5. Other Required NEPA and CEQA Considerations

Chapter 5 addresses the additional topics that are required by CEQA and/or NEPA. Section 5.1 discusses the long-term implications of the proposed Project/Action and alternatives, and includes a description of the unavoidable adverse effects of the TRTP (Section 5.1.3) as well as the Project's growth-inducing effects (Section 5.1.4). Section 5.2 discusses applicable federal environmental regulations, and describes how compliance with these regulations will occur as part of the USDA Forest Service's review of the Project.

5.1 Long-Term Implications

5.1.1 Relationship Between Short-term Use and Long-term Productivity of the Environment

The Council on Environmental Quality (CEQ) NEPA Regulations [40 C.F.R. Part 1500 *et seq*.] require that an EIS discuss issues related to environmental sustainability. In general, this EIS discussion is not included as environmental effects for which either significance is defined, or mitigation is recommended. However, the discussion, as it relates to environmental consequences, must be included in the EIS, including consideration of "the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity" [42 U.S.C. § 4332(C)(iv)].

In this section, the short-term effects and uses of various components of the environment in the vicinity of the proposed Project and alternatives are related to long-term effects and the maintenance and enhancement of long-term productivity. "Short term" refers to the total duration of the Project, whereas "long term" refers to an indefinite period beyond the construction of the TRTP and associated facilities. The specific impacts of the proposed Project and alternatives vary in kind, intensity, and duration according to the activities occurring at any given time. The Project involves tradeoffs between long-term productivity and short-term uses of the environment.

Construction of the TRTP would result in a number of temporary impacts that would cease upon completion of the construction phase. Such impacts include a temporary reduction of agricultural productivity in the Project area; loss of native vegetation as a result of its direct removal during construction activities, and impacts to wildlife from clearing, grading, and helicopter noise; water quality and geology impacts from erosion and sedimentation during construction; disruptions to existing utility systems; and traffic impacts from increased congestion and disruption to transit routes. As discussed in Sections 3.2, 3.4, 3.7, 3.8, 3.11, and 3.13, these impacts would be mitigable. The construction impacts associated with noise and air quality would not be mitigable to a less-than-significant level. Construction noise would significantly impact sensitive receptors along the Project route and would violate local noise ordinances (see Section 3.10). As discussed in Section 3.3 (Air Quality), the Project would exceed the South Coast Air Quality Management District (SCAQMD) Localized Significance Thresholds (LST) for PM10 and PM2.5 during construction.

The transmission towers and associated facilities may exist for decades and longer. Over the long term, several decades to several hundred years, natural environmental balances are expected to be restored. Many of the effects discussed in Chapter 3 are considered to be short term (occurring only during construction activities). These impacts could be further reduced by the mitigation measures discussed in Sections 3.2 through 3.17.

Over the operational lifetime of the proposed Project and alternatives, long-term adverse impacts associated with Agricultural Resources, Biological Resources, Hydrology and Water Quality, Land Use, Visual Resources, and Wildfire Prevention/Suppression would occur. These long-term impacts are summarized in the Executive Summary of this EIR/EIS and are analyzed in each issue area in Chapter 3. Examples of long-term impacts would include a permanent conversion of Farmland to non-agricultural uses; a permanent loss of native vegetation, including vegetation communities utilized for both common and sensitive wildlife; diversion of flood flows and increased erosion on adjacent properties from transmission structures; and an increased risk of wildfire.

Long-term benefits would also be associated with the TRTP. These benefits include interconnecting and integrating up to approximately 4,500 MW of new wind generation in the TWRA, thereby enabling SCE and other California utilities to comply with the California Renewables Portfolio Standard in an expedited manner; addressing the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and addressing the South of Lugo transmission constraints that are an ongoing source of concern for the Los Angeles Basin (see Section 1.2).

5.1.2 Irreversible and Irretrievable Commitment of Resources

Pursuant to Section 15126.2(c) of the CEQA Guidelines, an EIR must address significant irreversible and irretrievable environmental changes that would be caused by a proposed project. Also, Section 1502.16 of NEPA requires the environmental document to include a discussion of "any irreversible and irretrievable commitments of resources which would be involved in the Proposed Action should it be implemented." These changes include uses of nonrenewable resources during construction and operation, long-term or permanent access to previously inaccessible areas, and irreversible damages that may result from project-related accidents.

Implementation of the proposed Project or alternatives would result in the consumption of energy as it relates to the fuel needed for construction-related activities. Total fossil fuels used for construction vehicles and equipment associated with the proposed Project would include approximately 623,964 gallons of gasoline; 2,029,333 gallons of diesel fuel; and 709,571 gallons of Jet A fuel. The Project alternatives would have fuel use requirements similar to the proposed Project with the exception of Alternative 5 (Partial Underground) and Alternative 6 (Maximum Helicopter Construction in the ANF), which are expected to use substantially more fuel during construction than the other alternatives (see Section 3.3, Air Quality). Additionally, construction of the proposed Project and alternatives would require the manufacture of new materials, some of which would not be recyclable at the end of the Project's lifetime, and the energy required for the production of these materials, which would also result in an irretrievable commitment of natural resources. The anticipated equipment, vehicles, and materials required for construction of the TRTP are detailed in Section 2.2.12 (Proposed Project Construction). Maintenance and inspection of the proposed Project and alternatives would not change appreciably from SCE's existing activities in the Project area, and thus would not cause a substantial increase in the consumption or use of nonrenewable resources.

The proposed Project and each of the alternatives would result in the following permanent land disturbances:

- Alternative 2 (SCE's proposed Project): 277 acres (±15% range of 235-318 acres).
- Alternative 3 (West Lancaster): 277 acres (±15% range of 235-318 acres); difference of only one fewer tower compared to Alternative 2.

- Alternative 4 (Chino Hills Routes A-D): Route A – 291 acres (±15% range of 256-336 acres); Route B – 281 acres (±15% range of 238-324 acres); Route C – 287 acres (±15% range of 243-332 acres); Route D – 290 acres (±15% range of 245-335 acres).
- Alternative 5 (Partial Underground): 280 acres (±15/20% range of 237-323 acres).
- Alternative 6 (Maximum Helicopter Construction in the ANF): 230 acres (±15% range of 196-265 acres).
- Alternative 7 (66-kV Subtransmission): 277 acres (±15% range of 235-318 acres) ; additional permanent disturbance may result from the establishment of new access and spur roads for the approximately 1,200 feet of new ROW at the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows Overhead Re-Route.

As mentioned, an "irreversible or irretrievable" commitment of resources includes the use of nonrenewable resources during construction and operation, as well as the creation of long-term or permanent access to previously inaccessible areas, and irreversible damages that occur as a result of project-related accidents. Use of nonrenewable resources and permanent land disturbances that would occur as a result of the proposed Project and alternatives are summarized above. In addition, in accordance with the accepted definition of irreversible or irretrievable commitment of resources, following is a discussion of other environmental impacts of the proposed Project and alternatives that would result in an irreversible or irretrievable commitment of resources.

As described in Section 3.5 (Cultural Resources), impacts to cultural resources are site-specific. Properties that are eligible or potentially eligible for the National Register of Historic Places (NRHP) or the California Register of Historical Resources (CRHR) occur within and near the APE of several tower sites. Other eligible or potentially eligible cultural resource sites are located within or adjacent to the general transmission corridor. Direct impacts to cultural resources would result from ground-disturbing activities such as tower pad preparation and construction, grading of new access or spur roads, reconductoring, tower removal, transportation, storage, and maintenance of construction equipment and supplies, staging area and material yard preparation and use, and use or improvement of existing access roads. Indirect impacts to cultural resources from erosion may also occur within and in the vicinity of the Project area during operation and long-term presence of the proposed Project.

The Project would adversely affect visual resources, and substantially degrade the desired visual character of the ANF (see Section 3.14, Visual Resources). The southern portion of Segment 4 (S4 MP 14.9 to 17.9) would be in an entirely new 200-foot ROW immediately adjacent to 110th Street West, a County-designated Second Priority Scenic Highway. This new 500-kV transmission line would create adverse visual impacts to the existing rural landscape character and intact visual quality of West 110th Street. In the Center and South areas of the Project, existing towers would be replaced by new towers that are of a greater height and width, which would cause an increase in structural prominence, and create a visible increase in industrial character. As a result, future visual quality would be further reduced by contrasting, unnatural geometric forms and straight lines, and the resulting visual contrast would be very high. The proposed Project would appear to dominate the existing natural-appearing landscape character adjacent to the utility corridor. The new and increased structure height would create additional obstruction of the foreground, middleground, and background landscapes and would result in a high degree of view blockage of high quality landscapes as seen from the KOPs that are described in Section 3.14. Additional structure height also would cause additional structure skylining (towers and conductors extending above the horizon line), particularly for towers where, from some vantage points, the existing shorter structures remain below the skyline or only slightly extend above the horizon line. New taller, wider structures that would protrude above the skyline or ridgeline would block more of the natural-appearing horizon and impair scenic views in the ANF.

As described in Section 3.15 (Wilderness and Recreation), the Project would have the potential to permanently affect Off-Highway Vehicle (OHV) recreational opportunities, if Project activities require that OHV routes are permanently upgraded or repeatedly and frequently closed to OHV access in order to accommodate Project activities. The Project would traverse approximately 26.75 miles of NFS lands which are managed by the Forest Service (ANF) in accordance with Recreation Opportunity Spectrum (ROS) objective "Semi-Primitive Motorized", which accommodates extensive OHV use and OHV recreation opportunities. As discussed in Section 3.15, any long-term or permanent upgrade of the OML for an OHV route or for a Forest Road utilized by OHV recreationists would result in a loss of recreational opportunity to OHV users. Also as described in Section 3.15, implementation of the Project and alternatives would require roads on NFS lands in the ANF to be upgraded, which may subsequently provide access to previously inaccessible or not easily accessed areas of the ANF. This increased access to ANF lands would facilitate unmanaged recreation uses that may contribute to the long-term loss or degradation of recreational opportunities, particularly in connection with OHV use. If, as a result of Project-related road improvements, OHV recreationists are able to access previously inaccessible or difficult to access areas of the ANF that are restricted to OHV use under management direction provided by the 2005 Forest Land Management Plan (FLMP), the Forest Service would likely close the affected area of the ANF in order to contain unmanaged recreation uses. This action to prevent or control unmanaged recreation in the Forest would effectively remove other recreational opportunities previously available in the area(s) affected by unmanaged recreation, including those uses that would otherwise be in compliance with the 2005 FLMP. During the Project's operational phase, the transport of electrical power generated from nonrenewable resources (e.g., natural gas, large hydroelectric, coal) would continue. The TRTP would facilitate the distribution of renewable wind energy from the TWRA and would accommodate the area's potential for renewable power generation in order to achieve the goals of the California Renewables Portfolio Standard, as well as address projected load growth in the Antelope Valley and transmission constraints in the greater Los Angeles Basin.

5.1.3 Adverse Environmental Effects that Cannot be Avoided

As required by the CEQ NEPA Regulations (40 C.F.R. § 1502.16) and Section 15126.2(b) of the CEQA Guidelines, this EIR/EIS describes the adverse or significant environmental effects that cannot be avoided through implementation of the proposed Project or alternatives. In Chapter 3 of this document, the direct, indirect, and cumulative environmental effects of the Project are discussed in detail. Impacts that are significant and cannot be avoided or reduced to less-than-significant levels through the application of feasible mitigation measures have been characterized as Class I impacts. All significant and unavoidable Class I impacts resulting from the proposed Project and alternatives are summarized below. Refer to Sections 3.2 through 3.17 for a complete description of these impacts.

Air Quality

As described in Section 3.3 (Air Quality), construction of the proposed Project and alternatives would result in short-term impacts to ambient air quality. Daily construction emissions from the proposed Project and alternatives, including Nitrogen Oxides (NOx), Volatile Organic Compounds (VOC), Carbon Monoxide (CO), Particulate Matter (PM10) and Fine Particulate Matter (PM2.5), even after implementation of all feasible mitigation measures, will remain above the South Coast Air Quality Management District (SCAQMD) daily significance threshold. In addition, the NOx, VOC, CO, and PM10 emissions from the proposed Project and alternatives will remain above the Antelope Valley Air Quality Management District (AVAQMD) daily significance threshold values; as would the PM10 emissions from the proposed Project and alternatives remain above the Kern County Air Pollution Control District (KCAPCD) significance threshold value. Therefore, the

daily regional emissions from the proposed Project and alternatives would cause significant and unavoidable impacts in all three jurisdictions.

There are many areas of the construction route or substation construction for the proposed Project and alternatives that will be located near residences, schools, or other sensitive receptors. Construction of the proposed Project and alternatives would cause localized emissions above the SCAQMD Localized Significance Threshold (LST) thresholds even after mitigating to the maximum feasible extent; therefore, operation of the proposed Project and alternatives would have a significant and unavoidable impact to local sensitive receptors.

Cultural Resources

As described in Section 3.5 (Cultural Resources), direct impacts from the proposed Project and alternatives may be avoided through minor design modifications and project effects would be reduced to a less than significant level by avoidance and protection measures. If direct impacts to National Register of Historic Places (NRHP) properties eligible under Criterion d (significant data potential) are unavoidable, mitigation through data recovery would reduce impacts, but, under the National Historic Preservation Act (NHPA) regulations, effects would still be considered significant and avoidable. Likewise, if properties eligible for the NRHP under Criteria a, b, or c data recovery could not reduce impacts to a less than significant level, then effects would be considered significant and avoidable. Properties eligible for the California Register of Historical Resources (CRHR) under Criteria a, b, or c data recovery could not reduce impacts to a less-than-significant level.

Exposure of unanticipated Native American human remains or sacred features during construction of the proposed Project and alternatives would be a significant and unavoidable impact to the remains and an adverse effect under the regulations in the NHPA. Implementation of mitigation measures would reduce the severity of impacts to the extent feasible but would not reduce impacts to a level of less than significant.

Land Use

As described in Section 3.9 (Land Use), construction of the proposed Project and all Alternatives except 4 and 5 would result in impacts that would be less than significant not requiring mitigation or would be reduced to less than significant with the mitigation measures identified in Section 3.9.

Alternative 4

As described in Section 3.9 (Land Use), Routes A, B, C and D of Alternative 4 would traverse non-residential lands used for grazing, Chino Hills State Park, and open space (undeveloped) lands east of the Park. During construction, these routes would temporarily disrupt, displace or preclude operational and maintenance activities within the Park. Although Route B traverses the greatest distance within the Park and Route A would involve a new switching station within the Park, it would be anticipated that construction-related activities associated with Route C would be of a similar or perhaps greater duration than Routes A and B because it would involve the dismantling and re-construction (re-routing) of three existing transmission lines within the Park. The implementation of mitigation measures, in conjunction with the mitigation measures provided in the following sections: Air Quality, Noise, Traffic and Transportation, Biological Resources and Wilderness and Recreation, would lessen construction-related impacts within the Park, but it is not anticipated that these mitigation measures would reduce impacts to a level of less than significant, and impacts would be significant and unavoidable.

