2. Overview of Alternatives Evaluation Process

The alternatives evaluated in this report were identified through the EIR/EIS scoping process, and through supplemental studies and consultations that were conducted during the course of this analysis. The range of alternatives considered in the screening analysis encompasses:

- Alternatives identified by SCE, including refinements to the proposed route;
- Alternatives identified by the EIR/EIS team in response to issues identified as a result of independent examination of the Project and meetings with affected agencies and interested parties;
- Alternatives suggested by interested and affected public agencies during the EIR/EIS scoping period; and
- Alternatives identified by members of the public during the EIR/EIS scoping period.

2.1 Alternatives Considered

In total, the alternatives screening process resulted in the identification and screening of 29 potential alternatives. The alternatives considered included: (1) minor routing adjustments to SCE's proposed route; (2) entirely different transmission line routes for some segments of the proposed alignment; and (3) alternate system voltages and system configurations. Each category of alternative is presented below in Sections 2.1.1 through 2.1.3. Section 3 provides full descriptions of each alternative and detailed explanations of why each was either selected for full analysis in the EIR/EIS or eliminated from further consideration.

In addition to the alternatives that have been evaluated in this Alternatives Screening Report, other ideas for potential alternatives were suggested by agencies and the public during the scoping period for the EIR/EIS (August-October 2007). Many of these suggestions were conceptual and were not offered as specific alternatives, but rather as ideas to be explored. For various reasons, these suggestions did not lead to the development of viable alternatives and, therefore, could not be included in the screening process. These suggested ideas for alternatives and the reasons for their elimination are discussed in Section 2.1.4.

2.1.1 Design Variations to the Proposed Project/Action

The following alternatives are design variations to the proposed Project/Action, which would provide transmission capabilities between the new Windhub Substation and the existing Mira Loma Substation:

- **Whirlwind Substation Site A Alternative:** This alternative substation site was considered by SCE in its PEA (RA Retained 6, Alternative A). This alternative would place the new Whirlwind Substation on 113 acres of previously disturbed land east of Segment 4 and south of the proposed Whirlwind Substation.
- **Whirlwind Substation Site B Alternative:** This alternative substation site was considered by SCE in its PEA (RA Retained 6, Alternative B). This alternative would place the new Whirlwind Substation on 102 acres of previously undisturbed land west of Segment 4 and the proposed Whirlwind Substation.
- **Upgrade Transmission Through ANF in Segment 6 Only Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11A). It would replace one 220-kV T/L with one 500-kV T/L and construct a new 500-kV T/L in Segment 6, and establish a new east-west corridor between the cities of Duarte and Pasadena.
- **Upgrade Transmission Through ANF in Segment 11 Only Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11B). It would replace the existing 220-kV

T/L with one 500-kV T/L and construct a new 500-kV T/L in Segment 11, and establish a new east-west corridor between the cities of La Cañada Flintridge (Gould Substation) and Duarte.

- **Reduced Upgrades in Segment 6 Alternative:** This alternative was developed as a hybrid to the alternatives proposed by SCE (RA Eliminated 3, Options 6/11A and 6/11B) where upgrades through the ANF would occur within either Segment 6 or 11. This hybrid alternative would remove the need for a new east-west corridor associated with these other alternatives and would reduce the upgrades necessary within Segment 6 through the ANF required under the proposed Project/Action.
- **Co-Locate All SCE T/Ls in Either Segment 6 or 11 Across the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11C). Existing transmission facilities would be moved from one corridor to the other within the ANF. It would result in a total of five T/Ls being located in a single corridor through the ANF, either in Segment 6 or 11, both designated utility corridors. A new east-west corridor would need to be established between the cities of La Cañada Flintridge (Gould Substation) and Duarte to accommodate up to three T/Ls.
- **Reduced Number of 220-kV T/Ls in the ANF Alternative:** This alternative would provide similar upgrades to the proposed Project/Action, but would remove the Rio Hondo-Vincent No. 1 220-kV T/L from Segment 6 and the Mesa-Vincent No. 1 220-kV T/L from Segment 11, thereby reducing the amount of visual "clutter" within the ANF. Additional upgrades would include adding a new 500-kV T/L south of Gould Substation to Mesa Substation and upgrading both the Rio Hondo and Mesa Substations.
- **Minimize 500-kV Upgrades Alternative:** Portions of Segments 6, 7, and 11 are currently proposed to be built to 500-kV standards, but would initially be energized to 220 kV for an undetermined length of time. This alternative would rebuild Segment 6 (from Vincent Substation to the southern boundary of the ANF), Segment 7 (from the southern boundary of the ANF to Rio Hondo Substation), and Segment 11 (from Vincent Substation to Gould Substation) to 220-kV standards to allow for the use of new 220-kV conductor, which would provide for additional capacity within SCE's transmission system.
- **Segments 6 and 11 Double-Circuit Structures Alternative:** This alternative would remove the two existing 220-kV T/Ls located north of the crossover span in Segment 6, and an existing 220-kV T/L and 500-kV T/L south of the crossover span in Segment 6, and replace them with a new double-circuit 500-kV T/L (between the Vincent Substation and the southern boundary of the ANF). In addition, within Segment 11, this alternative would remove two existing 220-kV T/Ls and replace them with a new double-circuit 500-kV T/L (initially operated at 220 kV) between the Vincent Substation and La Cañada Flintridge (Gould Substation).
- **Segments 7/8A Single-Circuit 500-kV Structures Alternative:** This alternative was considered by SCE in its PEA (Technology Alternative 5). It would replace single-circuit 220-kV structures with single-circuit 500-kV structures between Rio Hondo Substation and Chino Substation within Segments 7 and 8A, whereas the proposed Project/Action would use double-circuit 500-kV structures.
- **Partial Underground Alternative:** This alternative would utilize underground construction in place of the proposed overhead line construction. Of the available technologies, Solid Dielectric Transmission Cables (XLPE) and Gas-Insulated Lines (GIL) are the two primary technologies being evaluated. Locations where underground construction would be considered to reduce significant visual and fire safety impacts, as requested by the public and agencies during the scoping period, include the ANF, Peaceful Valley (area north of Vincent Substation), Puente Hills, and Chino Hills.
- **Partial Composite Core Conductor Alternative:** This alternative was considered by SCE in its PEA (Technology Alternative 1). It would replace existing 220-kV conductors with lightweight composite core wrapped conductors for the purpose of increasing capacity (up to 50 percent) between the Vincent Substation and the Mesa Substation, and between the Mesa Substation and the Chino Substation.

2.1.2 Alternate Corridors

The following alternatives provide alternate corridors for some segments of the proposed alignment, which would provide for the delivery of power from the TWRA to the Mira Loma Substation in Ontario.

