CHAPTER 3
Alternatives and Cumulative Projects

This chapter documents (1) the range of alternatives that was suggested and evaluated; (2) the approach and methods used to screen the feasibility of these alternatives according to guidelines established under CEQA; and (3) the results of the alternatives screening. This section is organized as follows: Section 3.1 is an overview of the alternatives screening process; Section 3.2 describes the methodology used for alternatives evaluation; Section 3.3 presents a summary of which alternatives have been selected for full EIR analysis and which have been eliminated based on CEQA criteria; Section 3.4 describes the alternatives that have been retained for full EIR analysis, including the No Project alternative; and Section 3.5 presents descriptions of each alternative that was eliminated from EIR analysis and explains why each was eliminated. Finally, Section 3.6 identifies and describes the other past, present, and reasonably foreseeable future projects that are considered in the cumulative impact analysis for this EIR.

3.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the significant impacts of a proposed project. In addition to mandating consideration of the No Project Alternative, CEQA Guidelines (Section 15126(d)) emphasize the selection of a reasonable range of technically feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. CEQA Guidelines state that the discussion of alternatives shall focus on alternatives capable of eliminating or reducing significant adverse environmental effects of a proposed project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. However, CEQA Guidelines declare that an EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative.

Numerous alternatives to the Proposed Project were suggested during the scoping period (August 22, 2008 to September 22, 2008). Other alternatives were presented by SCE in its PEA, or developed by the EIR preparers.

In total, the alternatives screening process has culminated in the identification and screening of approximately 11 potential alternatives for SCE's proposed San Joaquin Cross Valley Loop Transmission Project. These alternatives range from different alignments to various reconductoring options as well as "Non-wires alternatives"[1].

[1] "Non-wires alternatives" include methods of meeting project objectives that do not require major transmission lines (e.g., renewable energy supplies, conservation and demandside management, etc.).

3.2 Alternatives Screening Methodology

The evaluation of alternatives to the proposed San Joaquin Cross Valley Loop Transmission Project was completed using a screening process that consisted of three steps:

> *Step 1*: Clarify the description of each alternative to allow comparative evaluation.
>
> *Step 2*: Evaluate each alternative using CEQA criteria (defined below).
>
> *Step 3*: Determine the suitability of each alternative for full analysis in the EIR. Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further analysis.

Following the three-step screening process, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA's criteria for consideration of alternatives. These criteria are discussed in greater detail below.

CEQA Guidelines (Section 15126(a)) state that:

> *An EIR shall describe a reasonable range of 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.*

In order to comply with CEQA's requirements, each alternative that has been suggested or developed for this project has been evaluated in three ways:

- Does the alternative meet most basic project objectives?
- Is the alternative feasible (legal, regulatory, technical)?
- Does 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)?

3.2.1 Consistency with Project Objectives

CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives" (Section 16126.6(b)). Therefore, it is not required that each alternative meet all of the project objectives.

The objectives of the Proposed Project are defined by SCE in its PEA (SCE, 2008). This EIR does not adopt or endorse the objectives that SCE has defined for its Proposed Project. SCE's defined objectives are presented below.

SCE's Proposed Project Objectives

- Provide safe and reliable electric service consistent with NERC/WECC and CAISO reliability criteria;

- Provide safe and reliable electric service consistent with SCE's electrical system planning guidelines;
- Increase transmission capacity between Big Creek Hydroelectric Project and Rector Substation to mitigate overload conditions;
- Reduce the need to interrupt customer electrical service under transmission line outage conditions;
- Minimize the need to reduce Big Creek Hydroelectric Project generation under transmission line outage conditions;
- Minimize electrical service interruptions to customers by scheduling the construction of new facilities in an orderly and rational manner;
- Meet project need while minimizing environmental impact; and
- Meet project need and construction schedule in a cost effective manner.

The EIR team requested additional technical data from SCE and conducted an independent assessment of that information to better define the most important basic objectives of the Proposed Project for use in the alternatives screening process. SCE prepared two technical papers, *System Strength and Short Circuit Duty (SCD)/Short Circuit Ratio (SCR) Analysis* and *San Joaquin Cross Valley Loop Project Supplemental Routing Analysis*, which are presented in Appendix D of this EIR. These SCE technical papers and the additional analysis by the EIR team helped to clarify that "safe and reliable electric service" in the Electrical Needs Area is currently limited by two critical system constraints: power flow capacity and system strength.

Limited power flow capacity is most acute in the summer (peak load) season, when the existing Big Creek 1-Rector and Big Creek 3-Rector 220 kV transmission lines simply cannot move enough electricity from the Big Creek Hydroelectric Project to meet the demand at the Rector Substation. This results in thermal overload (overheating) of the lines, which in turn results in reduced voltage in the system (brown-outs) and/or dropped load (black-outs).

The system strength analysis is a more complex measure of the transmission system to provide safe and reliable electrical service. Four factors are used to measure the adequacy or sufficiency of the transmission system strength:

- System thermal capacity;
- System post-transient voltage stability;
- System dynamic stability; and
- System short circuit duty (SCD).

This system strength analysis showed the existing Rector Substation system to be the "weakest" load-serving substation in the entire SCE service territory, and that improving the system strength was a critical objective of the Proposed Project.

The supplemental routing sensitivity analysis evaluated the effectiveness of various alternative routing configurations in addressing both the power flow constraint as well as the system strength constraint in the existing system. While several routing configurations were shown to help alleviate the power flow constraint, only loop configurations (i.e., looping the under-utilized Big Creek-Springville 220 kV lines into the Rector Substation) would also result in a meaningful improvement in system strength. Further, the electrical effectiveness of different loop alignments was shown to be nearly identical for tap points located north of the Rector Substation, whereas electrical effectiveness decreased substantially for tap points located south of the Rector Substation.

Consequently, the EIR team determined that to be considered for further analysis an alternative would have to meet both of the following basic objectives of the Proposed Project:

- Substantially improve power flow capabilities; and
- Substantially improve system strength.

3.2.2 Feasibility

CEQA Guidelines (Section 15364) define feasibility as:

> *. . . capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.*

In addition, CEQA requires that the Lead Agency consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and proponent's control over alternative sites in determining the range of alternatives to be evaluated in the EIR (CEQA Guidelines Section 15126.6(f)). Feasibility can include three components:

- **Legal Feasibility:** Does the alternative have the potential to avoid lands that have legal protections that may prohibit or substantially limit the feasibility of permitting a 220 kV transmission line?

- **Regulatory Feasibility:** Does the alternative have the potential to avoid lands that have regulatory restrictions that may substantially limit the feasibility of, or permitting of, a 220 kV transmission line within a reasonable period of time?

- **Technical Feasibility:** Is the alternative feasible from a technological perspective, considering available technology; the construction, operation, and maintenance or spacing requirements of multiple facilities using common rights-of-way (ROW); and the potential for common mode failure?

For the screening analysis, the legal, technical, and regulatory feasibility of potential alternatives was assessed. The assessment was directed toward reverse reason; that is, a determination was made as to whether there was anything about the alternative that would be infeasible on technical, legal, or regulatory grounds.

This screening analysis does not focus on relative economic factors or costs of the alternatives (as long as they are found to be economically feasible) since CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly" (CEQA Guidelines Section 16126.6(b)).

3.2.3 Potential to Eliminate Significant Environmental Effects

CEQA requires that to be fully considered in an EIR, an alternative must have the potential to "avoid or substantially lessen any of the significant effects of the project" (CEQA Guidelines Section 16126.6(a)).

If an alternative was identified that clearly would not provide potential overall environmental advantage as compared to the Proposed Project, it was eliminated from further consideration. At the screening stage, it is neither possible, nor legally required, to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

Table 3-1 presents a summary of the potential significant environmental effects of the Proposed Project. The impacts in the Table 3-1 are representative of those resulting from preliminary EIR preparation and were therefore used to determine whether an alternative met CEQA Guidelines Section 16126.6(a) requirements.

3.3 Summary of Screening Results

Table 3-2 provides a composite list of the alternatives considered, and the results of the screening analysis with respect to the criteria findings for consistency with project objectives, feasibility and environmental effectiveness. Alternatives carried forward for full EIR analysis are listed below in Section 3.3.1. Alternatives eliminated from further consideration follow in Section 3.3.2.

3.3.1 Alternatives Analyzed in the EIR

The alternatives listed below are those that have been selected through the alternative screening process for detailed EIR analysis; the No Project alternative is also included as required by CEQA. Each of the alignment alternatives would substantially meet project objectives, would be feasible, and would avoid or reduce potential environmental effects of the Proposed Project. The alternatives are illustrated in Figure 3-1, and briefly described in Table 3-2 as well as in greater detail in Section 3.4.