Route A, B, C and D of Alternative 4 would require the expansion of ROWs within Chino Hills State Park. The loss of land would be anticipated to cause long-term conflicts with, and disruptions of, existing uses and operations within the Park. Additionally, the placement of these features would be anticipated to conflict with the Park's management of affected Natural Open Space and Core Habitat Zones. These impacts would be significant and unavoidable.

Implementation of Alternative 4 would not be consistent with the Chino Hills State Park General Plan. In order to achieve consistency, the Chino Hills State Park General Plan would require amendment; the amendment would subsequently require approval by the State Department of Parks and Recreation Commission. Therefore, the existing inconsistency between Alternative 4 and the Chino Hills State Park General Plan would be considered a significant and unavoidable impact.

Alternative 5

As discussed in Section 3.9 (Land Use), there are commercial and services uses adjacent to both sides of the ROW on Alternative 5. To accommodate the Eastern Transition Station, the existing ROW north of an existing flood control channel would need to be expanded by 100 feet, for a total ROW width of 250 feet. The expanded ROW and construction of the Eastern Transition Station would require the removal of a commercial car wash, a retail business, and a portion of a parking lot. Although it is assumed that SCE would make all efforts to purchase the property needed for construction of the Eastern Transition Station, it is feasible that the owner (or owners) of both the property and the affected businesses would not agree to, or be willing to negotiate, SCE's proposed acquisition agreement (or agreements). Under this scenario, implementation of Alternative 5 would likely require that the CPUC exercise eminent domain. The take of the property and businesses affected by Alternative 5 through eminent domain would be considered an unavoidable and significant impact.

Noise

As described in Section 3.10 (Noise), construction noise from the proposed Project and alternatives would substantially disturb ambient noise conditions to sensitive receptors and increase noise levels within 200 feet of construction activities, along the proposed Project and alternatives ROW. During construction, noise levels would violate local standards. Although construction noise would be temporary and would be reduced by implementation of APMs and mitigation measures, significant impacts cannot be reduced to a less-than-significant level.

Permanent noise levels along the ROW would increase due to corona noise from operation of the transmission lines and substations in the vicinity of the sensitive receptors. Corona noise generated by the proposed Project and alternatives would not be in compliance with noise standards of Los Angeles County, and the Cities of Chino, Monterey Park, and Whittier. Since no feasible mitigation exists to reduce or eliminate the corona noise that would be generated by the proposed Project or Alternatives, the increase in corona noise levels would result in a significant unavoidable impact.

Visual Resources

Section 3.16 (Visual Resources) states that short-term visual impacts on landscape character and visual quality of landscape views as seen from various vantage points due to construction of the proposed Project and alternatives would be significant and unavoidable. There are no mitigation measures available to make vehicles, heavy equipment, helicopters, and other related components less than visible during construction.

There is no mitigation available to make new transmission lines disappear or become inconspicuous as seen from the thousands of vantage points from which the proposed Project and alternatives would be visible. The presence of new transmission line structures, conductors, access and spur roads, and new rights of way in landscapes that currently have no transmission line facilities would be a significant and unavoidable adverse visual impact.

Wildfire Prevention and Suppression

As described in Section 3.15 (Wildfire Prevention and Suppression), the presence of the rerouted portion of Alternative 4 would incrementally increase the likelihood of a wildfire in fire-prone areas along the transmission ROW where new or expanded transmission line would be constructed. Mitigation measures would reduce the risk of vegetation contact with conductors, the likelihood of component failures that could result in wildfire ignitions, and the potential damage to homes from Project-related wildfires. However, the creation of defensible space would not guarantee structure protection during severe fire weather, and the potential for the Project to ignite a wildfire would remain significant overall. Although mitigation measures would reduce the risk of fire ignition and the potential for damage to homes from Project-related wildfires, the potential to ignite a fire and cause damage to homes would still exist and remain significant and unavoidable.

The portion of the Alternative 4 route that traverses the CHSP would be accessed by narrow, unpaved roads that could be obstructed by construction and maintenance vehicles which may obstruct emergency fire vehicle access. The Routes A through D of Alternative 4 would each introduce varying lengths of new transmission ROW through an area containing high-risk fuels and steep topography in CHSP. The introduction of a new linear element across the landscape would introduce a new obstruction to aerial and ground-based firefighting operations. This would occur for 5.3 miles along Route D, which would introduce a new transmission corridor that, in combination with existing transmission lines, would create an area of indefensible space of approximately 2,000 acres in CHSP. The creation of indefensible spaces allows fires to build in intensity unchecked by firefighters until the fire burns through the area. Implementation of mitigation measures would result in the creation and maintenance of fuelbreaks that would slow the passage of fire through the Project area and provide a slight advantage for firefighting ground forces. However, the presence of the taller transmission lines would still result in decreased effectiveness of firefighting, which would remain a significant and unavoidable impact.

5.1.4 Growth-inducing Effects

Section 15126.2(d) of the CEQA Guidelines requires that an EIR discuss the ways in which a proposed project may foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment. The CEQ NEPA Regulations also provide for discussing the growth-inducing impacts of a project. (40 C.F.R. § 1508.8(b) [“Indirect effects may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.”].) The discussion must additionally address how a proposed project may remove obstacles to growth, or encourage and facilitate other activities that could significantly affect the environment, either individually or cumulatively.

Typically, the growth-inducing potential of a project would be considered significant if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Significant growth impacts could also occur if a project provides

infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

Growth Caused by Project-Related Employment

As discussed in Section 2.2, construction of the proposed Project would occur over an estimated 55-month period and require a workforce ranging between ten to 300 persons, with an average daily workforce of approximately 75 persons. It is assumed that the construction of the alternatives would employ a similar number of construction personnel because the alternatives would be constructed under similar time constraints. Operation and maintenance of the proposed Project and alternatives would be conducted by SCE's existing labor force and would not create new jobs locally or regionally (see Section 2.2).

Section 3.12 (Socioeconomics) provides a detailed assessment of the existing labor force within the Project area. Construction employment for the proposed Project would include skilled or semi-skilled positions such as line workers, welders, heavy equipment operators, surveyors, engineers, utility equipment workers, truck drivers, warehouse workers, clerical workers, and laborers. As described in Section 3.12, there is a substantial construction workforce available throughout the Project area, particularly within the North and South Regions. The Project construction schedule is estimated to extend for about 55 months and would require an average daily workforce of approximately 75 persons (actual workforce would range between 10 and 300 works, as needed). Total construction workforce available in the Counties of Kern, Los Angeles, and San Bernardino are respectively as follows: 13,300, 134,500, and 90,900. As such, total construction workforce available in the Project area is approximately 238,700 personnel. The maximum required construction workforce of 300 personnel for the Project would comprise approximately 0.12 percent of the total construction workforce available in the Project area. No workers would be required to relocate into the Project area for construction of the Project and no new workers are required for operation of the Project. Local employment conditions in the Project area are not expected to be affected by the Project.

Growth Related to the Provision of Additional Electric Power

As outlined in Section 1.3, Purpose and Need, the primary purposes of the proposed Project and alternatives are to provide the electrical facilities necessary to interconnect and integrate up to approximately 4,500 MW of new wind generation in the TWRA 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); to address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and to address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin. The TWRA is considered to be one of the world's leading wind energy centers and SCE, pursuant to several State and federal goals and policies related to renewable energy sources, is obligated to accommodate future wind-generated electricity in southern California. As discussed in Section 2.2, the proposed Project would construct a new substation near the TWRA in Kern County; construct new single-circuit 220-kV and 500-kV transmission lines between the proposed new substation and existing substations in Kern and Los Angeles counties; rebuild existing 220-kV transmission lines to 500-kV standards in the ANF, Los Angeles County, and San Bernardino County; upgrade the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new transmission line construction and system compensation infrastructure; and install associated telecommunications infrastructure.

Section 2.8 (Cumulative Projects) provides a description of the existing and projected population within the Project area. Between 2000 and 2030, the population of Kern County is anticipated to increase by 68 percent,

while the Los Angeles and San Bernardino County region will experience a population growth rate anywhere between 2.5 and 186.5 percent. Both locally and regionally, the Project area is experiencing substantial population growth, which is reflected in the large number of proposed and planned future residential development projects listed in Table 2.8-4. This growth is expected to occur with or without implementation of the proposed Project or alternatives.

SCE is responding to sources of wind energy generation that are being proposed by independent generators for construction in the Tehachapi area. The TRTP would accommodate the anticipated future load growth in a timely manner and would be consistent with local planning documents and policies (see Section 2.8). Any growth that occurs with the availability of the additional power provided by the Project would need to conform to the local planning documents and policies. An assessment of the potential significant cumulative impacts of the proposed Project and alternatives is provided for each of the issue areas discussed in Chapter 3. Although the TRTP would not directly result in growth in the Project area, its implementation would remove future obstacles to population growth by facilitating the transmission of future power generation in the TWRA (as described in Chapter 6).

Development of Wind Generation in the Tehachapi Wind Resource Area

Several wind generation facilities are proposed for the Tehachapi area and are currently in the California Independent System Operator's (CAISO) Interconnection Queue (CAISO, 2008). Per the Federal Power Act [16 U.S.C. §§ 824a-3, 824i, 824k] and Article 25 of the CAISO Tariff (CAISO, 2007), SCE is obligated to integrate power generation facilities, including wind farms, into its electrical system.

While the proposed Project and alternatives would provide a portion of the infrastructure necessary for the development of future wind generation facilities, it would also assist with meeting the goals and policies of local and regional land use plans. Kern County has identified a lack of adequate power transmission capacity as an obstacle to the development of wind energy within the County. The Kern County 2004 General Plan includes a policy to support the construction of additional transmission capacity projects where land use and other constraints are minimal. Wind energy development projects that currently have submitted an application to the County include the PdV Wind Energy Project and the Alta-Oak Creek Mojave Project. Construction of the Pine Tree Wind Development Project began in January of 2008. See Section 2.8.3 for a description of these projects.

A detailed discussion of the present and future development of the TWRA is included in Chapter 6 of this EIR/EIS. Please refer to Chapter 6 for further information regarding the TWRA.

5.2 Compliance with Applicable Federal Environmental Regulations and Policies

The proposed Project and alternatives have been developed in accordance with the requirements of the federal environmental statutes and regulations outlined below. Specific actions needed to ensure compliance with these statutes and regulations are also discussed. These discussions of compliance with applicable federal environmental regulations and policies are also presented in the resource-specific issue area analyses in Chapter 3 (Environmental Analysis) of this EIR/EIS.

5.2.1 National Environmental Policy Act (NEPA) of 1969, as amended

National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. §§ 4321-4347) Section 102 (2) (C) states that all agencies of the Federal Government shall -- include in every recommendation or report on proposals for legislation and other major Federal actions significantly affecting the quality of the human environment, a detailed statement by the responsible official on - (i) the environmental impact of the proposed action, (ii) any adverse environmental effects which cannot be avoided should the proposal be implemented, (iii) alternatives to the proposed action, (iv) the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity, and (v) any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

NEPA Conformity

This EIR/EIS has been prepared in accordance with the requirements and guidelines as set forth in: (1) Section 102 of NEPA; (2) the Council on Environmental Quality Regulations on Implementing National Environmental Policy Act Procedures (40 C.F.R. Part 1500 *et seq*.); and (3) the U.S. Department of Agriculture Procedures for Implementing the National Environmental Policy Act (7 C.F.R. Part 1b). Potential environmental effects of the proposed Project/Action, including any unavoidable adverse effects, are discussed in Sections 3.2 through 3.17 of this EIR/EIS. Reasonable alternatives have been considered during the planning process, and a description of these alternatives as well as a discussion of their potential impacts can be found in Chapters 2 and 3 of the EIR/EIS, respectively. The relationship between short-term uses and long-term productivity and the irreversible and irretrievable commitment of resources involved in the proposed Project/Action are described in Sections 5.1.1 and 5.1.2. The proposed Project/Action will meet all procedural federal and State review requirements, as discussed below and in Chapter 7 of this EIR/EIS. The analysis of the proposed Project/Action is therefore considered consistent with and in compliance with the requirements of NEPA.

5.2.2 Endangered Species Act

The Endangered Species Act (ESA) of 1973, as amended (PL 108-136, November 2003), is administered jointly by the U.S. Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service). The ESA protects threatened and endangered species, as listed by the USFWS, from unauthorized take, and directs federal agencies to ensure that their actions do not jeopardize the continued existence of such species. Section 7 (a) (3) states that federal agencies shall "consult with the Secretary [USFWS] on any prospective agency action at the request of, and in cooperation with, the prospective permit or license applicant if the applicant has reason to believe that an endangered species or a threatened species may be present in the area affected by his project and that implementation of such action will likely affect such species."

ESA Conformity

The arroyo toad is a federally listed endangered species that is known to occur at drainages in the Project area. The California red-legged frog is a federally listed threatened species that has not been observed in the Project ROW, but has the potential to occur within the Northern Region of the Project area. These species have been fully addressed within the context of this EIR/EIS (see Section 3.4, Biological Resources) and mitigation measures have been proposed to reduce potential impacts on these species. In compliance with the

requirements of the ESA, the USDA Forest Service will consult with the USFWS regarding the effects of the Project on these species. As part of consultation with USFWS, the USDA Forest Service will prepare and submit a Biological Assessment (BA) for federally endangered or threatened species that could potentially be adversely affected by the proposed Project. Subsequently, any "take" of a federally endangered or threatened species as a result of implementation of the proposed Project would only be allowed under the context of a Biological Opinion (BO) issued by USFWS.

5.2.3 Clean Water Act

The Clean Water Act (CWA) (33 U.S.C. § 1251 *et seq*.), formerly the Federal Water Pollution Control Act of 1972, was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA § 402). In California, NPDES permitting authority is delegated to, and administered by, the nine Regional Water Quality Control Boards (RWQCBs). Section 401 of the CWA requires that any activity, including river or stream crossing during road, pipeline, or transmission line construction, which may result in a discharge into a State water body, must be certified by the applicable RWQCB to ensure that the proposed activity does not violate State and/or federal water quality standards. Section 404 of the CWA authorizes the U.S. Army Corps of Engineers to regulate the discharge of dredge or fill material to the waters of the United States and adjacent wetlands through the issuance of individual site-specific or general (Nationwide) permits for such discharges.