- **Segment 10A Route Alternative:** This alternative route was considered by SCE in its PEA (RA Retained 7). It would route approximately 18 miles of a single-circuit 500-kV T/L along a new 330-foot-wide corridor, mostly parallel to the Los Angeles Aqueduct and associated access roads. This would connect the new Windhub Substation with the proposed Whirlwind Substation.
- **Segment 10B Route Alternative:** This alternative route was considered by SCE in its PEA (RA Retained 7). It would follow the Segment 10A Route Alternative for approximately 2.5 miles, turn west for approximately 4 miles, and then turn south along the undesignated 160th Street for approximately 2 miles. From this point, the route would realign with the Segment 10A Route Alternative.
- **Windhub Substation to Cottonwind Substation to Whirlwind Station Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 7). It would establish a new corridor along the foothills of the Tehachapi Mountain Range from Windhub Substation to Cottonwind Substation. From this point, the route would continue southeast along the Segment 4 corridor to Whirlwind Substation.
- **Whirlwind Substation to Antelope Substation Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 1). It would establish a new utility corridor between the proposed Whirlwind Substation and the existing Antelope Substation in Segment 4 at a distance of at least 2,000 feet from either the east or west side of the existing corridor.
- **Antelope Substation to Vincent Substation Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 2). It would establish a new utility corridor between Antelope Substation and Vincent Substation in Segment 5 at a distance of at least 2,000 feet from either the east or west side of the existing corridor.
- **Use LADWP Transmission Corridor through the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11D). It would establish two new 500-kV T/Ls in one of two existing LADWP utility corridors, which would be expanded to accommodate the new lines. For the northern corridor, the new 500-kV T/Ls would originate at Antelope Substation and continue to Sylmar Substation. For the southern corridor, the new 500-kV T/Ls would originate at Vincent Substation and continue to the Tujunga Valley. Both would require a new east-west corridor to Gould Substation to connect into the southern portion of Segment 11 and on to the City of Duarte to connect into Segment 7.
- **New SCE Corridor Across the ANF Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 3, Option 6/11E). It would locate two new 500-kV T/Ls in a new corridor that would generally follow State Highway 39 through the ANF. A new east-west corridor would be required from where the T/Ls exit the ANF to the City of Duarte to connect into Segment 7 and to a point south of the Gould Substation to connect into the southern portion of Segment 11.
- **New Corridor along Highway 14 Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 4). It would locate two new 500-kV T/Ls in a new corridor from the Vincent Substation, along State Highway 14, to the Rinaldi Substation area (near the interchange of the I-5 and Highway 210). A new east-west corridor would be required from the Rinaldi Substation area to the City of Duarte.
- **New Corridor through Cajon Pass Alternative:** This alternative was considered by SCE in its PEA (RA Eliminated 5). This would route a new 500-kV T/L in a new corridor from Vincent Substation east, towards the Lugo Substation through the San Bernardino National Forest (SBNF), and then south through the Cajon Pass to the Mira Loma Substation.

- **West Lancaster Alternative:** This alternative was suggested by members of the public prior to the scoping period. It would re-route the new ROW in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West.
- **Chino Hills Route A Alternative:** This alternative was suggested by the City of Chino Hills during the scoping period. This represents a substantial refinement on the Chino Hills State Park alternatives considered by SCE in its PEA (RA Eliminated 6, Options 1 and 2). It would route the new double-circuit 500-kV T/L (Segment 8A) through Chino Hills State Park (CHSP) parallel to an existing double-circuit 220-kV T/L. This alternative would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Chino Hills Route B Alternative:** This alternative was suggested by the City of Chino Hills. This represents a refinement to the Chino Hills Route A Alternative. It would route the new double-circuit 500-kV T/L (Segment 8A) completely through CHSP parallel to an existing double-circuit 220-kV T/L. This alternative would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, which would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.
- **Chino Hills Route C Alternative:** This alternative was suggested by the City of Chino Hills based on discussions between Chino Hills, CHSP, SCE, and the CPUC. This represents a refinement to the Chino Hills Route A Alternative. It would route the new double-circuit 500-kV T/L (Segment 8A) parallel to an existing double-circuit 220-kV T/L up to CHSP. At this point, the alternative route would turn east for approximately 1.6 miles, remaining just north of the CHSP boundary, to a new 500-kV switching station. A portion of the existing 500-kV T/Ls within CHSP would be re-routed to tie into the new switching station, which would allow the new 500-kV T/L to connect to these existing 500-kV T/Ls to allow power flow to continue on to the Mira Loma Substation. In addition, a portion of the existing 220-kV T/Ls within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV T/L from just west of the CHSP boundary to the new switching station. Upon leaving the new switching station, the re-routed 500-kV and 220-kV T/Ls would re-enter CHSP traversing around Raptor Ridge, and then reconnecting to the existing T/Ls that currently traverse the park.
- **Chino Hills Route D Alternative:** This alternative was suggested by the City of Chino Hills. This represents a refinement on the Chino Hills Route A Alternative. It would route a new double-circuit 500-kV T/L (Segment 8A) parallel to an existing double-circuit 220-kV T/L up to CHSP. At this point, the alternative route would turn east and proceed to follow the northern boundary of CHSP for approximately 4.0 miles, then just east of Bane Canyon the alignment would turn southeast and cut across CHSP for approximately 1.3 miles, and then turn northeast for approximately 0.4 mile to a new 500-kV switching station located east of the boundary of CHSP. This switching station would allow the new 500-kV T/L to connect to existing 500-kV T/Ls located in this area to provide connections to the Mira Loma Substation.
- **San Gabriel Valley New Corridor Alternative:** This alternative would differ from the proposed Project/Action within Segments 7 and 8a only. The new Rio Hondo-Vincent No. 2 T/L would follow the existing Antelope-Mesa alignment and terminate at the Rio Hondo Substation utilizing single-circuit 500-kV structures rather than double-circuit 500-kV structures. In addition, the new Mira Loma-Vincent 500-kV T/L would head east upon leaving the ANF within a new approximately 200-foot wide ROW for approximately 20 miles, along the foothills of the San Gabriel Mountains, between the cities of Azusa and Rancho Cucamonga. This route would then turn south at Blanchard Street in Rancho Cucamonga to join the existing Lugo-Serrano transmission corridor, which parallels Day Creek, before terminating at Mira Loma Substation. Under this alternative, no construction activities would occur between Rio Hondo Substation and Chino Substation within Segments 7 and 8a.

2.1.3 System Alternatives

The following alternatives are system-wide variations to the proposed Project/Action. These system alternatives were developed by the Tehachapi Collaborative Study Group.

- **Transmission Lines to Midway Substation Alternative:** This system alternative was suggested by SCE in its PEA (System Alternative 1). In addition to the upgrades proposed for Segments 5 through 11, this alternative would construct a new 500-kV T/L within a new ROW between Whirlwind Substation and Midway Substation near Bakersfield.
- **Non-Transmission System Alternative:** This system alternative was suggested by SCE in its PEA (System Alternative 2). It would include the development of in-basin generation instead of interconnecting generation from the TWRA. In addition, demand-side management and energy efficient programs would be implemented.

