a number of customers in the Bear Valley Springs community area for approximately 45 minutes.

In August 2007, to alleviate the risk of dropping load due to peak demand exceeding maximum operating limit, SCE increased Cummings Substation's maximum operating limit to 24.4 MVA by adding cooling fans to the existing single phase transformers. In 2008, SCE further relieved Cummings Substation by transferring approximately 6.6 MVA of electrical demand to the existing Monolith 66/12 kV Substation located approximately 6.5 miles east of Cummings Substation.

Load transfers are standard procedure to resolve distribution circuit and substation overloads during normal and abnormal operating conditions. If the ability to transfer load is limited, the end result would be diminished operating capabilities and reduced reliability. Furthermore, reliability issues arise from longer distribution circuits which create difficulties in transferring load between distribution circuits and between distribution substations. As distribution circuits increase in length and the load on those circuits continues to grow, the delivery voltage to the end of the circuits decreases and exposure to outages increases, thereby resulting in reduced reliability to the customers served by those circuits.

Two of the existing 12 kV distribution circuits that exit Cummings Substation to serve the Bear Valley Springs and Stallion Springs communities are approximately 22 miles and 14 miles long, respectively. These circuits have very limited load transfer capability, and the lengths of the circuits significantly exceed SCE's maximum preferred distribution circuit length for urban circuits of approximately three to five miles. In fact, the customers in the Bear Valley Springs and Stallion Springs communities have experienced outages due to excessive load at Cummings Substation in excess of the substation's maximum operating limits. SCE has also implemented improvements on these 12 kV distribution circuits to correct low voltage problems. These improvements include the addition of circuit regulators used to boost circuit voltage, the addition of field capacitor banks to improve power factor, and the replacement of circuit conductors to minimize voltage drop.

Based on historical growth trends and known residential and agricultural developments either under construction or planned to be constructed, SCE projects that the forecasted peak demand of a 1-in-10 year heat storm in accordance with SCE's peak demand forecast for the Bear Valley Springs and Stallion Springs communities will increase by approximately 0.2 MVA and approximately 0.6 MVA in 2012 and 2013. As a result, the electrical demand is projected to exceed the operating limits of the circuits serving these communities, even with the existing 12 kV circuit improvements in place, increasing the risks of service interruptions due to overloaded automatic reclosers (ARs).[1]

[1] An automatic recloser is a protective device used to clear downstream electrical faults.