- No Project
- Alternative 2
- Alternative 3
- Alternative 6

TABLE 3-1
SUMMARY OF PRELIMINARY SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

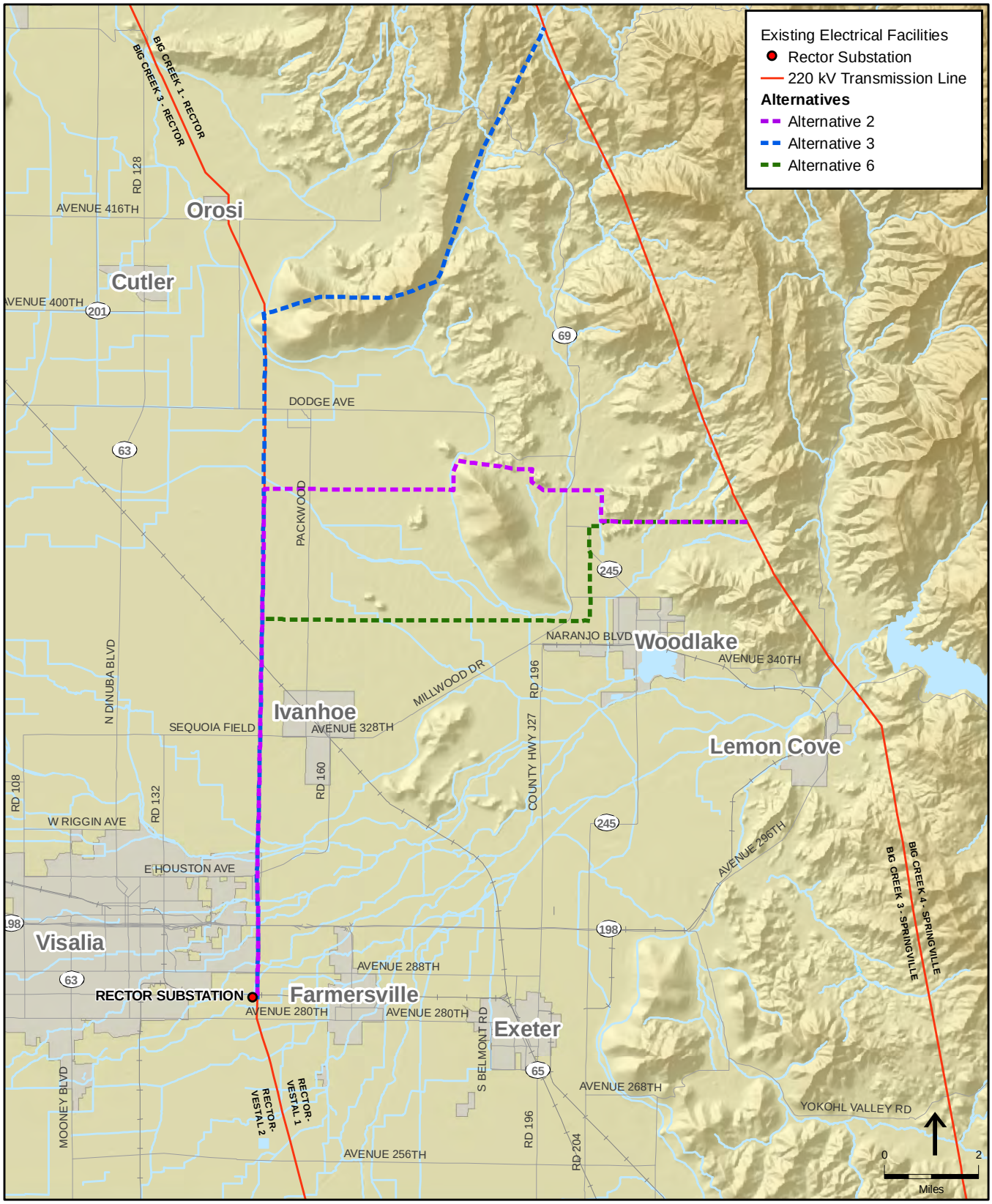
Issue Area	Impact
Aesthetics	• Degradation of eligible scenic highway (State Route (SR) 198) viewshed where no transmission line currently exists • Degradation of viewshed due to replacement of lattice towers with taller poles and modifications at substations
Agriculture	• Permanent removal of Farmland and removal of walnut orchards from production
Air Quality	• Short-term equipment exhaust emissions could require Indirect Source Review • Permanently disturbed land that could degrade air quality as a source of fugitive dust emissions
Biological Resources	• Permanent impacts to wetlands, rare plants and habitat that could support kit fox, burrowing owl, and vernal pool fairy shrimp
Cultural Resources	• Construction disturbance to recorded and/or unknown cultural and historic resources • Permanent impacts to the Big Creek Hydroelectric System Historic District
Geology, Soils, and Mineral Resources	• Soil erosion or loss of top soil through construction-related soil disturbance and use of new access roads for maintenance
Hazards and Hazardous Materials	• Impacts to surface or groundwater from construction-related use of hazardous materials • Construction-related short-term impacts from blasting • Construction-related short-term and long-term potential to create wildfires • Create permanent safety hazard to aerial spray applicators
Hydrology and Water Quality	• Degradation of water quality through sedimentation or construction-related erosion
Land Use and Planning	• Potential conflict with the City of Farmersville General Plan
Noise	• Construction-related short-term noise impacts on sensitive land uses • Continuous operational noise from substations and/or transmission line corona
Population and Housing	• Permanent removal of one home
Public Services	• Short-term increase of demand for fire and police services • Short-term construction interruption to emergency vehicle access and response times.
Transportation and Traffic	• Short-term closures or traffic controls on highways and roads during construction • Short-term construction interruption to pedestrian/bicycle/vehicular traffic, public transit, property access, and/or emergency response vehicles

TABLE 3-2
SUMMARY OF ALTERNATIVES SCREENING ANALYSIS
SCE'S SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria
Passes Screening			
Alternative 2 • Follows alignment several miles north of Proposed Project • Uses 10.8 miles of existing ROW • Avoids communities of Farmersville and Lemon Cove • Total length, 4.5 miles longer than Proposed Project	Meets both basic project objectives.	Meets feasibility criteria.	Meets environmental criteria, although may result in different types of impacts than the Proposed Project.
Alternative 3 • Follows alignment several miles north of Proposed Project • Uses 14.6 miles of existing ROW • Avoids communities of Farmersville and Lemon Cove • Total length, 5.8 miles longer than Proposed Project • Requires construction of more roads to access difficult terrain	Meets both basic project objectives.	Meets feasibility criteria.	Meets environmental criteria, although may result in different types of impacts than the Proposed Project.
Alternative 6 • Follows alignment several miles north of Proposed Project • Uses approximately 8.1 miles of existing ROW • Passes through fewer walnut orchards • Total length, two miles longer than Proposed Project	Meets both basic project objectives.	Meets feasibility criteria.	Meets environmental criteria, although may result in different types of impacts than the Proposed Project.
Fails Screening			
Alternative 4 • Alignment is located south of Proposed Project • Requires all new ROW • Similar construction as Proposed Project	Fails. Does not meet reliability criteria. Criteria violation was associated with system voltage drops that are not allowable under N-1 line outage conditions.	Meets feasibility criteria.	Meets environmental criteria, although may result in different types of impacts than the Proposed Project.
Alternative 5 • Shifts a portion of the alignment one to two miles north of Proposed Project • Passes through agricultural areas similar to Proposed Project • Uses slightly more existing ROW	Meets both basic project objectives.	Meets feasibility criteria.	Would not reduce impacts to the environment compared to the Proposed Project.

TABLE 3-2 (Continued)
SUMMARY OF ALTERNATIVES SCREENING ANALYSIS
SCE'S SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria
Fails Screening (cont.)			
Reconductoring • Replacement of conductor with increased capacity conductor on existing poles for Magunden-Rector, Rector-BC1 and Rector-BC3 lines	Fails. Does not meet reliability criteria. Would not improve system strength.	Meets feasibility criteria.	Meets environmental criteria.
Replacement • Remove existing tower lines and reconstruct with one double-circuit line for Magunden-Rector, Rector-BC1 and Rector-BC2	Fails. Does not meet reliability criteria. Fails to improve system stability under outage conditions.	Fails. Only replacement alternative that could possibly meet reliability criteria would require a minimum of four seasons to construct.	Meets environmental criteria.
System Alternative • New 220kV transmission line Magunden-Rector-BC3 (or BC1) • Widen existing ROW (130 miles) • Build with double-circuit poles for future upgrades	Fails – Does not meet reliability criteria – issues are the same as the Replacement alternative above.	Meets feasibility criteria.	Due to increased project length, is likely to result in increased environmental impacts compared to Proposed Project.
System Alternative • Loop Springville-Magunden Line into Vestal Substation • Upgrade Vestal-Rector (new line, reconstruct, or reconductor)	Fails. Does not meet criteria for increased power flow from Big Creek.	Meets feasibility criteria.	Meets environmental criteria.
Non-Wires – Demand Management Conservation • Replace need for transmission line loop through implementation of energy conservation program	Fails. Would not improve either the power flow or system strength objectives for the Proposed Project.	Fails. These programs are not feasible on a scale that would be suitable to replace the Proposed Project within a reasonable period of time.	Meets environmental criteria. Complete avoidance of the Proposed Project would eliminate the potential impacts of the construction, operation and maintenance of the transmission line and substation upgrade, and no new significant impacts would be created.
Non-Wires – New Generation • Renewable or Conventional/Distributed Generation • Provide local sources of electricity that would not require the upgrade of the transmission line or substations	Fails. There is limited potential for local renewable resources or distributed generation to meet the power flow or system strength objectives for the Proposed Project.	Fails. Because even local renewable or distributed resources would require upgraded or new transmission infrastructure.	Fail. Large scale geothermal, wind, or solar facilities would potentially result in greater environmental impacts for aesthetics, cultural, and biological resources, and would occur in addition to the impacts from upgraded or new transmission infrastructure.