2.1.4 Scoping Suggestions

During the scoping period (August-October 2007), members of the public and various agencies submitted requests and suggestions for potential alternatives. While some of these requests were detailed enough to generate viable alternatives, others lacked specificity and instead only suggested that some other alternative must be possible. It was also determined that some suggestions were better suited for consideration as mitigation measures within the EIR/EIS. Below is a list of concepts for alternatives brought up during the scoping period that did not result in the formulation of potential alternatives, along with explanations of why these concepts were not included in the alternatives screening process.

- **Avoid Impacts to Habitat Authority Properties.** The Puente Hills Landfill Native Habitat Authority requested that all possible alternatives be explored that would avoid any impacts to the Habitat Authority properties, including the No Project Alternative. A mapping exercise followed by field reconnaissance was conducted to determine if potential areas for re-routing the proposed Project/Action alignment north of the Habitat Authority Jurisdictional Boundary were available. Possible routes were considered north of the Pomona Freeway (State Route 60) through the San Gabriel Valley, including existing freeway, rail, transmission, and flood control corridors. No specific re-route was identified that could avoid Habitat Authority properties without displacing numerous existing homes and businesses. A broader look at routing possibilities within existing transportation and commercial corridors south of the ANF is further discussed below under the bullet entitled "Use Existing Corridors."
- **Avoid Parklands, Public Open Space, and Recreation Areas.** It was requested that the EIR/EIS consider alternative alignments that would avoid existing parkland and other public open space and recreation areas; however, no specific alignments were suggested. Significant impacts to parklands, open space, and recreation areas will be addressed in the EIR/EIS and mitigation measures will be applied to reduce impacts to the extent feasible, which may include minor re-routes of the proposed alignment. These will be determined based on a review and analysis of each park, open space, and recreational facility affected. As such, a specific alternative was not developed to address this issue.
- **Reduce Impacts to the River Commons Project.** The Watershed Conservation Authority (WCA), which is Joint Powers Authority operated by the Los Angeles County Flood Control District and the San Gabriel and Lower Los Angeles Rivers and Mountains Conservancy (RMC), has an approved project called the River Commons Project adjacent to the San Gabriel River. The River Commons Project is located along Segment 7 between approximately MP 8.9 (Valley Blvd.) and MP 10.55 (San Jose Creek Diversion Channel). The WCA requested that the EIR/EIS consider

alternatives to going through their project area as it would affect the plan for the River Commons Project. Alternate corridors to Segment 7 were investigated, as discussed below under the bullet entitled "Use Existing Corridors." Furthermore, members of the TRTP EIR/EIS Team met with the RMC on December 6, 2007, to discuss the proposed Project and learn about the issues and concerns of the RMC.

Phase 1A of the River Commons Project (Valley Blvd. to Avocado Creek, north of I-605) is planned to begin construction in June 2008, which would be prior to TRTP construction. As such, the RMC stated that they would like SCE to mitigate for any construction damage resulting from the TRTP, and would like to coordinate with SCE on the TRTP construction staging areas, construction schedule, and any transmission tower location changes, in order to minimize impacts to Phase 1A. RMC stated that they are willing to adjust the planned development of the River Commons Project to minimize impacts to their project. RMC also expressed concerns regarding the radius buffer required at each tower site during construction of the TRTP as well as once the TRTP is operational. They stated that 200-foot radius buffers would conflict with planned riparian habitat; however, 100-foot radius buffers would not.

Initial investigations by SCE determined that Segment 7 would not appear to prevent the River Commons Project from moving forward, although additional coordination between SCE and the WCA on design and construction issues would be necessary to minimize impacts to the River Commons Project. While all components of the proposed Project/Action (construction and operations) would remain within the existing SCE easement along Segment 7, the ROW would be disturbed during construction beyond the tower sites, including use of the existing access roads and additional areas for pulling sites. As these activities could impact the current Phase 1A of the River Commons Project, the WCA should work closely with SCE to adjust the planned development of the River Commons Project based on the TRTP design and construction schedule to minimize impacts to their project. The need for mitigation measures to address significant environmental impacts at the River Commons Project site will be evaluated in the EIR/EIS.

- **Reduce New ROW Width West of Mira Loma Substation.** The City of Ontario noted that the 500-kV and 220-kV T/Ls, which have been proposed along a new 150-foot ROW located west of Haven Avenue and south of Chino Avenue, just west of the Mira Loma Substation, would affect existing entitled projects and proposed developments in this area. The City of Ontario requested that the EIR/EIS consider reducing the ROW width from 150 to 100 feet to minimize potential impacts to the development. According to SCE, the 150-foot ROW width is a minimum requirement for the new T/Ls in this area and cannot be reduced. As such, no new alternative resulted from this request; however, mitigation measures may be recommended in the EIR/EIS to address any significant impacts identified in this area.
- **Use Existing Corridors.** It was requested that the proposed alignment, specifically along Segment 8A between the San Gabriel Junction (S8A MP 2.2) and Chino Substation, be re-routed to follow existing transportation and commercial corridors, including freeways, railroad tracks, flood control channels, etc. A detailed examination of maps and aerial photographs verified by field reconnaissance was conducted to determine if any existing corridors within the project area would be viable candidates for an alternative route for Segment 8A. To be considered a viable route, a corridor of adequate minimum width (180 to 200 feet) would need to be established between the southern boundary of the ANF and Mira Loma Substation. The following corridors were considered:

