

1.1 PURPOSE OF THE PROPOSED PROJECT**1.1.1 Introduction**

The California Energy Commission (CEC) has identified the Tehachapi Wind Resource Area (TWRA) to be the richest wind resource area in the State of California. In D. 07-03-012 and D.07-04-045, the California Public Utilities Commission (CPUC) approved Southern California Edison's (SCE) Antelope Transmission Project (Certificate of Public Convenience and Necessity (CPCN) filings A.04-12-007 and A.04-12-008) to allow for the initial 700 MW of this new wind generation in the TWRA to be connected to SCE's transmission system. Additional wind generation resources in the TWRA above the initial 700 megawatts (MW) and up to the projected 4,500 MW maximum load capacity of the proposed Tehachapi Renewable Transmission Project (TRTP) will require the construction of additional new and/or upgraded transmission lines (T/Ls) and facilities to interconnect this wind generation with SCE's transmission system and deliver the power produced to utility load centers.

The purpose of the proposed Tehachapi Renewable Transmission Project (TRTP) is to provide the electrical facilities necessary to integrate levels of new wind generation in excess of 700 MW and up to approximately 4,500 MW in the TWRA.

The TRTP consists of eight segments enumerated as Segment 4 through Segment 11 (see summary in Section 2.4). Segments 4, 5, 9, and 10 involve upgrading and expanding SCE's transmission system north of SCE's Vincent Substation in order to integrate Tehachapi area wind generation to SCE's electric system. Segments 6, 7, 8, and 11 involve upgrading and expanding SCE's transmission system south of SCE's Vincent Substation in order to deliver Tehachapi area wind generation to SCE's load centers. As discussed below, the proposed multi-segment TRTP is needed to:

1. Comply with Ordering Paragraph No. 2 of California Public Utilities Commission (CPUC) Resolution E-3969 which required SCE to "perform the studies necessary for the preparation of PEAs (Proponent's Environmental Assessment) and the filing of CPCNs" for specified transmission facilities to accommodate future Tehachapi wind generation projects
2. Comply with the state-mandated Renewables Portfolio Standard (RPS) (i.e., 20 percent renewable by year 2010 per California Senate Bill 107¹) in an orderly, rational and

¹ SB 107; Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

cost-effective manner, while also considering the need for maintaining reliable electric service during the upgrade and/or construction of new facilities

3. Integrate planned renewable generation resources², including those for which SCE has executed a Power Purchase Agreement (PPA) totaling approximately 1,790 MW, from the TWRA in a manner that minimizes potential environmental impacts and impacts to existing and planned residences, where feasible, by maximizing the use of existing transmission corridors with facilities identified through the planning process of the California Independent System Operator (CAISO) South Regional Transmission Plan for 2006 in order to:
 - a) maximize the use of existing, previously disturbed T/L right-of-way to minimize effect on previously undisturbed land and resources;
 - b) select route and tower locations with the lowest potential for environmental impacts while still meeting project objectives; and
 - c) select the shortest feasible route that minimizes environmental impacts and project costs.
4. Meet the transmission reliability needs of the SCE-owned and CAISO-controlled transmission grid in the Antelope Valley resulting from projected load growth in this area
5. Increase transmission capability from SCE's Lugo Substation (located in Hesperia) to the Mira Loma area (South of Lugo³), which is an existing transmission "bottleneck" that has been an ongoing source of reliability concern for the Los Angeles Basin and that will worsen with the inclusion of additional generation resources in the Tehachapi area
6. Interconnect and deliver energy from up to 4,500 MW of renewable and non-renewable resources located in the TWRA and in the SCE Big Creek Transmission Corridor in a way that complies with all applicable NERC/WECC⁴ Planning Standards, and in a manner that minimizes transmission line crossings
7. Support the State of California Greenhouse Gas Reduction Program

² Under Sections 210 and 212 of the Federal Power Act (16 U.S.C § 824 (i) and (k)) and Sections 3.2 and 5.7 of the California Independent System Operator's (CAISO) Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system.

³ South of Lugo is the term used to define the transmission corridor containing three SCE 500kV T/Ls from Lugo Substation to Mira Loma Substation.

⁴ North American Electric Reliability Corporation (NERC) and Western Electricity Coordinating Council (WECC).