SOURCE: ESRI, 2008; SCE, 2008; Thomas Bros. Maps, 2008

San Joaquin Cross Valley Loop Transmission Project. 207584.01

Figure 3-1
Alternatives Overview

3.3.2 Alternatives Eliminated from EIR Consideration

The alternatives that have been eliminated through the alternative screening process from EIR analysis are listed below. As summarized in Table 3-2, these alternatives have been eliminated due to project objectives and feasibility concerns and in some cases because the alternative would have greater environmental impacts than the Proposed Project. The rationale for elimination of each alternative is summarized in Table 3-2 and is described in greater detail in Section 3.5.

- Alternative 4 – alignment variation
- Alternative 5 – alignment variation
- Reconductoring
- Replacement
- System Alternatives
- "Non-Wires" – Demand Management Conservation
- "Non-Wires" – New Generation
  - Conventional/Distributed Generation
  - Renewable Energy

3.4 Alternatives Evaluated in this EIR

3.4.1 Alternative 2

Description

Alternative 2 includes a transmission line loop following a different alignment than the Proposed Project. Modifications to the Rector, Springville, Vestal, and Big Creek 3 substations would be the same as under the Proposed Project. The Alternative 2 alignment would be approximately 23 miles long using 10.8 miles of existing ROW and require the acquisition of 12.2 miles of new ROW (Appendix C). Within the 10.8 miles of existing ROW, the Proposed Project would require the consolidation of two sets of single circuit lattice towers with double circuit tubular poles along the western side of the ROW. The first 10.8 miles of new double circuit transmission line would be built within the eastern side of the existing ROW.

Alternative 2 would begin at Rector Substation and head due north, following the existing SCE ROW for approximately 10.8 miles. At mile 10.8, the alignment would turn east for 3.5 miles. From mile 14.3 to mile 15.0, the alignment would turn north to parallel Road 176 until Avenue 376. The alignment would then proceed east, paralleling Avenue 376 and then southeast through a saddle along the base of Colvin Mountain until Road 194. From mile 17.3 to mile 17.9 the alignment would extend south and then southeast to Road 196. From there, the alignment would continue east for approximately 1.2 miles and then south for approximately 0.6 miles. At mile 19.7, the alignment would turn east along the base of Lone Oak Mountain and continue east until it reached the existing Big Creek 3-Springville 220 kV transmission line at a point approximately 52 miles south of the Big Creek Powerhouse No. 3. The total length of Alternative 2 would be approximately 23 miles.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on a per-pole/tower basis. The total number of work areas for pole/tower installation and removal would be higher under this alternative as there would be approximately 44 additional new structures compared to the Proposed Project, for a total of 149 tubular steel poles and 15 steel lattice towers. Similar to the Proposed Project, the majority of work areas would be located within the ROW (either existing or acquired). Work areas (i.e., tensioning, stringing, and pulling sites) would be required outside of the ROW at Alternative 2 Structures #5, #74, #78, #87, #89, #97, #100, and #115 (see Appendix C, Section 1, *Alternative 2 Road Story*). Table 3-3 and Table 3-4 summarize Alternative 2 metrics and access road requirements, respectively.

TABLE 3-3
SUMMARY OF TYPICAL POLE INSTALLATION METRICS FOR ALTERNATIVE 2

	Single Circuit Lattice Tower	Double Circuit Lattice Tower	Double Circuit Tubular Pole	Single Phase Tap Pole
Poles/Towers Removed	184	0	0	0
Poles/Towers Installed	0	15	149	0
Height (feet above ground surface)	63	120 - 160	120 - 160	120 - 160
Construction set up area at each structure	NA	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)
Number of foundations required	NA	4	1	1
Excavation diameter (feet)	NA	3 to 6	6 to 10	6 to 10
Excavation depth (feet)	NA	15 to 30	20 to 60	20 to 60

SOURCE: SCE, 2008

TABLE 3-4
SUMMARY OF ACCESS ROAD REQUIREMENTS FOR ALTERNATIVE 2

Type of Road	Description	Miles	Acreage[a]
New Permanent Access Roads	Would be 20 feet wide, with 16 feet of road and two feet of berms on each side. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	11.4	27.63
Existing Access and Spur Roads	Various types of access and spur roads to be used including paved roads and dirt ranch roads	10.6	Unknown as road widths vary

[a] Based on typical road width of 20 feet.

SOURCE: This table represents an approximation based upon information for Alternative 2 provided by the project applicant.

Vegetation clearance and disturbance requirements would be similar to the Proposed Project but the acreages involved would be different. The requirements for Alternative 2 are shown below:

- Temporary disturbance area (i.e., vegetation clearing and grading to be restored following completion of construction): 126 acres.
- Permanent disturbance area (i.e., access roads and 50-foot clearance areas surrounding structures): 48 acres.

Implementation of this alternative would include similar construction, operation and maintenance activities to those activities described for the Proposed Project except the Alternative 2 alignment would take approximately 20 months to construct assuming there are no outage constraints. Given that combined work activities in the existing ROW are expected to exceed six months, an additional six to 12 months may be required to work around the April 1 though October 1 outage restrictions. Table 3-5 below summarizes the length of time anticipated to construct each phase of Alternative 2. This alternative is 4.5 miles longer and involves replacement of existing structures on 9.7 more miles than the Proposed Project requiring the removal and installation of more towers and poles than under the Proposed Project.

TABLE 3-5
CONSTRUCTION TIMETABLE FOR ALTERNATIVE 2

Alternative 2 Construction Activity	Duration (months)
Material Staging Yard preparation	Less than 1
Demolition of 10.8 miles of existing Big Creek 3-Rector 220 kV transmission facilities	4
Construction of 10.8 miles of new Big Creek 1-Rector and Big Creek 3-Rector 220 kV double circuit transmission line	6
Demolition of 10.8 miles of existing Big Creek 1-Rector 220 transmission facilities	4
Construction of 10.8 miles of new Cross Valley 220kV Double Circuit Transmission Line within the Big-Creek Rector Corridor	6
Construction of 12.2 miles of new Cross Valley 220kV Double Circuit Transmission Line across the San Joaquin Valley	7
Construction of new Cross Valley 220kV Double Circuit Transmission Line tap into Big Creek-Springville Corridor	1
Post construction clean-up and restoration	2

SOURCE: SCE, 2009

Rationale for Full Analysis

Project Objectives

This alternative would meet both basic project objectives.

Feasibility

This alternative would meet all legal, regulatory, and technical feasibility criteria. Additional ROW easements would have to be negotiated with property owners to gain easements for the new ROW. However, SCE can choose to pursue legal condemnation should negotiations fail to result in equitable agreements.

Lessen Significant Environmental Impacts

Similar to the Proposed Project, Alternative 2 would result in significant unmitigable impacts to agricultural and cultural resources. This alternative would result in the permanent removal of fewer acres of Farmland than the Proposed Project and would also permanently remove fewer acres of walnut orchards from production. Impacts on cultural resources would be generally similar as under the Proposed Project.

Potential New Impacts Created

Alternative 2 would result in impacts to additional sensitive biological resources (i.e., Critical Habitat) and although potential impacts would be mitigated to less than significant, impacts would be greater than under the Proposed Project.

3.4.2 Alternative 3

Description

Alternative 3 includes a transmission line loop following a different alignment than the Proposed Project. Modifications to the Rector, Springville, Vestal, and Big Creek 3 substations would be the same as under the Proposed Project. The Alternative 3 alignment would be approximately 24.3 miles long, would use 14.6 miles of existing ROW and would require the acquisition of 9.7 miles of new ROW (Appendix C).

Similar to the Proposed Project, the alignment would proceed north from the Rector substation within existing SCE ROW. At Structure #7, where the Proposed Project would turn east, Alternative 3 would continue north in the existing ROW. The alignment would then proceed north from Rector Substation for approximately 14.6 miles within the existing SCE ROW. At mile 14.6 (approximately 400 feet south of the Friant-Kern Canal), the alignment would turn east on Stokes Mountain, leaving the existing SCE ROW. The alignment would then cross Stokes Mountain for approximately three miles and then descend from the Stokes Mountain ridgeline (one mile) and turn northeast to parallel the Stokes Mountain/Stone Corral Canyon interface for approximately four miles. The alternative would then cross Boyd Drive and continue in the same northeasterly direction to crest the Goldstein Peak ridgeline at mile 23. The alignment would then descend into the Rattlesnake Creek Valley until it reached the existing Big Creek 3-Springville 220 kV transmission line at a point approximately 40 miles south of Big Creek Powerhouse No. 3.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on a per-pole/tower basis, but Alternative 3 would use more lattice towers which have different foundation requirements than poles. The total number of work areas for pole/tower installation and removal would be higher under this alternative as there would be approximately 79 additional new structures compared to the Proposed Project, for a total of 142 tubular steel poles and 57 steel lattice towers. Similar to the Proposed Project, the majority of work areas would be located within the ROW (either existing or acquired). Work areas (i.e., stringing, tensioning, and pulling sites) would be required outside of the ROW at structures #74, #81, #93, and #128 of this alternative (see Appendix C, Section 2, *Alternative 3 Road Story*). Table 3-6 and Table 3-7 summarize project metrics and access road requirements for Alternative 3, respectively.