- Interstate 210 (Foothill Freeway) beginning in Duarte, just east of the intersection with Interstate 605 (San Gabriel River Freeway), and ending at the Lugo-Serrano transmission corridor (parallel to Day Creek) in Rancho Cucamonga
- Interstate 10 (San Bernardino Freeway) beginning in Baldwin Park, at the intersection with Interstate 605, and ending at the Lugo-Serrano transmission corridor in Ontario
- State Route 60 (Pomona Freeway) beginning in the City of Industry, at the intersection with Interstate 605, and ending at the Lugo-Serrano transmission corridor, just north of the Mira Loma Substation in Ontario
- State Highway 57 (Orange Freeway) considered as a north-south connector between two or more east-west routes (i.e., between Interstate 210 and State Route 60)
- Valley Boulevard beginning at the City of Bassett/City of Industry border, at the intersection with Interstate 605, and ending at State Highway 57 in Pomona
- Union Pacific rail corridor beginning just north of the Santa Fe Flood Control Basin (just east of the intersection of Interstate 210 and Interstate 605) in Irwindale, and ending at the Lugo-Serrano transmission corridor in Rancho Cucamonga
- Union Pacific rail corridor considered as a north-south connector between two east-west rail corridors, beginning at the Orange Avenue Junction in Irwindale and running north-south between Irwindale Avenue and the Santa Fe Flood Control Basin
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading northeast parallel to Feather Avenue in Baldwin Park, then turning east at the Orange Avenue Junction in Irwindale and ending at the Lugo-Serrano transmission corridor in Rancho Cucamonga
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading southeast parallel to and just north of Valley Boulevard in the City of Industry, and ending at the Lugo-Serrano transmission corridor in Ontario
- Union Pacific rail corridor beginning in the City of Industry just east of Interstate 605, then heading southeast parallel to and just south of Valley Boulevard in the City of Industry, and ending at the Lugo-Serrano transmission corridor in Ontario
- Big Dalton Wash flood control channel beginning at its confluence with Walnut Creek just east of the intersection of Interstate 10 and Interstate 605 in Baldwin Park, and ending at the 210 in Glendora
- Walnut Creek flood control channel beginning at its confluence with the San Gabriel River and ending at State Highway 57
- San Jose Creek flood control channel beginning at its confluence with the San Gabriel River and ending at State Highway 57
- LADWP 287-kV transmission corridor beginning just south of the Santa Fe Flood Control Basin and just east of the Rio Hondo Substation in Irwindale, and ending at the Lugo-Serrano transmission corridor north of Rancho Cucamonga
- SCE Lugo-Serrano 500-kV transmission corridor beginning at Blanchard Street just north of Rancho Cucamonga, then running north-south along Day Creek, and ending just west of the Mira Loma Substation in Ontario
- Based on field reconnaissance, no available re-route was identified that had adequate width and provided a re-route for Segment 8A. The only way to establish such a route, even with maximum use of existing transportation and utility corridors, would require extensive acquisition and relocation of residences and businesses. Therefore, no such alternative route was evaluated in the screening analysis.

- **Rowland Heights Water District Detour.** To accommodate a new 500-kV T/L, the proposed Project/Action re-routes the existing 220-kV T/Ls near Fullerton Road to the west and south of their current location due to the narrow ROW in this area. A member of the public suggested the use of tubular steel poles (TSPs) for the new 500-kV T/L, and also the replacement of the existing 220-kV LSTs with TSPs, with the intent of enabling the upgrades to remain in the existing ROW and avoid the need for new ROW in this area. SCE reviewed the feasibility of this suggestion and determined that replacing all the structures within the ROW with TSPs would not avoid the need for new ROW (SCE, 2007b). A ROW width of 330 feet would be required to accommodate the new structures; however, the existing ROW in this area is only 230 feet wide. Therefore, to

accommodate the use of TSPs would require the acquisition of 100 feet of additional ROW in this area, which would affect several developed parcels, including a church, several water tanks, and private residences (SCE, 2007b). Additional ROW in this area may also impact the intersection of Fullerton Road and Pathfinder Road and require the relocation of existing lines. Consequently, no alternative was developed.

- **Chino Hills 500-kV Split.** In response to community concerns in the City of Chino Hills, Hills for Everyone represented by Shute, Mihaly & Weinberger LLP suggested that the 500-kV T/L within Segment 8A be split. As proposed, this alternative would involve constructing a new substation at the point that the existing Mira Loma-Serrano corridor branches off from the proposed Project route, in or near the Firestone Boy Scout Reservation. At this substation, the power would be stepped down into two 220-kV T/Ls. One of the 220-kV T/Ls would follow the existing Mira Loma-Serrano corridor through Chino Hills State Park (CHSP), using the existing towers. The other 220-kV T/L would follow the proposed Segment 8A route, with the additional potential to underground the T/L at this lower voltage. This proposed alternative would not meet two of the main project objectives, which are to provide the electrical facilities necessary to reliably interconnect and integrate up to 4,500 MW and address the South of Lugo transmission constraints (SCE, 2008c – DR#5-09). Generally speaking, power flow on an interconnected transmission system follows a path of least resistance. The 500-kV portion of the Project has been configured to deliver bulk power into a 500-kV substation that has substantial other transmission interconnections which will provide a low resistance path. By placing a substation in the 500-kV line and stepping it down to just two 220-kV T/Ls, a choke point or higher resistance path would be created on the transmission network. The use of 220-kV infrastructure would not allow for the transmission of the necessary capacity to Chino and Mira Loma Substations. The desired power flow would most likely not be accomplished over the two new 220-kV T/Ls, due to the choke point, and the power may flow over other parts of the transmission network which could lead to overloading on other T/Ls and reduced system reliability, or the need to build additional 220-kV T/Ls between the new substation and Mira Loma Substation. Furthermore, use of existing structures through CHSP would not be possible as they are not sufficiently strong enough to accommodate the new larger conductor needed to provide the higher capacity required to meet the Project objectives. Therefore, this potential alternative would not meet most of the project objectives and would not reduce environmental impacts. Consequently, this alternative was not further developed and evaluated in the screening process.
- **Use Tubular Steel Poles.** It was requested that TSPs be used to reduce visual impacts created by the proposed Project/Action. The visual resources analysis in the EIR/EIS will assess appropriate locations for use of TSPs. Issues of symmetry with existing structures, land use, construction constraints, and terrain will be considered. Where determined to be feasible and where significant visual impacts would need to be addressed, the use of TSPs will be considered as a possible mitigation measure. As such, the use of TSPs has not been addressed as an alternative.
- **Match Existing Structure Heights.** It was requested that the height of the new T/L structures be reduced to match existing structure heights. The majority of the existing T/L structures located along the proposed route are 220-kV and 66-kV lines. The new 500-kV T/Ls would be placed on larger, taller structures that are required to maintain a minimum separation between the 500-kV conductor and the ground. Higher voltage lines require a greater separation between the conductor

and ground, which does not allow higher voltage T/Ls to be constructed at the same height as lower voltage lines. Therefore, it is not feasible to match the existing structure heights.

- **Solar Power.** The Wildlife Corridor Conservation Authority suggested that the amount of money needed to implement the proposed Project/Action could be allocated to building a large number of solar panels on public land and private rooftops in the immediate area that needs to be serviced, and stated that solar power has the advantage of having immediate effects. This idea, while commendable, does not accomplish one of the primary objectives of the TRTP, which is to interconnect and integrate wind energy projects in the Tehachapi area. SCE is obligated under federal rules to interconnect these energy generators to its transmission system, if feasible. However, the use of solar power as an alternative to the proposed Project/Action will be considered as part of the No Project/Action Alternative in the EIR/EIS as an alternate method for generating renewable energy in response to California's Renewables Portfolio Standard.

2.2 Alternatives Screening Methodology

The evaluation of the alternatives identified above 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/NEPA criteria (defined below)

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

As noted above for Step 2, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA and NEPA criteria for consideration of alternatives. These criteria are discussed in the following section.

2.3 CEQA and NEPA Requirements for Alternatives

Both CEQA and NEPA provide guidance on selecting a reasonable range of alternatives for evaluation in an EIR and EIS. The CEQA and NEPA requirements for selection and analysis of alternatives are similar, thereby allowing the use of an alternatives screening and evaluation process that satisfies both State and federal requirements. The CEQA and NEPA requirements for selection of alternatives are described below.