1.1.2 Compliance with CPUC Resolution E-3969

In December 2005, SCE filed Advice Letter (AL) 1950-E seeking urgent approval of tracking accounts for, among other things, its cost to perform biological studies during 2006 for T/L routes needed to provide transmission for RPS generators for which SCE already had executed RPS contracts. In response to SCE's AL filing, the CPUC issued Resolution E-3969 which directed SCE to:

- Commence without delay all studies leading up to and including the spring 2006 biological studies needed to accommodate the RPS generation projects for which SCE has PPA contracts as well as some of the facilities needed to accommodate TWRA wind generation projects
- Perform the studies necessary for the preparation of PEAs and the filing of CPCNs by the end of 2006 for the Antelope-Mesa T/L upgrades identified as Phase 2 in the Tehachapi Collaborative Studies Group (TCSG) report filed March 4, 2005, and the Antelope to Tehachapi Substation 5 220 kilovolt (kV) line(s)
- Perform the studies necessary for the preparation of PEAs and the filing of CPCNs by the end of 2006 for a second 500 kV line between Tehachapi Substation 1 and Antelope Substation in parallel with the 500 kV line known as Phase 1, Segment 3, which is part of A.04-12-008

Resolution E-3969 was based on a determination that the Energy Action Plan (EAP) directs California utilities to deliver 20 percent of their power from renewable energy resources by the end of 2010 would be jeopardized if additional transmission construction were delayed. The facilities identified in this application satisfy Resolution E-3969 Ordering Paragraph No. 2 requirements.

1.1.3 Compliance with Renewable Portfolio Standard

The California Renewables Portfolio Standard (RPS) was established in 2002 by Senate Bill 1078.⁵ The RPS requires investor-owned utilities, including retail sellers of electricity such as SCE, to increase their sale of electricity produced by renewable energy sources (such as wind) by at least one percent per year, achieving 20 percent by 2017 (at the latest). These

⁵ SB1078 (Stats. 2002, Ch. 516), adding Article 16 (California Renewables Portfolio Standard Program) to the Cal. Pub. Util. Code § 399.11, *et seq.* (2004) (SB 1078).

requirements were accelerated by the passage of Senate Bill 107⁶ to be consistent with the EAP. The EAP adopted by CPUC, CEC and the now defunct California Power Authority pledged that the agencies will accelerate RPS implementation to meet the 20 percent goal by 2010, instead of 2017. In order for investor-owned utilities, including retail sellers of electricity such as SCE, to satisfy these target goals, new transmission facilities will be required to interconnect remote areas of high renewable generation concentration. One of these remote areas is referred to as TWRA.

The unique geography of the Antelope Valley and Tehachapi Region makes it one of the world's leading wind energy centers. Prevailing northwesterly winds blow through the passes in the Tehachapi Mountains that connect the San Joaquin Valley with the Mojave Desert. As a result of the regional geography, tax incentives, and favorable legislation in the wake of the 1970s energy crisis, California became the first state to develop large wind farms in the early 1980s. Upgrades to the SCE transmission grid (such as the proposed Project) are necessary in order to interconnect and integrate ongoing regional development of power generation such as renewable wind power.

The CEC's 2005 Integrated Energy Policy Report (IEPR) states that "California needs major investments in new transmission infrastructure to interconnect with remote renewable resources in the Tehachapi and Imperial Valley areas, without which it will not be able to meet its RPS targets" (CEC, 2005). RPS targets are required by PUC Section 399.14. The IEPR further explains that the "Tehachapi area transmission projects" proposed by SCE are critical in order to facilitate the development of renewable energy resources required by the State RPS targets."

Consequently, the TRTP will enable California utilities to comply with the state mandated RPS. Because of the complexity of this project, timelines for construction of the upgrades identified in each segment of the project will require coordination between other segments in order to ensure that upgrades are implemented in a rational and orderly fashion in order to minimize service disruptions to existing customers.