TABLE 3-6
SUMMARY OF TYPICAL POLE INSTALLATION METRICS FOR ALTERNATIVE 3

	Single Circuit Lattice Tower	Double Circuit Lattice Tower	Double Circuit Tubular Pole	Single Phase Tap Pole
Poles/Towers Removed	242	0	0	0
Poles/Towers Installed	0	57	142	0
Height	63 feet (AGS)	120 to 160 feet (AGS)	120 to 160 feet (AGS)	80 to 160 feet (AGS)
Construction set up area at each structure	NA	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)
Number of foundations required	NA	4	1	1
Excavation diameter (feet)	NA	3 to 6	6 to 10	6 to 10
Excavation depth (feet)	NA	15 to 30	20 to 60	20 to 60

SOURCE: SCE, 2008

TABLE 3-7
SUMMARY OF ACCESS ROAD REQUIREMENTS FOR ALTERNATIVE 3

Type of Road	Description	Miles	Acreage[a]
New Permanent Access roads	Would be 20 feet wide, with 16 feet of road and two feet of berms on each side. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	18.5	44.84 acres
Existing Access and Spur Roads	Various types of access and spur roads to be used including paved roads and dirt ranch roads	15.8	Unknown as road widths vary

[a] Based on typical road width of 20 feet.

SOURCE: This table represents an approximation based upon information for Alternative 3 provided by the project applicant.

Vegetation clearance and disturbance requirements would be similar to the Proposed Project but the acreages involved would be different. The requirements for Alternative 3 are shown below:

- Temporary disturbance area (i.e., vegetation clearing and grading to be restored following completion of construction): 161 acres.
- Permanent disturbance area (i.e., access roads and 50-foot clearance areas surrounding structures): 71 acres.

Implementation of this alternative would include similar construction, operation and maintenance activities to those described for the Proposed Project except that Alternative 3 would take approximately 24 months assuming there are no outage constraints. Table 3-8 below summarizes the length of time estimated to construct each phase of Alternative 3. This alternative would be 5.8 miles longer and involves replacement of existing structures on 13.5 more miles than the Proposed Project. The terrain for Alternative 3 is more rugged requiring the construction of more miles of access roads than the Proposed Project.

TABLE 3-8
CONSTRUCTION TIMETABLE FOR ALTERNATIVE 3

Alternative 3 Construction Activity	Duration (months)
Material Staging Yard preparation	Less than 1
Demolition of 14.6 miles of existing Big Creek 3 – Rector 220 kV transmission facilities	5
Construction of 14.6 miles of new Big Creek 1-Rector and Big Creek 3 – Rector 220 kV double circuit transmission line	8
Demolition of 14.6 miles of existing Big Creek 1-Rector 220 transmission facilities	5
Construction of 14.6 miles of new Cross Valley 220kV Double Circuit Transmission Line within the Big-Creek Rector Corridor	8
Construction of 9.7 miles of new Cross Valley 220kV Double Circuit Transmission Line across the San Joaquin Valley	9
Construction of new Cross Valley 220kV Double Circuit Transmission Line tap into Big Creek-Springville Corridor	1
Post construction clean-up and restoration	2

SOURCE: SCE, 2009

Rationale for Full Analysis

Project Objectives

This alternative would meet both basic project objectives.

Feasibility

This alternative would meet all legal, regulatory, and technical feasibility criteria. Additional ROW easements would have to be negotiated with property owners to gain easements for the new

ROW. However, SCE can choose to pursue legal condemnation should negotiations fail to result in equitable agreements.

Lessen Significant Environmental Impacts

Similar to the Proposed Project, Alternative 3 would result in significant unmitigable impacts to agricultural and cultural resources. This alternative would result in the permanent removal of fewer acres of Farmland than the Proposed Project and would also permanently remove fewer acres of walnut orchards from production. Impacts on cultural resources would be generally similar as under the Proposed Project.

Potential New Impacts Created

Alternative 3 would result in significant unmitigitable impacts on northern claypan vernal pool habitat that is protected in the Stone Corral Ecological Reserve as well as on jurisdictional waters of the United States and waters of the State, including drainages and seasonal wetlands.

3.4.3 Alternative 6

Description

Alternative 6 includes a transmission line loop following a different alignment than the Proposed Project. Modifications to the Rector, Springville, Vestal, and Big Creek 3 substations would be the same as under the Proposed Project. The Alternative 6 alignment would be approximately 20.5 miles long, would use 8.1 miles of existing ROW and would require the acquisition of 12.4 miles of new ROW (Appendix C).

Similar to the Proposed Project, this alternative would begin at the Rector Substation and head north for approximately 8.1 miles within existing SCE ROW. At mile 8.1 the alignment would head east, paralleling a road located approximately one-half mile north of Avenue 344 for approximately 6.9 miles. The majority of the road is private; however, a small portion on the eastern side of the alignment parallels Avenue 348. At mile 15, the alignment would then turn and head north for approximately two miles. At mile 17 the alignment would head east and then northeast for approximately 0.3 miles where it would begin to follow the same alignment as Alternative 2 for approximately 3.2 miles until it reached the existing Big-Creek 3-Springville 220 kV transmission line at a point approximately 52 miles south of Big Creek Powerhouse No. 3 (Appendix C).

Since Alternative 6 was developed by the EIR preparers, detailed construction metrics have not been developed by SCE. As described above, the first 8.1 miles and final 3.2 miles of Alternative 6 would follow the same routing as Alternative 2; therefore, detailed construction metrics such as the number of replacement structures and new structures required for these portions of Alternative 6 were derived from SCE data developed for Alternative 2. For the remaining 9.2 miles of the Alternative 6 alignment that have not been developed by SCE, metrics were scaled based on information provided in the PEA for the SCE-developed alternatives. It should be noted that the construction metrics provided for Alternative 6 would be subject to change based on final design

and engineering that would be developed for the alternative prior to commencement of construction activities. Table 3-9 below shows scaled construction metrics for Alternative 6.

TABLE 3-9
SUMMARY OF CONSTRUCTION ASSUMPTIONS FOR ALTERNATIVE 6

		New ROW		
	Existing SCE ROW[a]	Developed by EIR Team[b]	Developed by SCE[a]	Total
Distance	8.1 miles	9.2 miles	3.2 miles	20.5 miles
Structures Removed	138	0	0	138
Double Circuit Lattice Towers Constructed	4	3	3	10
Double Circuit Tubular Poles	78	54	13	145

[a] Based on data developed by SCE for Alternative 2.
[b] Based on assumptions derived from the PEA.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on a per-pole/tower basis. The total number of work areas for pole/tower installation and removal would be higher under this alternative as there would be approximately 112 additional structures removed (138 in total) and 35 additional structures installed (43 additional tubular steel poles, two fewer lattice steel towers, and six fewer single phase tap poles) compared to the total under the Proposed Project. Similar to the Proposed Project, the majority of work areas would be located within the ROW (either existing or acquired). Table 3-10 summarizes assumed construction metrics for Alternative 6.

TABLE 3-10
SUMMARY OF TYPICAL POLE INSTALLATION METRICS FOR ALTERNATIVE 6[a]

	Single Circuit Lattice Tower	Double Circuit Lattice Tower	Double Circuit Tubular Pole	Single Phase Tap Pole
Poles/Towers Removed	138	0	0	0
Poles/Towers Installed	0	10	145	0
Height	63 feet (AGS)	120 to 160 feet (AGS)	120 to 160 feet (AGS)	80 to 160 feet (AGS)
Construction set up area at each structure	NA	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)	100 x 100 foot (min) 200 x 200 ft (max)
Number of foundations required	NA	4	1	1
Excavation diameter (feet)	NA	3 to 6	6 to 10	6 to 10
Excavation depth (feet)	NA	15 to 30	20 to 60	20 to 60

[a] This table represents an approximation based upon information for Alternative 2 provided by the project applicant and information provided in the PEA.

The first 8.1 miles of Alternative 6 would be accessible via existing roads; however, a number of small spur roads would need to be graded to facilitate access to each individual pole. The majority of the 9.2 mile portion of Alternative 6 that has not been developed by SCE would be accessible via existing private roads. Most of these roads would need to be widened to meet SCE's 20 foot requirement. Alternatively, spur roads could be developed from existing public roadways that run perpendicular to the Alternative 6 alignment. In areas where poles are located in close proximity to existing roadways, this could help reduce the amount of land impacted from grading of new access roads. The final 3.2 miles of the alternative would utilize the same existing and proposed access roads as those developed by SCE for Alternative 2.

Vegetation clearance and disturbance requirements would be similar to the Proposed Project but the acreages involved would be different. Temporary land disturbance from tower/pole installation and removal and stringing activities were estimated based on data provided in the PEA. Land disturbance from access road grading were estimated assuming that new access road would be 20 feet wide and that existing access roads in CPUC developed ROW would be widened by eight feet to achieve SCE's 20-foot requirement. The estimated requirements for Alternative 6 are shown below in Table 3-11:

- Temporary disturbance area (i.e., vegetation clearing and grading to be restored following completion of construction): 97 acres.

- Permanent disturbance area (i.e., access roads and 50-foot clearance areas surrounding structures): 45 acres.

TABLE 3-11
CONSTRUCTION TIMETABLE FOR ALTERNATIVE 6

Alternative 6 Construction Activity	Duration (months)
Material Staging Yard preparation	Less than 1
Demolition of 8.1 miles of existing Big Creek 3 – Rector 220 kV transmission facilities	3
Construction of 8.1 miles of new Big Creek 1-Rector and Big Creek 3 – Rector 220 kV double circuit transmission line	5
Demolition of 8.1 miles of existing Big Creek 1-Rector 220 transmission facilities	3
Construction of 8.1 miles of new Cross Valley 220kV Double Circuit Transmission Line within the Big-Creek Rector Corridor	5
Construction of 12.4 miles of new Cross Valley 220kV Double Circuit Transmission Line across the San Joaquin Valley	7
Construction of new Cross Valley 220kV Double Circuit Transmission Line tap into Big Creek-Springville Corridor	1
Post construction clean-up and restoration	2

SOURCE: SCE, 2009

Rationale for Full Analysis

Project Objectives

This alternative would meet both basic project objectives.