2.3.1 CEQA

An important aspect of EIR preparation is the identification and assessment of feasible alternatives that have the potential for avoiding or minimizing the significant effects of a proposed project. In addition to mandating consideration of the No Project Alternative, the State CEQA Guidelines (§15126.6[e]) emphasize the selection of a reasonable range of feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. The State CEQA Guidelines (§15126.6[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, and evaluate the comparative merits of the alternatives. An EIR need not consider every conceivable alternative to a project.*

Rather it must consider a reasonable range of potentially feasible alternatives that will foster informed decisionmaking and public participation.

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 accomplish all or most of the basic project objectives?
- Is the alternative feasible (from economic, environmental, legal, social, technological standpoints)?
- 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)?

2.3.1.1 Consistency with Project Objectives/Purpose, and Need

A project's statement of objectives (required by CEQA) and purpose of and need for action (required by NEPA) describe the underlying purpose of the project and the reasons for undertaking the project. The purpose and need statement is used to identify a range of reasonable alternatives to be analyzed in the EIR/EIS. In the PEA submitted as part of SCE's application to the CPUC for the TRTP, SCE states that "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".

In addition, SCE identified the following nine objectives as part of its PEA (Section 1.3):

- 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 Renewables Portfolio Standard in an expedited manner.
- Comply with all applicable reliability planning criteria required by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and the North American Electric Reliability Council (NERC).
- Construct facilities in an orderly, rational and cost-effective manner to maintain reliable electric service, by minimizing service interruptions, during construction.
- Address the reliability needs of the CAISO controlled grid due to projected load growth in the Antelope Valley.
- Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.
- Maximize the use of existing T/L ROW in order to minimize effects on previously undisturbed land and resources.
- Minimize environmental impacts, through selection of routes, tower types and locations, while still meeting project objectives.
- Where existing ROW is not available, select the shortest feasible route that minimizes environmental impacts.
- Meet project needs in a cost-effective and timely manner.

For the purposes of CEQA/NEPA compliance, the Lead Agencies have identified the following objectives, based on SCE's stated purpose and objectives, for meeting the purpose and need of the TRTP and to allow the development of a reasonable range of potential alternatives.

(1) Provide the electrical facilities necessary to reliably interconnect and integrate up to approximately 4,500 megawatts (MW) of new wind generation in the Tehachapi Wind Resource Area currently being planned or expected in the future, thereby enabling SCE and other

California utilities to comply with the California Renewables Portfolio Standard in an expedited manner (i.e., 20 percent renewable energy by year 2010 per California Senate Bill 107).

(2) Address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley.

(3) Address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

The above objectives as identified by the Lead Agencies are described in greater detail below, including background information on the planning, legislation, and transmission criteria used to develop the TRTP.

Accommodate Potential Renewable Power Generation

As noted above, a primary objective of the proposed TRTP is to accommodate the potential renewable power generation that has been identified in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard (RPS). To allow for a better understanding of this primary objective of the TRTP, the following discussion provides additional information regarding the TWRA, SCE's obligation to provide transmission capacity to the TWRA and other sources of generation, and the RPS requirements which are currently driving renewable energy development.

Tehachapi Wind Resource Area (TWRA). The TWRA is situated in southeastern Kern County and includes parts of the San Joaquin Valley, the Tehachapi Mountains, and the Mojave Desert. The unique geography of this area 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 and the high potential for wind power, this area has become the focus for current and future wind generation facilities. Wind power is increasingly encouraged by the State of California, beginning with tax incentives and favorable legislation in the wake of the 1970s energy crisis. In the early 1980s, California became the first state to develop large-scale wind farms.

The TWRA is widely considered the largest resource for wind energy in California. As a result, both federally-regulated and State-regulated utilities have focused on the development of wind projects in this area. Wind energy development in the TWRA, as well as in other areas of Kern County and northern Los Angeles County, could meet a significant portion of the State's goals for provision of renewable energy in California. However, a current lack of transmission capacity is a severely limiting factor to new wind installations. Large-scale transmission upgrades, such as the TRTP, are needed to cost-effectively utilize the TWRA's potential for generation of renewable energy.

A variety of wind generation projects currently have applications pending before the Counties of Kern and Los Angeles, or are expected to submit applications in the near future. The CAISO currently estimates that a total of 5,949 MW of wind energy generation facilities are in the planning stages for the Tehachapi and Mojave areas of Kern County (CAISO, 2007). Consequently, the TRTP is needed to increase the capacity of the SCE system to a level that would accommodate proposed or planned wind energy projects in the TWRA.

Requirement for SCE to Provide Transmission. 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 CAISO's Tariff, SCE is obligated to interconnect and integrate power generation facilities into its electric system. As described above, wind power generation facilities are currently being developed and planned in Kern County. In addition to wind

farms, other sources of power generation within SCE's service region include gas-fired thermal power plants and hydroelectric plants to the north, east, and south of the Los Angeles metropolitan area. As a variety of power sources continue to develop and become operational in the Antelope Valley and Tehachapi areas, transmission capacity beyond that which is currently available will be required in order to supply customers in SCE's service region.

The SCE power grid is made up of a complex and dynamic network of infrastructure which includes generation, transmission, and distribution facilities. In order for power to be reliably delivered from generation sites to areas of demand, it is essential that all aspects of the SCE power grid develop in conjunction with each other. System upgrades such as the proposed TRTP are necessary for SCE to maintain a reliable transmission network with adequate capacity to transmit electrical power from new and developing generation sources to areas of electrical load or demand. As such, TRTP is needed to expand the SCE transmission grid and deliver power from current and future renewable power sources in the Antelope Valley and Tehachapi areas to SCE's high electrical demand areas further south.

As part of the development of the TRTP, SCE identified the "weak links" or "choke points" within the existing SCE system, which would limit transmission capacity and the ability to provide additional transmission to new wind generation sources. Specifically, within Segment 6 between Vincent Substation and the City of Duarte, the Antelope-Mesa 220-kV T/L was identified as the transmission facility that limits south of Vincent capability (SCE, 2007a). Consequently, removal and replacement of existing T/Ls in any other transmission corridor would not result in increased transmission capability south of Vincent unless the limiting component (i.e., the Antelope-Mesa 220-kV T/L) is upgraded. Alternatively, if new T/Ls are constructed in a new ROW without upgrading the limiting component, the amount of transmission capability increase would continue to be severely limited by the limiting element and would therefore result in substantial underutilization of the new transmission infrastructure. Therefore, in order to maximize the use of south of Vincent capability to allow up to 2,200 MW of new wind generation to be integrated into the grid, the Antelope-Mesa 220-kV T/L must be upgraded as part of the TRTP (SCE, 2007a).