The CEC's 2006 IEPR Update Report (January 2007) similarly encourages the development of additional transmission infrastructure to interconnect and deliver renewable resources located in the TWRA. The IEPR Update Report identified the lack of transmission infrastructure to access remote renewable resources as the most critical barrier to meeting California's 20 percent target by 2010. Furthermore, the IEPR Update Report states that

⁶ SB 107, Chapter 464, Statutes of 2006. SB 107 amends pertinent provisions in Public Resources Code Sections 25740 through 25751 and Public Utilities Code Sections 399.11 through 399.16.

achieving the state's RPS is an essential component of California's greenhouse gas emission reduction targets.

1.1.4 Integrate Planned Renewable Generation Resources

Under the Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 (i) and (k)) and the CAISO Tariff Sections 24 and 25, SCE is obligated to interconnect and integrate power generation facilities into its electric system. As of June 1, 2007, there were 29 requests for interconnection listed in the CAISO interconnection queue and three requests for interconnection on SCE distribution network with a sum of all 32 requests totaling 8,142 MW⁷ of new generation interconnections in the vicinity of the Tehachapi area or SCE's Big Creek 220 kV transmission corridor. Of these 32 requests, 25 are for wind generation projects in the TWRA, which are located in the mountainous region between Bakersfield and Mojave, totaling 5,589 MW. Two of the remaining seven interconnection requests are for solar generation projects in the TWRA totaling 1,000 MW. The remaining five interconnection requests, totaling 1,553 MW, are for natural gas. It should be noted that the TWRA is recognized as California's largest wind resource area and has been recognized as vital for the state to meet the RPS target goals as further discussed below. Furthermore, SCE has executed several PPAs, totaling approximately 1,790 MW of the interconnection requests, with various wind developers in the TWRA.⁸ Consequently, the TRTP, summarized in Section 2.4, will enable California utilities to access renewable generation, and thus comply with the state mandated RPS goals.

1.1.5 Meet Growing Transmission Reliability Needs of the Antelope Valley Area

Upgrades to the existing Antelope Valley transmission facilities are needed to reliably serve growing area load. The Antelope Valley area has experienced above-average electrical demand growth, and is forecast to continue above-average growth at about 5 percent per year. SCE currently forecasts that the bulk transmission system facilities in this area will experience reliability problems by 2011.⁹

Currently, operating procedures are used to mitigate reliability problems on the existing 220 kV system that occur during heavy load conditions. These operating procedures typically

⁷ See Table 1-2.

⁸ In D.07-04-012 and D.07-03-045, the Commission requested that future CPCNs for project based on need pursuant to PU Code Section 399.25 should address the value of the project to California ratepayers.

⁹ The CAISO has posted its annual 10-year transmission plan which summarizes SCE's Expansion Plan Study results at <http://www.caiso.com/1b6b/1b6bb4d51db0.pdf>.

call for dropping of area load during overload conditions. SCE transmission studies indicate that continued use of such operating procedures will be insufficient to mitigate thermal overload problems on both the existing Antelope-Mesa 220 kV and Antelope-Vincent 220 kV T/Ls. The inclusion of the Antelope-Pardee 500 kV T/L to be initially energized at 220 kV, referred to as Segment 1 of the Antelope Transmission Project (A.04-12-007), and the Antelope-Vincent 500 kV T/L to be initially energized at 220 kV, referred to as Segment 2 of the Antelope Transmission Project (part of A.04-12-008), will provide sufficient transmission capacity to reliably serve the forecast load growth beyond the ten-year planning window in the Antelope Valley.

The subsequent north of Vincent Substation transmission upgrades needed to interconnect and transmit the electrical power from the new planned generation resources were developed to both reliably serve the load requirements for the Antelope Valley and deliver power to Vincent Substation.

1.1.6 Mitigate South of Lugo Transmission Bottleneck

As part of the CAISO controlled SCE Transmission Expansion Plan, SCE identified the need to increase transmission transfer capability from the northern portion of the SCE service territory, where significant renewable resources are located north of SCE's Vincent and Lugo Substations, into SCE's load centers in the Los Angeles Basin. Given continued load growth in Southern California, SCE forecasts that the South of Lugo transmission corridor will exceed its current transfer capability limitation of 6,100 MW prior to the addition of the proposed Rancho Vista 500 kV Substation, located in the city of Fontana. SCE also forecasts that the South of Lugo transmission corridor will exceed the transfer capability limitation of 6,400 MW that will be established after the addition of the proposed Rancho Vista Substation. The TRTP is expected to increase the total import capability into the Mira Loma area from 6,400 MW up to 7,400 MW.