CWA Conformity

For the proposed Project, NPDES permits would be issued by the Lahontan, Los Angeles, and Santa Ana RWQCBs. In order to comply with NPDES regulations, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared for the proposed Project construction activities. For more information about the SWPPP, see Section 3.8 (Hydrology and Water Quality).

A Section 404 permit would be required for the proposed Project construction activities involving excavation or replacement of fill material into waters of the United States. In addition, a Water Quality Certification pursuant to Section 401 of the CWA is required for Section 404 permit actions. See Section 3.8 (Hydrology and Water Quality) for further information on the 404 permit requirements.

5.2.4 National Historic Preservation Act

The National Historic Preservation Act (NHPA) of 1966 as amended in 1980 and 1992 (16 U.S.C. § 470 *et seq*.), provides for the listing of historic properties and sites in the National Register of Historic Places (NRHP) and provides for the protection of these properties and sites. Section 106 of the NHPA requires that federal agencies take into account the effect of a federal undertaking on properties listed on the National Register or potentially eligible for listing on the National Register, and consult with the state historic preservation officer (SHPO) regarding these properties or sites. The agencies must afford the Advisory Council on Historic Preservation (ACHP) a reasonable opportunity to comment on the undertaking. A federal undertaking is a project that is federally funded, takes place on federal land, or that requires a federal permit or license.

NHPA Conformity

Section 106 applies to the proposed Project because a portion of the proposed transmission upgrades are located on the Angeles National Forest and a permit from the USDA Forest Service is required for implementation of the proposed Project. For cultural resources that cannot be avoided by the Project, NRHP eligibility will be evaluated and a determination of eligibility will be made by the Forest Service in concurrence with the SHPO.

5.2.5 Clean Air Act

The Clean Air Act (CAA), as revised in 1990, (PL 101-542; 42 U.S.C. § 7401) requires the U.S. EPA and states to carry out programs intended to ensure attainment of National Ambient Air Quality Standards (NAAQS). The General Conformity Requirements of the Code of Federal Regulations require that federal actions do not interfere with state programs to improve air quality in nonattainment areas. A comparison of the Project emissions to the General Conformity *de minimis* limits is included in Section 3.3 (Air Quality).

The 1990 amendments to the federal CAA Section 176 require the U.S. EPA to promulgate rules to ensure that federal actions conform to the appropriate State Implementation Plan (SIP). These rules, known together as the General Conformity Rule (40 C.F.R. §§ 51.850-51.860; 40 C.F.R. §§ 93.150-93.160), require any federal agency responsible for an action in a nonattainment or attainment/maintenance area to determine that the action conforms to the applicable SIP or that the action is exempt from the General Conformity Rule requirements. This means that federally supported or funded activities will not (1) cause or contribute to any new federal air quality standard violation, (2) increase the frequency or severity of any existing federal standard violation, or (3) delay the timely attainment of any federal standard, interim emission reduction, or other milestone. Actions can be exempt from a conformity determination if an applicability analysis shows that the total direct and indirect emissions from the project construction and operation activities would be less than specified emission rate thresholds, known as de minimis limits, and that the emissions would be less than 10 percent of the area emission budget.

CAA Conformity

The USDA Forest Service regulates the portion of the Project's route that goes through the ANF and the Forest Service has prepared a planning document for the ANF. The Angeles National Forest Strategy does not include any air quality strategies that would be significantly impacted by the construction or operation of the proposed Project or alternatives.

The part of the Project area that is located within the KCAPCD and the AVAQMD is in nonattainment for the federal 8-hour ozone standard. Additionally, the part of the Project area within the SCAQMD is in nonattainment of the federal 8-hour ozone, PM10, and PM2.5 standards.

Potential air quality impacts have been assessed in Section 3.3 (Air Quality) of this EIR/EIS. Both short and long-term emissions of criteria pollutants resulting from the construction and operation of the Project were evaluated. As discussed in Section 3.3, the annual emissions for the proposed Project and all alternatives are expected to exceed the General Conformity Rule *de minimis* emission thresholds for NOx in the South Coast Air Basin (SoCAB). Therefore, a comprehensive General Conformity analysis would be required prior to the issuance of a Record of Decision for the Project.

5.2.6 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) was passed by Congress as part of the Agriculture and Food Act of 1981 (PL 97-98). The purpose of the FPPA is to minimize the impact that federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses (NRCS, 2008). Actions are subject to FPPA requirements if they may irreversibly convert farmland, either directly or indirectly, to nonagricultural use and are completed by a federal agency or with assistance from a federal agency. For the purposes of the FPPA, assistance from a federal agency includes: acquiring or disposing of land; providing financing or loans; managing property; or providing technical assistance. The USDA Natural Resources Conservation Service (NRCS) is responsible for administering the FPPA.

FPPA Conformity

The Project would not affect Farmland or agricultural activities on land that is under the jurisdiction of the USDA Forest Service, which is the federal lead agency for the Project under NEPA. Therefore, no FPPA compliance actions are required for the proposed Project.

5.2.7 Migratory Bird Treaty Act and Executive Order 13186

The Migratory Bird Treaty Act (16 U.S.C. §§ 703-712) implements a number of international, bilateral conventions between the U.S. and Canada, Japan, Mexico, and the former Soviet Union for the conservation of migratory birds. Under the Migratory Bird Treaty Act, taking, killing, or possessing a migratory bird is unlawful [16 U.S.C. § 703(a)].

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), dated January 10, 2001, directs federal agencies to meet the requirements of the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712), the Bald and Golden Eagle Protection Acts (16 U.S.C. §§ 668-668d), the Fish and Wildlife Coordination Act (16 U.S.C. §§ 661-666c), the Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544), the National Environmental Policy Act of 1969 (42 U.S.C. §§ 4321-4347), and other statues pertinent to the conservation of migratory birds and their habitat. In order to identify the potential effects of future federal projects on migratory birds, federal agencies are required to develop a Memorandum of Understanding (MOU) with the USFWS that would promote migratory bird conservation. Agencies are directed to implement their MOUs through a number of actions, such as to "ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern" [Executive Order 13186, § 3(e)(6)].

Migratory Bird Treaty Act/Executive Order 13186 Conformity

The Project would have the potential to impact nesting birds, which are protected under this Act. As described in Section 3.4 (Biological Resources), Applicant-Proposed Measures have been incorporated into the Project to minimize the effects on nesting birds. In addition, mitigation measures are recommended to further reduce avian impacts to a level that is not significant.

5.2.8 National Forest Management Act

The National Forest Management Act (16 U.S.C. § 1600) (NFMA) requires the USDA Forest Service to prepare management plans for all National Forest System lands. The process for developing, amending, and revising these land management plans is set forth in 36 C.F.R. Part 219 (National Forest System Land and

Resource Management Planning). 36 C.F.R. § 219.12, describes the use of land management plans to identify the desired conditions and objectives for each of the areas within NFS lands in order to guide proposed project and activity decisionmaking. Land use designations are subject to change through plan amendment or plan revision.

NFMA Conformity

To ensure consistency with management direction in the governing Forest Plan, the proposed Project and alternatives would require several amendments to the Forest Plan regarding visual resources, scenic integrity, management of PCT foreground views, and riparian conservation areas. Any proposed Forest Plan amendments pertaining to this Project have be included as part of the need for action and included in the analysis of the proposed Project and alternatives in this document. The Forest Plan amendments must be approved before Special Use authorization(s) can be issued to SCE for the proposed Project or a Project alternative. A description of the Forest Plan amendments required for approval of the proposed Project is provided in Section 1.3 (Agency Use of this Document).

5.2.9 Wild and Scenic Rivers Act

In accordance with the Wild and Scenic Rivers Act (Public Law 90-542), certain selected rivers in the United States are to be protected and preserved in free-flowing condition because of their "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values…" Every wild, scenic, or recreational river in a free-flowing condition, or upon restoration of this condition, is eligible for inclusion in the National Wild and Scenic Rivers System. If determined to be eligible, a suitability analysis is conducted for the river's current level of development, accounting for water resource projects, shoreline development, and accessibility. A recommendation is also made that the eligible river be placed in one or more of three classes: wild, scenic, and/or recreational. Prior to official designation, eligible rivers are afforded federal protection against activities or actions that could potentially interfere with the "outstandingly remarkable values" (ORVs) of the river that make it eligible for the recommended classification/s within the National Wild and Scenic Rivers System.

After a river is determined to be eligible for the National Wild and Scenic Rivers System, all existing facilities, management actions, and approved uses may continue in the river corridor, provided they do not interfere with the protection of the river's ORV's or potential classification. The corridor width for eligible and designated rivers is usually one-quarter mile on both sides of the river. Uses of the eligible river corridor must comply with the Forest Service Handbook (FSH) 1909.12, Chapter 8.2, which discusses activities that are permitted, restricted, or prohibited in the eligible river corridor for each of the three potential classifications.

Wild and Scenic Rivers Act Conformity

For an eligible river under the recreational classification, such as West Fork of the San Gabriel River, the construction of new transmission lines is permitted when there is "no reasonable alternative," and the transmission line must be situated in an existing right-of-way (USDA Forest Service, 2006). As the proposed TRTP traverses the ANF, Segment 6 would be located within the existing Vincent Rio Hondo utility corridor and Segment 11 would be located within the existing Vincent Gould utility corridor, thereby complying with the FSH 1909.12, as described above. Furthermore, construction and operation of the Project would not affect the criteria for the classification of the West Fork of the San Gabriel River as a recreational river in the National Wild and Scenic Rivers System. Therefore, the Project would be in full compliance with the Wild and Scenic Rivers Act.

5.2.10 Executive Order 11990 – Protection of Wetlands

Executive Order 11990, dated May 24, 1977, is intended to support NEPA by directing federal agencies and programs to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands, and to avoid direct or indirect support of new construction in wetlands whenever a practicable alternative exists

Executive Order 11990 Conformity

Both federal and State jurisdictional waters would be affected by construction of the proposed Project and alternatives, primarily from the siting of access roads across these waters. Section 3.4 (Biological Resources) describes Applicant-Proposed Measures that will be incorporated into the Project to avoid or compensate impacts to jurisdictional waters and wetlands. Mitigation measures are also recommended in Section 3.4 to further minimize impacts to riparian areas such as wetlands.

5.2.11 Executive Order 13045 – Protection of Children from Environmental Risks

Executive Order 13045 (Protection of Children from Environmental Health Risks and Safety Risks) was issued in 1997 and implemented by the U.S. EPA in April of 1998. Executive Order 13045 developed as a result of the establishment of the National Agenda to Protect Children's Health from Environmental Threats (National Agenda) in 1996 and the Office of Children's Health Protection (OCHP) in 1997. As children are typically more susceptible to many environmental hazards than adults are because of their smaller size, weight, and stage of development, among other factors, the purpose of Executive Order 13045 is to minimize harm incurred by children as a result of health and safety risks associated with federal regulatory actions.

Executive Order 13045 Conformity

As the proposed Project and alternatives are not a regulatory action that would result in a draft regulation, Executive Order 13045 would not apply to the Project.

5.2.12 Executive Order 12898 – Environmental Justice

On February 11, 1994, President Clinton issued an "Executive Order on Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (Executive Order 12898, 1994). This Order is designed to focus Federal attention on environmental and human health conditions in minority communities and low-income communities. The Order is further intended to promote non-discrimination in Federal Programs substantially affecting human health and the environment and to provide for information access and public participation relating to such matters.

The aim of this analysis is to achieve compliance with the letter and spirit of Executive Order 12898 and to address any community concerns raised in the scoping process for this project. This section analyzes the distributional patterns of minority and low-income populations at a regional level as well as using census tracts traversed and within 0.5 miles of the proposed Project transmission line corridor to characterize the distribution of such populations.

Affected Environment

As defined by the "Final Guidance for Incorporating Environmental Justice Concerns" contained in the Guidance Document of the United States Environmental Protection Agency's NEPA Compliance Analysis (USEPA, 1998), minority (people of color) and low-income populations are identified where either:

- The minority or low-income population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority or low-income population percentage of the affected area is meaningfully greater (50 percent or greater per EPA Guidance Document) than the minority population percentage in the general population of the jurisdiction or other appropriate unit of geographic analysis (i.e., County or Native American Reservation) where the affected area is located.

In 1997, the President's Council on Environmental Quality issued Environmental Justice Guidance that defines minority and low-income populations as follows:

- "Minorities" are individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black not of Hispanic origin; or Hispanic (without double-counting non-white Hispanics falling into the Black/African-American, Asian/Pacific Islander, and Native American categories)
- "Low-income populations" are identified as populations with mean annual incomes below the annual statistical poverty level.

The following analysis describes the numbers of existing low income and minority population both within the study area (regional setting) and within 0.5 miles of the proposed Project alignment. The proposed Project study area includes jurisdictions within Kern, Los Angeles, and San Bernardino Counties. In addition to the Project study area, census tract data is presented for population within 0.5 miles of the proposed Project transmission line alignment.

Regional Setting

North Region. The North Regions extends from the Windhub Substation (Milepost 0.0 of the proposed Project's Segment 10) to the Vincent Substation (Milepost 17.8 of the proposed Project's Segment 5). The Northern Region included the proposed Project's Segments 4, 5 and 10 and traverses parts of southern Kern County and northern Los Angeles County, as well as the incorporated cities of Lancaster and Palmdale. The regional setting for the TRTP Project includes jurisdictions within Kern, Los Angeles, and San Bernardino Counties. Table 5.2-1 identifies the total population and both low income and minority population contained within the North Region.

Table 5.2.-1. Year 2000 North Region Low Income and Minority Population Characteristics

Jurisdiction	Total Population	Low Income Population (%)	Minority Population (%)
County of Kern	661,645	137,622 (20.8%)	255,395 (38.6%)
County of Los Angeles	9,519,338	1,703,961 (17.9%)	4,892,940 (51.4%)
County of San Bernardino	1,919,215	303,236 (15.8%)	792,636 (41.3%)
City of Lancaster	118,718	19,470 (16.4%)	39,177 (33.0%)
City of Palmdale	116,670	18,434 (15.8%)	57,052 (48.9%)

Source: U.S. Census Bureau, 2000.

Central Region. The Central Region is located between the Vincent Substation (Milepost 0.0 of the proposed Project's Segments 6 and 11) and the southern boundary of the US Forest Service Angeles National Forest (ANF) (Milepost 24.5 of the proposed Project's Segment 11 and Milepost 26.9 of the proposed Project's Segment 6). The majority of the Central Region falls within the jurisdictional boundaries of the ANF and includes all of the proposed Project's Segment 6 and approximately 70 percent of Segment 11. The Gould Substation is located outside of the ANF's jurisdictional boundaries, but is part of the Central Region. The Central Region also includes a portion of unincorporated area of Los Angeles County, and a number of incorporated and unincorporated cities. Table 5.2-2 identifies the total population and both low income and minority population contained within the Central Region.