Additional upgrades to the next limiting element would also be needed to accommodate the additional megawatts necessary to meet the TRTP purpose and need to integrate 4,500 MW of new wind generation. The Segment 11 corridor would be used as an alternative corridor to provide for new T/Ls south of Vincent through the ANF towards La Cañada Flintridge. Similar to Segment 6, unless the limiting transmission element in this corridor is upgraded, the amount of incremental transmission capability that can be realized by the addition of new T/Ls would be severely limited. With the Segment 6 upgrades in place, the next limiting transmission element south of Vincent is identified to be the Eagle Rock-Pardee 220-kV T/L in Segment 11 (SCE, 2007a). For the same reasons as discussed above, upgrades to accommodate more than 2,200 MW of new wind generation that do not include upgrading the next limiting transmission element south of Vincent (i.e., Eagle Rock-Pardee 220-kV T/L) would result in underutilization of the upgrades. Such underutilization would not satisfy the TRTP purpose and need to accommodate up to 4,500 MW of new generation resources. Therefore, as part of the TRTP, the Eagle Rock-Pardee 220-kV T/L would be upgraded in Segment 11.

Renewable Portfolio Standard (RPS) Requirements. The California Renewables Portfolio Standard (RPS) was established in 2002 by Senate Bill 1078. 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 requirements were accelerated by the passage of Senate Bill 107 to be consistent with the Energy

Action Plan (EAP) adopted in 2003. The EAP adopted by the 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 (CEC, 2007). This RPS target of 20 percent renewable energy by 2010 is required by the Public Utilities Code (PUC) §399.14. As a crucial step in fulfilling this purpose, the CPUC must explore possibilities for the removal of constraints on the transmission of electricity from its point of generation to its point of use, which are otherwise known as load centers. In order for SCE and other investor-owned utilities to satisfy the target goal of 20 percent by 2010, new transmission facilities are required to interconnect remote areas of high renewable power generation, such as the TWRA, to areas of high load, including portions of the Los Angeles metropolitan area which are within the SCE service area.

While the most recent RPS target of 20 percent renewable energy by 2010 is required by the PUC §399.14, as described above, additional RPS goals have been proposed by the State. Currently, the CEC is conducting feasibility studies for a new RPS goal of 33 percent renewable energy by the year 2020, as mandated by Assembly Bill 1585 (CEC, 2007). The CEC's 2007 Integrated Energy Policy Report (IEPR) states the following: "Meeting the 33 percent goal in 2020 is feasible, but it will require significant changes in infrastructure and significant changes in program structure. Specifically, meeting the 33 percent goal will require…investments in the state's transmission infrastructure to adequately access renewable-rich resource areas…[and] the ability to integrate large quantities of intermittent resources…" (CEC, 2007).

Upgrades to the SCE transmission grid are necessary in order to maximize benefits from continued regional development of renewable wind power. The CEC's 2007 IEPR further states: "The proposed transmission development for the Tehachapi Wind Resource Area would capture much of the estimated economic potential for renewable energy development in that region…An Energy Commission report identifies potential renewable energy in Tehachapi by 2020 as about 8,000 megawatts of wind, with 4,500 megawatts included in a scenario achieving 33 percent by 2020." (CEC, 2007). As such, Tehachapi-area transmission projects are essential to facilitate the development of renewable energy resources required by existing and proposed RPS goals. The TRTP will enable SCE as well as other California utilities to comply with the State-mandated RPS.

Improve System Reliability to Address Projected Load Growth

Upgrades to existing Antelope Valley transmission facilities are needed to reliably serve growing area load within the Antelope Valley as well as regions farther south. The Antelope Valley area has experienced above-average electrical demand growth and is forecast to continue above-average growth of about five percent per year. SCE currently forecasts that the bulk transmission system facilities in this area will experience reliability problems by 2011. 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 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 and Antelope-Vincent 220-kV T/Ls.

The inclusion of the Antelope-Pardee 500-kV T/L (initially energized at 220 kV), referred to as Segment 1 of the Antelope Transmission Project (CPCN filing A.04-12-007), and the Antelope-Vincent 500-kV T/L (initially energized at 220 kV), referred to as Segment 2 of the Antelope Transmission Project (CPCN filing 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 (Segments 3, 4,5,and 10) needed to interconnect and transmit the electrical power from the new potential generation resources were developed to both reliably serve the load requirements for the Antelope Valley and deliver power to Vincent Substation.

Mitigate Existing Transmission Constraints South of Lugo Substation

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 substantial renewable resources are located north of SCE's Vincent and Lugo Substations, into SCE's load centers in the Los Angeles Basin. One existing transmission path between the northern portion of SCE's service territory and the Los Angeles Basin is referred to as the "South of Lugo transmission corridor," which currently contains three 500-kV T/Ls beginning at the Lugo Substation in Hesperia, traversing through the Cajon Pass along the I-15 freeway, and terminating at the Mira Loma Substation in Ontario.

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, as well as after, the addition of the new Rancho Vista 500-kV Substation (not part of TRTP), located in the city of Fontana. Furthermore, within the Cajon Pass, history has demonstrated that forest fires are a serious risk factor affecting multiple T/Ls in a common corridor on an annual basis, as exemplified in 2002 when all three of the existing 500-kV T/Ls located in the Cajon Pass were lost due to a forest fire during the heavy load demand period. To manage power flow under these circumstances, SCE has a special protection system (SPS) currently in place, which measures voltages at key substations within SCE's network. When the T/Ls within the Cajon Pass are lost (common mode failure), power is transmitted through other T/Ls within SCE's network to the load centers in the Los Angeles Basin. As a result of the substantial and rapid increase in current flowing over the remaining facilities, the voltage on these T/Ls rapidly decays over the length of the line. As a result, the voltage at the receiving end, or the "load center," can drop below acceptable levels, resulting in these facilities being removed from the grid, thus further perpetuating the voltage decay. This is referred to as "voltage collapse." Under these circumstances, the SPS requires that SCE shed a significant amount of SCE system load, resulting in power outages. Addition of power from the new wind generation facilities north of Vincent Substation adds further to the loading on these key transmission lines, thus compounding the existing system problems (voltage collapse) during outages of two or more of the lines located south of Lugo Substation.

The TRTP is expected to increase the total import capability of power into the Mira Loma area from 6,400 MW to 7,400 MW by providing additional transmission paths within the SCE system which would help alleviate the load on the Lugo-Mira Loma T/Ls. As a result, the overall reliability of the SCE system would be increased.

Discussion on Consistency with Project Objectives/Purpose, and Need

As noted above, CEQA §15126.6(a) requires that alternatives "feasibly attain most of the basic objectives of the project." Similar to CEQA, NEPA allows consideration of alternatives that meet "most" of the project purpose. As noted in the findings for *Natural Resources Defense Council v. Morton (458 F.2d 827 [D.C. Cir. 1972])*, "Nor is it appropriate to disregard alternatives merely because they do not offer a complete solution to the problem." While the concept of meeting *most* of the basic project objectives allows for some flexibility within the alternatives screening process to allow for alternatives that do not meet *all* of the project objectives, the reality is that some project objectives must be met, while others are

weighted with respect to their importance. Of the three main objectives identified by the Lead Agencies, the hierarchy and reasoning is discussed below.