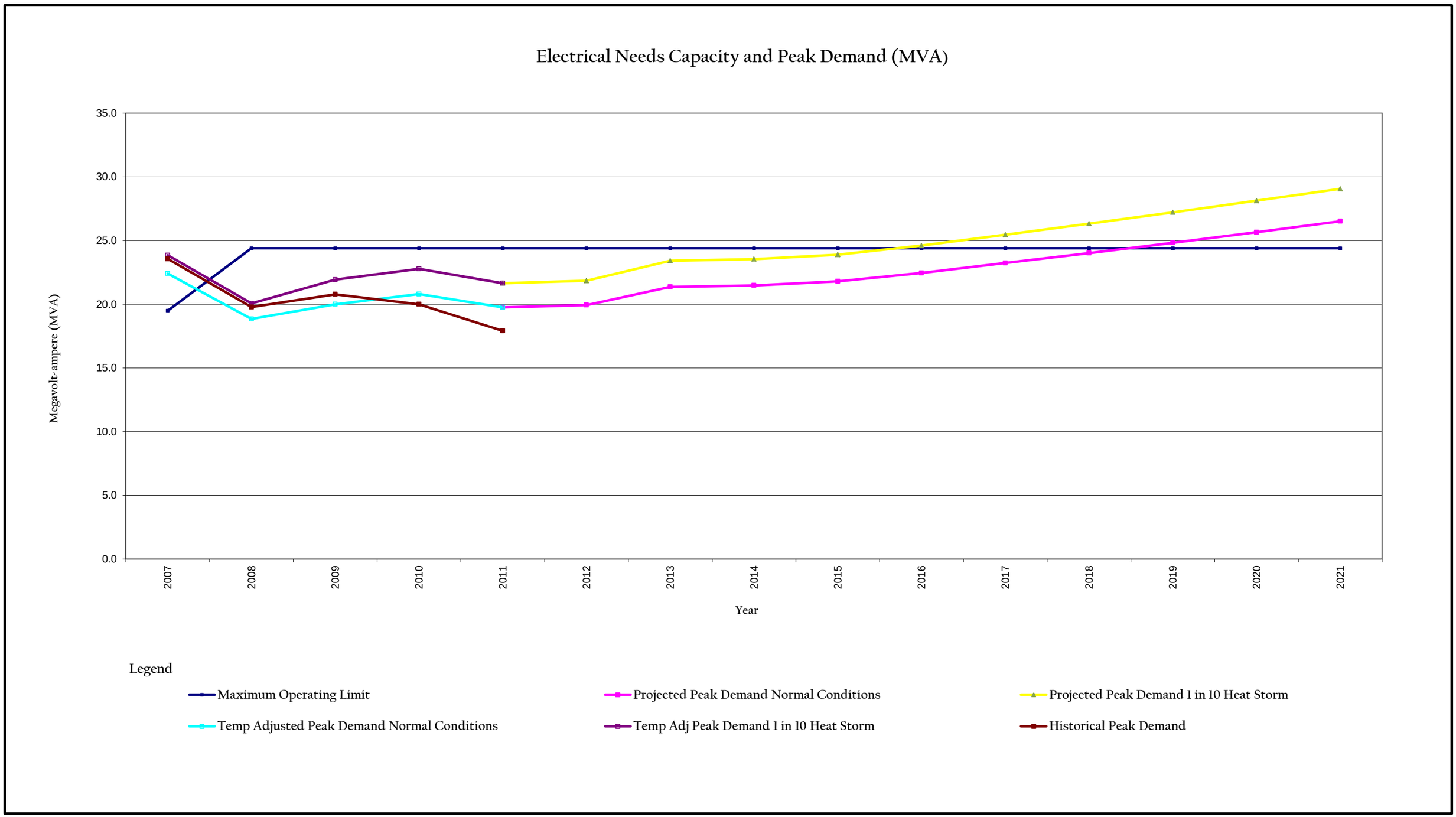

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Figure 1.3: Substation Capacity and Electrical Needs Area Peak Demand

Proposed Banducci Substation Project

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1.3 Electrical System Alternatives

The California Environmental Quality Act (CEQA) and the CEQA Guidelines (Section 15126.6(a)) require consideration of a reasonable range of alternatives to a proposed project, or to the location of a project, which would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project. CEQA Guidelines Section 15126.6(d) requires that sufficient information about each alternative be included to allow meaningful evaluation, analysis, and comparison with the proposed project. In addition, CEQA Guidelines Section 15126.6(e) requires the evaluation of a "no project" alternative to compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project (No Project Alternative).

SCE first evaluates whether the existing electrical infrastructure can be modified to meet the project objectives; if not, then SCE evaluates what new infrastructure is required (System Alternatives) and where it would be located (Site Alternatives) in order to meet project objectives. The following sections describe the methodology for screening System Alternatives and Site Alternatives. Alternatives developed by these methodologies are screened for their ability to meet the project objectives. The section concludes with a brief description of the Site Alternatives retained for full analysis in the Proponent's Environmental Assessment (PEA).

This section discusses the methodology for screening System Alternatives. System Alternatives developed by these methodologies were analyzed for their ability to meet the project objectives described in Chapter 1, Section 1.4, Basic Objectives. Site Alternatives were not considered in this screening step.

System Alternatives Screening Methodology

System Alternatives are developed using a four-step process summarized below:

Step 1. Perform technical engineering analyses to determine whether modifying electrical equipment at existing facilities could accommodate the forecasted peak electrical demand.

Step 2. If the forecasted electrical demand cannot be accommodated by modifying existing electrical facilities, develop System Alternatives upgrades that consider new facilities.

Step 3. Evaluate each System Alternative in consideration of the following criteria:

- The extent to which the System Alternative would substantially meet the forecasted electrical demand.

