3.0 Description of Alternatives

This chapter describes the alternatives to the South Orange County Reliability Enhancement Project (proposed project) under consideration in this Environmental Impact Report (EIR), as well as the process used to screen and develop them. The discussion in Chapter 5, "Comparison of Alternatives," compares the environmental advantages and disadvantages of the proposed project with those of the alternatives. An Environmentally Superior Alternative is proposed in Chapter 5. Provisions of the California Environmental Quality Act (CEQA) Guidelines (Section 15126.6) that address project alternatives in an EIR state the following:

- The range of alternatives required in an EIR is governed by a "rule of reason." Therefore, the EIR must evaluate only those alternatives necessary to permit a reasonable choice. The alternatives shall be limited to those that would avoid or substantially lessen any of the significant effects of a proposed project.
- A No Project Alternative shall be evaluated, along with its impacts. The purpose of describing and analyzing a No Project Alternative is to allow decision-makers to compare the effects of approving the proposed project with the effects of not approving the proposed project.
- An EIR does not need to consider an alternative whose effects cannot reasonably be ascertained and whose implementation is remote and speculative.

3.1 Alternatives Development and Screening Process

The Alternatives Screening Report (Appendix B) documents the alternatives development and screening analysis conducted to determine the range of alternatives for consideration in this EIR. It documents the criteria used to evaluate and select alternatives for further analysis, including their feasibility, the extent to which they would meet most of the basic objectives of the proposed project, and their potential to avoid or substantially lessen any of the significant effects of the proposed project. The Alternatives Screening Report provides a complete description of each alternative considered during screening, including figures, and discusses why each alternative was either eliminated from further consideration or retained for further consideration in this EIR. The alternatives reviewed included alternative substation sites, alternative transmission line routes, reduced footprint alternatives, and alternatives to constructing new transmission facilities or that would reconductor existing transmission lines.

3.1.1 Alternatives Screening Methodology and Criteria

Each potential alternative to the proposed project that was identified by the California Public Utilities Commission (CPUC) for the CEQA review as described in Section 1 were screened using a three-step process:

Step 1: Clarify the description of the alternative to allow for comparative evaluation.

Step 2: Evaluate the alternative by comparing it with the proposed project and with respect to the CEQA criteria for alternatives.

Step 3: Determine the suitability of each alternative for full analysis in the EIR based on the results of Step 2. If the alternative is unsuitable, eliminate it from further consideration.

To comply with CEQA requirements for the evaluation of alternatives, each alternative identified was evaluated according to three criteria (CEQA Guidelines Section 15126.6):

I. Would the alternative accomplish most of the basic project objectives?

II. Would the alternative be feasible (from an economic, legal, and technological perspective)?

III. Would the alternative avoid or substantially lessen any significant effects of the proposed project (including consideration of whether the alternative itself could create significant effects potentially greater than those of the proposed project)?

The Alternatives Screening Report (Appendix B) provides more information about the alternatives screening methodology and criteria.

3.1.2 Alternatives to Transmission Facilities

California Public Utilities Code Section 1002.3 requires that the CPUC consider cost-effective alternatives to transmission facilities when evaluating project applications for a Certificate of Public Convenience and Necessity. Alternatives A, B1, B2, and B3 (see section 3.2, below) would be cost-effective alternatives that meet Section 1002.3 requirements because they include methods for meeting project objectives that would not require new transmission facilities that would operate at voltages equal to or greater than 200 kilovolts (kV) and would incorporate energy conservation and efficiency improvement measures. Alternative A would not include the construction of new or upgraded transmission lines. Alternatives B1, B2, and B3 would reconductor existing 138-kV transmission lines or, to the extent feasible, make use of transmission lines that are currently not in use.

Alternatives A, B1, B2, and B3 include cost-effective demand-side alternatives, e.g., targeted energy efficiency, demand reduction measures (demand response and load management), and local generation, that may be implemented within the applicant's 10-year transmission planning horizon. Local generation refers to small-scale, customer-level distributed generation resources within an electrical service area, e.g., rooftop solar photovoltaic generation on single-family homes. Alternatives to transmission facilities may include other types of distributed generation installations (e.g., rooftop solar photovoltaic generation on commercial facilities, combined heat and power units, and biomass facilities, as well as small wind and other small-scale, often community-based facilities; CEC 2009) and larger-scale renewable and conventional generation facilities (e.g., solar fields and natural gas power plants).

3.1.3 Alternatives Considered in the Screening Report

Some of the alternatives considered during the screening process were presented in the Proponent's Environmental Assessment (PEA), and others were suggested by the public during scoping or identified by the CPUC's Energy Division as a result of the agency's independent review. Each of the alternatives considered in the Alternatives Screening Report is identified in Table 3-1. The alternatives retained for further consideration in this EIR are described in Section 3.2. The alternatives eliminated from further consideration are described in the Alternatives Screening Report (Appendix B).

Table 3-1 Alternatives Considered in the Screening Report

Alternative	Identified by	Meets Basic Objectives	Feasible	Would Likely Avoids or Substantially Lessens a Potentially Significant Effect	Retained for Consideration in EIR
A. No Project	CPUC	Yes	Yes	Yes	**Yes**
B1. Reconductor Laguna Niguel–Talega 138-kV Line	CPUC	Yes	Yes	Yes	**Yes**
B2. Use of Existing Transmission Lines	CPUC	Yes	Yes	Yes	**Yes**
B3. Phased Construction of Alternatives B1 and B2	CPUC	Yes	Yes	Yes	**Yes**
B4. Rebuild South Orange County 138-kV System	SDG&E	Yes	Yes	Yes	**Yes**
C1. SCE 230-kV Loop In to Capistrano Substation	SDG&E[a]	Yes	Yes	Yes	**Yes**
C2. SCE 230-kV Loop In to Capistrano Substation Alternative Route	CPUC	Yes	Yes	Yes	**Yes**
D. SCE 230-kV Loop In to Reduced-Footprint Substation at Landfill	SDG&E[a]	Yes	Yes	Yes	**Yes**
E. New 230-kV Line Operated at 138 kV	CPUC	Yes	Yes	Yes	**Yes**
F. 230-kV Rancho Mission Viejo Substation	CPUC	Yes	Yes	Yes	**Yes**
G. New 138-kV San Luis Rey–San Mateo Line and San Luis Rey Substation Expansion	SDG&E	Yes	Yes	Yes	**Yes**

Note:
[a] Alternative presented as described by SDG&E but with CPUC modifications or additional design details.

Key:
CPUC = California Public Utilities Commission
EIR = Environmental Impact Report
kV = kilovolt
SCE = Southern California Edison
SDG&E = San Diego Gas and Electric Company

3.2 Alternatives Evaluated in this EIR

This section describes the alternatives retained for consideration in this EIR. Each of the following alternatives is potentially feasible and would meet most of the basic objectives of the proposed project as discussed in the Alternatives Screening Report (Appendix B) and below in Section 3.2.1.2.