One of the primary objectives of the Project would be to provide the electrical facilities to reliably interconnect and integrate new wind generation in the TWRA to comply with the California Renewables Portfolio Standard (RPS). This is one of the driving forces for SCE applying for a CPCN for the TRTP. While there could be some flexibility with respect to meeting the target capacity of 4,500 MW, any alternative considered *must* provide at least some reasonable percentage of the target capacity and *must* provide for a reliable system (see Section 2.3.1.4 for a discussion on reliability). Furthermore, the design of any alternative should allow SCE to reach the RPS target by 2010 as required by Public Utilities Code (PUC) §399.14 (State law). An equally important objective of the Project is to alleviate the South of Lugo transmission constraints. As noted, this has been an ongoing issue for the Los Angeles Basin and is represented by the majority of the proposed infrastructure upgrades south of Vincent Substation.

Addressing projected load growth in Antelope Valley is almost a secondary outcome of reliability interconnecting and integrating new wind generation in the TWRA, as the infrastructure that would meet this objective would invariably meet the projected load growth of the Antelope Valley. The other objectives stated by SCE, which are not covered by the three objectives identified by the Lead Agencies to meet the purpose and need for the TRTP, represent planning and management guidance. While these objectives help to facilitate the design of the Project, strict adherence to these objectives would potentially result in inappropriately limiting the range of alternatives. Therefore, these objectives have been presented, but were not considered by the Lead Agencies. For example, an alternative that requires new ROW and does not provide for the shortest feasible route, may in fact be a better route for other environmental reasons, and therefore would not be eliminated based on this criteria alone.

2.3.1.2 Feasibility

The State CEQA Guidelines (§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.*

The alternatives screening analysis is largely governed by what CEQA terms the "rule of reason," meaning that the analysis should remain focused, not on every possible eventuality, but rather on the alternatives necessary to permit a reasoned choice. Furthermore, of the alternatives identified, the EIR is expected to fully analyze those alternatives that are feasible, while still meeting most of the project objectives.

According to the State CEQA Guidelines (§15126.6[f][1]), among the factors that may be taken into account when addressing the feasibility of alternatives to determine the range of alternatives to be evaluated in the EIR include: site suitability; economic viability; availability of infrastructure; general plan consistency; other plans or other regulatory limitations; jurisdictional boundaries; and whether the proponent can reasonably acquire, control or otherwise have access to alternative sites in determining the range of alternatives to be evaluated in the EIR. For the screening analysis, the feasibility of potential alternatives was assessed taking the following factors into consideration:

- **Economic Feasibility.** Is the alternative so costly that implementation would be prohibitive?
- **Environmental Feasibility.** Would implementation of the alternative cause substantially greater environmental damage than the proposed Project, thereby making the alternative clearly inferior from an environmental standpoint?

- **Legal Feasibility.** Do legal protections on lands preclude or substantially limit the feasibility of permitting a high-voltage transmission line? Do regulatory restrictions substantially limit the feasibility or successful permitting of a high-voltage transmission line? Is the alternative consistent with regulatory standards for transmission system design, operation, and maintenance?
- **Social Feasibility.** Would the alternative cause significant damage to the socioeconomic structure of the community and be inconsistent with important community values and needs?
- **Technical Feasibility.** Is the alternative feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?

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

2.3.1.3 Potential to Eliminate Significant Environmental Effects

The State 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" (§15126.6[b]). At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the proposed Project/Action with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of the proposed Project/Action that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area to determine whether or not an alternative may reduce such impacts.

Table 2.3-1 presents a summary of the potential significant effects of the proposed Project/Action. This impact summary was prepared prior to completion of the EIR/EIS analysis, so it may not be complete in comparison to the detailed analysis that will be included in the EIR/EIS. The impacts stated below are based on a preliminary assessment of potential impacts and were used to determine whether an alternative met the CEQA requirement to reduce or avoid potentially significant effects of the proposed Project/Action.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action

Environmental Issue Area	Potential Issues or Impacts
Aesthetics/Visual Resources	• Permanent impacts related to visual contrast, alterations in existing scenic integrity, blocked or partially blocked views and the introduction of industrial-like facilities and new sources of light and glare due to the placement of towers, new or expanded substations, and new access and spur roads in all project segments, including scenic vistas and other designated scenic resources. • Construction-related activities would result in the temporary degradation of existing visual character and quality in all project segments, including scenic vistas and other designated scenic resources. • Possible conflicts with federal, State and local plans, regulations or standards applicable to the protection of visual resources.
Agricultural Resources	• Project's potential to impact Prime Farmland, Farmland of Statewide Importance, and lands under Williamson Act Contracts.
Air Quality	• Impacts during construction would occur when heavy equipment, support vehicles, and other internal combustion engines creates fugitive dust and/or generates exhaust containing: carbon monoxide (CO), reactive organic compounds (ROC), nitrogen oxide (NOx), sulfur oxides (SOx), and particulate matter (PM10). • Impacts would result from fugitive dust generated from ground clearing, grading, vehicle traffic on the access roads, and vehicle traffic at the construction sites. • Potential ongoing impacts from emissions and fugitive dust produced during operation and maintenance of proposed transmission line. • Potential temporary and long-term impacts from toxic air contaminants including diesel particulate matter that have localized effects.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action	
Biological Resources	• Construction activities and project facilities would result in temporary and permanent loss of native wildlife and habitat. • Loss of habitat for sensitive species designated by State and federal resource agencies. • Construction and operation could disturb wildlife and cause changes in wildlife behavior. • Construction activities may conflict with local policies or ordinances protecting biological resources.
Cultural & Paleontological Resources	• Construction of new towers and access roads could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources. • Temporary use of staging areas and conductor pull sites could damage or destroy historic and archaeological sites, traditional cultural properties, or areas containing paleontological resources.
Geology and Soils	• Soil erosion on low fill slopes and steeply graded areas could result in sedimentation of water bodies. • Ground surface rupture could occur where the proposed transmission line would cross active fault lines. • Landslides, mudslides, or other related ground failures from seismic activity, could occur and damage facilities, particularly where the proposed transmission line would cross active fault lines.
Hazards and Hazardous Materials	• Temporary relocation of residents along parts of the project might be required where helicopter construction is required (FAA safety regulations of helicopter flight paths). • Improper storage or handling of hazardous materials and/or hazardous wastes during project construction, operations, or maintenance could present hazards to construction workers or the public. • Leaking or spilling of petroleum or hydraulic fluids from construction equipment or other vehicles during project construction, operation, or maintenance could contaminate soils, surface waters, or groundwater. • The inadvertent uncovering of hazardous materials during excavation activities could cause toxic releases to the environment.
Fire Prevention and Suppression	• Wildfires could be caused by construction or operation of the transmission lines. • Facilities and activities could interfere with wildfire suppression.
Hydrology and Water Quality	• Increased surface water runoff, erosion, siltation, and sedimentation could diminish water quality. • Water quality of streams or washes could be diminished from violation of water quality standards or waste discharge requirements.
Land Use	• Possible conflicts with applicable local agency land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. • Possible conflict with the Forest Land Management Plan, Puente Hills Landfill Native Habitat Authority Resource Management Plan, and other resource management plans that protect resources along project route. • Construction would temporarily disturb the land uses it traverses or adjacent land uses. • Operation would result in permanent preclusion of, or substantial conflict with, land uses it traverses, or adjacent land uses.
Noise	• During construction, noise generated by construction equipment could create nuisance to nearby residents, park users, or other sensitive receptors. Volume range could be 80 to 100 dBA at a range of 50 feet from the active construction site. • Corona noise generated during the operation of the proposed transmission line would increase ambient noise levels surrounding the corridor. • Construction or corona noise in residential areas along the proposed transmission corridor could violate local noise ordinances (for volume and hours of operation).
Socioeconomics	• Employment of construction personnel could be beneficial to regional economy. • Remote areas of Los Angeles, San Bernardino and Kern Counties could lose access to temporary housing due to the possible influx of construction labor, if housing is required during construction of the proposed transmission line. • Additional property-taxes could be provided to local jurisdictions. • Construction activities could temporarily impact local business revenues due to limited access or disruptions of operations. • Operation would have the potential to decrease property values traversed by or adjacent to the transmission line. • Potential for project impacts to disproportionately affect low-income or minority populations (environmental justice).
Public Services and Utilities	• Construction activities could cause increased demand on public resources, services, and utilities. • Construction activities could result in increased generation of waste and disposal needs.
Recreational Resources and Wilderness Areas	• Construction or operation could cause conflicts with established or pending resource management or conservation plans. • Recreational land users would be disturbed by construction and operation where the proposed transmission line crosses the Angeles National Forest and other designated recreational areas. • Road closures and increased traffic during construction activities may impede or prevent access to recreational and wilderness areas.