Table 5.2-2. Year 2000 Central Region Low Income and Minority Population Characteristics

Jurisdiction	Total Population	Low Income population (%)	Minority Population (%)
County of Los Angeles	9,519,338	1,703,961 (17.9%)	4,892,940 (51.4%)
City of Duarte	21,486	2,428 (11.3%)	9,389 (43.7%)
City of La Cañada Flintridge	20,318	874 (4.3%)	6,603 (32.5%)
City of Monterey Park	60,051	9,368 (15.6%)	45,819 (76.3%)
City of Pasadena	133,936	21,296 (15.9%)	56,655 (42.3%)
City of Rosemead	53,505	12,199 (22.8%)	37,989 (71.0%)
City of San Gabriel	39,804	6,329 (15.9%)	25,514 (64.1%)
Community of Altadena	42,610[1]	n/a	n/a
Community of East Pasadena	6,045[1]	n/a	n/a
Community of East San Gabriel	14,512[1]	n/a	n/a
Community of South San Gabriel	7,595[1]	n/a	n/a

Source: U.S. Census Bureau, 2000.
[1] Source: SCE, 2007
n/a: Data Not Available

South Region. The South Region extends from the southern boundary of the ANF (Milepost 0.0 and 24.5 of the proposed Project's Segments 7 and 11, respectively) to the Mira Loma Substation (Mileposts 35.2, 6.8 and 6.4 of the proposed Project's Segments 8A, 8B and 8C, respectively). The South Region includes the Goodrich, Rio Hondo, Mesa, Chino, and Mira Loma Substations and traverses lands within Los Angeles and San Bernardino Counties, as well as multiple incorporated cities. Table 5.2-3 identifies the total population and both low income and minority population contained within the South Region.

Table 5.2-3. Year 2000 South Region Low Income and Minority Population Characteristics

Jurisdiction	Total Population	Low Income population (%)	Minority Population (%)
County of Los Angeles	9,519,338	1,703,961 (17.9%)	4,892,940 (51.4%)
County of San Bernardino	1,919,215	303,236 (15.8%)	792,636 (41.3%)
City of Baldwin Park	75,837	13,802 (18.2%)	42,544 (56.1%)
City of Chino	67,168	5,575 (8.3%)	27,002 (40.2%)
City of Chino Hills	66,787	3,406 (5.1%)	26,581 (39.8%)
City of Duarte	21,486	2,428 (11.3%)	9,389 (43.7%)
City of Industry	777	112 (14.5%)	317 (40.8%)
City of Irwindale	1,446	237 (16.4%)	709 (49.0%)
City of La Cañada Flintridge	20,318	874 (4.3%)	6,603 (32.5%)
City of La Habra Heights	5,712	194 (3.4%)	1,405 (24.6%)
City of Lancaster	118,718	19,470 (16.4%)	39,177 (33.0%)
City of Montebello	62,150	10,566 (17.0%)	30,143 (48.5%)
City of Monterey Park	60,051	9,368 (15.6%)	45,819 (76.3%)
City of Ontario	158,007	24,491 (15.5%)	75,527 (47.8%)
City of Pico Rivera	63,428	7,992 (12.6%)	28,987 (45.7%)
City of South El Monte	21,144	4,017 (19.0%)	11,671 (55.2%)

Table 5.2-3. Year 2000 South Region Low Income and Minority Population Characteristics			
Jurisdiction	Total Population	Low Income population (%)	Minority Population (%)
City of Whittier	83,680	8,786 (10.5%)	27,112 (32.4%)
Community of Avocado Heights	15,148[1]	n/a	n/a
Community of Hacienda Heights	53,122[1]	n/a	n/a
Community of Rowland Heights	48,553[1]	n/a	n/a

Source: U.S. Census Bureau, 2000.
[1] Source: SCE, 2007
n/a: Data Not Available

Proposed Project Right-of-Way

Table 5.2-4 identifies the low income and minority population contained within Census Tracts located 0.5 miles of the proposed Project right-of-way (ROW). As shown in Table 5.2-4, in Kern County, the proposed Project traverses Census Tracts 60.05 and 55.06. Data presented in Table 5.2-4 indicate that the proportions of both minority and low-income households in these tracts fall well below the 50 percent threshold and by this criteria would not be considered low-income or minority communities. As shown in Table 5.2-4, a large number of census tracts located within 0.5 miles of the proposed Project ROW within Los Angeles County contain over 50 percent minority population. However, all Los Angeles County census tracts identified as being within 0.5 miles of the ROW have low-income population levels below 50 percent. Census tracts within 0.5 miles of the proposed Project ROW within San Bernardino County indicate that all census tracts exhibit low proportions of low-income households, while several census tracts within 0.5 miles of the proposed Project ROW contain a minority population greater than 50 percent.

As shown at the end of Table 5.2-4, within 0.5 miles of the entire proposed Project ROW, the total population is 569,811 persons with 52.0 percent of the total population minority and 12.3 percent low-income.

Table 5.2-4. Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within One-Half Mile of Proposed Project ROW				
Census Tract	Total Population	Minority Population	Low-Income Population	Project Segment(s)
Kern County				
55.06	4,885	1,134 (23.2%)	772 (15.8%)	4, 10
60.05	11,596	1,375 (11.9%)	1,009 (8.7%)	4, 10
Subtotal	*16,481*	*2,509 (15.2%)*	*1,781 (4.7%)*	--
Los Angeles County				
4006.03	4,336	1,770 (40.8%)	551 (12.7%)	7
4033.24	7,401	4,920 (66.5%)	651 (8.8%)	8A
4033.25	4,684	2,646 (56.5%)	234 (5.0%)	8A
4046	1,446	766 (53.0%)	237 (16.4%)	7
4047.01	5,975	3,869 (64.8%)	1,548 (25.9%)	7
4047.02	6,307	4,281 (67.9%)	1,388 (22.0%)	7
4047.03	3,406	2,358 (69.2%)	950 (27.9%)	7
4049.01	5,672	3,291 (58.0%)	686 (12.1%)	7
4049.02	3,793	2,197 (57.9%)	603 (15.9%)	7
4050.01	6,265	3,561 (56.8%)	1,115 (17.8%)	7
4070.02	3,870	2,522 (65.2%)	670 (17.3%)	7
4083.01	5,628	3,048 (54.2%)	1,255 (22.3%)	7
4083.02	3,646	1,782 (49.0%)	219 (6.0%)	7
4083.03	3,948	1,618 (41.0%)	391 (9.9%)	7
4084.02	5,469	2,317 (42.4%)	356 (6.5%)	8A
4085.03	6,258	3,397 (54.3%)	244 (3.9%)	8A
4086.25	4,113	2,393 (58.3%)	354 (8.6%)	8A
4086.26	5,225	4,158 (79.5%)	496 (9.5%)	8A

Table 5.2-4. Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within One-Half Mile of Proposed Project ROW

Census Tract	Total Population	Minority Population	Low-Income Population	Project Segment(s)
4086.27	3,201	2,117 (66.1%)	272 (8.5%)	8A
4086.28	5,548	4,373 (78.8%)	549 (9.9%)	8A
4086.29	2,860	1,759 (61.5%)	100 (3.5%)	8A
4087.03	6,898	5,882 (85.2%)	345 (5.0%)	8A
4087.22	4,380	2,830 (64.6%)	337 (7.7%)	8A
4300.01	4,654	1,745 (37.5%)	205 (4.4%)	6, 7
4300.02	7,107	3,484 (49.0%)	846 (11.9%)	7
4301.01	4,720	2,301 (48.8%)	732 (15.5%)	7
4301.02	5,005	2,778 (55.5%)	651 (13.0%)	7
4302	1,261	253 (20.1%)	20 (1.6%)	7
4322.01	4,105	2,626 (64.0%)	759 (18.5%)	11
4322.02	4,112	2,884 (70.1%)	687 (16.7%)	11
4325	7,578	4,239 (55.9%)	1,114 (14.7%)	7
4326.02	4,561	3,108 (68.1%)	771 (16.9%)	7
4329.01	4,347	3,262 (75.0%)	687 (15.8%)	11
4333.01	9,992	6,890 (69.0%)	2,778 (27.8%)	7
4333.02	1,409	865 (61.4%)	376 (26.7%)	7
4333.03	7,447	5,418 (72.8%)	2,145 (28.8%)	7
4336.01	4,931	3,777 (76.6%)	942 (19.1%)	11
4336.02	2,804	2,005 (71.5%)	317 (11.3%)	11
4337	3,332	1,717 (51.5%)	510 (15.3%)	7
4338.01	6,263	3,954 (63.1%)	1,691 (27.0%)	7
4338.02	2,865	1,683 (58.7%)	212 (7.4%)	7, 8A
4339.01	5,779	3,737 (64.7%)	2,369 (41.0%)	7
4339.02	3,980	2,300 (57.8%)	1,126 (28.3%)	7
4340.01	4,727	3,031 (64.1%)	865 (18.3%)	7
4340.02	7,561	4,423 (58.5%)	1,248 (16.5%)	7
4600	4,569	1,079 (23.6%)	105 (2.3%)	11
4601	5,940	1,640 (27.6%)	101 (1.7%)	11
4602	5,567	3,417 (61.4%)	457 (8.2%)	11
4603.01	4,515	3,033 (67.2%)	343 (7.6%)	11
4604	886	675 (76.2%)	100 (11.8%)	11
4605.01	5,560	1,624 (29.2%)	184 (3.3%)	11
4612	4,398	1,053 (23.9%)	150 (3.4%)	11
4613	6,569	1,958 (29.8%)	769 (11.7%)	11
4625	6,046	1,652 (27.3%)	460 (7.6%)	11
4629	3,659	1,145 (31.3%)	231 (6.3%)	11
4630	1,834	479 (26.1%)	101 (5.5%)	11
4631.01	2,458	1,106 (45.0%)	206 (8.4%)	11
4631.02	3,656	1,622 (44.4%)	358 (9.8%)	11
4632	3,569	1,351 (37.9%)	339 (9.5%)	11
4642	5,848	3,579 (61.2%)	357 (6.1%)	11
4800.02	3,246	1,642 (50.6%)	149 (4.6%)	11
4800.11	5,077	3,082 (60.7%)	665 (13.1%)	11
4800.12	4,813	2,740 (56.9%)	554 (11.5%)	11
4801.01	3,784	2,185 (57.7%)	325 (8.6%)	11
4801.02	4,187	2,557 (61.1%)	410 (9.8%)	11
4811.02	3,605	2,463 (68.3%)	663 (18.4%)	11
4811.03	5,295	3,380 (63.8%)	937 (17.7%)	11
4812.01	3,199	1,827 (57.1%)	400 (12.5%)	11
4812.02	6,607	4,380 (66.3%)	1,044 (15.8%)	11
4813	2,963	2,141 (72.3%)	530 (17.9%)	11

Table 5.2-4. Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within One-Half Mile of Proposed Project ROW

Census Tract	Total Population	Minority Population	Low-Income Population	Project Segment(s)
4814.02	6,989	5,211 (74.6%)	1,195 (17.1%)	11
4823.01	5,180	4,027 (77.7%)	1295 (25.0%)	11
4823.03	5,765	4,461 (77.4%)	1,741 (30.2%)	11
4823.04	3,890	2,890 (74.3%)	1,451 (37.3%)	11
4824.01	3,919	2,944 (75.1%)	890 (22.7%)	11
4824.02	6,972	4,970 (71.3%)	1,625 (23.3%)	7, 8A, 11
4825.02	3,420	2,694 (78.8%)	1,009 (29.5%)	11
4825.03	4,322	3,259 (75.2%)	1,227 (28.4%)	11
4825.21	5,525	3,796 (68.7%)	746 (13.5%)	11
4825.22	4,434	2,886 (65.1%)	328 (7.4%)	7, 8A
4826	6,752	5,098 (75.5%)	466 (6.9%)	11
4828	4,309	2,634 (61.1%)	573 (13.3%)	7, 8A, 11
5001	3,343	652 (19.5%)	60 (1.8%)	8A
5002.01	5,950	902 (15.2%)	280 (4.7%)	8A
5002.02	4,451	1,105 (24.8%)	218 (4.9%)	8A
5003	2,894	1,340 (46.3%)	200 (6.9%)	8A
5004.01	8,980	4,420 (49.2%)	494 (5.5%)	8A
5015.01	2,164	538 (24.9%)	175 (8.1%)	8A
5016	6,915	2,152 (31.1%)	595 (8.6%)	8A
5300.03	2,942	1,349 (45.9%)	168 (5.7%)	7, 8A
5300.04	3,773	1,956 (51.8%)	328 (8.7%)	8A
5300.05	4,478	3,192 (71.3%)	260 (5.8%)	8A
9009	2,347	386 (16.4%)	289 (12.3%)	4
9012.03	1,482	275 (18.6%)	218 (14.7%)	4
9012.05	6,302	1,431 (22.7%)	555 (8.8%)	4, 5
9012.07	2,731	455 (16.7%)	205 (7.5%)	5
9102.05	1,040	283 (27.2%)	251 (24.1%)	5
9102.06	142	16 (11.3%)	0 (0.0%)	5
9107.08	476	43 (9.0%)	91 (19.2%)	6
9108.04	2,502	266 (10.6%)	175 (7.0%)	5
9108.05	5,040	625 (12.4%)	428 (8.5%)	5, 6, 11
9108.06	347	97 (28.0%)	38 (10.8%)	6, 11
9300	685	212 (31.0%)	55 (8.0%)	6, 11
9301	177	11 (6.2%)	0 (0.0%)	6, 11
9302	750	177 (23.6%)	149 (19.8%)	11
Subtotal	*458,107*	*252,898 (55.2%)*	*62,672 (13.7)*	--
San Bernardino County				
1.05	6,095	3,544 (58.1%)	354 (5.8%)	8A
1.06	11,989	6,141 (51.2%)	396 (3.3%)	8A
1.07	2,982	758 (25.4%)	75 (2.5%)	8A
1.08	4,905	1,719 (35.0%)	378 (7.7%)	8A
1.09	7,093	1,739 (24.5%)	411 (5.8%)	8A
1.10	10,407	4,416 (42.4%)	957 (9.2%)	8A
1.11	2,081	467 (22.4%)	21 (1.0%)	8A
4.01	6,418	2,090 (32.6%)	340 (5.3%)	8A
5	17,269	7,173 (41.5%)	984 (5.7%)	8A, 8B, 8C
7	7,658	5,423 (70.8%)	996 (13.0%)	8A
19	18,326	7,648 (41.7%)	843 (4.6%)	8A, 8B, 8C
Subtotal	*95,223*	*41,118 (43.2%)*	*5,401 (5.7%)*	--
TOTAL	*569,811*	*296,525 (52.0%)*	*69,854 (12.3%)*	--

Source: U.S. Census, 2000.