3.2.1 Alternative A – No Project

The No Project Alternative is the circumstance under which the proposed project does not proceed (CEQA Guidelines Section 15126.6(e)(3)(B)). The purpose of describing and analyzing a No Project Alternative is to allow decision-makers to compare the effects of approving versus not approving the proposed project. The components of the No Project Alternative described in this report were defined by the CPUC with input from San Diego Gas & Electric Company (SDG&E, or the applicant). Regardless of

whether the proposed project is constructed, it is reasonably foreseeable that the following would occur prior to 2018 (SDG&E 2012; CAISO 2014):

- Talega Substation's STATCOM[1] would be replaced; and
- New dynamic synchronous condensers[2] would be installed as approved by the California Independent System Operator (CAISO) to provide additional reactive power support in the proposed project area (approximately 700 mega volt amperes reactive (MVARs) at 230 kilovolts [kV]) between 2015 and 2017.

For further information about the STATCOM replacement and dynamic synchronous condenser installations, refer to the Alternatives Screening Report (Appendix B).

In addition, if equipment at Capistrano Substation[3] or existing distribution or 138-kV lines within the South Orange County Service Area fail or would be inadequate to serve customer demand, it is anticipated that the applicant would replace the equipment or facilities pursuant to CPUC General Order 131-D and CEQA Guidelines Section 15260 et seq. and 15300 et seq. (statutory and categorical exemptions). For example, the applicant is expected to replace 138-kV transformers and update protection equipment at Capistrano Substation and Trabuco Substation in 2015 (SDG&E 2012). The applicant is able to replace facilities without obtaining a Certificate of Public Convenience and Necessity or Permit to Construct from the CPUC as specified in CPUC General Order 131-D for:

a. Power line[4] facilities or substations with an in-service date occurring before January 1, 1996, which have been reported to the CPUC in accordance with the CPUC's decision adopting General Order 131-D.
b. The replacement of existing power line facilities or supporting structures with equivalent facilities or structures.
c. The minor relocation of existing power line facilities up to 2,000 feet in length, or the intersetting of additional support structures between existing support structures.
d. The conversion of existing overhead lines to underground.
e. The placing of new or additional conductors, insulators, or their accessories on supporting structures already built.
f. Power lines or substations to be relocated or constructed that have undergone environmental review pursuant to CEQA as part of a larger project and for which the final CEQA document (EIR or Negative Declaration) finds no significant unavoidable environmental impacts caused by the proposed line or substation.

[1] A STATCOM is a regulating device used to optimize the power transfer capability of alternating current transmission systems. Reactive power (volt-amperes reactive or VARs) is regulated in alternating current transmission systems to maintain required voltage levels. STATCOMs are one option for regulating reactive power. Talega Substation has a STATCOM rated for 100 megavolt-amperes reactive power, which may be referred to as 100 mega VARs or 100 MVARs. It is connected to SDG&E's 138-kV system.

[2] A dynamic synchronous condenser, similar to a STATCOM, is type of device used to optimize the power transfer capability of alternative current transmission systems. Dynamic synchronous condensers are another option for regulating reactive power.

[3] Capistrano Substation was constructed in the 1960s.

[4] As defined by CPUC General Order 131-D, a power line is a line designed to operate between 50 and 200 kV. A distribution line is a line designed to operate under 50 kV.

g. Power line facilities or substations to be located in an existing franchise, road-widening setback easement, or public utility easement; or in a utility corridor designated, precisely mapped and officially adopted pursuant to law by federal, state, or local agencies for which a final Negative Declaration or EIR finds no significant unavoidable environmental impacts.

h. The construction of projects that are statutorily or categorically exempt pursuant to § 15260 et seq. of the Guidelines adopted to implement the CEQA, 14 Code of California Regulations § 15000 et seq. (CEQA Guidelines).[5]

Additionally, CPUC General Order 131-D states that the construction of electric distribution line facilities, or substations with a high side voltage under 50 kV, or substation modification projects that increase the voltage of an existing substation to the voltage for which the substation has been previously rated within the existing substation boundaries, does not require the issuance of a Certificate of Public Convenience and Necessity or permit from the CPUC, nor discretionary permits or approvals by local governments. However, to ensure safety and compliance with local building standards, the utility must first communicate with, and obtain the input of, local authorities regarding land use matters and obtain any non-discretionary local permits required for the construction and operation of these projects. Hence, it is reasonably foreseeable that substation and power line work allowed by General Order 131-D without CPUC approval could occur under the No Project Alternative.

3.2.1.2 No Project Alternative and Objectives of the Proposed Project

The Alternatives Screening Report states that the No Project Alternative would at least partially meet Objectives 1 and 2 (Appendix B). Given the applicant's ability to replace failed or inadequate equipment at Capistrano Substation to meet conditions that may occur under the No Project Alternative pursuant to General Order 131-D and CEQA (see above), it is clear that the No Project Alternative would meet Objective 2 as defined by the CPUC (Section 1.2.1, "Objectives of the Proposed Project"). General Order 131-D would also allow the applicant to reconductor or otherwise modify existing 138-kV power lines without obtaining a Certificate of Public Convenience and Necessity or Permit to Construct from the CPUC; therefore, it is reasonable to assume that as part of the No Project Alternative, the applicant would modify its existing 138-kV system to the extent allowed by General Order 131-D to avoid power line failures and meet customer demand. The following section describes why the No Project Alterative could fully meet Objective 1.

Objective 1: Reduce the Risk of Instances that Could Result in the Loss of Power to Customers through the 10-year Planning Horizon

The applicant's power flow data indicate that if no work is conducted on the South Orange County 138-kV System by 2020, a section of the Talega–Laguna Niguel–San Mateo 138-kV Line (TL13835) could overload should either of the following Category C, N-1-1 scenarios (see Chapter 1, Section 1.1.2, "Transmission and Electrical Demand Planning") occur:

1. Failure of the Pico–Capistrano 138-kV Line (TL13816) followed by failure of the Pico–Trabuco 138-kV Line (TL13833); or
2. Failure of the Talega–Pico Line (TL13836) followed by failure of a section of the Talega–Pico–San Mateo Line (TL13846).

[5] These exemptions do not apply when a significant effect on the environment would occur as defined in CEQA Guidelines Section 15300.2 or CPUC General Order 131-D.

Other Category C (N-1-1) scenarios are also possible by 2020, but these are the two worst-case (highest potential overload) scenarios described by the applicant. In accordance with CPUC General Order 131-D, it is anticipated that the applicant would implement system adjustments (e.g., reconductor 138-kV line segments) prior to this date to ensure that some or all of these overload scenarios do not occur. Examples of system adjustments that could be implemented may be similar to the installations discussed under Alternatives B1 through B4. It is also possible that an N-2 (Category B) event could occur by 2020, but it is not anticipated that the applicant would make system adjustments to address these events, as load shedding would be allowable.

In addition, under the No Project Alternative, it is assumed that energy efficiency improvements and distributed generation facilities (including rooftop solar generation) will continue to be implemented throughout the 10-year planning horizon that will incrementally reduce load on SDG&E's 138-kV South Orange County System. The installation of new rooftop solar generation facilities is expected to continue during the 10-year planning horizon for the proposed project. Nationwide, the cost of new solar installations is anticipated to continue to decrease, and the amount of solar power generation is expected to increase through 2024. Solar energy is the fastest-growing source of renewable generation. Solar generation is projected to increase by 7.5 percent per year through 2040 nationwide almost exclusively as a result of increased photovoltaic capacity in both the utility-side and customer-side sectors (USEIA 2014).