1.1.7 Compliance with NERC/WECC Reliability Planning Criteria

T/Ls must be constructed in accordance with reliability planning criteria, including criteria developed by the CAISO, the WECC, and the NERC. These criteria require that the potential loss of T/Ls (proposed and existing) be analyzed and the transmission system be designed to continue to function if a loss occurs. A T/L could be lost (i.e., removed from service) due to a natural disaster or accident, or even intentional attack. To the extent that simultaneous loss of two or more T/Ls occurs within the same transmission corridor and creates a problem with respect to system reliability, SCE must utilize acceptable mitigation measures, such as Special Protection Systems, or construction of additional facility upgrades. Of particular concern in terms of system reliability are the T/Ls located within the South of Lugo transmission corridor and the Vincent to Rio Hondo transmission corridor.

1.1.7.1 South of Lugo Transmission Corridor

Currently, the three existing 500 kV T/Ls South of Lugo travel from the Victorville area down the Cajon Pass in the same corridor towards the Mira Loma area, subjecting them to simultaneous forced outage conditions on an annual basis. SCE has experienced numerous forced outages associated with forest fires in the Cajon Pass during the peak load demand periods which coincides with the fire season. To ensure such forced outages do not result in a Western United States wide-spread uncontrolled cascading outage condition, SCE has implemented a special protection system which would automatically shed up to 2,500 MW of load demand served from the San Bernardino, Padua, Walnut and the Villa Park 220 kV substations should a simultaneous outage condition occur. This special protection system would be ineffective to mitigate the risk of uncontrolled cascading outage conditions if a fourth 500 kV T/L was added in the Cajon Pass and the corridor capability increased without first establishing new 500 kV transmission corridors. As a result, adding a fourth T/L down the Cajon Pass will not allow for SCE to increase the overall transfer capability South of Lugo without subjecting the entire Western United States to possible wide-spread uncontrolled cascading outage conditions. Consequently, this alternative should be discarded as a viable option for eliminating the identified South of Lugo transmission constraint. Therefore, to increase north-to-south transmission capability, SCE has planned for a new Mira Loma-Vincent 500 kV T/L, Segments 6, 7, and 8, in a different transmission corridor.

1.1.7.2 Vincent to Rio Hondo Transmission Corridor

As discussed above, a new Mira Loma-Vincent 500 kV T/L will be placed in a different transmission corridor. Given that new Tehachapi area renewable resources result in overloading the existing Antelope-Mesa 220 kV T/L, SCE is proposing to minimize impacts on new lands that do not currently contain T/Ls. Therefore, the new Mira Loma-Vincent 500 kV T/L will replace an existing T/L between Vincent and the Mesa area. Including the new 500 kV T/L south of Vincent to the Rio Hondo area, a total of three lines will be maintained over the Angeles National Forest in the same right-of-way. Two of the three lines will be constructed with 500 kV design standards and one with 220 kV design standard with corridor capability increased to allow for deliverability of new renewable resources to be located in Kern County. As a result, of evaluating simultaneous outage conditions of two or more of these T/Ls, increased flows will require additional upgrades in a different corridor in order to reliably transmit renewable energy to Edison's load centers. Consequently, to further increase north-to-south transmission capability to accommodate up to 4,500 MW of new generation resources north of Vincent, SCE has planned for a new Mesa-Vincent 220 kV T/L, Segment 11, in a different transmission corridor.

1.1.8 Support California's Greenhouse Gas Reduction Program

With the recent signing of Assembly Bill 32 (Nuñez), Chapter 488, Statutes of 2006, California will embark on an ambitious program to reduce greenhouse gas (GHG) emissions. The 2006 IEPR Update states that “achieving the state’s Renewable Portfolio Standard goals is an essential component of California’s greenhouse gas emission reduction targets.”

Consequently, the TRTP will enable California to integrate renewable resources (such as wind) with no GHG emissions, which could help the State of California achieve GHG emissions reduction targets.