Impact Analysis Methodology

As defined by the "Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis" (EPA 1998), minority and low-income populations are identified where either:

- The minority or low-income population of the affected area is greater than 50 percent of the affected area's general population; or
- The minority or low-income population percentage of the area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

A disproportionate environmental justice impact would occur if a significant unavoidable environmental impact (Class I) associated with the proposed Project was to occur in an area identified as having a population of greater than 50 percent for either minority or low-income categories disproportionately over areas containing below 50 percent minority or low-income population.

Proposed Project Environmental Justice Impact Analysis

As indicated in Table 5.2-4, census tracts within 0.5 mile of the proposed Project ROW contain less than 50 percent low-income population. Therefore, because the low-income population within the CPP study area is less than 50 percent and no adverse socioeconomic impacts would result from the CPP, the proposed project would not result in any disproportionate impacts to any low-income populations. However, as indicated in Table 5.2-4, the total population within 0.5 miles of the proposed Project transmission line ROW contains a total minority population of 226,525 minority individuals resulting in 52.0 percent of the total population within 0.5 miles of the proposed Project transmission line ROW being minority.

A number of technical sections in the EIR/EIS have identified significant impacts resulting from proposed Project construction and implementation. Because the potentially affected minority population accounts for greater than 50 percent of the total minority population contained within 0.5 miles of the proposed Project transmission line ROW, significant unavoidable (Class I) environmental impacts associated with proposed Project construction or operations could disproportionately affect minority populations and are analyzed below.

Air Quality. Significant air quality impacts have been identified for construction activities associated with the proposed Project. As discussed in Section 3.3 (Air Quality), Class I impacts have been identified for Impacts A-1 (Construction emissions would exceed the SCAQMD, AVAQMD, and KCAPCD regional emission thresholds) and A-3 (Construction of the Project would expose sensitive receptors to substantial pollutant concentrations). Use of construction equipment, emissions from motor vehicles used to mobilize the workforce, and materials for construction would result in temporary air quality impacts as a result of emissions of ozone precursors (NOx) and particulate matter (PM10 and PM2.5). Additionally, construction activities, especially site preparation, excavation, and installing structure foundations, would involve travel on unpaved roads and surfaces and material handling that would create fugitive dust and other criteria pollutant emissions from equipment. As identified in Chapter 2 (Description of Alternatives), similar construction activities would occur along the entire proposed Project ROW. Therefore, construction related activities that generate air quality pollutants would be similar along the entire proposed Project transmission line. Construction activities that could result in this significant air quality impact within census tracts 0.5 mile of the proposed Project ROW containing greater than 50 percent minority population would be similar to those census tracts containing less than 50 percent minority population, as shown in Table 5.2-4. Therefore, construction activities would not result in disproportionate air quality impacts to minority populations.

Cultural Resources. Significant cultural resource impacts have been identified for construction activities associated with the proposed Project. As discussed in Section 3.5 (Cultural Resources), Class I impacts have been identified for Impact C-3 (Native American human remains could be uncovered, exposed, and/or damaged during construction). As identified in Chapter 2 (Description of Alternatives), similar construction activities would along the entire proposed Project ROW. Therefore, construction related activities that could uncover unknown Native American human remains would be similar along the entire proposed Project transmission line. Construction activities that could result in this significant cultural resource impact within census tracts 0.5 miles of the proposed Project ROW containing greater than 50 percent minority population would be similar to those census tracts containing less than 50 percent minority population, as shown in Table 5.2-4. Therefore, construction activities would not result in disproportionate cultural resource impacts to minority populations.

Noise. Significant noise impacts have been identified for both construction related noise and operational related (corona noise) effect of the proposed Project. As discussed in Section 3.10 (Noise), Class I impacts have been identified for Impacts N-1 (Construction noise would substantially disturb sensitive receptors), N-2 (Construction noise levels would violate local standards), N-3 (Permanent noise levels along the ROW would increase due to corona noise from operation of the transmission lines and substations in the vicinity of sensitive receptors), and N-4 (Operational noise levels would violate local standards). Due to the dissipation of sound with distance, it is assumed both construction and operational significant noise impacts would be limited to the population identified above within 0.5 miles of the proposed Project ROW. As identified in Chapter 2 (Description of Alternatives), construction activities would be distributed similarly along the entire proposed Project ROW. Therefore, construction noise would be similar along the entire proposed Project transmission line. Construction noise impacts to census tracts greater than 50 percent minority population within 0.5 miles of the proposed Project ROW would be similar to those census tracts containing less than 50 percent minority population, as shown in Table 5.2-4. Therefore, construction related noise would not disproportionately impact minority populations.

As identified in Section 3.10 (Noise), corona noise generated by the proposed Project along Segments 5, 6, 7, 8, 10, and 11 would substantially increase existing ambient noise conditions to sensitive receptors located along the ROW of these segments, resulting in a significant unavoidable operation related noise impact. As shown in Table 5.2-4, significant operational noise impacts within these proposed Project Segments would occur to census tracts containing greater than 50 percent minority population within 0.5 miles of the proposed Project ROW identical to those census tracts containing less than 50 percent minority population. Therefore, corona noise will impact receptors in census tracts with less than 50 percent minority equally to those census tracts containing greater than 50 percent minority. Furthermore, as shown in Table 5.2-4, while the minority population within a 0.5 mile radius of the proposed Project ROW is 52.0 percent, it is not disproportionately higher than the total minority percentage of the jurisdictions they are located within as presented in Tables 5.2-2 through 5.2-4. Therefore, no disproportionate operational related noise impacts would occur from the proposed Project to minority populations impacted.

Visual Resources. Significant visual impacts have been identified for both construction and operational effect of the proposed Project. As discussed in Section 3.14 (Visual Resources), Class I impacts have been identified for Impacts V-1 (Temporary visibility of construction activities and equipment involved with the Project would alter the landscape character and visual quality of landscape views), V-2 (Introduction of new lattice steel towers and conductors or new tubular steel poles and conductors would adversely affect landscape character and visual quality), V-3 (Increased structure size and new materials would result in adverse visual effects), V-4 (Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations would

adversely affect landscape character and visual quality), V-5 (New metal surfaces associated with transmission infrastructure would potentially reflect sunlight and produce glare in certain lighting conditions), V-6 (The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or scenic trail viewshed), and V-7 (The Project would conflict with established visual resource management plans or landscape conservation plans).

As discussed in Section 3.14 (Visual Resources), of the identified Class I visual impacts, Impacts V-1 (Temporary visibility of construction activities and equipment involved with the Project would alter the landscape character and visual quality of landscape views) and V-7 (The Project would conflict with established visual resource management plans or landscape conservation plans) would occur evenly along the entire proposed Project transmission line ROW. Because these impacts would occur at locations along the entire ROW, impacts would be distributed among receptors in census tracts with less than 50 percent minority equally to those census tracts containing greater than 50 percent minority. Therefore, these proposed Project visual impacts would not occur disproportionately to minority populations versus the entire population impacted.

As discussed in Section 3.14 (Visual Resources), impacts V-2 (Introduction of new lattice steel towers and conductors or new tubular steel poles and conductors would adversely affect landscape character and visual quality) and V-3 (Increased structure size and new materials would result in adverse visual effects) significant unavoidable impacts would be limited to viewpoints and locations within proposed Project Segment 4 only. These areas of Segment 4 subject to significant unavoidable Class I visual impacts are contained within Census Tracts 55.06 and 9012.03. As shown above in Table 5.2-4 (Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within 0.5 Mile of Proposed Project ROW), these Census Tracts contain a total minority population of 23.2 and 18.6 percent, respectively. These percentages of minority population are well below the total minority population within 0.5 mile of the entire proposed Project ROW (52.0 percent). Therefore, these visual impacts would not occur disproportionately to minority populations.

As discussed in Section 3.14 (Visual Resources), the visual impacts associated with Impact V-4 (Vegetative clearing and/or earthwork associated with road improvements and pulling/splicing locations) would only occur within proposed Project Segments 6, 10 and 11, would remain significant and adverse (Class I), and would adversely affect landscape character and visual quality. Table 5.2-5 identifies the Census Tracts contained within Segments 6, 10, and 11 subject to this significant unavoidable Class I visual impact. These census tracts are included above in Table 5.2-4 (Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within 0.5 Mile of Proposed Project ROW).

Table 5.2-5. Year 2000 Low Income Characteristics of Census Tracts Within One-Half Mile of Proposed Project ROW Impacted by Visual Resource Impact V-4

Census Tract	Total Population	Minority Population
4631.01	2,458	1,106 (45.0%)
9108.05	5,040	625 (12.4%)
9108.06	347	97 (28.0%)
9300	685	212 (31.0%)
9301	177	11 (6.2%)
9302	750	177 (23.6%)
Total	*9,457*	*2,228 (23.6%)*

As shown above in Table 5.2-5 (Year 2000 Low Income Characteristics of Census Tracts Within One-Half Mile of Proposed Project ROW Impacted by Visual Resource Impact V-4), these Census Tracts contain a total

minority population of 17.1 percent, with no individual Census Tract containing a minority population greater than 50 percent. These percentages of minority population are well below the total minority population within 0.5 mile of the entire proposed Project ROW (52.0 percent). Therefore, this visual impact would not occur disproportionately to minority populations.

As discussed in Section 3.14 (Visual Resources), Impact V-6 (The Project would contribute to the long-term loss or degradation of a scenic highway viewshed or scenic trail viewshed), significant unavoidable impacts would be limited to viewpoints and locations at scenic trails within proposed Project Segments 6 and 11 only. Because impacts to State Scenic Highway's would be limited to motorists, Environmental Justice impacts do not apply. Table 5.2-6 identifies the Census Tracts contained within Segments 6 and 11 subject to this significant unavoidable Class I visual impact. These census tracts are included above in Table 5.2-4 (Year 2000 Low Income and Minority Population Characteristics of Census Tracts Traversed and Within One-Half Mile of Proposed Project ROW).

Table 5.2-6. Year 2000 Low Income Characteristics of Census Tracts Within One-Half Mile of Proposed Project ROW Affected by Visual Resource Impact V-6

Census Tract	Total Population	Minority Population
60.05	11,596	1,375 (11.9%)
4631.01	2,458	1,106 (45.0%)
9108.05	5,040	625 (12.4%)
9108.06	347	97 (28.0%)
9300	685	212 (31.0%)
9301	177	11 (6.2%)
9302	750	177 (23.6%)
Total	*9,457*	*2,228 (23.6%)*

As shown above in Table 5.2-6 (Year 2000 Low Income Characteristics of Census Tracts Within One-Half Mile of Proposed Project ROW Impacted by Visual Resource Impact V-6), these Census Tracts contain a total minority population of 23.6 percent, with no individual Census Tract containing a minority population greater than 50 percent. These percentages of minority population are well below the total minority population within 0.5 mile of the entire proposed Project ROW (52.0 percent). Therefore, this visual impact would not occur disproportionately to minority populations.

Wildfire Prevention and Suppression. Significant fire impacts have been identified for operational of the proposed Project. As discussed in Section 3.16 (Wildfire Prevention and Suppression), Class I impacts have been identified for Impact F-4 (Presence of the overhead transmission line would increase the risk of wildfire). As identified in Chapter 2 (Description of Alternatives), operation of the proposed transmission line would occur similarly along the entire proposed Project ROW. Therefore, operational related activities that could increase the risk of wildfire would be similar along the entire proposed Project transmission line. Operational activities that could result in this significant risk of fire impact within census tracts 0.5 miles of the proposed Project ROW containing greater than 50 percent minority population would be similar to those census tracts containing less than 50 percent minority population, as shown in Table 5.2-4. Therefore, operational activities would not result in disproportionate fire risk impacts to minority populations.

5.3 Other Considerations

5.3.1 Magnetic Field Concerns

5.3.1.1 Introduction

Recognizing that there is a great deal of public interest and concern regarding potential health effects from exposure to EMFs from power lines, this section provides information regarding EMF associated with electric utility facilities and the potential effects of the proposed Project to allow understanding of the issue by the public and decisionmakers. There is no consensus in the scientific community regarding health risks associated with EMF exposure and, therefore, conclusions regarding this concern cannot be reached in this discussion. In addition, there are no federal or State standards limiting human exposure to EMF from transmission lines or substation facilities.

Defining Electric and Magnetic Fields

Electric and magnetic fields are separate phenomena and occur both naturally and as a result of human activity across a broad electrical spectrum. Naturally occurring electric and magnetic fields are caused by the weather and the earth's geomagnetic field. The fields caused by human activity result from technological application of the electromagnetic spectrum for uses such as communications, electrical equipment and appliances, and the generation, transmission, and local distribution of electricity.

The frequency of a power line is determined by the rate at which electric and magnetic fields change their direction each second. For power lines in the United States, the frequency of change is 60 times per second and is defined as 60 Hertz (Hz) power. In Europe and many other countries, the frequency of electric power is 50 Hz. Radio, television and communication waves operate at much higher frequencies: 500,000 Hz to 1,000,000,000 Hz. The information presented in this document is limited to the EMF from power lines operating at frequencies of 50 or 60 Hz, often referred to as Extremely Low Frequency (ELF) fields.

Electric power flows across transmission systems from generating sources to serve electrical loads within the community. The power flowing over a transmission line is determined by the transmission line's voltage and the current. The higher the voltage level of the transmission line, the lower the amount of current needed to deliver the same amount of power. For example, a 115-kV transmission line with 200 amps of current will transmit approximately 40,000 kilowatts (kW), and a 230-kV transmission line requires only 100 amps of current to deliver the same 40,000 kW.

Electric Fields

Electric fields from power lines are created whenever the lines are energized, with the strength of the field dependent directly on the voltage of the line creating it. Electric field strength is typically described in terms of kilovolts per meter (kV/m). Electric field strength attenuates (reduces) rapidly as the distance from the source increases. Electric fields are reduced at many receptors because they are shielded by most objects or materials such as trees or houses.

Unlike magnetic fields, which penetrate most materials and are unaffected by buildings, trees, and other obstacles, electric fields are distorted by any object that is within the electric field including the human body. Even trying to measure an electric field with electronic instruments is difficult because the devices themselves will alter the levels recorded. Determining an individual's exposure to electric fields requires the understanding

of many variables, one of which is the electric field itself, with others including how effectively the person is grounded and their body surface area within the electric field.