The applicant's data indicate that by the end of 2014, more than 12.6 megawatts (MW) of demand within the south Orange County service area will be provided by rooftop solar generation, which is approximately 3 percent of the approximately 450 MW South Orange County 138-kV System (see Appendix B). Should the installation of new rooftop solar generation continue to increase within southern Orange County, the additional generation would substantially offset the increase in electrical demand anticipated by the applicant, which is estimated at 5.7 MW per year (1.1 percent per year) through 2024; Table 1-1. In 2013, 3.1 MW of new solar generation was installed within the applicant's South Orange County service area (see Appendix B).[6] Additionally, peak demand typically occurs during daylight hours in the summer, when rooftop solar facilities are capable of generating power. For further discussion of demand-side management, energy conservation programs, and distributed and renewable generation, refer to the Alternatives Screening Report (Appendix B).

Given the anticipated rooftop solar facility installations and the applicant's ability to replace both distribution line facilities and 138-kV line facilities to meet conditions that may occur under the No Project Alternative, this alternative would fully meet Objective 1 as defined by the CPUC (Section 1.2.1, "Objectives of the Proposed Project"). Therefore, Alternative A would meet two of the three basic objectives of the proposed project.

Additionally, the No Project Alternative described in this report is considered an alternative that meets the CPUC's requirements for consideration of cost-effective alternatives to transmission facilities as described in Section 3.1.2, "Alternatives to Transmission Facilities."

[6] The rooftop solar generation capacity data provided by the applicant refer to the nameplate capacity of installed rooftop solar equipment. The applicant is not able to report the specific amount of power provided by Net Energy Metering program participants with rooftop solar installations. Net Energy Metering program generation, however, is accounted for in the South Orange County 138-kV System's recorded (historical) peak loads (Figure 1-1) and is reflected in the applicant's system-wide load forecasts, which are based in part, on historical peak loads.

3.2.2 Alternative B1 – Reconductor Laguna Niguel–Talega 138-kV Line

Under Alternative B1, which was identified by the CPUC, a segment of the Laguna Niguel–Talega 138-kV Line (TL13835) would be reconductored with conductor of a comparable size but higher capacity, such as aluminum conductor steel supported (ACSS) or similar. ACSS has a higher operating temperature and greater resistance to overload than other types of comparably sized conductor, such as aluminum conductor steel reinforced (ACSR) (Southwire 2014). The use of ACSS or similar high-capacity conductor would allow for high power transfer (e.g., 273 megavolt amperes [MVA]) in comparison to the existing 138-kV line's 136 MVA rating.[7]

Under this alternative, a 138-kV segment (approximately 7.8 miles long) from Capistrano Substation to Talega Substation would be reconductored (Figure 3-1). Reconductoring would occur along the same transmission line route (Segments 1b to 4) as the proposed project (Figures 2-1 and 3-1). In addition, an approximately 2.5-mile-long segment of transmission line (TL13835) from Laguna Niguel Substation would be tied into Capistrano Substation (but would not require reconductoring) at a location adjacent to the substation to create a new Laguna Niguel–Capistrano 138-kV Line under this alternative. Some structures may need to be replaced during reconductoring. Equipment at Capistrano Substation found to be inadequate would also be replaced.

This alternative includes the assumption that the CAISO-approved installation of reactive power support equipment and anticipated increase in rooftop solar installations within South Orange County as described under Alternative A would take place. Alternative B1 would meet the CPUC's requirements for consideration of cost-effective alternatives to transmission facilities as described in Section 3.1.2, "Alternatives to Transmission Facilities."

The applicant proposed a reconductoring project similar to Alternative B1 to the CAISO in 2010 and 2011 to address a forecast overload of TL13835 due to a potential Category B (N-1) event caused by the loss of the Talega–Pico 138-kV Line (TL13836). In 2011, the CAISO recommended the reconductoring project be evaluated in the future because the overload identified would be only by 1 percent. The CAISO also noted that TL13835 might be upgraded as part of the version of the proposed project presented to the CAISO at that time (CAISO 2010, 2011).

3.2.3 Alternative B2 – Use of Existing Transmission Lines (Additional Talega–Capistrano 138-kV Line)

Under this alternative, which was identified by the CPUC, an existing 138-kV transmission line currently operated as a distribution line (12-kV circuit 315) and an unused transmission line would be connected and energized at 138 kV. The existing 138-kV line extends approximately 3 miles from Capistrano Substation southeast to the San Juan Hills High School area. The other transmission line, which is assumed to be an unused 66-kV or 69-kV line, extends from the San Juan Hills High School approximately 4.8 miles south to Talega Substation. Sections of the transmission line were identified as unused by the applicant during the CPUC's October 16, 2012 site visit. At that time, the applicant indicated that it planned to remove the line at a future date but not as part of the proposed project.

[7] Transmission line TL13835's existing ACSR conductor has a diameter of 336 kcmil. A circular mil (cmil) is a standard unit of measure used for electrical systems that refers to the area of the cross section of conductor. One cmil is equal to the area of a circle with a 1-mil diameter, and 1 kcmil is equal to 1,000 cmils. Large conductor sizes rated for use on electrical transmission lines are generally 0.6-inches to 2-inches in diameter. ACSR 336-kcmil conductor is approximately 0.7 inches in diameter (Grigsby 2001).