1.2 NEED FOR THE PROPOSED PROJECT

The proposed TRTP is needed to interconnect and deliver energy from up to 4,500 MW of renewable and non-renewable resources located in the TWRA and in the SCE Big Creek Transmission Corridor in a way that complies with all applicable NERC/WECC Planning Standards. All existing, under construction, and previously committed generation resources are shown in Table 1-1, while all new interconnection requests are shown in Table 1-2. The studies conducted as part of the CSRTP determined that the planned additional generation interconnections would result in unacceptable thermal overload conditions, as well as degraded voltage performance of the existing transmission system. In particular, these studies identified the need to construct new transmission on new right-of-way located north of SCE’s Antelope Substation to interconnect up to 4,500 MW of new generation resources. In addition, the studies determined that new and upgraded transmission facilities south of SCE’s Antelope Substation and south of SCE’s Vincent Substation are required for delivery of energy from the new generation resources to SCE’s load centers. Finally, to support system voltage requirements, the studies identified the need for the installation of reactive support devices, both static and dynamic, at the Antelope and Vincent Substations as well as the new 500 kV substations in the TWRA.

The TRTP will allow for future low cost network upgrades to further increase renewable resource integration beyond the TRTP estimated 4,500 MW capability. Given that the total amount of requested interconnections (as shown in Table 1-2) are in excess of 4,500 MW, the use of 500 kV construction standards is prudent and will allow for installation of additional 500 kV T/Ls with minimal environmental impact when required. Although not part of this plan, SCE also envisions a possible future Mesa 500 kV Substation, which can only be accomplished with minimal impacts if 500 kV design specification for the new transmission construction is implemented as part of this project (both single-circuit and double-circuit). Since the executed PPAs are less than the TRTP 4,500 MW capability and not all projects in the CAISO’s interconnection queue are expected to materialize, justification of the additional 500 kV T/Ls and Mesa 500 kV Substation is not appropriate at

**TABLE 1-1
BIG CREEK CORRIDOR
EXISTING LOCAL AREA GENERATION**

| Generation Unit | Type | Size (MW) |
|---|---------------------|------------------|
| Big Creek | Hydro | 1,000 |
| Pastoria Energy Facility and Pandol | Market | 806 |
| Antelope-Bailey 66 kV & Sagebrush Partnership | Qualifying Facility | 630 |
| Omar & Sycamore | Qualifying Facility | 600 |
| Antelope-Bailey 66 kV & CDWR | Hydro | 110 |
| Sagebrush | RPS Wind Project | 65 |
| Ultragen | Qualifying Facility | 41 |
| Total | | 3,252 |

this time. Therefore, SCE has not included these additional facility upgrades as part of this Project.

Segments 6, 7, 8, and 11 of the TRTP will increase import capability into the Mira Loma area thereby eliminating the existing South of Lugo transmission bottleneck. Currently, SCE and the CAISO utilize operating procedures and special protection systems to mitigate reliability problems associated with high flows on the South of Lugo 500 kV transmission corridor during heavy load conditions. For example, the existing procedures may require increased use of available generation resources located in the Los Angeles basin in order to manage South of Lugo flows to within operating limits. Because the State of California RPS requirements are based on actual energy deliveries from renewable resources, rather than scheduled or forecast deliveries, the addition of new renewable generation resources in the Tehachapi area will further increase power flow South of Lugo exacerbating the identified South of Lugo problem. System impact studies performed for renewable resources located north of Vincent have identified that approximately one-third of the total renewable resources will flow South of Lugo. Consequently, continued use of the operating procedures and special protection systems will be insufficient to allow SCE and the CAISO operators the ability to continue to manage power flow South of Lugo.

The TRTP will integrate new wind generation in a geographic area approximately 14 miles southwest of the existing Tehachapi Wind Resource Area in an optimal way by utilizing existing 500 kV facilities. To integrate the new geographic area, a new wind generation collector substation and use of the existing Midway-Vincent No. 3 500 kV T/L is required to integrate over 1,100 MW of new wind generation interconnection requests in this area.