Feasibility

This alternative would meet all legal, regulatory, and technical feasibility criteria. Additional ROW easements would need to be negotiated with property owners to gain easements for the new ROW. However, SCE can choose to pursue legal condemnation should negotiations fail to result in equitable agreements.

Lessen Significant Environmental Impacts

Similar to the Proposed Project, Alternative 6 would result in significant unmitigable impacts to agricultural and cultural resources. This alternative would result in the permanent removal of fewer acres of Farmland than the Proposed Project and would also permanently remove fewer acres of walnut orchards from production. Impacts on cultural resources would be generally similar as under the Proposed Project.

Potential New Impacts Created

Alternative 6 would result in impacts to additional sensitive biological resources (i.e., Critical Habitat) and although potential impacts would be mitigated to less than significant, impacts would be greater than under the Proposed Project.

3.4.4 No Project Alternative

CEQA requires an evaluation of the No Project Alternative in order that decision makers can compare the impacts of approving the project with the impacts of not approving the project. According to CEQA Guidelines (Section 15126.6[e]), the No Project Alternative must include:

(a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and

(b) the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in the EIR for each environmental discipline as the "environmental baseline," since no impacts of the Proposed Project would be created. This section defines the second condition of reasonably foreseeable actions or events. The impacts of these actions are evaluated in each issue area's analysis in Chapter 4.

Under the No Project alternative, the Proposed Project would not be implemented. The San Joaquin Cross Valley Loop would not be created and the modifications to the four substations would not occur. None of the project objectives would be met and demand in the Electrical Needs Area would not be adequately met. The unequal distribution of load would continue to result in overloads on the 220 kV lines serving Rector Substation from the Big Creek

Hydroelectric Project. This condition would continue to jeopardize SCE's ability to provide safe and reliable electric service to customers within the Electrical Needs Area.

3.5 Alternatives Eliminated from Full EIR Evaluation

As discussed in Section 3.1, alternatives were assessed for their ability to reasonably achieve both basic project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical, legal, and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives eliminated from EIR consideration are listed above in Section 3.3.2. The rationale for elimination of each alternative is presented below.

3.5.1 Alternative 4 – Alignment Variation

Description

This alternative (called Alternative 4 in the SCE Application and PEA) would create a cross valley loop using an alignment located south of the Proposed Project alignment. Alternative 4 would be approximately 18.8 miles long and would require the acquisition of new ROW for its entire length. Approximately 15 miles would traverse through an area primarily developed for agriculture. Approximately four miles would be located within the Yokohl Valley area of the foothills to the Sierra Nevada.

Beginning at Rector Substation, the alignment would proceed west for approximately one-half mile and then south for 2.3 miles. At mile 2.8, the alignment would turn east for 2.8 miles. From mile 5.6 to mile 9.6 the alignment would turn southeast to Avenue 264 and then travels east, paralleling the north side of Avenue 264. From mile 9.6 to mile 11.8, the alignment would travel north paralleling Road 216, and then northeast paralleling Myer Road. From mile 12.7 to mile 14.7 the alignment would travel east across farmland until Yokohl Drive. The alignment would then turn parallel to Yokohl Drive and the base of Monument Hill to the existing Big Creek 3-Springville 220 kV transmission line at a point approximately 65 miles south of Big Creek Powerhouse No. 3.

Construction, operation and maintenance activities associated with this alternative would be similar to the Proposed Project.

Rationale for Elimination

A supplemental alignment sensitivity analysis was conducted by SCE and independently reviewed by the EIR team to assess the reliability of various alignment alternatives (Appendix D). The analysis of anticipated power flow implications for Alternative 4 identified reliability criteria violations associated with voltage drops under N-1 line outage conditions. This violation would occur for alignments terminating approximately 65 miles or more south of the Big Creek Powerhouse 3. The voltage drops would exceed the allowable voltage drops identified in SCE's Transmission Guidelines. As a result, this alternative fails to meet the basic technical objective of

improving power flow capabilities in the system. Therefore Alternative 4 was eliminated from further consideration.

3.5.2 Alternative 5 – Alignment Variation

Description

This alternative, developed by the EIR team, would tie into the Big Creek 3-Springville 220 kV transmission line at the same location as the Proposed Project to create a cross valley loop. Alternative 5 would be approximately 18.3 miles long and would require acquisition of 15.4 miles of new ROW.

Alternative 5 would begin at Rector Substation and head north for approximately 2.9 miles within existing SCE ROW. At mile 2.9 the alignment would head east for approximately 0.4 miles until it reached State Route (SR) 216. The alignment would then head north east, running parallel to SR 216 for approximately 0.6 miles. From here the alignment would head generally east for approximately 3.6 miles, heading north in a few locations to maximize the use of existing local roads. At mile 7.5 the alignment would head north for approximately 0.3 miles until it reached Avenue 312 where it would turn and head generally east for approximately 4.2 miles, making a few turns towards the north along the way. At mile 12, the alignment would meet up with mile 12.2 of the Proposed Project. From here the alignment would follow the Proposed Project alignment for 6.3 miles where it would terminate at the existing Big Creek 3-Springville 220 kV transmission line at a point 58 miles south of Big Creek 3 Powerhouse No. 3.

Rationale for Elimination

Alternative 5 would not lessen significant environmental impacts compared to the Proposed Project. The transmission line alignment would have similar to or greater impacts on agricultural resources, specifically walnut orchards.

3.5.3 Reconductoring Existing Transmission Lines

Description

In an attempt to avoid the development of new ROW, alternatives for reconductoring existing transmission facilities were considered. Given the current line and ROW configuration in the Big Creek to Magunden corridor, the following three options were considered:

- Reconductor both of the Magunden to Rector 220 kV circuits (158 circuit miles),
- Reconductor both of the Rector to Big Creek 220 kV circuits (136 circuit miles), and
- Reconductor both Magunden to Rector 220 kV circuits and Rector to Big Creek 220 kV circuits (294 circuit miles).

In each of these options the existing tower structures would be preserved and new, larger capacity conductor would be used in place of the existing wires. These larger conductors would be capable

of transmitting greater amounts of power, thus helping to eliminate thermal overloading during normal peak and various system contingencies.

Rationale for Elimination

The structural characteristics of the existing towers limit the conductor weight as well as the maximum wind and ice loading that may be safely applied. Therefore, the size of the new conductors that could be safely installed is limited. Tower heights, line tension and physical properties of the conductor materials also impact the sag characteristics of the conductor. These factors limit the addition of new transmission capacity through reconductoring.

Because the system must be designed to withstand the outage of any one line or two lines, reconductoring the lines within either the Magunden to Rector or the Rector to Big Creek corridors would not result in a system that would meet applicable reliability criteria. Therefore, both corridors from Magunden and Big Creek to Rector would need to be reconductored thereby eliminating the first two reconductoring options described above.

Under the third option, all of the existing 220 kV transmission circuits from Magunden to Rector to Big Creek would be replaced with a high temperature low sag conductor of similar weight but having the ability to transmit larger amounts of power. This would be problematic due to the short window available in which the reconductoring work could be carried out. The period from the beginning of October to the end of March, a six month period, would be the only time that does not overlap with either spring runoff conditions for the Big Creek Hydroelectric plants or the summer peak load conditions. During this period the system must remain intact. Construction of this alternative would take two or more construction seasons making the permitted window infeasible. As a result, construction of this alternative would take a minimum of four seasons to complete.

All three of the reconductoring options would fail to improve system strength. The analysis in Appendix D shows that all three of the reconductoring options result in the same system stability problems as the existing system. Therefore, this alternative fails to meet one of the two basic project objectives and was eliminated from further analysis.

3.5.4 Rebuild Existing Transmission Lines

Description

As an alternative to reconductoring existing transmission facilities between Big Creek and Magunden, the possibilities of rebuilding existing transmission facilities was explored in an attempt to avoid the development of new ROW. Given the current line and ROW configuration the following three options were explored:

- Rebuild both of the Magunden to Rector 220 kV circuits
- Rebuild both of the Rector to Big Creek 220 kV circuits
- Rebuild both Magunden to Rector 220 kV circuits and Rector to Big Creek 220 kV circuits.

In each of these options the existing tower structures (two for each line segment) would be removed and replaced with one double circuit tower supporting bundled conductor. These new and larger conductors would replace the existing wires. The larger conductors would be capable of transmitting greater amounts of power, thereby helping to eliminate overloading during normal peak and various system contingencies. The structural characteristics of the existing towers would no longer limit the size or number of conductors placed on the structures.

Rationale for Elimination

Similar to the reconductoring alternative described previously, the first two options presented above would not meet the reliability criteria. Additionally, the rebuilt system could be more susceptible to failure from the loss of a single tower because the system would use double circuit towers as opposed to the existing single circuit towers. Therefore, both corridors from Magunden and Big Creek to Rector would need to be rebuilt thereby eliminating the first two rebuild options described above.