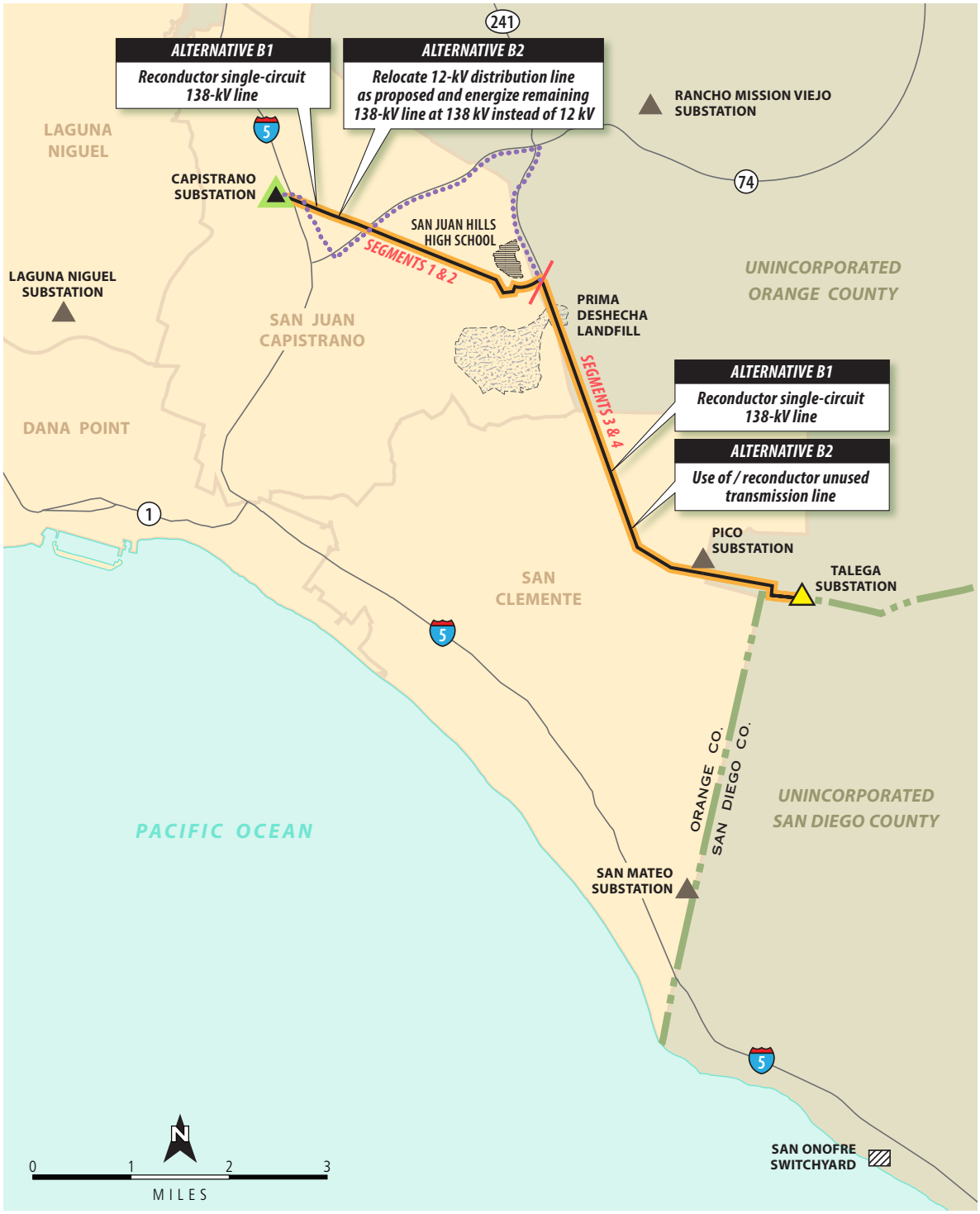

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Figure 3-1

138-kV Reconductoring and Use of Existing Transmission Lines

Alternatives B1, B2 and B3*

South Orange County Reliability Enhancement Project

For this alternative, the existing 66-kV/69-kV line's conductor would be replaced with higher-capacity but comparably sized conductor (e.g., ACSS). Replacement of the existing wood structures may also be required. Reconductoring, if required, would occur along the same transmission line route (Segments 1b to 4) as the proposed project (Figures 2-1 and 3-1). The new Talega–Capistrano 138-kV Line would have a capacity of approximately 270 MVA depending on whether reconductoring is required and the type of conductor installed. In addition, equipment at Capistrano Substation found to be inadequate as described in Section 1.4.1 would be replaced.

Under this alternative, the operation of 12-kV distribution circuit 315 at 138 kV would necessitate the additional installation of a new distribution line route, which would be identical to the distribution component of the proposed project. This alternative also assumes that the CAISO-approved installation of reactive power support equipment and anticipated increase in rooftop solar installations within South Orange County as described under Alternative A would take place. Alternative B2 would meet the CPUC's requirements for consideration of cost-effective alternatives to transmission facilities as described in Section 3.1.2.

3.2.4 Alternative B3 – Alternative B3 – Phased Construction of Alternatives B1 and B2

Under this alternative, which was identified by the CPUC, the construction of either Alternative B1 or B2, or the construction of both alternatives, would occur. The construction of both alternatives would only occur if necessary to address potential overload events that may be forecast by future transmission planning studies.

If, under this alternative, the components described under Alternative B2 were to be constructed first, the existing 138-kV line (TL13835) could continue operation while these initial components were constructed. There would be minimal, if any, impact on the South Orange County 138-kV system during construction, which would likely result in fewer service disruptions than would otherwise occur. If the components described under Alternative B1 are constructed first (reconductoring of TL13835), the existing 138-kV transmission line (currently operated at 12 kV) and unused 66-kV/69-kV transmission line could potentially be operated at 138 kV during reconductoring of TL13835 to ensure that continuous electrical service is maintained, which could result in fewer disruptions in service.

It is unclear at this time whether the 2.5-mile-long segment of TL13835 from Laguna Niguel Substation would be required to be tied into Capistrano Substation as described under Alternative B1 if this alternative is constructed. This alternative includes the assumption that the CAISO-approved installation of reactive power support equipment and anticipated increase in rooftop solar installations within South Orange County as described under Alternative A would take place. Alternative B3 would meet the CPUC's requirements for consideration of cost-effective alternatives to transmission facilities as described in Section 3.1.2.

3.2.5 Alternative B4 – Rebuild South Orange County 138-kV System

This alternative was identified by the applicant in the PEA and further refined by the applicant in response to the CPUC's request for further description of the improvements that SDG&E anticipates would be required for the South Orange County 138-kV System should the proposed project not be approved. Under this alternative, all of the existing 138-kV lines that extend between the applicant's Trabuco, Capistrano, Laguna Niguel, and Talega substations would be reconductored (approximately 34 miles; Figure 3-2) except and the Capistrano–Laguna Niguel 138-kV Line (TL13837) and a short section