- The feasibility of a System Alternative, considering capacity limits, the ability to upgrade the system on existing sites, and economic viability.

Step 4. If a System Alternative is not feasible, eliminate it from further consideration. If feasible, the System Alternative is retained for full analysis in the PEA, as required by the California Public Utilities Commission General Order 131-D.

If it is determined that a new electrical infrastructure upgrade or addition is required, Site Alternatives are considered as described later in this section.

To meet the need in the Electrical Needs Area, SCE considered three System Alternatives:

System Alternative 1: Construction of the new Banducci Substation, which would incorporate two new 28.0 MVA banks and three new 12 kV distribution circuit getaways.

System Alternative 2: Expansion of the existing Cummings Substation, which would incorporate two new 28.0 MVA replacement banks and three additional 12 kV distribution circuit getaways.

System Alternative 3: No Project Alternative

1.3.1 System Alternative 1

System Alternative 1 would include the following components and provide the following benefits:

System Alternative 1 Components

- Construction of a new Banducci 66/12 kV Substation. Banducci Substation would be an unstaffed, automated, 56.0 MVA, low-profile substation with a potential capacity of 112 MVA at final build out. The proposed 66/12 kV distribution substation would be located on an approximately 6.3 acre parcel in the unincorporated Cummings Valley area of Kern County.

- Construction of two new 66 kV subtransmission line segments that would loop the existing Correction-Cummings-Kern River 1 66 kV Subtransmission Line: one that would enter and one that would exit the proposed Banducci Substation creating the new Banducci-Kern River 1 66 kV Subtransmission Line and the new Banducci-Correction-Cummings 66 kV Subtransmission Line.

- Construction of three new underground 12 kV distribution getaways.

- Installation of telecommunications facilities to connect the proposed Banducci Substation to SCE's existing telecommunications system.

System Alternative 1 Benefits

System Alternative 1 would mitigate the forecasted substation overloads at the existing Cummings Substation by facilitating a large -- approximately 500 amperes (A) -- load transfer from Cummings Substation to the new Banducci Substation.

System Alternative 1 would result in shorter 12 kV distribution circuit lengths. The existing 12 kV distribution circuits, one of which exceeds 20 miles in length, would be reconfigured and shortened to approximately 5 to 17 miles. A shorter circuit improves voltage regulation, thereby raising the circuit load capacity beyond the capacity of the original longer circuit. Shorter

circuits also improve short circuit duty protection capabilities enabling the addition of more customer load. Placing the new Banducci Substation in Cummings Valley and connecting the existing circuit to the new Banducci Substation would reduce the probability of circuit outages on that circuit, improve circuit reliability, and allow one of the existing 12 kV circuits to transfer load to a point below its planned loading limit.

- System Alternative 1 would allow SCE to meet the forecasted increase in electrical demand within the Electrical Needs Area with an increased capacity of 56.0 MVA.

- System Alternative 1 would provide greater operational flexibility because having two substations in an area allows for greater operability than only having one substation in the area.

- Placing System Alternative 1 in Cummings Valley would allow for shortening of the existing circuitry by placing the new Banducci Substation between Cummings Substation and the end of the existing 12 kV circuits. Reducing the 12 kV circuit length would result in less circuit impedance, thereby improving voltage regulation and mitigating future overloaded ARs.

- Operational flexibility of the existing radial circuits would be improved with the addition of three new 12 kV distribution circuits and the accompanying circuit ties.

- Placing System Alternative 1 in Cummings Valley adjacent to the existing 66 kV right of way minimizes the need to construct long 66 kV subtransmission line segments.

1.3.2 System Alternative 2

System Alternative 2 would include the following components and provide the following benefits:

System Alternative 2 Components

- Expansion of the Cummings Substation to include two new 28.0 MVA replacement banks.

- Construction of three new 12 kV distribution getaways.

- Installation of telecommunications facilities to connect the existing Cummings Substation to SCE's existing telecommunications system.