Table 2.3-1. Summary of Preliminary Impacts of the Proposed Project/Action	
Transportation and Traffic	• Construction could result in a temporary disruption of traffic flow, transit services, emergency services, or rail services.
Cumulative and Growth-Inducing Impacts	• Cumulative impacts could occur (considering other projects that are proposed or under construction in the project area). • Growth-inducing effects could occur.

2.3.1.4 Reliability

In addition to the feasibility considerations discussed above, the reliability of the transmission system must also be considered to meet one of the primary objectives of the Project, which is to reliably interconnect and integrate up to approximately 4,500 MW of new wind generation in the TWRA into the CAISO-controlled grid. Planning criteria developed by the California Independent System Operator (CAISO), Western Electricity Coordinating Council (WECC), and the North American Electric Reliability Council (NERC), requires the loss of a single transmission line to be analyzed (N-1). For this case, the reliability criteria do not allow unplanned load interruption following the loss of a single transmission line. Further, for the case where multiple lines of the same voltage originating from the same source are placed in a common ROW, the reliability criteria require the loss of up to two transmission lines be analyzed (N-2). For the situation where two lines are lost, the CAISO criteria limit the amount of generation drop or reduction to no more than 1,400 MW. All reasonable alternatives must meet CAISO/WECC/NERC planning criteria.

2.3.2 NEPA

According to the Council on Environmental Quality's (CEQ) NEPA Regulations (40 CFR. 1502.14), an EIS must present the environmental impacts of the proposed action and alternatives in comparative form, defining the issues and providing a clear basis for choice by decision makers and the public. The alternatives discussion shall:

a) Rigorously explore and objectively evaluate all reasonable alternatives, and for alternatives which were eliminated from detailed study, briefly discuss the reasons for their having been eliminated.

b) Devote substantial treatment to each alternative considered in detail including the proposed action so that reviewers may evaluate their comparative merits.

c) Include reasonable alternatives not within the jurisdiction of the lead agency.

d) Include the alternative of no action.

e) Identify the agency's preferred alternative or alternatives, if one or more exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference.

f) Include appropriate mitigation measures not already included in the proposed action or alternatives.

The CEQ has stated that "[r]easonable alternatives include those that are practical or feasible from the technical and economic standpoint and using common sense rather than simply desirable from the standpoint of the applicant" (CEQ, 1983). In addition, as stated in 40 CFR §1502.1, Purpose, an Environmental Impact Statement "shall inform decisionmakers and the public of the reasonable

alternatives which would avoid or minimize adverse impacts or enhance the quality of the human environment."

In order to comply with NEPA's requirements, each alternative that has been suggested or developed for this project has been evaluated using the following:

- Does the alternative meet the statement of purpose and need?
- Is the alternative feasible?
- Does the alternative avoid or minimize adverse impacts or enhance the quality of the human environment?

2.3.2.1 Consistency with Purpose and Need

CEQA (State CEQA Guidelines §15124[b]) and NEPA (CFR Title 40 §1502.13) both explain that an agency's statement of objectives or purpose and need should describe the underlying purpose of the proposed project and reasons to which an agency is responding. For the proposed Project/Action, the objectives or purpose and need, are described in Section 2.3.1.1, above. Similar to CEQA, NEPA allows consideration of alternatives that meet "most" of the project purpose. As noted in the findings for *Natural Resources Defense Council v. Morton (458 F.2d 827 [D.C. Cir. 1972])*, "Nor is it appropriate to disregard alternatives merely because they do no offer a complete solution to the problem."

2.3.2.2 Feasibility

The environmental consequences of the alternatives, including the proposed action, are to be discussed in the EIR/EIS per CEQ NEPA Regulations (40 CFR 1502.16). The discussion shall include "Possible conflicts between the proposed action and the objectives of federal, regional, State, and local land use plans, policies and controls for the area concerned." Other feasibility factors to be considered may include cost, logistics, technology, and social, environmental, and legal factors (Bass et. al., 2001). The feasibility factors are substantially the same as described for CEQA in Section 2.3.1.2, above.

2.3.3 Summary of CEQA and NEPA Screening Methodology

Unlike CEQA's requirements, NEPA does not screen out alternatives based on avoiding or lessening significant environmental effects. However, CEQ NEPA Regulations (40 CFR 1500.2[e]) state that "Federal agencies shall to the fullest extent possible: Use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." Therefore, to ensure that the alternatives considered for the EIR/EIS would meet the requirements of both CEQA and NEPA, a reasonable range of alternatives has been considered and evaluated as to whether or not the alternatives meet (1) most of the project objectives/purpose and need, (2) are considered feasible, (3) meet CAISO/WECC/NERC reliability planning criteria, and (4) would avoid or lessen adverse effects of the proposed Project/Action.