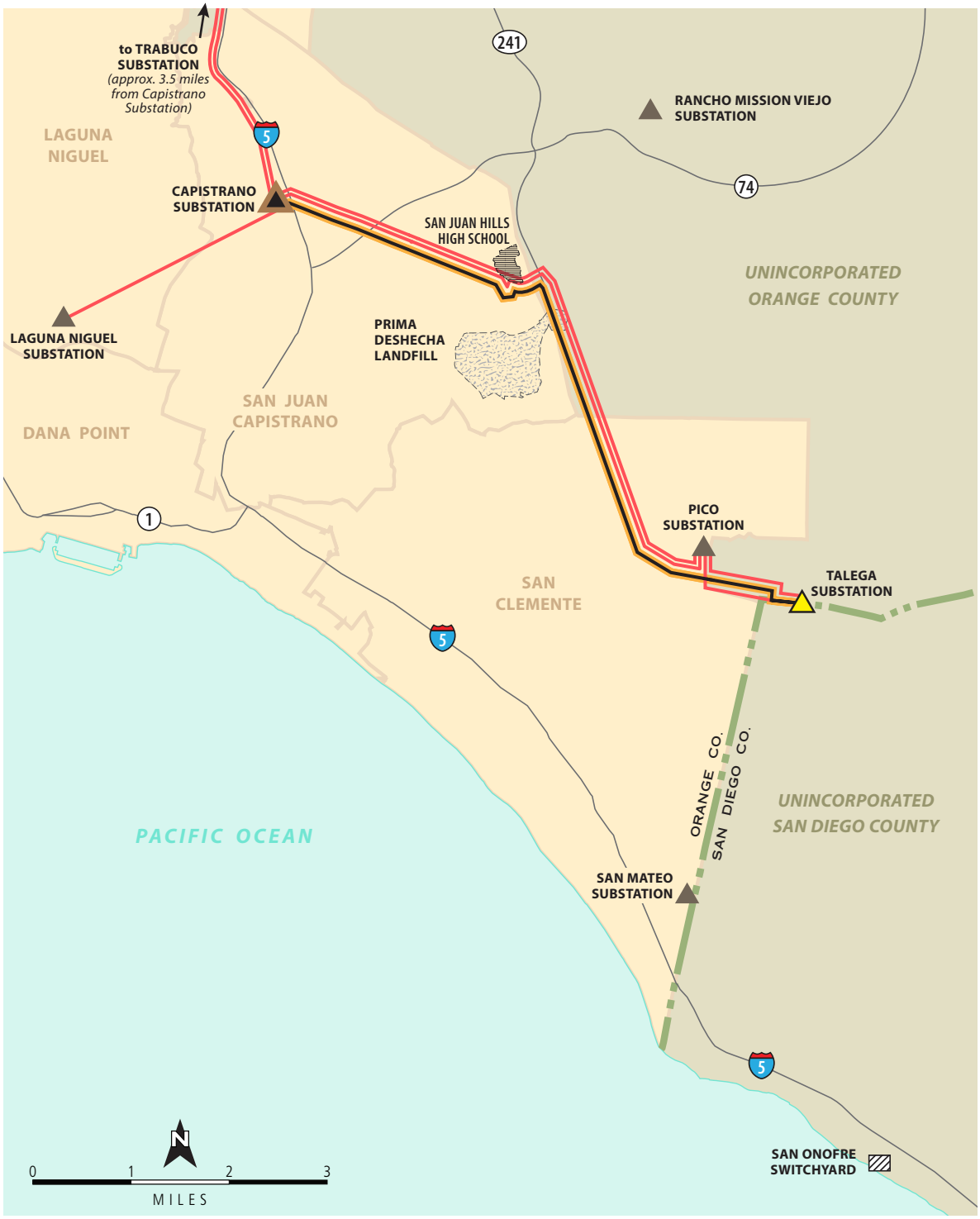

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Figure 3-2

Rebuild South Orange County 138-kV System

Alternative B4

South Orange County Reliability Enhancement Project

(TL13846C) that extends through the Talega Corridor area to connect the Talega–Pico–San Mateo 138-kV Line (TL13846) to Talega Substation. This would include reconductoring, the installation of new structures, the installation of new underground conduit along five 138-kV lines (TL13816, TL13833, TL13835, TL13836, and TL13846), and the 7.8 miles of reconductoring described under Alternative B1.

In addition, new 138-kV facilities at Capistrano Substation would be constructed as described for the proposed project and would include the installation of three 138/12-kV transformers and space for a fourth 138/12-kV transformer at the lower yard of the Capistrano Substation site (Figure 2-3). This substation expansion would likely result in demolition of the former utility structure that fronts the substation property on Camino Capistrano; however, no 230-kV substation would be constructed at the site, and the profile of the rebuilt substation would be lower in height than for the proposed project. Two 230/138-kV transformers that the applicant has indicated are outdated would be replaced at Talega Substation as proposed. The applicant has also indicated that this alternative would include the reactive power support elements described under the No Project Alternative. It is assumed that the other No Project Alternative elements would be included under Alternative B4 as well.

3.2.6 Alternative C1 – SCE 230-kV Loop-in to Capistrano Substation

A version of this alternative was initially identified by the applicant in the PEA. As compared to the PEA alternative, Alternative C1 includes sufficient design details to ensure that analysis pursuant to CEQA may be conducted. Under this alternative, San Juan Capistrano Substation would be constructed as described for the proposed project. A new double-circuit 230-kV transmission line (3 to 4 miles long) would be constructed. The line would extend from the proposed San Juan Capistrano Substation to a location in proximity to Prima Deschecha Landfill (PDL) and the San Juan Hills High School area (Figure 3-3). At this location, the new 230-kV line would loop in (connect) to Southern California Edison's (SCE's) existing Serrano–SONGS 230-kV line. The new 230-kV line and loop-in connection would be constructed within the same right-of-way (ROW) as the double-circuit 230-kV line that would be used for the proposed project. A small amount of new ROW may be required, depending on where the loop-in connection is constructed. Distribution circuit 315 (12 kV) would be relocated as described for the proposed project.

3.2.7 Alternative C2 – SCE 230-kV Loop-in to Capistrano Substation Routing Alternative

A version of this alternative was initially identified by the applicant in the PEA. Like the PEA alternative, Alternative C2 includes design details sufficient to ensure that analysis pursuant to CEQA may be conducted, and includes details based on comments received during the EIR scoping meeting held in the city of San Juan Capistrano. Many of the same components described under Alternative C1 would be constructed, but instead of connecting to SCE's Serrano–SONGS 230-kV line at a location in proximity to PDL and south of the San Juan Hills High School area, the connection would be made north of the San Juan Hills High School area (Figure 3-3). The new double-circuit 230-kV line would be constructed along the same ROW southeast from Capistrano Substation to San Juan Creek Road. At San Juan Creek Road, new 230-kV line would be constructed in new underground conduit and within new ROW along San Juan Creek Road for approximately 1 mile northeast to a location near La Pata Avenue where it would connect to SCE's existing 230-kV line. It is assumed that distribution circuit 315 (12-kV) would be relocated as described for the proposed project.

3.2.8 Alternative D – SCE 230-kV Loop In to Reduced-Footprint Substation at Landfill

A version of this alternative was initially identified by the applicant in the PEA. Like the alternative presented in the PEA, Alternative D includes design details sufficient to ensure that analysis pursuant to CEQA may be conducted. Under this alternative, a new 230/138/12-kV substation would be constructed at PDL in proximity to the transmission corridor that crosses the landfill (Figure 3-3). Both SDG&E and SCE transmission lines are located within this corridor. Power would be provided to the new substation from SCE's Serrano–SONGS 230-kV line. A new double-circuit 230-kV line segment (less than 0.25 miles long) would be constructed, possibly within new ROW, which would loop the new substation into SCE's 230-kV line.

Under this alternative, a new, single-circuit 138-kV line segment (approximately 0.75 miles long) would be installed that would use the existing 66-kV/69-kV transmission line route described for Alternative B2. This line segment would extend from the new substation west to the applicant's transmission ROW and then extend north along the 66-kV/69-kV line route to the San Juan Hills High School area, where it would connect to the applicant's existing underground 138-kV line.