At reasonably close distances, electric fields of sufficient strength in the vicinity of power lines can cause the same phenomena as the static electricity experienced on a dry winter day, or with clothing just removed from a clothes dryer, and may result in small nuisance electric discharges when touching long metal fences, pipelines, or large vehicles. An acknowledged potential impact to public health from electric transmission lines is the hazard of a direct electric shock. This hazard is not due to the electric field in the area surrounding a transmission line, but rather electric shocks from transmission lines are generally the result of accidental or unintentional direct contact by the public with the energized wires.

Magnetic Fields

Magnetic fields from power lines are created whenever current flows through power lines at any voltage. The strength of the field is directly dependent on the current in the line. Magnetic field strength is typically measured in milliGauss (mG) or microTesla (μT) (10mG = 1μT). Similar to electric fields, magnetic field strength attenuates rapidly with distance from the source. However, unlike electric fields, magnetic fields are not easily shielded by objects or materials.

The nature of EMF can be illustrated by considering a household appliance. When the appliance is energized by being plugged into an outlet, but is not turned on, no current flows through the appliance. Under such circumstances, an electric field is generated around the cord and appliance, but no magnetic field is present. If the appliance is switched on, the electric field would still be present and a magnetic field would also be created. The electric field strength is directly related to the magnitude of the voltage from the outlet and the magnetic field strength is directly related to the magnitude of the current flowing in the cord and appliance.

5.3.1.2 Affected Environment

Electric and magnetic fields surround the energized conductors of a transmission line and decrease in strength rapidly as distance from the transmission line conductors increases. From an EMF perspective the affected environment is along the entire length of the transmission line. For the transmission lines discussed in this section, the width of the affected environment is taken as the width of the transmission line right-of-way (ROW).

As described above in Section 5.3.1.1, potential health effects from exposure to electric fields from power lines is typically not of concern since electric fields are shielded by most materials such as trees, walls, etc.(PTI, 1993). Therefore, the majority of the following information related to EMF focuses primarily on exposure to magnetic fields from power lines.

Regional Setting

The Project crosses a wide geographical area with varied, existing land uses. From an EMF perspective, there are two primary factors which affect the existing setting. These factors are the nature of the surrounding land uses and whether or not the new transmission facilities are adjacent to existing circuits. The Project passes though natural areas, undeveloped range or agricultural lands, and developed semi-urban and urban areas.

In natural areas and undeveloped range or agricultural lands, measurable EMFs are not present except in the vicinity of existing power line corridors. Public exposure to EMF in these areas would be limited, primarily due to the absence of the public; however, periodic and transient uses of these areas for activities such as

recreation or farming would result in public exposure to EMF when in the vicinity of existing electric transmission lines.

In developed areas, public exposure to EMFs is more widespread and encompasses a very broad range of field intensities and durations. EMFs are prevalent from the use of electronic appliances or equipment and existing low voltage (35-kV and below) electric distribution lines, such as those that deliver electricity to residences and businesses. In general distribution lines exist throughout developed urban portions of the community and represent the predominant source of public exposure to power line EMF, except in the immediate vicinity of existing transmission corridors.

Alternative 2: SCE's Proposed Project

The proposed Project consists of the installation of a number of new, or upgraded, 500-kV and 220-kV transmission lines, and associated substations. For this discussion the proposed Project has been divided into several different transmission segments. Each of these segments has been further subdivided into a number of sub-segments, as identified in SCE's Field Management Plan, based upon the voltage of the circuits proposed, the type of structures being used, adjacent land uses, and the configuration of other adjacent transmission circuits.

Table 5.3-1 characterizes the existing environmental setting for each of the proposed transmission line segments based on the adjacent land uses and if the segment is planned to be adjacent to an existing transmission line corridor.

Table 5.3-1. Electric and Magnetic Fields – Existing Environmental Setting

Line Sub-Segment	Location by Milepost	Segment Length (Miles)	Adjacent Land Use	Adjacent Circuits
4A	0 to 5	5	UND/AG	YES
4B	5 to 13.2 & 14.8 to 15.8	9.2	UND/AG	YES
4C	13.2 to 14.8	1.6	UND/AG	YES
4D	15.8 to 19.5	3.7	DEV	NO
5A	0 to 1.9	1.9	UND	YES
5B	1.9 to 4.4	2.5	DEV	YES
5C	4.4 to 8.0	3.6	DEV	YES
5D	8.0 to 11	3.0	DEV	YES
5E	11.0 to 15.7	4.7	UND	YES
5F	15.7 to 17.3	1.6	UND	YES
5G	17.3 to 17.8	0.5	UND	YES
6A	0.0 to 0.6	0.6	DEV	YES
6B	0.0 to 3.0	3.0	DEV	YES
6B	3.0 to 4.0	1.0	UND	YES
6C	5.0 to 6.0	1.0	UND	YES
6D	7.0	---	UND	YES
6E	9.0 to 26.0	17.0	FOR	YES
7A	0.0 to 5.0	5.0	DEV	YES
7A	2 TSP Structures	2,000 feet	DEV	YES
7B	5.0 to 7.6	2.6	UND	YES
7C	7.6 to 11.6	4.0	DEV	YES
7D	11.6 to 13.0	1.4	DEV	YES
7E	13.0 to 15.8	2.8	DEV	YES
8A	2.3 to 4.4	2.1	DEV	YES
8B	4.4 to 9.0	4.6	DEV	YES
8C	9.0 to 9.7	0.7	DEV	YES
8D	9.7 to 11.2	1.5	DEV	YES

Table 5.3-1. Electric and Magnetic Fields – Existing Environmental Setting

Line Sub-Segment	Location by Milepost	Segment Length (Miles)	Adjacent Land Use	Adjacent Circuits
8E	11.2 to 13.3	2.1	DEV	YES
8F	13.3 to 13.5	0.2	DEV	YES
8G	13.5 to 19.3	5.8	DEV	YES
8H	19.3 to 22.7	3.4	DEV	YES
8I	22.7 to 26.9	4.2	DEV	NO
8J	26.9 to 27.6	0.7	URB	YES
8K	27.6 to 28.1	0.5	URB	YES
8L	28.4 to 28.7 (8B 0.0 to 0.3)	0.3	URB	YES
8M	28.7 to 29.4 (8B 0.3 to 0.7)	0.7	DEV/URB	YES
8N	29.4 to 34.0	4.6	AG	YES
8N	TSP Structures	N/A	DEV	YES
8O	1.0 to 5.2	4.2	AG/DEV	YES
8P	5.2 to 5.6	0.4	DEV	YES
8Q	6.0 to 6.8	0.8	AG/DEV	YES
8R	34.0 to 34.4 (8B 5.6 to 6.0)	0.4	AG/DEV	YES
8S	34.5 to 35.2	0.7	AG/DEV	YES
10	0.0 to 16.5	16.5	AG/UND	YES
11A	0.0 to 0.9	9.0	DEV	YES
11B	0.9 to 2.3	1.4	DEV	YES
11C	2.3 to 3.9	1.6	DEV	YES
11D	3.9 to 18.7	14.8	FOR	YES
11E	18.7 to 27.2	8.5	DEV/URB	YES
11F	27.2 to 36.2	9.0	DEV/URB	YES

Table Notes: Land Use Key – UND = Undeveloped, DEV = Residences located within 300 feet, AG = Agricultural, URB = Developed Urban, FOR =Forest.

Alternative 3: West Lancaster Alternative

For this alternative, a new segment of 500-kV transmission line would be constructed within a new ROW, replacing portions of sub-segments 4B and 4D of the proposed Project. The existing environment for this portion of Alternative 3 consists of either undeveloped or agricultural lands. There are no residences adjacent to the alternative segment and there are no existing transmission lines adjacent to the alternative corridor.

Alternative 4: Chino Hills Route Alternatives

For this alternative, there are four different routing variations in the area of Chino Hills. The existing environment for re-routed portions of Alternatives 4A, 4B and 4C are the same and consist of undeveloped or park lands (Chino Hills State Park), where there are existing transmission lines located adjacent to each of these alternative alignments.

For Alternative 4D, the existing environment for the first approximately 4 miles from the point of deviation from the proposed Project consists of undeveloped lands, where existing transmission lines are located adjacent to the alternative alignment. For the remaining approximately 5 miles of the re-routed portion of this alternative, where the route would follow the boundary of Chino Hills State Park, the existing environment consists of undeveloped park lands with no existing transmission lines located adjacent to the alternative alignment.

Alternative 5: Partial Underground Alternative

For this alternative, the existing environmental setting is the same as for the proposed Project, as described above.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative

For this alternative, the existing environmental setting is the same as for the proposed Project, as described above.

Alternative 7: 66-kV Subtransmission Alternative

For this alternative, the existing environmental setting is the same as for the proposed Project, as described above.

5.3.1.3 Applicable Laws, Regulations, and Standards

A number of counties, states, and local governments have adopted or considered regulations or policies related to power line field exposure. In the case of EMF, the reasons for these actions have been varied; in general, however, the actions can be attributed to addressing public reaction to and perception of EMF as opposed to responding to the findings of any specific scientific research. Following is a brief summary of the guidelines and regulatory activity regarding EMF.

International Guidelines

The International Radiation Protection Association, in cooperation with the World Health Organization (WHO), has published recommended guidelines (NIRC, 1998) for electric and magnetic field exposures. For the general public, the limits are 4.2 kV/m for electric fields, and 833 mG for magnetic fields. Neither of these organizations has any governmental authority nor recognized jurisdiction to enforce these guidelines. However, because they were developed by a broad base of scientists, these guidelines have been given merit and are considered by utilities and regulators when reviewing EMF levels from electric power lines.

Federal Guidelines

Although the U.S. Environmental Protection Agency (EPA) has conducted investigations into EMF related to power lines and health risks, no national standards have been established. There have been a number of studies sponsored by the U.S. EPA, the Electric Power Research Institute (EPRI), and other institutions. Several bills addressing EMF have been introduced at the congressional level and have provided funding for research; however, no bill has been enacted that would regulate EMF levels.

The 1999 National Institute of Environmental Health Sciences (NIEHS) report to Congress suggested that the evidence supporting EMF exposure as a health hazard was insufficient to warrant aggressive regulatory actions. The report did suggest passive measures to educate the public and regulators on means aimed at reducing exposures. NIEHS also suggested the power industry continue its practice of siting lines to reduce public exposure to EMF and to explore ways to reduce the creation of magnetic fields around lines.

State Guidelines

Several states have adopted limits for electric field strength within transmission line ROWs. Florida and New York are the only states that currently limit the intensity of magnetic fields from transmission lines. These regulations include limits within the ROW as well as at the edge of the ROW and cover a broad range of

values. Table 5.3-2 lists the states regulating EMF and their respective limits. The magnetic field limits were based on an objective of preventing field levels from increasing beyond levels currently experienced by the public and are not based upon any link between scientific data and health risks (Morgan, 1991).

Table 5.3-2. EMF Regulated Limits (by State)

State	Electric Field (kV/M)	Magnetic Field (mG)	Location	Application
Florida (codified)				
500-kV Lines	10	---	In ROW	Single circuit
	2	200	Edge of ROW	Single circuit
	2	250	Edge of ROW	Double circuit
230-kV Lines or less	8	---	In ROW	
	2	150	Edge of ROW	230-kV lines or less
Minnesota	8	---	In ROW	>200 kV
Montana (codified)	1	---	Edge of ROW	>69 kV
	7	---	In ROW	Road crossings
New Jersey	3	---	Edge of ROW	Guideline for complaints
New York	1.6	200	Edge of ROW	>125 kV, >1 mile
	7	---	In ROW	Public roads
	11	---	In ROW	Public roads
	11.8	---	In ROW	Other terrain
North Dakota	9	---	In ROW	Informal
Oregon (codified)	9	---	In ROW	230 kV, 10 miles

Source: Public Utilities Commission of Texas, 1992.

Elsewhere in the United States, several agencies and municipalities have taken action regarding EMF policies. These actions have been varied and include requirements that the fields be considered in the siting of new facilities. The manner in which EMF is considered has taken several forms. In a few instances, a concept referred to as "prudent avoidance" has been formally adopted. Prudent avoidance, a concept proposed by Dr. Granger Morgan of Carnegie-Mellon University, is defined as ". . . limiting exposures which can be avoided with small investments of money and effort" (Morgan, 1991). Some municipalities or regulating agencies have proposed limitations on field strength, requirements for siting of lines away from residences and schools, and, in some instances, moratoria on the construction of new transmission lines. The origin of these individual actions has been varied, with some initiated by regulators at the time of new transmission line proposals within their community, and some by public grass-roots efforts.

California Department of Education's (CDE) Standards for Siting New Schools Adjacent to Electric Power Lines Rated 50 kV and Above

The California Department of Education (CDE) evaluates potential school sites under a range of criteria, including environmental and safety issues. There are no EMF guidelines that apply to existing school sites; this information is presented in order to demonstrate the range of existing guidelines that address EMF.

Exposures to power-frequency EMFs are one of the criteria used by CDE in its site selection process, and are defined in the "School Site Selection and Approval Guide" by the School Facilities Planning Division of the California Department of Education. CDE has established the following "setback" limits for locating any part of a school site property line near the edge of easements for any electrical power lines rated 50 kV and above:

- 100 feet for lines from 50 to 133 kV
- 150 feet for lines from 220 to 230 kV
- 350 feet for lines from 500 to 550 kV

School districts that have sites that do not meet the California Department of Education setbacks may still obtain construction approval from the State by submitting an EMF mitigation plan. The mitigation plan should consider possible reductions of EMF from all potential sources, including power lines, internal wiring, office equipment and mechanical equipment.

California Public Utility Commission Guidelines

In 1991, the CPUC initiated an investigation into EMFs associated with electric power facilities. This investigation explored the approach to potential mitigation measures for reducing public health impacts and possible development of policies, procedures or regulations. Following input from interested parties the CPUC implemented a decision (D.93-11-013) that requires that utilities use "low-cost or no-cost" mitigation measures for facilities requiring certification under General Order 131-D, "Rules Relating to the Planning and Construction of Electric Generation, Transmission/Power/Distribution Line Facilities and Substations Located in California." The decision directed the utilities to use a four percent benchmark on the low-cost mitigation. This decision also implemented a number of EMF measurement, research, and education programs, and provided the direction that led to the preparation of the Department of Health Services (DHS) study described in Section 5.3.1.4, below. The CPUC did not adopt any specific numerical limits or regulation on EMF levels related to electric power facilities.

In Decision D.93-11-013, the CPUC addressed mitigation of EMF of utility facilities and implemented the following recommendations:

- No-cost and low-cost steps to reduce EMF levels
- Workshops to develop EMF design guidelines
- Uniform residential and workplace programs
- Stakeholder and public involvement
- A four-year education program
- A four-year non-experimental and administrative research program
- An authorization of federal experimental research conducted under the National Energy Policy Act of 1992.