TABLE 1-2
BIG CREEK CORRIDOR
NEW GENERATION INTERCONNECTION REQUESTS

| CAISO Queue Position | Type | Size (MW) |
|--|--------------------------|------------------|
| CAISO Queue #20 | New Wind Project | 300 |
| CAISO Queue #31 | New Wind Project | 201 |
| CAISO Queue #34 | New Wind Project | 300 |
| CAISO Queue #41 | Combustion Turbine | 159 |
| SCE WDAT #190 | Combustion Turbine | 50 |
| CAISO Queue #73 | New Wind Project | 250 |
| CAISO Queue #79 | New Wind Project | 51 |
| CAISO Queue #84 | New Wind Project | 400 |
| CAISO Queue #85 | New Wind Project | 120 |
| CAISO Queue #86 A | New Wind Project | 33 |
| CAISO Queue #86 B | New Wind Project | 34 |
| CAISO Queue #91 | New Wind Project | 51 |
| CAISO Queue #92 | Combined Cycle | 570 |
| CAISO Queue #93 | New Wind Project | 220 |
| CAISO Queue #94 | New Wind Project | 180 |
| CAISO Queue #95 | New Wind Project | 550 |
| CAISO Queue #96 | New Wind Project | 600 |
| CAISO Queue #97 | New Wind Project | 160 |
| CAISO Queue #100 | Alternative to Queue #85 | - |
| Total for Tehachapi Cluster Filed at FERC | | 4,229 |
| CAISO Queue #119 | New Wind Project | 500 |
| CAISO Queue #132 | New Wind Project | 297 |
| CAISO Queue #149 | New Wind Project | 362 |
| CAISO Queue #153 | New Wind Project | 100 |
| SCE WDAT #246 | New Wind Project | 80 |
| SCE WDAT #247 | New Peaker | 49 |
| CAISO Queue #157 | New Wind Project | 100 |
| CAISO Queue #158 | New Wind Project | 100 |
| CAISO Queue #159 | New Wind Project | 100 |
| CAISO Queue #170 | New Solar Project | 500 |
| CAISO Queue #175 | New Wind Project | 500 |
| CAISO Queue #182 | New Solar Project | 500 |

TABLE 1-2 (CONTINUED)
BIG CREEK CORRIDOR
NEW GENERATION INTERCONNECTION REQUESTS

| | |
|--|---------------------|
| Total Beyond Tehachapi Cluster | 3,188 |
| Grand CAISO Queue #195 Combustion Turbine | 725 |
| Total Cluster and Non-cluster | 3,913 |
| Grand Total Tehachapi Cluster and Non-cluster | 8,142 ¹⁰ |

1.3 PROJECT OBJECTIVES

The California Environmental Quality Act (CEQA) and the CEQA Guidelines (section 15126.6(a)) require the consideration of a reasonable range of alternatives to a proposed project, or the location of a proposed project that 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. CEQA Guidelines (section 15124(b)) require that the statement of objectives sought to be achieved by the project include the underlying purpose of the Project. In addition to the purposes described in the Section 2.1 above, SCE has identified the following objectives for meeting the Proposed Project's purpose and need described in this chapter:

1. Construct the project to reliably interconnect new wind generation resources in the TWRA, and enable SCE and other California utilities to comply with California's RPS in an expedited manner
2. Comply with all applicable reliability planning criteria required by NERC, WECC and the CAISO
3. Construct facilities in an orderly, rational and cost-effective manner to maintain reliable electric service, by minimizing service interruptions, during construction
4. Address the reliability needs of the CAISO controlled grid due to projected load growth in the Antelope Valley
5. Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin

¹⁰ In November of 2003, the CEC identified the TWRA as having up to 4,500 MW of wind generating potential. The TRTP is based on this estimate. As of June 1, 2007, approximately 8,000 MW of generation interconnection requests were in the California Independent System Operator (CAISO) interconnection queue, however, it is unknown whether all of these MW would be developed.

6. Maximize the use of existing T/L right-of-ways in order to minimize effects on previously undisturbed land and resources¹¹
7. Minimize environmental impacts, through selection of routes, tower types and locations, while still meeting project objectives
8. Where existing right-of-way is not available, select the shortest feasible route that minimizes environmental impacts
9. Meet project needs in a cost-effective and timely manner

These objectives guide SCE in developing a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic project objectives.