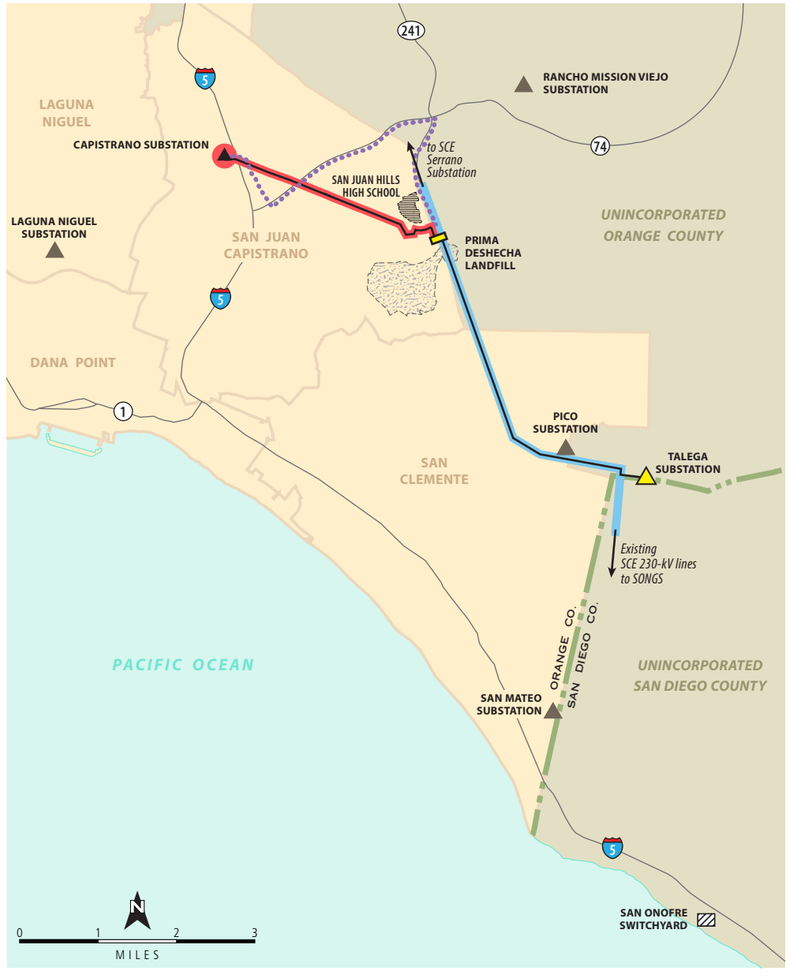
Distribution circuit 315 (12 kV) would be relocated as described for the proposed project, which would allow the existing 138-kV line that extends from the San Juan Hills High School area to Capistrano Substation to be energized at 138 kV instead of 12 kV. The new 138-kV segment would be used to create a continuous new 138-kV line between the new substation and Capistrano Substation.

One 230/138-kV transformer would be installed at the new substation with space for a spare if the applicant provides data indicating a spare could be needed. One 138/12-kV transformer would also be installed. Space for additional 138/12-kV transformers and/or additional distribution-level transformers would also be included in the substation design if the applicant provides data indicating that the space could be needed. The substation would be gas insulated and require 3 to 10 acres of land. In addition, equipment at Capistrano Substation found to be inadequate would be replaced.

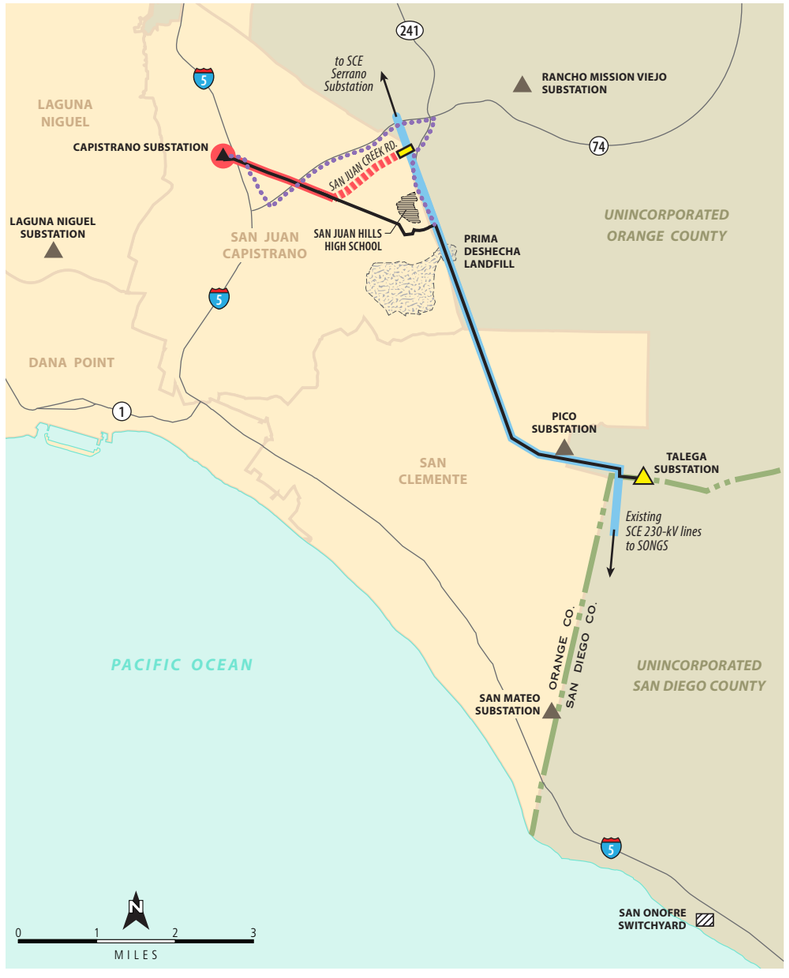
3.2.9 Alternative E – New 230-kV Talega–Capistrano Line Operated at 138 kV

Under this alternative, which was identified by the CPUC, the proposed double-circuit 230-kV line would be constructed between Talega Substation and the San Juan Hills High School and Rancho San Juan residential development area (Figure 3-4). The two new circuits would be operated at 138 kV rather than 230 kV. The new double-circuit transmission line would connect to two existing transmission line segments between Capistrano Substation and the San Juan Hills High School and Rancho San Juan residential development area.

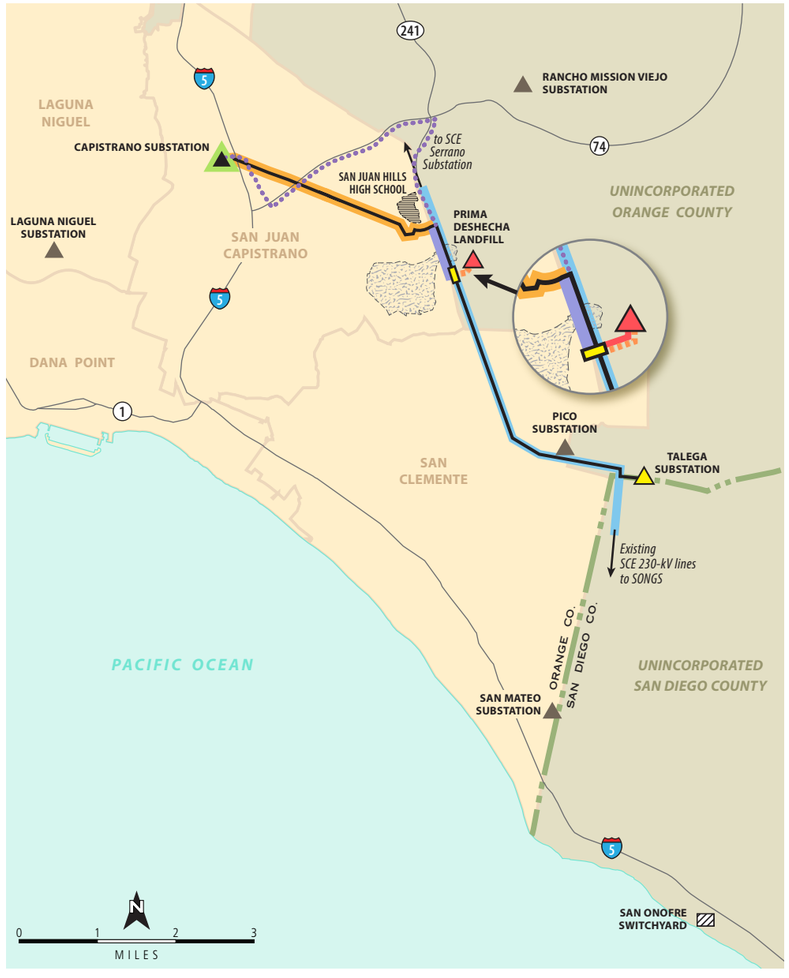
One of the existing 138-kV lines is the Laguna Niguel–San Mateo–Talega 138-kV Line (TL13835), and the second 138-kV line is currently operated at 12 kV (distribution circuit 315). Distribution circuit 315 would be relocated as proposed, and the existing 138-kV circuit would be energized at 138 kV. If reconductoring is required between Capistrano Substation and the San Juan Hills High School and Rancho San Juan residential development area to upgrade sections of circuit 315, higher-capacity conductor (e.g., ACSS) similar in size to the existing conductor would be installed. The new Talega–Capistrano 138-kV Lines that would be created under this alternative could have a capacity of approximately 270 MVA, depending on whether reconductoring is required and the type of conductor installed.