Most recently the CPUC issued Decision D.06 01 042, on January 26, 2006, affirming the low-cost/no-cost policy to mitigate EMF exposure from new utility transmission and substation projects. This decision also adopted rules and policies to improve utility design guidelines for reducing EMF. The CPUC stated "at this time we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences." The CPUC has not adopted any specific limits or regulation on EMF levels related to electric power facilities.

Local Guidelines

No local regulations have been identified pertaining to EMF.

5.3.1.4 Scientific Background

EMF Research

For more than 20 years, questions have been asked regarding the potential effects within the environment of EMFs from power lines, and research has been conducted to provide some basis for response. Earlier studies focused primarily on interactions with the electric fields from power lines. In the late 1970s, the subject of magnetic field interactions began to receive additional public attention and research levels have increased.

A substantial amount of research investigating both electric and magnetic fields has been conducted over the past several decades; however, much of the body of national and international research regarding EMF and public health risks remains contradictory or inconclusive.

Extremely low frequency (ELF) fields are known to interact with tissues by inducing electric fields and currents in the tissue. However, the electric currents induced by ELF fields commonly found in our environment are normally much lower than the strongest electric currents naturally occurring in the body, such as those that control the beating of the heart.[1]

Research related to EMF can be grouped into three general categories: cellular level studies, animal and human experiments, and epidemiological studies. These studies have provided mixed results, with some studies showing an apparent relationship between magnetic fields and health effects while other similar studies do not.

Since 1979, public interest and concern specifically regarding magnetic fields from power lines has increased. This increase has generally been attributed to publication of the results of a single epidemiological study (Wertheimer and Leeper, 1979). This study observed an association between the wiring configuration on electric power lines outside of homes in Denver and the incidence of childhood cancer. Following publication of the Wertheimer and Leeper study, many epidemiological, laboratory, and animal studies regarding EMF have been conducted.

Research on ambient magnetic fields in homes and buildings in several western states found average magnetic field levels within most rooms to be approximately 1 mG, while in a room with appliances present, the measured values ranged from 9 to 20 mG (Severson et al., 1988, and Silva, 1988). Immediately adjacent to appliances (within 12 inches), field values are much higher. Tables 5.3-3 and 5.3-4 indicate typical sources and levels of electric and magnetic field exposure the general public experiences from appliances.

Table 5.3-3. Typical Electric Field Values for Appliances, at 12 Inches

Appliance	Electric Field Strength (kV/m)
Electric Blanket	0.25*
Broiler	0.13
Stereo	0.09
Refrigerator	0.06
Iron	0.06
Hand Mixer	0.05
Phonographs	0.04
Coffee Pot	0.03

Source: Enertech, 1985.
*1 to 10 kV/M next to blanket wires.

Table 5.3-4. Magnetic Field from Household Appliances

Appliance	Magnetic Field (mG)	
	12" Distant	Maximum
Electric range	3–30	100–1,200
Electric oven	2–25	10–50
Garbage disposal	10–20	850–1,250
Refrigerator	0.3–3	4–15
Clothes washer	2–30	10–400
Clothes dryer	1–3	3–80
Coffee maker	0.8–1	15–250
Toaster	0.6–8	70–150
Crock pot	0.8–1	15–80
Iron	1–3	90–300
Can opener	35–250	10,000–20,000
Mixer	6–100	500–7,000
Blender, popper, processor	6–20	250–1,050
Vacuum cleaner	20–200	2,000–8,000
Portable heater	1–40	100–1,100
Fan/blower	0.4–40	20–300
Hair dryer	1–70	60–20,000
Electric shaver	1–100	150–15,000
Color TV	9–20	150–500
Fluorescent fixture	2–40	140–2,000
Fluorescent desk lamp	6–20	400–3,500
Circular saw	10–250	2,000–10,000
Electric drill	25–35	4,000–8,000

Source: Gauger, 1985

Scientific Panel Reviews

Numerous panels of expert scientists have convened to review the data relevant to the question of whether exposure to power

[1] The power frequencies (50/60 Hz) are part of the ELF (3 Hz to 300 Hz) bandwidth.

line-frequency EMF is associated with adverse health effects. These evaluations have been conducted in order to advise governmental agencies or professional standard-setting groups. These panels of scientists first evaluate the available studies individually, not only to determine what specific information they can offer, but also in terms of the validity of their experimental design, methods of data collection, analysis, and suitability of the authors' conclusions to the nature and quality of the data presented. Subsequently, the individual studies, with their previously identified strengths and weaknesses, are evaluated collectively in an effort to identify whether there is a consistent pattern or trend in the data that would lead to a determination of possible or probable hazards to human health resulting from exposure to these fields.

These reviews include those prepared by international agencies such as WHO (WHO, 1984, WHO, 1987, and WHO, 2001) and the international Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA/INIRC, 1998) as well as governmental agencies of a number of countries, such as the U.S. EPA, the National Radiological Protection Board of the United Kingdom, the Health Council of the Netherlands, and the French and Danish Ministries of Health.

As noted below these scientific panels have varied conclusions on the strength of the scientific evidence suggesting that power frequency EMF exposures pose any health risk.

In May 1999 the NIEHS submitted to Congress its report titled, *Health Effects from Exposure to Power-Line Frequency Electric and Magnetic Fields*, containing the following conclusion regarding EMF and health effects:

> Using criteria developed by the International Agency for Research on Cancer (IARC), none of the Working Group considered the evidence strong enough to label ELF-EMF exposure as a known human carcinogen or probable human carcinogen. However, a majority of the members of this Working Group concluded that exposure to power-line frequency ELF-EMF is a possible carcinogen [emphasis added].

In June 2001, a scientific working group of IARC (an agency of WHO) reviewed studies related to the carcinogenicity of EMF. Using standard IARC classification, magnetic fields were classified as "possibly carcinogenic to humans" based on epidemiological studies. "Possibly carcinogenic to humans" is a classification used to denote an agent for which there is limited evidence of carcinogenicity in humans and less than sufficient evidence of carcinogenicity in experimental animals. Other agents identified as "possibly carcinogenic to humans" include gasoline exhaust, styrene, welding fumes, and coffee (WHO, 2001).

On behalf of the CPUC, the California Department of Health Services (DHS) completed a comprehensive review of existing studies related to EMF from power lines and potential health risks. This risk evaluation was undertaken by three staff scientists with the DHS. Each of these scientists is identified in the review results as an epidemiologist, and their work took place from 2000 to 2002. The results of this review titled, *An Evaluation of the Possible Risks From Electric and Magnetic Fields (EMFs) From Power Lines, Internal Wiring, Electrical Occupations, and Appliances*, were published in June 2002. The conclusions contained in the executive summary are provided below:

- To one degree or another, all three of the DHS scientists are inclined to believe that EMFs can cause some degree of increased risk of childhood leukemia, adult brain cancer, Lou Gehrig's disease, and miscarriage.
- They strongly believe that EMFs do not increase the risk of birth defects, or low birth weight.
- They strongly believe that EMFs are not universal carcinogens, since there are a number of cancer types that are not associated with EMF exposure.

- To one degree or another they are inclined to believe that EMFs do not cause an increased risk of breast cancer, heart disease, Alzheimer's disease, depression, or symptoms attributed by some to sensitivity to EMFs. However, all three scientists had judgments that were "close to the dividing line between believing and not believing" that EMFs cause some degree of increased risk of suicide.
- For adult leukemia, two of the scientists are "close to the dividing line between believing or not believing" and one was "prone to believe" that EMFs cause some degree of increased risk.

The report indicates that the DHS scientists are more inclined to believe that EMF exposure increased the risk of the above health problems than the majority of the members of scientific committees that have previously convened to evaluate the scientific literature. With regard to why the DHS review's conclusions differ from those of other recent reviews, the report states:

> The three DHS scientists thought there were reasons why animal and test tube experiments might have failed to pick up a mechanism or a health problem; hence, the absence of much support from such animal and test tube studies did not reduce their confidence much or lead them to strongly distrust epidemiological evidence from statistical studies in human populations. They therefore had more faith in the quality of the epidemiological studies in human populations and hence gave more credence to them.

While the results of the DHS report indicate these scientists believe that EMF can cause some degree of increased risk for certain health problems, the report did not quantify the degree of risk or make any specific recommendations to the CPUC.

In addition to the uncertainty regarding the level of health risk posed by EMF, individual studies and scientific panels have not been able to determine or reach consensus regarding what level of magnetic field exposure might constitute a health risk. In some early epidemiological studies, increased health risks were discussed for daily time-weighted average field levels greater than 2 mG. However, the IARC scientific working group indicated that studies with average magnetic field levels of 3 to 4 mG played a pivotal role in their classification of EMF as a possible carcinogen.

5.3.1.5 Applicant-Proposed Measures (APMs)

There are no applicable regulations related to EMF levels from power lines. Similarly, there are no significance criteria related to EMF levels from power lines, as applicable to the proposed Project and alternatives. Therefore, no impact conclusions can be made associated with EMF. However, the CPUC has implemented, and recently re-confirmed, a decision requiring utilities to incorporate "low-cost" or "no-cost" measures for managing EMF from power lines, which SCE has incorporated as mitigation for magnetic fields. Following is a brief overview of techniques for managing magnetic field levels and what EMF mitigation SCE proposes to implement for the proposed Project.

Methods to Reduce EMF

EMF levels from transmission lines can be reduced in three primary ways: shielding, field cancellation, or increasing the distance from the source. Shielding, which primarily reduces exposure to electric fields, can be actively accomplished by placing trees or other physical barriers along the transmission line ROW. Shielding also results from existing structures the public may use or occupy along the line. Since electric fields can be blocked by most materials, shielding is effective for the electric fields but is of limited effectiveness for magnetic fields.

Magnetic fields can be reduced either by cancellation or by increasing distance from the source. Cancellation is achieved in two ways. A transmission line circuit consists of three "phases": three separate wires or bundles of wires (conductors) on a transmission tower. The configuration of these three conductors can affect magnetic field levels. First, when the configuration places the three conductors closer together, the interference, or cancellation, of the fields from each wire is enhanced. This technique has practical limitations because of the potential for short circuits if the wires are placed too close together. There are also worker safety issues to consider if spacing is reduced. Second, in instances where there are two circuits (more than three phase wires), such as in portions of the proposed Project, cancellation can be accomplished by arranging phase wires from the different circuits near each other. In underground lines, the three phases are typically much closer together than in overhead lines because the cables are insulated (coated).

The distance between the source of fields and the public can be increased by either placing the wires higher above ground, burying underground cables deeper, or by increasing the width of the ROW. For transmission lines, these methods can prove effective in reducing fields because the reduction of the field strength drops rapidly with distance.

SCE's Proposed EMF Mitigation

In accordance with SCE's EMF Design Guidelines, filed with the CPUC in compliance with CPUC Decisions D.93-11-013 and 06-01-042, SCE identified a number of "no-cost" or "low-cost" magnetic field reduction measures shown in Table 5.3-5. SCE evaluated these magnetic field reduction measures in the Field Management Plan prepared for the proposed Project and selectively adopted the measures for different segments of the proposed Project.

Table 5.3-5. Applicant-Proposed Measures – Electric and Magnetic Fields

APM EMF-1	Circuit Phasing – Arrange the transmission line phases to reduce the level of magnetic field.
APM EMF-2	Taller Structures – Utilize taller structures, than required by standard line design, in order to reduce the level of magnetic field.
APM EMF-3	Circuit Placement – Locate the new transmission line in an inside position amongst existing transmission lines.
APM EMF-4	Compact Design – Utilize a different structure type, than required by standard design, which results in closer phase spacing and raises the conductor height, resulting in reduced magnetic field level.
APM EMF-5	Double-Circuit Construction – Combine the transmission line with another circuit on a single tower, which increases conductor height, resulting in reduced magnetic field.
APM EMF-6	Split Phasing – For a transmission line with bundled conductor, utilize a double-circuit tower and split the conductors to each side of the structure and arrange the phases to reduce the level of magnetic field.
APM EMF-7	Re-Phasing – Re-arrange the phases of an existing transmission line in the corridor with the proposed Project to reduce the level of magnetic field.
APM EMF-8	Increase ROW Width – Utilize a wider ROW than is the minimum necessary such that the magnetic field at the edge of the ROW is lower.

5.3.1.6 EMF Effects

Alternative 1 (No Project/Action)

Under the No Project/Action Alternative, the proposed Project would not be implemented and, therefore, the existing magnetic field due to existing transmission lines would remain unaltered. However, in the absence of the Project, other actions would occur. Some wind projects in the Antelope Valley and Tehachapi areas would be postponed or cancelled, or alternatives would be developed to meet the RPS goal by 2010. SCE would need to accommodate the power load by upgrading existing transmission infrastructure or building new transmission facilities along a different alignment. The resulting EMF associated with these activities is unknown as it is wholly dependent on the new infrastructure to be installed and where it is installed.

Alternative 2 (SCE's Proposed Project)

In the absence of consensus in the scientific community in regard to public health impacts due to EMF at the levels expected from electric power facilities and lacking any federal or State standards or thresholds limiting human exposure to EMFs from transmission lines or substation facilities, there is no basis to develop specific impact assessment for EMF. The following information is provided to illustrate the effect on EMF as a result of implementation of the proposed Project for consideration by the public and decision-makers. For other concerns regarding Electrical Interference and Hazards, impacts and mitigation measures are provided in Sections 3.17.6 and 3.17.7 of this EIR/EIS.

Direct and Indirect Effects Analysis

EMF levels in the Project area would not change during construction of the proposed Project, since the lines would not be energized during construction. When the transmission lines are energized, there would be some permanent increase in the level of EMFs in the existing environment. These effects are anticipated to be localized.

The magnetic field levels calculated by SCE have been reviewed and are considered to be accurate. The magnetic field from the proposed Project would continuously vary depending upon the amount of power flowing over the transmission lines. SCE's analysis of magnetic fields is based upon peak loading on the lines in the year they are constructed. Table 5.3-6 identifies the various line segments by milepost location, circuit type, structure configuration, and whether there are any adjacent circuits. It also presents the estimated magnetic field, in milliGauss (mG), at the edges of the ROW under existing conditions, once the new lines are operational, and the change in magnetic field level as a result of the proposed Project.