Under the third option, all of the existing 220 kV transmission circuits and towers from Magunden to Rector to Big Creek would be rebuilt. Although this would help relieve the thermal overload problems, instability under a scenario where two lines are out of service could not be mitigated. In addition, the construction time required due to limitations on construction period as described for the reconductoring alternative above would be prohibitive. Construction would take a minimum of four seasons and likely longer. Further, as described in Appendix D, under base-case SCD analysis this alternative would meet the basic technical objective of improving system strength, but under line outage scenarios (in particular N-2), the rebuild alternative would fail to improve system strength. Because this alternative would not meet one of the two basic project objectives it was eliminated from further consideration.

3.5.5 System Alternative – New 220 kV Transmission Line Magunden-Rector-Big Creek 3 (or Big Creek 1)

Description

This alternative would add a new 220 kV transmission line from Magunden, connecting to Rector and Big Creek. While a specific alignment for this new line was not identified it was assumed the existing corridor would be widened as necessary. The transmission line would consist of a double circuit 220 kV line, with one set of bundled conductors initially being installed. The double circuit pole configuration would allow for future use of the ROW. This alternative would require the development of new ROW for up to 135 miles.

Rationale for Elimination

This alternative is technically feasible but would take longer to complete due to the need to acquire substantially more new ROW and permits for State and federal lands. Additionally, the potential loss of a section of corridor containing all three lines would require the implementation of involuntary load shedding. This could occur as the result of a fire in the ROW requiring the

simultaneous shutdown of all three lines either north or south of Rector. As a result, this alternative would result in a system that would be less reliable than the Proposed Project. Therefore, this alternative was eliminated from consideration.

3.5.6 System Alternative – Loop Springville-Magunden Line into Vestal Substation

Description

This alternative would loop the existing Magunden-Springville 220 kV line into the Vestal Substation (approximately 13 miles) and either (a) build a third 220 kV line between Vestal and Rector substations (approximately 33 miles) or (b) reconstruct/reconductor the existing Vestal-Rector 220 kV lines. Option (a) would result in the addition of a fifth 220 kV line feeding the Rector Substation.

Rationale for Elimination

This alternative would be similar in scope to the Proposed Project but fails to add new transmission capacity at Rector Substation. Additionally, the alternative would require substantial reconductoring, which would encounter the same construction window issues described under the reconductoring alternative above. Due to the limited system improvements and lack of a reduction in environmental impacts, this alternative was eliminated from consideration.

3.5.7 Non-Wires Alternative – Demand Management Conservation

Description

Demand Management Conservation programs are designed to reduce customer energy consumptions. CPUC regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. These programs are designed to either reduce the overall use of energy or to shift the consumption of energy to off-peak times.

SCE offers a number of energy efficiency programs in California, under the umbrella of its Rebate and Savings program. The specific programs are divided into residential, business, builders and buyers, and energy management assistance programs.

Rationale for Elimination

Reductions in demand through energy conservation programs are part of SCE's future operations and are incorporated into its long-term peak load forecasts. However, as separate and stand alone programs, these programs do not provide either the capacity or reliability needs of SCE, as stated in the objectives for the Proposed Project. For these reasons, this alternative was eliminated from further consideration.

3.5.8 Non-Wires Alternative – Renewable or Conventional/ Distributed Generation Energy Resources

Description

Renewable

Executive Order #S-14-08 sets California's renewable energy goals at 33 percent by 2020. This requires all retail sellers of electricity to increase their procurement of eligible renewable resources to 33 percent by 2020. This is an increase from California's Renewable Portfolio Standard (RPS) that required retail sellers of electricity to increase their procurement of eligible renewable to 20 percent by 2017. The RPS Program was mandated by Senate Bill 1078 (SB 1078, Sher, Chapter 516, Statutes of 2002) under Public Utilities Code sections 381, 383.5, 399.11 through 399.15, and 445. The CPUC, in collaboration with the California Energy Commission (CEC), is addressing its responsibilities in implementing the RPS through its own proceedings. On April 22, 2004 the CPUC issued an Order Instituting Rulemaking to specifically address the RPS (R.04-04-026). On March 8, 2003, the CEC and the CPUC approved an Energy Action Plan in addition to the Renewable Portfolio Standard. On September 21, 2005, the Energy Action Plan II was finalized. The shared goal of the Energy Action Plan is to:

> *"Ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California's consumers and taxpayers."*

In January 2006, the CPUC created the California Solar Initiative (CPUC ruling R.04-03-017) which moves the consumer renewable energy rebate program for existing homes from the CEC to the utility companies under the direction of the CPUC.

The CEC manages $350 million targeted for new residential building construction. It will use funds already allocated to the CEC to foster renewable projects between 2007 and 2011. Called the New Solar Homes Partnership, it will focus on new residential construction.

Most of California's developed geothermal resources are located in Sonoma, Lake, Imperial, and Inyo Counties. Other geothermal resource areas in the State are found in Lassen, Mono, Siskiyou, and Modoc Counties. Some of the sites for new geothermal development are located in areas characterized by sensitive cultural and environmental concerns. Other issues that could delay development include permitting and access to transmission. The technologies most often used to produce electricity from geothermal resources in California are flash steam power and binary cycle power plants. The flash steam power technology is typically used at sites that have high temperature fluids (usually above 400 degrees Fahrenheit). Fluids at these sites boil into steam as they rise to the surface. The steam is used to power a turbine, which turns a generator to produce electricity. Binary cycle power plants can be used with lower temperature geothermal resources where the water does not become steam before rising to the surface.

At present, there are over 16,000 wind turbines in the U.S., with most of them located in California. In total, approximately 1,800 megawatts (MW) of electricity is generated from 105 separate wind farms. According to the Renewable Resources Development Report (CEC, 2003), Tulare County has a low potential for wind generation capacity. Even in high capacity areas, wind energy technology requires approximately five to six acres per megawatt of wind power. In addition, the primary technical obstacle to utilizing wind generation is the lack of existing transmission infrastructure to transport the wind-generated power to the grid.

Currently there are two types of solar generation available: solar thermal power (also known as concentrating solar power) and photovoltaic (PV) power generation. At present, California generates approximately 345MW of power with solar thermal power plants, with the majority of these facilities being parabolic-trough electric plants installed in the Mojave Desert, due to the large tracks of land required for this technology. PV power systems are available on a significantly smaller scale, and have received increased support from private and public sections since the 1970s. PV systems typically convert about 10 percent of the available solar energy to alternating current electricity, and require approximately one square kilometer (247 acres) for a 100MW rated power system.

Distributed Generation

Distributed generation is electricity production that is on-site or close to the load center that could be interconnected at distribution, sub-transmission, or transmission system voltages. Distributed generation is generally limited to systems less than 20 MW. Distributed generation does not included hydroelectricity, geothermal, non-combined heat and power related digester gas, landfill gas, and municipal solid waste.

In March 2007 the California Energy Commission released the staff report *Distributed Generation and Cogeneration Policy Roadmap for California* (CEC, 2007*).* The report included a vision for Distributed Generation and Cogeneration of being significant components of California's electrical system, meeting over 25 percent of the total peak demand. To achieve its vision, California will support incentives in the near term, transition to new market mechanisms, and reduce remaining institutional barriers.

Rationale for Elimination

Renewable resources for renewable energy programs are part of SCE's future operations and are incorporated into its long-term peak load forecasts. As separate and stand-alone programs, these renewable resource alternatives would not replace the need for upgrading the existing transmission infrastructure in the study area. Indeed, transmission system constraints are noted by the CEC as a substantial impediment to effective integration of renewable resources statewide. However, because renewable resources would not provide either the capacity or reliability needs of SCE, as stated in the objectives for the Proposed Project, and transmission infrastructure upgrades would still be required to integrate any renewable resources, this alternative was eliminated from further consideration.

The distributed generation industry is still a nascent industry that survives despite some difficult market conditions. There are numerous institutional, industry and market barriers that have impeded the growth and adoption of the industry to date. Although the potential is recognized, it is not currently a significant energy resource. The current distributed generation penetration is 2.5 percent of total peak demand in California (CEC, 2007). Because distributed generation would not provide either the capacity or reliability needs of SCE, as stated in the objectives for the Proposed Project, and transmission infrastructure upgrades would still be required to integrate distributed generation, this alternative has been eliminated from further consideration.

3.6 Cumulative Projects

As required by CEQA (Section 15130 et seq. of the CEQA Guidelines), this EIR includes an analysis of "cumulative impacts." CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the "incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable probable future projects" and can result from "individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines, Section 15355).

Consistent with the CEQA requirements (Section 15355), a cumulative scenario has been developed to identify projects analysis that could potentially contribute to cumulative impacts for the Proposed Project. The projects that comprise the cumulative scenario do not include existing projects that completed and in operation, as those are included as part of the environmental setting for individual resource areas and are analyzed with respect to each resource area in Chapter 4. The cumulative scenario is comprised of projects that are within the defined study area for the Proposed Project and alternatives, and include:

- Projects that are currently under construction;
- Approved projects that have not yet been constructed;
- Projects requiring an agency approval for an application that has been received at the time the Notice of Preparation was released;
- Projects that have been budgeted, planned, or included as a later phase of a previously approved project;
- Probable future projects that are determined to be reasonably foreseeable for other reasons.

The projects considered to be part of the cumulative scenario are presented in Table 3-12, which also describes the approximate geographic location of each project (Figure 3-2). The projects in the cumulative scenario include a range of project types from small single-family housing developments and road improvements to one industrial project.