1.4 SUMMARY OF PROJECT

To interconnect the new planned generation resources, SCE needs to develop new and upgraded transmission facilities into the areas where the generation resources are to be located because insufficient transmission capability currently exists in these areas. Furthermore, to transmit the electrical power from these new planned generation resources to areas of electrical load or demand, SCE needs to develop and maintain a reliable transmission network with adequate capacity. The facilities needed to interconnect and transmit the electrical power from the new potential generation resources have been identified through a collaborative planning process held as part of the CAISO South Regional Transmission Plan. The major components of these facilities are summarized below with more complete descriptions provided in Section 3.0.

Segment 4

- Two new 220 kilovolt (kV) T/Ls traveling approximately 4 miles over new right-of-way (R-O-W) from the Cottonwind Substation to the proposed new Whirlwind Substation

¹¹ See Garamendi Principles (Senate Bill 2431, Stats. 1988, Ch. 1457) regarding State transmission siting policies, including; 1) encourage the use of existing rights-of-way by upgrading existing transmission facilities where technically and economically justifiable; 2) when construction of new transmission lines is required, encourage expansion of existing right-of-way, when technically and economically feasible; 3) provide for the creation of new rights-of-way when justified by environmental, technical, or economic reasons as determined by the appropriate licensing agency; 4) where there is a need to construct additional transmission capacity seek agreement among all interested utilities on the efficient use of that capacity.

- A new 500 kV T/L, initially energized to 220 kV, traveling approximately 16 miles over new R-O-W from the proposed new Whirlwind Substation to the existing Antelope Substation

Segment 5

- A rebuild of approximately 18 miles of the existing Antelope – Vincent 220 kV T/L and the existing Antelope – Mesa 220 kV T/L to 500 kV standards over existing R-O-W between the existing Antelope Substation and the existing Vincent Substation

Segment 6

- A rebuild of approximately 32 miles of existing 220 kV T/L to 500 kV standards from existing Vincent Substation to the southern boundary of the Angeles National Forest (ANF). This segment includes the rebuild of approximately 27 miles of the existing Antelope – Mesa 220 kV T/L and approximately 5 miles of the existing Rio Hondo – Vincent 220 No. 2 T/L.

Segment 7

- A rebuild of approximately 16 miles of existing 220 kV T/L to 500 kV standards from the southern boundary of the ANF to the existing Mesa Substation. This segment would replace the existing Antelope – Mesa 220 kV T/L.

Segment 8

- A rebuild of approximately 33 miles of existing 220 kV T/L to 500 kV standards from a point approximately 2 miles east of the existing Mesa Substation (the “San Gabriel Junction”) to the existing Mira Loma Substation. This segment would also include the rebuild of approximately 7 miles of the existing Chino – Mira Loma No. 1 line from single-circuit to double-circuit 220 kV structures.

Segment 9

- Whirlwind Substation, a new 500/220 kV substation located approximately 4 to 5 miles south of the Cottonwind Substation near the intersection of 170th Street and Holiday Avenue in Kern County in the TWRA
- Upgrade of the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new T/L construction and system compensation elements

Segment 10

- A new 500 kV T/L traveling approximately 17 miles over new R-O-W between the Windhub¹² Substation and the proposed new Whirlwind Substation

Segment 11

- A rebuild of approximately 19 miles of existing 220 kV T/L to 500 kV standards between the existing Vincent and Gould Substations. This segment would also include the addition of a new 220 kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock – Mesa 220 kV T/L between the existing Gould Substation and the existing Mesa Substation.

It should be noted that the use of 500 kV design specification (both double-circuit and single-circuit) for new construction is prudent and recommended to maximize capability of limited transmission corridors. This will minimize environmental impacts, maximize use of existing T/L right-of-way, and avoid significant waste associated with multiple tear-down and rebuild construction activities. Furthermore, use of 500 kV design specification is consistent with Assembly Bill 857 (Wiggins) Chapter 1016, Statutes of 2002, which laid out three planning priorities: promote infill development and social equity in existing communities; protect and conserve environmental and agricultural resources; and achieve more efficient use of land, transportation, energy, and public resources outside the infill areas. The use of 500 kV design specification (both double-circuit and single-circuit) achieves the most efficient use of land for energy.

¹² The Windhub Substation was included in SCE's proposed Antelope Transmission Project Segments 2&3 and approved in Decision 07-03-045.