Alternative C1
(SCE 230-kV Loop-in to Capistrano Substation)



Alternative C2
(SCE 230-kV Loop-in to Capistrano Substation Routing Alternative)



Alternative D
(New 230-kV Substation at Landfill)

LEGEND

- Proposed 230-kV substation upgrade
- Existing 230-kV substation
- Existing 138-kV substation
- Replace inadequate equipment at substation
- Loop-in to existing transmission line
- Existing 230-kV lines (SCE)
- Existing Talega-Capistrano (SDG&E) 138-kV line
- Relocate 12-kV distribution line as proposed
- New double-circuit 230-kV line
- New double-circuit 230-kV line in new right-of-way
- Energize existing 138-kV line that is currently operated at 12 kV (SDG&E)
- Reconductor unused 66-kV line
- New 138-kV line in new right-of-way

CAISO	California Independent System Operator
SDG&E	San Diego Gas & Electric Company
SCE	Southern California Edison Company
MVAR	Megavolt Ampere Reactive power
kV	kilovolt (= 1000 volts)

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Figure 3-3 **SDG&E 230-kV Interconnect with SCE Alternatives C1, C2, and D**

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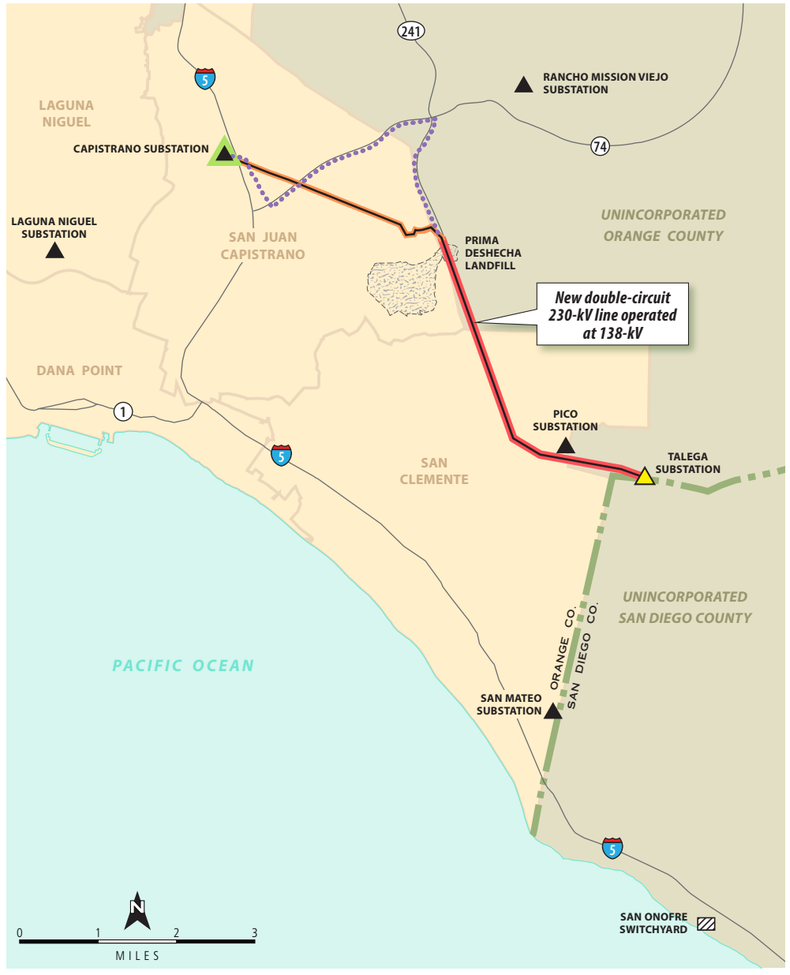
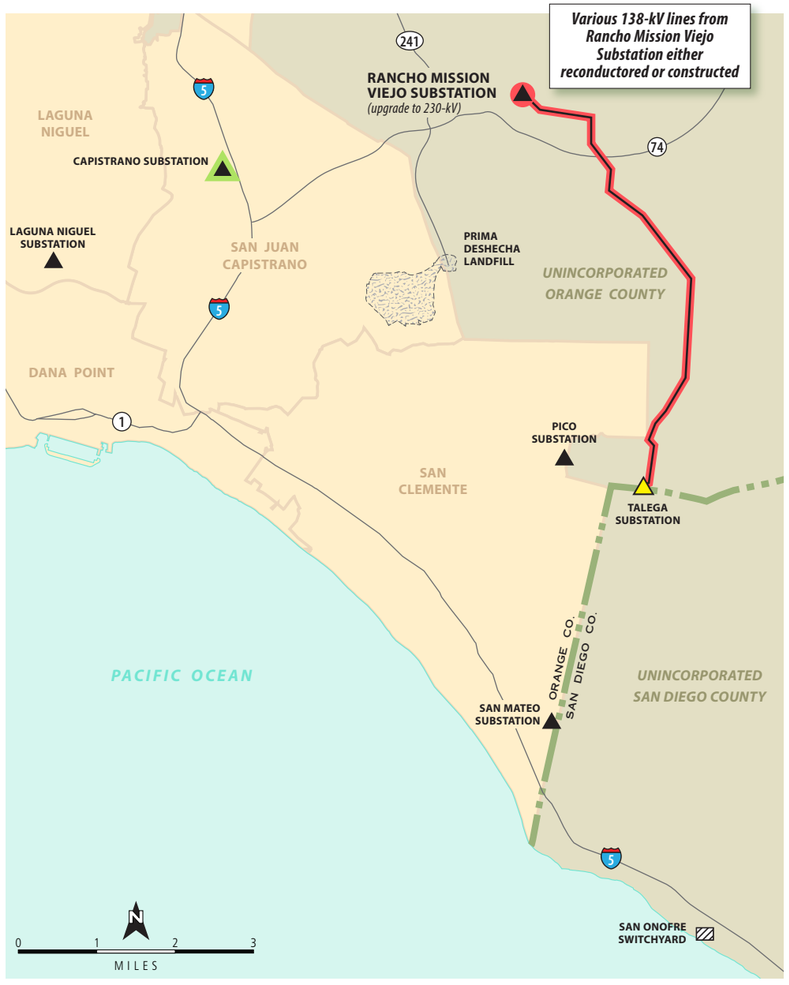