TABLE 3-12
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
1	SR 65 Widening	Road Widening	Along SR 65 from Hermosa Avenue to SR 198.	Caltrans	Widen SR 65 to a four-lane expressway from Hermosa Avenue to SR 198.	In project approval and environmental documentation phase. Construction estimated to start in 2013.	Intersects with Proposed Project.
2	SR 65 Resurfacing	Road Resurfacing	Along SR 65 from Avenue 236 to SR 198.	Caltrans	Provide resurface asphalt-concrete (AC) overlay.	In project approval and environmental documentation phase. Construction estimated to start in 2012.	Intersects with Proposed Project.
3	SR 245 Resurfacing and Widening	Road Resurfacing	Along SR 245 to SR 201.	Caltrans	Provide resurface AC overlay. Widen SR 245 up to 55 feet from centerline.	AC overlay in project approval and environmental documentation phase. Construction estimated to start in 2011. Widening based on Caltrans projected ROW requirements, and would not be expected to occur until 2030.	Intersects with Alternative 2 and 6.
4	State Highway 198 / Road 148 Grade-Separated Interchange	Freeway interchange	Located at Highway 198 and currently un-constructed Road 148.	City of Visalia and Caltrans	Planned freeway interchange between Highway 198 and the currently un-constructed Road 148.	Called out in the City's Circulation Element. Construction would be a collaborative effort between City of Visalia and Caltrans and is not scheduled until 2023 or later.	Intersects with Alternatives 2 and 3.
5	River Run Ranch Units 5-7 Vesting Tentative Subdivision Map	Phased Subdivision	Located on Visalia Parkway, between St. Johns Parkway and Houston Avenue.	City of Visalia	Phased subdivision approved for the construction of 158 single-family residences.	Tentative map approved on August 16, 2006; improvement plans for the first phase are currently under review. Construction has not commenced but build-out is expected in the next one to 10 years.	Directly adjacent to Alternatives 2, 3 and 6.
6	Willow Creek #2 Multifamily Residential Development	Multifamily Residential Development	Located west of existing Big-Creek Rector lines on the north side of Mineral King Avenue.	City of Visalia	Planned development approved for construction of duplex and triplex residences (27 total dwelling units).	Development approved on August 25, 2008. Construction has not commenced, however build-out is expected in the next one to five years.	Directly adjacent to Alternatives 2, 3 and 6.

TABLE 3-12 (Continued)
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
7	South Point Villas	Residential Subdivision	Located on the northwest corner of Caldwell Avenue and Pinkham Street.	City of Visalia	Subdivision of 5.2 acres into 18-multifamily lots and 5.9 acres into 15 single family lots.	Tentative map approved on August 13, 2007.	Approximately 1.5 miles west-southwest of Rector Substation.
8	Willow Springs	Residential Subdivision	Located on the south side of Walnut Avenue, east of Santa Fe Street.	City of Visalia	Subdivision of 45 acres into 167 single family lots.	Tentative map approved on July 25, 2005.	Approximately 2.25 miles west of the Proposed Project and Alternatives 2, 3 and 6.
9	DeeLynna Ranch	Residential Subdivision	Located on the east side of McAuliff Street, south of Noble Avenue.	City of Visalia	Subdivision of 14.7 acres into 77 single family lots and open space and landscaping lots.	Tentative map approved on July 25, 2005.	Approximately 0.5 miles west of Alternatives 2, 3 and 6.
10	Eagle Meadows of Visalia No. 2	Residential Subdivision	Located on the north side of Goshen Avenue approximately 500 feet west of Lovers Lane.	City of Visalia	Subdivision of 21.5 acres into 86 single family lots.	Tentative map approved on October 10, 2005.	Approximately 1.25 miles west of Alternatives 2, 3 and 6.
11	Eagle Meadows of Visalia No. 1	Residential Subdivision	Located on the north side of Goshen Avenue approximately 1,500 feet west of Lovers Lane.	City of Visalia	Subdivision of 19.6 acres into 65 single family lots.	Tentative map approved on October 10, 2005.	Approximately 1.25 miles west of Alternatives 2, 3 and 6.
12	Woodside Sousa Property	Residential Subdivision	Located on the south side of Walnut Avenue, east of McAuliff Street.	City of Visalia	Subdivision of 53 acres into 256 single family lots.	Final map for Phase 1 (129 lots) was recorded and some building permits have been issued. 127 lots are still tentative.	Approximately 1,500 feet west of the Proposed Project and Alternatives 2, 3 and 6.
13	Quail River	Vesting Residential Subdivision	Located on Walnut Avenue between Lovers Lane and Road 148.	City of Visalia	Subdivision of 67.32 acres into 323 single family lots and 1 multifamily lot.	Final map has been recorded but no building permits have been issued to date.	Approximately 0.5 miles west of the Proposed Project and Alternatives 2, 3 and 6.
14	Rivers Edge Unit No. 3	Vesting Residential Subdivision	Located on the corner of Goddard Street and Houston Avenue.	City of Visalia	Subdivision of 5.33 acres into 20 single family lots and 3 multifamily lots.	Tentative map approved on January 23, 2006.	Approximately 1.25 miles west of Alternatives 2, 3 and 6.

TABLE 3-12 (Continued)
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
15	Lance Lane Estates	Residential Subdivision	Located on the south side of Houston Avenue at Goddard Street.	City of Visalia	Subdivision of 19.7 acres into 84 single family lots.	Tentative map approved on October 10, 2005.	Approximately 1.25 miles west of Alternatives 2, 3 and 6.
16	Riverbend Estates	Residential Subdivision	Located on the south side of Goshen Avenue between Cain Street and Lovers Lane.	City of Visalia	Subdivision of 25.3 acres into 111 single family lots.	Tentative map approved on October 10, 2005.	Approximately 1.5 miles west of Alternatives 2, 3 and 6.
17	Maddox at Caldwell VI	Residential Subdivision	Located north and south of Monte Verde Avenue between Ben Maddox Way and Burke Street.	City of Visalia	Subdivision of 29.29 acres into 148 single family lots.	Tentative map approved on August 14, 2006.	Approximately 1.75 miles west of the Rector Substation.
18	St. Charles Park	Residential Subdivision	Located on the south side of Houston Avenue, approximately 1,700 feet west of Lovers Lane.	City of Visalia	Subdivision of 9.58 acres into 17 single family lots.	Tentative map approved on March 13, 2006.	Approximately 1.25 miles west of Alternatives 2, 3 and 6.
19	Graystone	Residential Subdivision	Located on the south side of K Road, approximately 1,250 feet east of Pinkham Road.	City of Visalia	Subdivision of 5.25 acres into 18 single family lots.	Tentative map approved on January 23, 2006.	Approximately 1.1 miles west of the Rector Substation.
20	Teakwood Estates	Residential Subdivision	3504 E. Douglas Avenue	City of Visalia	Subdivision of 5 acres into 23 single family residential lots.	Tentative map approved on September 25, 2006.	Approximately 0.5 miles west of Alternatives 2, 3 and 6.
21	Stonecrest Estates	Residential Subdivision	Located on the southeast corner of Pinkham Street and Laura Avenue.	City of Visalia	Subdivision of 7 acres into 43 residential lots.	Tentative map submitted for review on August 8, 2006.	Approximately 1.35 miles west of the Proposed Project and Alternatives 2, 3 and 6.
22	Mineral King Business Park	Subdivision	3240 E. Mineral King Avenue.	City of Visalia	Subdivision of 0.9 acres into 5 lots with one common lot.	Tentative map approved on February 12, 2007.	Approximately 0.75 miles west of Alternatives 2, 3 and 6.

TABLE 3-12 (Continued)
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
23	Maddox @ Caldwell VII	Residential Subdivision	Located at the southwest and southeast corners of Ben Maddox Way and K Avenue.	City of Visalia	Subdivision of 13.5 acres into 115 lots to allow 95 single-family detached units and 20 duplex structures yielding 40 multifamily attached units.	Tentative map approved on April 23, 2007.	Approximately 1.5 miles west of the Rector Substation.
24	St. John's Riverwalk	Residential Subdivision	Located at the northeast corner of the junction of St. Johns Parkway and Cain Street.	City of Visalia	Subdivision of 2.02 acres into 32 condominium lots.	Tentative map approved on July 9, 2007.	Approximately 1.75 miles west of Alternatives 2, 3 and 6.
25	Sequoia Heights No. 2	Residential Subdivision	Located south of Goshen Avenue, west of Oak Avenue and Irma Street in the Sequoia Heights Subdivision.	City of Visalia	Subdivision of 4.66 acres into 20 lots.	Tentative map submitted for review on June 25, 2007.	Approximately 1.3 miles west of Alternatives 2, 3 and 6.
26	Oak Park Estates	Residential Subdivision	Located on the northwest corner of Lovers Lane and Goshen Avenue.	City of Visalia	Subdivision of 11.25 acres into 57 single family lots.	Tentative map approved on September 24, 2007.	Approximately one mile west of Alternatives 2, 3 and 6.
27	Pinkham Ranch	Residential Subdivision	Located on the west side of Pinkham Street approximately 20 feet south of Laura Avenue.	City of Visalia	Subdivision of 4.33 acres into 18 single family lots.	Tentative map approved on March 24, 2008.	Approximately 1.5 miles west of the Proposed Project and Alternatives 2, 3 and 6.
28	La Dolce Villas	Residential Subdivision	1008 N. Lovers Lane	City of Visalia	Subdivision of a 40,668 square foot lot into 11 numbered lots and one letter lot for common ownership in the multi-family residential zone.	Tentative map approved on July 14, 2008.	Approximately one mile from Alternatives 2, 3 and 6.
29	Sierra Woods/ Phase IV	Single Family Residential	Located along Walnut Avenue, west of Farmersville Boulevard.	City of Farmersville	Phased housing development; current phase consists of 28 units.	Phase IV currently under construction.	Approximately 1,000 feet south of the Proposed Project.
30	Walnut Creek, All American	Single Family Residential	Located south of Walnut Avenue, west of Farmersville Boulevard.	City of Farmersville	Development of 6 single family residential units.	Currently under construction.	Approximately 0.75 miles south of the Proposed Project.