System Alternative 2 would consist of expanding the existing Cummings Substation, which is approximately 120 feet by 130 feet. In order to add transformer and circuit capacity, the substation property would need to be expanded by approximately 200 feet to the north and approximately 200 feet to the east onto private property, which SCE would need to purchase. Expansion of the existing Cummings Substation would also require installation of one new 66 kV switchrack, and one new 12 kV switchrack, two new 28.0 MVA transformer banks, two new

12 kV capacitor banks, and new telecommunication facilities. Cummings Substation is located on a hillside and therefore it is expected to require more substantial grading than typically expected for a level lot.

System Alternative 2 Benefits

System Alternative 2 would mitigate the substation capacity deficit forecasted at the existing Cummings Substation and would be expected to provide the following benefits:

- The expansion of Cummings Substation and installation of a net additional 32.0 MVA of transformer capacity would allow SCE to meet the forecasted electrical demand within the Electrical Needs Area.
- Provide additional circuit ties and could improve reliability or reduce circuit outage duration.
- System Alternative 2 would provide for expansion and modification of Cummings Substation, thereby resulting in an electrical substation that is consistent with current substation design standards.

1.3.3 No Project Alternative

Under the No Project Alternative, no action would be taken. The No Project Alternative would involve no construction and no modifications to the existing electrical system. Therefore, there would be no benefits associated with the No Project Alternative.

1.4 Basic Objectives

The objectives for constructing the Proposed Project include:

- Provide safe and reliable electrical service.
- Add capacity to serve long-term forecasted electrical demand requirements in the Cummings Valley (Bear Valley Springs and Stallions Springs communities) beginning in 2016.
- Maintain system reliability within the Electrical Needs Area.
- Provide greater operational flexibility to transfer load between circuits and substation(s) within the Electrical Needs Area.
- Alleviate the anticipated service delivery voltage problems as the forecasted demand in the Bear Valley Springs and Stallion Springs areas grows beyond what can be reliably served by the existing 12 kV distribution circuits from the existing Cummings Substation.
- Meet project needs while minimizing environmental impacts.

- Design and construct the project in conformance with SCE's approved engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects.

1.5 System Alternatives Comparison

- System Alternative 1 would provide greater operational flexibility because having two substations in an area allows for greater operability than only having one substation in the area. This flexibility allows SCE to manage the system more efficiently. Service reliability would be improved because the new 12 kV circuits would be shorter in length than the existing circuits emanating from Cummings Substation. Having a second substation would facilitate scheduled maintenance outages at the other substation without dropping customer load.

- System Alternative 2 would require expansion of the existing Cummings Substation property. This expansion would require the acquisition of additional private property. System Alternative 2 would also require construction of at least two 6-mile long circuits. Construction of these new circuits may require a new pole line adjacent to or in close proximity to residential communities and through undeveloped terrain, potentially resulting in additional environmental impacts. However, System Alternative 2 would not resolve the inherent problems of poor voltage regulation and depressed fault duty and possible overloaded ARs due to excessively long circuit lengths. Additionally, System Alternative 2 would not mitigate the existing poor circuit reliability, which raises the probability of circuit outages from weather and other causes outside SCE's control. Accordingly, in addition to the fact that System Alternative 2 has the potential to cause greater environmental impacts to undeveloped land, System Alternative 2 would not achieve the Project Objectives to the same extent as System Alternative 1. [2]

- Although it would not cause environmental impacts, the No Project Alternative would provide no electrical benefits to the Electrical Needs Area and would not achieve the Project Objectives.

[2] The size of the existing Cummings Substation site is not suitable for SCE to permanently increase the substation capacity to accommodate the capacity required to serve the ENA. If a new transformer bank were installed, SCE would need to bring the substation up to existing SCE standards. The existing substation parcel is only 130' X 150', well short of SCE's standard 66/12 kV distribution substation parcel of 350' X 395', making it impossible to construct to SCE's standard design. Although it may be possible to add some transformation capacity within the existing Cummings Substation footprint, the load serving capacity would be significantly limited due to the inability to construct new circuit positions within the same footprint. Therefore, even if additional transformation capacity were to be added at Cummings Substation, the objective of constructing a project that is consistent with SCE's design standards would not be met and such an option should only be considered as temporary mitigation until a new substation that meets SCE's standards (e.g., the Proposed Project) could be constructed.