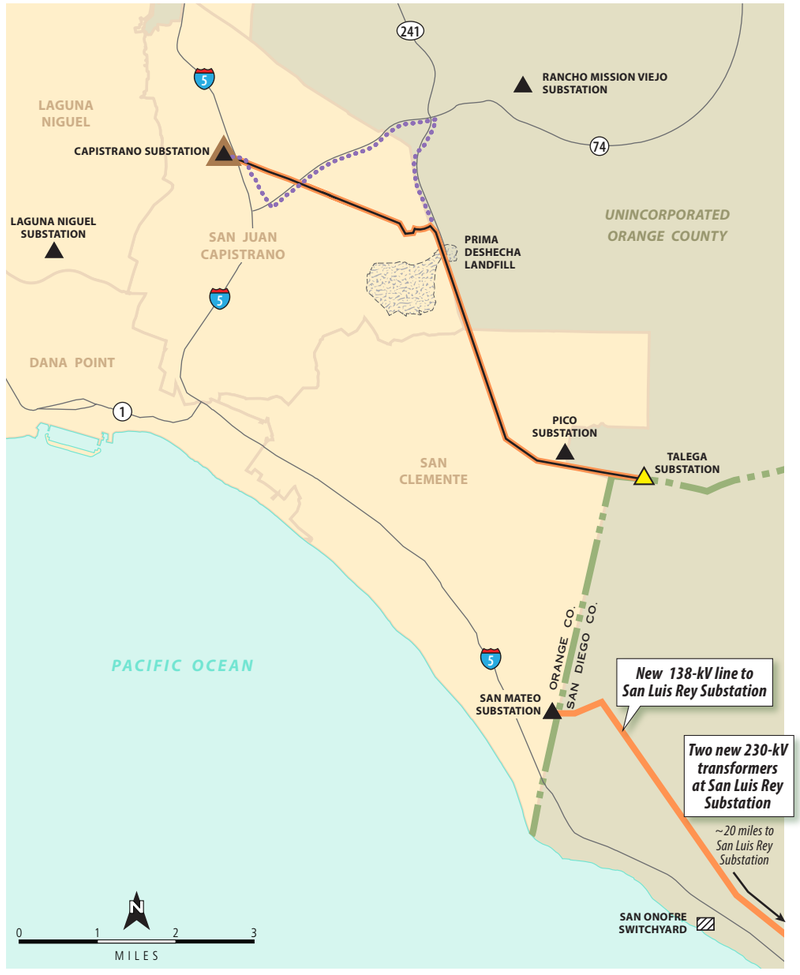
Alternative E

(New 230-kV Talega–Capistrano Line Segments Operated at 138 kV)



Alternative F

(230-kV Rancho Mission Viejo Substation)



Alternative G

(New 138-kV San Luis Rey–San Mateo Line and San Luis Rey Substation Expansion)

LEGEND

- Proposed 230-kV substation upgrade
- Replace inadequate equipment at substation
- Rebuild and expand substation without increase to 230 kV
- Existing 230-kV substation
- Existing 138-kV substation
- Existing 138-kV line
- New double-circuit 230-kV line
- New or reconductored 138-kV line in existing right-of-way
- Relocate 12-kV distribution line as proposed

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Figure 3-4 **New 138-kV Transmission Line and Rancho Mission Viejo Alternatives (Alternatives E, F, and G)**

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If it is not feasible to make use of circuit 315 under this alternative, only one 230-kV circuit (operated at 138-kV) would be installed between Talega Substation and the San Juan Hills High School and Rancho San Juan residential development area on the new double-circuit poles. Circuit 315 would not be relocated and the Laguna Niguel–San Mateo–Talega 138-kV Line (TL13835) section between Capistrano Substation and the San Juan Hills High School and Rancho San Juan residential development area would be reconductored with higher-capacity conductor (see also Alternative B1).

Equipment at Capistrano Substation would be replaced to the extent that the applicant can provide data indicating such replacement would be required to accommodate this alternative or would otherwise be required because the equipment is inadequate. If future load forecast and power flow studies indicate that the existing 138/12-kV Capistrano Substation must be expanded to a larger 230/138/12-kV substation as described for the proposed project, 4.8 miles of the proposed double-circuit 230-kV line (7.8 miles long) would already be in place to support this expansion.

3.2.10 Alternative F – 230-kV Rancho Mission Viejo Substation

This alternative was identified by the CPUC based on comments received during the EIR scoping meeting held in the city of San Juan Capistrano. In addition, details regarding the Eastern Talega 230-kV Transmission Line Route alternative, as described in the applicant's PEA, are incorporated into this alternative. Under this alternative, the applicant's 138/12-kV Rancho Mission Viejo Substation (Figure 3-4) would be expanded to a 230/138/12-kV substation with specifications comparable to those of the proposed project's new San Juan Capistrano Substation. Capistrano Substation would not be expanded, but equipment at Capistrano Substation found to be inadequate would be replaced.

To bring a new 230-kV source into the South Orange County service area, a new, double-circuit 230-kV Talega–Rancho Mission Viejo line would be constructed along the Eastern Talega 230-kV Transmission Line Route described in the PEA. This route follows the existing Talega–Rancho Mission Viejo 138-kV Line (TL13831). Although two new 230-kV circuits would be installed, one of the circuits would be energized at 138 kV and operated as TL13831. The existing TL13831 structures and conductor would be removed, and the existing ROW (100-feet wide) would be increased by approximately 20 feet.

3.2.10.1 Work Planned at Rancho Mission Viejo Substation

The applicant plans to replace 81 138-kV wood poles with steel poles between Talega Substation and Rancho Mission Viejo Substation along the Eastern Talega Transmission Line Route described under Alternative F (138-kV line TL13831). The replacement would be completed in 2016. The applicant anticipates that the conductor with a greater electrical carrying capacity would be installed on the new steel structures if approved by the CPUC (SCE 2012). The applicant also plans to construct three new 12-kV distribution lines from Rancho Mission Viejo Substation and replace approximately ten 138-kV wood poles with steel poles between Rancho Mission Viejo and Margarita substations (TL13838).

3.2.11 Alternative G – New 138-kV San Luis Rey–San Mateo Line and San Luis Rey Substation Expansion

This alternative was identified by the applicant in the PEA. Under this alternative, a new, approximately 18-mile-long 138-kV transmission line would be constructed within existing and new ROW from San Luis Rey Substation to San Mateo Substation (Figure 3-4). Two new 230/138-kV transformers would be installed at San Luis Rey Substation, the substation would be expanded, and three 230-kV line segments would be modified. Capistrano Substation's 138-kV and 12-kV facilities would be rebuilt as described

for the proposed project, and a number of 138-kV transmission lines would be reconductored. In addition, a segment of the Laguna Niguel–Talega 138-kV Line (TL13835) from Capistrano Substation to Talega Substation would be modified to support a second 138-kV line, which would require a similar amount of construction as the double-circuit 230-kV transmission line that would be constructed as part of the proposed project.