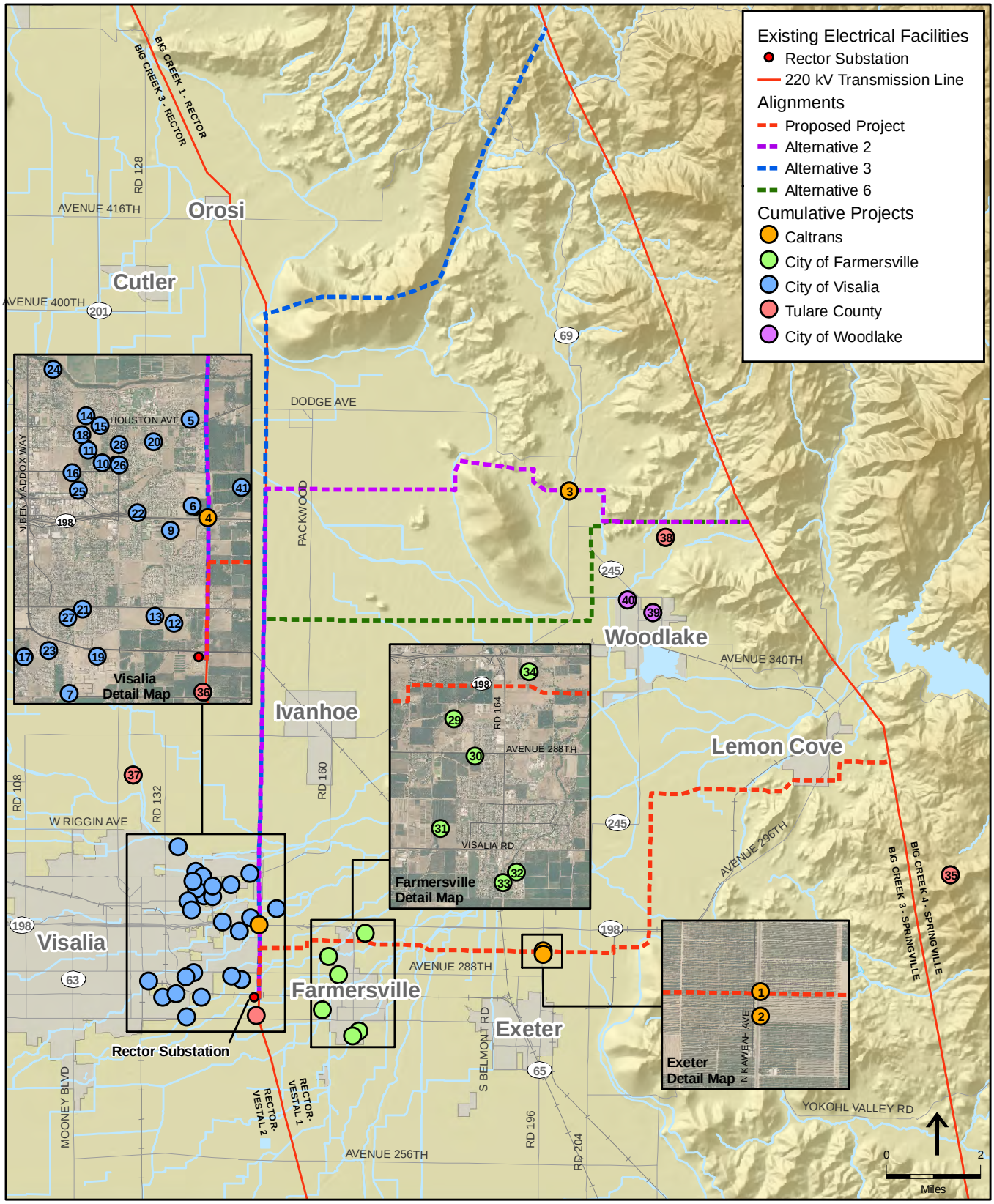
TABLE 3-12 (Continued)
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
31	Hacienda Place	Mixed Use Development	Located west of Farmersville Boulevard, north of Avenue 280.	City of Farmersville	Planned development that would include 121 single family homes, 8 mixed use loft apartments, a 2 acre park, and 5 acres of commercial development.	Currently under review.	Approximately 1.5 miles south of the Proposed Project.
32	Romero	Single Family Residential	Located east of Farmersville Boulevard, south of Avenue 280.	City of Farmersville	Development of 9 single family residential units.	Currently under construction.	Approximately two miles south of the Proposed Project.
33	Farmersville Senior Complex/Village Grove	Senior housing development	675 S. Farmersville Boulevard	City of Farmersville	Senior complex that would include 48 senior housing units.	Funding has been secured and Farmersville has issued will serve letters.	Approximately two miles south of the Proposed Project.
34	Highway 198 Corridor Specific Plan	Specific Plan	Bounded by State Highway 198 to the north, Terry Avenue to the south, Road 168 to the east and approximately one half mile west of Farmersville Boulevard.	City of Farmersville	Specific plan that would include development of industrial, commercial, and public facilities.	Specific Plan has been adopted and City of Farmersville has secured the land. The City is currently working on extending sewer lines to the Specific Plan Area.	Intersects with the Proposed Project.
35	Yokohl Ranch Project	Master Planned Community	Located 15 miles east of southeast Visalia.	Tulare County RMA	Master planned community that would include phased development of 10,000 residential units, approximately 550,000 square feet of mixed use commercial space, public/quasi-public areas, and infrastructure such as roads and utilities.	Notice of Preparation circulated on February 12, 2008.	Approximately three miles southeast of the Proposed Project.
36	Avenue 280 (Caldwell Avenue) Widening Project	Road Widening	Avenue 280 between SR 99 and Quince Avenue.	Tulare County RMA	Widen Avenue 280 (Caldwell Avenue) from a two-lane undivided road to a four/six-lane divided road with a median from the junction with SR 99 in Tulare County east to Mooney Boulevard in the City of Visalia and from Santa Fe Street in the City of Visalia to	Notice of Preparation of the Draft Environmental Impact Report circulated August 25, 2008.	Approximately 2,000 feet south of the Rector Substation.

TABLE 3-12 (Continued)
CUMULATIVE SCENARIO FOR THE SAN JOAQUIN CROSS VALLEY LOOP TRANSMISSION PROJECT

Map ID	APN(s) or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Alternatives
					Quince Avenue in the City of Exeter, excluding the roadway segment through Farmersville.		
37	Tentative Subdivision Map 767	Residential Subdivision	Located 185 feet north of Avenue 320, approximately 1,500 feet east of Road 124.	Tulare County RMA	Subdivision of 14.7 acres into 55 residential lots and one ponding/drainage basin.	Tentative map approved by Tulare County in May 2006; valid through May 17, 2011 with extensions possible through 2015.	Approximately 2.5 miles west of Alternatives 2, 3 and 6.
38	Tentative Subdivision Map 805	Residential Subdivision	Located north of Avenue 360, west of Road 220.	Tulare County RMA	Subdivision of parcel 064-140-017 into 46 residential lots.	Tentative map hearing scheduled on December 17, 2008.	Approximately 1,500 feet south of Alternative 2 and 6.
39	Castle Rock Park	Residential Subdivision	Sierra Avenue and Wutchumna Avenue, Woodlake.	City of Woodlake	Subdivision of parcel 061-020-038 into 28 single-family lots.	Development approved September 11, 2006. Currently under construction.	Approximately 1.4 miles west of Alternative 6, and two miles south of Alternative 2.
40	Majestic Homes	Residential Subdivision	Between Cajon Avenue and Kaweah Avenue west of Acacia Avenue.	City of Woodlake	Subdivision of parcel 060-020-044 into 46 single-family lots.	Development approved May 30, 2007. Currently under construction.	Approximately 0.8 miles west of Alternative 6, and 1.5 miles south of Alternative 2.
41	Future Community Park	Community Park	Located north of SR 198, between Roads 148 and 152.	City of Visalia	100 acre community park.	Build-out date of 2012.	Adjacent to Alternative 2, 3 and 6, to the east of existing SCE ROW.
NA	APN: 120-070-07	Motel	Near Shaver Lake Point.	Fresno County	Request to rezone APN 120-070-07 and process a conditional use permit for a 50-cabin motel and wastewater treatment facility.	Construction would not occur until at least April 2010.	Approximately five miles from Big Creek 3 Substation.

SOURCES: Caltrans, 2008; City of Farmersville, 2008; City of Visalia, 2008a, 2008b and 2008c; City of Woodlake, 2009a and 2009b; County of Fresno, 2009; and County of Tulare, 2008a, 2008b and 2008c.



SOURCE: ESRI, 2008; SCE, 2008; Thomas Bros. Maps, 2008; City of Visalia, 2008; City of Farmersville, 2008; Tulare County, 2008; City of Woodlake, 2008

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Figure 3-2
Cumulative Projects

References – Alternatives and Cumulative Projects

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SCE, 2008. Response to Data Request #5. November 26, 2008.

SCE, 2009. Response to Data Request #6. February 6, 2009.