Table 5.3-6. Magnetic Fields – SCE's Proposed Project

Line Segment	Location by Milepost	Project Circuits	Adjacent Circuits	Left Edge ROW (mG)			Right Edge ROW (mG)		
				Existing	New	Change	Existing	New	Change
4A	0 to 5.0	2 Sgl Ckt 220 kV	YES	49.8	15.5	-34.3	3.6	35.7	32.1
4B	5.0 to 13.2 & 14.8 to 15.8	Sgl Ckt 500 kV	YES	6.6	35.7	29.1	37.4	26.5	-10.9
4C	13.2 to 14.8	Sgl Ckt 500 kV	YES	7.7	42.6	34.9	56.9	43.6	-13.3
4D	15.8 to 19.5	Sgl Ckt 500 kV	NO	0	38.7	38.7	0	38.7	38.7
5A	0 to 1.9	Sgl Ckt 500 kV	YES	20.3	18.7	-1.6	11.4	14.6	3.2
5B	1.9 to 4.4	Sgl Ckt 500 kV	YES	12.9	15.5	2.6	12.7	25.0	12.3
5C	4.4 to 8.0	Sgl Ckt 500 kV	YES	34.2	35.7	1.5	7.1	72.3	65.2
5D	8.0 to 11.0	Sgl Ckt 500 kV	YES	32.6	27.8	-4.8	17.7	14.8	-2.9
5E	11.0 to 15.7	Sgl Ckt 500 kV	YES	53.6	41.7	-11.9	0.9	1.7	0.8
5F	15.7 to 17.3	Sgl Ckt 500 kV	YES	10.2	14.6	4.4	7.4	28.1	20.7
5G	17.3 to 17.8	Sgl Ckt 500 kV	YES	53.4	39.6	-13.8	8.6	33.8	25.2
6A	0.0 to 0.6	Sgl Ckt 220 kV, Sgl Ckt 500 kV	YES	9.7	4.6	-5.1	5.1	10.1	5
6B	0.0 to 3.0	Sgl Ckt 220 kV, Sgl Ckt 500 kV	YES	143.2	141.3	-1.9	48.6	45.0	-3.6
6B	3.0 to 4.0	Sgl Ckt 220 kV, Sgl Ckt 500 kV	YES	49.2	37.8	-11.4	46.6	96.6	50
6C	5.0 to 6.0	Upgrade 220 kV, to 500 kV	YES	25.7	82.7	57	65.6	63.3	-2.3
6D	7.0	Upgrade 220 kV, to 500 kV	YES	125.2	150.6	25.4	41.1	38.0	-3.1
6E	9.0 to 26.0	Upgrade 220 kV, to 500 kV	YES	126.0	149.3	23.3	59.0	54.4	-4.6
7A	0 to 5.0	Sgl Ckt 500 kV	YES	42.8	18.2	-24.6	47.9	72.7	24.8

Table 5.3-6. Magnetic Fields – SCE's Proposed Project

Line Segment	Location by Milepost	Project Circuits	Adjacent Circuits	Left Edge ROW (mG)			Right Edge ROW (mG)		
				Existing	New	Change	Existing	New	Change
7A	Where 2 TSP Structures Used	Sgl Ckt 500 kV	YES	42.8	15.1	-27.7	47.9	43.5	-4.4
7B	5.0 to 7.6	Sgl Ckt 500 kV	YES	9.4	7.5	-1.9	33.1	43.1	10
7C	7.6 to 11.6	Sgl Ckt 500 kV	YES	10.7	6.8	-3.9	40.5	25.6	-14.9
7D	11.6 to 13.0	Sgl Ckt 500 kV	YES	7.7	15.5	7.8	31.5	24.5	-7
7E	13.0 to 15.8	Sgl Ckt 500 kV	YES	20.5	50.9	30.4	4.4	3.0	-1.4
8A	2.3 to 4.4	Sgl Ckt 500 kV	YES	28.3	26.3	-2	17.7	26.9	9.2
8B	4.4 to 9.0	Sgl Ckt 500 kV	YES	23.8	14.9	-8.9	5.2	32.2	27
8C	9.0 to 9.7	Sgl Ckt 500 kV	YES	7.8	4.3	-3.5	6.3	23.2	16.9
8D	9.7 to 11.2	Sgl Ckt 500 kV	YES	7.8	4.5	-3.3	6.3	56.6	50.3
8E	11.2 to 13.3	Sgl Ckt 500 kV	YES	21.7	34.0	12.3	1.6	38.1	36.5
8F	13.3 to 13.5	Sgl Ckt 500 kV	YES	19.9	35.8	15.9	4.8	23.1	18.3
8G	13.5 to 19.3	Sgl Ckt 500 kV	YES	31.7	14.8	-16.9	12.4	37.5	25.1
8H	19.3 to 22.7	Sgl Ckt 500 kV	YES	91.7	30.4	-61.3	19.1	6.8	-12.3
8I	22.7 to 26.9	Sgl Ckt 500 kV	NO	80.2	27.0	-53.2	51.7	27.0	-24.7
8J	26.9 to 27.6	Sgl Ckt 500 kV	YES	6.0	28.2	22.2	26.9	29.0	2.1
8K	27.6 to 28.1	Sgl Ckt 500 kV	YES	69.2	11.5	-57.7	30.6	20.0	-10.6
8L	28.4 to 28.7 (8B 0.0 to 0.3)	Sgl Ckt 500 kV	YES	3.3	0.7	-2.6	11.0	29.5	18.5
8M	28.7 to 29.4 (8B 0.3 to 0.7)	Sgl Ckt 500 kV	YES	14.1	1.8	-12.3	94.4	69.9	-24.5
8N	29.4 to 34.0	Sgl Ckt 500 kV	YES	15.2	27.8	12.6	77.1	86.7	9.6
8N	Where TSP Structures Used	Sgl Ckt 500 kV	YES	15.2	17.0	1.8	77.1	49.9	-27.2
8O [1]	1.0 to 5.2	Upgrade 220 kV, to 500 kV	YES	18.3	1.6	-16.7	23.2	15.1	-8.1
8P	5.2 to 5.6	Sgl Ckt 220 kV	YES	23.9	23.0	-0.9	5.2	2.3	-2.9
8Q	6.0 to 6.8	Sgl Ckt 220 kV	YES	4.8	3.2	-1.6	12.6	3.8	-8.8
8R	34.0 to 34.4 (8B 5.6 to 6.0)	Sgl Ckt 500 kV	YES	16.6	8.3	-8.3	2.4	42	39.6
8S	34.5 to 35.2	Sgl Ckt 500 kV	YES	34.0	38.3	4.3	6.0	28.1	22.1
10	0.0 to 16.8	Sgl Ckt 500 kV	YES	6.1	0	-6.1	27.2	0	-27.2
11A	0.0 to 0.9	Sgl Ckt 500 kV	YES	9.7	4.6	-5.1	5.1	10.1	5
11B	0.9 to 2.3	Sgl Ckt 500 kV	YES	145.8	174.2	28.4	3.7	13.8	10.1
11C	2.3 to 3.9	Sgl Ckt 500 kV	YES	145.9	174.0	28.1	5.4	81.0	75.6
11D	3.9 to 18.7	Sgl Ckt 500 kV	YES	109.7	108.1	-1.6	48.2	200.4	152.2
11E	18.7 to 27.2	Sgl Ckt 220 kV	YES	83.2	61.6	-21.6	70.6	28.9	-41.7
11F [2]	27.2 to 36.2	Sgl Ckt 220 kV	YES	78.9	69.7	-9.2	65.0	30.8	-34.2

Source: SCE, 2007.

Table Notes: Sgl = Single, Dbl = Double, Ckt = Circuit.

[1] A 10 foot taller structure (153 feet) at M5-T1 of Segment 8O of the reconfigured Chino-Mira Loma #1 and #2 220-kV T/L near residences would be used to further reduce EMF on the left ROW to 1.5 mG (majority of segment = 1.6 mG) and on the right ROW to 11.8 mG (majority of segment is 15.1 mG).

[2] It is recommended in two locations along Segment 11F that the existing T/Ls be re-phased to reduce EMF. Near Shuey Elementary School in Rosemead (Left ROW = 69.0 mG; Right ROW = 36.2 mG) and near Willard Elementary School in Pasadena (Left ROW = 68.8 mG; Right ROW = 34.8 mG).

Alternatives 3, 4, 5, 6, and 7

Direct and Indirect Effects Analysis

The alternatives evaluated in this EIR/EIS include both routing alternatives and alternative construction methods such as undergrounding or changes to structure types. In most instances the routing alternatives utilize transmission line configurations which would mimic the configuration of one of the segments of the proposed

Project segment, and may involve similar levels of EMF to those described in Table 5.3-6 above for the proposed Project, with the magnetic field level highly dependent upon whether the alternative is adjacent to existing transmission circuits. Where the alternative is adjacent to existing transmission circuits, the magnetic field levels cannot be identified since the current flow and EMF of these other transmission lines has not been modeled.

For the purpose of comparison, the following discussion reviews the EMF associated with the alternatives to identify sections of the proposed Project that are similar.

Alternative 3: West Lancaster Route Alternative

This 3.4-mile alternative would re-route a portion of 500-kV transmission line that is a part of Segment 4 of the proposed Project. The alternative would pass through agricultural lands and would not be adjacent to existing transmission lines. The magnetic field levels would be similar to those in proposed Project Sub-Segment 4D from S4 MP 15.8 to 19.5, and would be 38.7 milliGauss (mG) at each edge of the ROW.

Alternative 4: Chino Hills Route Alternative

Four different routing alternatives were identified in the Chino Hills area.

Alternative 4A is a 6.2-mile re-route of a portion of the 500-kV transmission line that is a part of Segment 8A of the proposed Project. This re-route would pass through undeveloped lands and park lands (Chino Hills State Park) and would be adjacent to existing transmission lines. The adjacent lines have not been modeled so the magnetic field levels cannot be estimated. However, the configuration of Alternative 4A is similar to Segment 8B of the proposed Project.

Alternative 4B is an 8.6-mile re-route of a portion of the 500-kV transmission line that is a part of Segment 8A of the proposed Project. The first 6.2 miles of this re-route would be the same as Alternative 4A above and would pass through undeveloped lands and park lands and would be adjacent to existing transmission lines. The adjacent lines have not been modeled so the magnetic field levels cannot be estimated. However, the configuration of this portion of Alternative 4B is similar to Segment 8B of the proposed Project. For the final two miles of Alternative 4B, the line would continue in park lands, however, the configuration of this portion is not similar to any of the segments of the proposed Project.

Alternative 4C is a 5.5-mile re-route of a portion of the 500-kV transmission line that is a part of Segment 8A of the proposed Project. This alternative would also re-route a portion of an existing 220-kV transmission line. The Alternative 4C re-route would pass through undeveloped lands for its entire length, although approximately 1.6 miles would be routed along the border of park lands. This re-route is the same as Alternative 4A above in terms of being adjacent to existing transmission lines. The adjacent lines have not been modeled so the magnetic field levels cannot be estimated. However, the configuration of the first 3.9 miles of Alternative 4C would be similar to Segment 8B of the proposed Project. For the final 3.5 miles, Alternative 4C includes the re-routed 220-kV transmission line and the configuration of this portion is not similar to any of the segments in the proposed Project.

Alternative 4D is a 9.6-mile re-route of a portion of the 500-kV transmission line that is a part of Segment 8A of the proposed Project. The Alternative 4D re-route would pass through undeveloped lands for its entire length, although 5.3 miles of this alternative would be routed along the border of park lands. The first 3.9 miles of this re-route is the same as Alternative 4A above in terms of being adjacent to existing transmission lines. The adjacent lines have not been modeled so the magnetic field levels cannot be estimated. However, the

configuration of the first 3.9 miles of Alternative 4D is similar to Segment 8B of the proposed Project. For the final 5.7 miles, Alternative 4D is routed by itself in a 200-foot wide ROW. The configuration of this portion of Alternative 4D is similar to Sub-Segment 8H. The ROW for Alternative 4D is wider than for Sub-Segment 8H of the proposed Project; therefore, the magnetic field level at the left edge of the ROW would be less than the 30.4 mG that is shown for Sub-Segment 8H (see Table 5.3-6).

Alternative 5: Partial Underground Alternative

This alternative would utilize underground construction in place of the proposed overhead line construction following generally the same route as the proposed Project through Chino Hills. New underground facilities consisting of three separate underground GIL enclosures (similar to pipes) would be installed below grade in a tunnel. This alternative configuration has not been modeled so the magnetic field values cannot be estimated. However, placing the transmission line underground is expected to result in a higher magnetic field level directly above the underground line than for the overhead line. Conversely, the magnetic field attenuates much more rapidly for an underground line such that within a relatively short distance the magnetic field level is expected to be lower than for the overhead line.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative

This alternative would utilize helicopter construction within Segments 6 and 11 to minimize the need for new road construction. Once operational, the magnetic field levels would be identical to the proposed Project along all segments, as provided in Table 5.3-6, above.

Alternative 7: 66-kV Subtransmission Alternative

This alternative would re-route two portions of 66-kV subtransmission line (Segment 7 and 8A both to avoid Whittier Narrows Recreation Area) and utilize underground construction in place of the proposed overhead line construction for two portions of the 66-kV subtransmission circuits (Segment 7 through the Duck Farm and Segment 8A north of Whittier Narrows Recreation Area). New underground facilities consisting of a concrete duct bank would be installed below grade. This alternative configuration has not been modeled so the magnetic field values cannot be estimated; however, placing the subtransmission line underground is expected to result in a higher magnetic field level directly above the underground line than for the overhead line. Conversely, the magnetic field attenuates much more rapidly for an underground line such that within a relatively short distance the magnetic field level is expected to be lower than for the equivalent overhead line.

Cumulative Effects Analysis of EMF

The approach to analysis of the cumulative effects of EMF entailed first determining the geographic extent of the fields. Next, the existing cumulative conditions related to EMF were reviewed in order to describe how the Project's EMFs would change the cumulative conditions in the area of the new transmission lines.

Geographic Extent

EMFs only occur within a narrow corridor along the energized conductors of a transmission line and decrease in strength rapidly as distance from the transmission line conductors increases. From an EMF perspective, the geographic extent of Project is directly along the entire length of the transmission line for the width of the ROW. The areas where there could be cumulative impacts are where the Project is adjacent to other transmission lines.

Existing Cumulative Conditions

Along the majority of the Project alignment, new transmission lines are being routed adjacent to existing transmission lines.

Cumulative Analysis of the Alternatives

EMF from the alternatives, where they are adjacent to existing lines, would be additive. For the various alternatives, the magnetic field from adjacent facilities would interact in a manner such that the cumulative impact would be a change in the magnetic field at the edge of the ROW. Depending upon a number of variables, this magnetic field change could result in either an increase or decrease in the field strength.

5.3.2 Terrorism

5.3.2.1 Introduction

The number and high profile of international and domestic terrorist attacks during the last decade presents a new and realistic threat to the safety and security of the United States of America's people, infrastructure, and resources. Extremist organizations have proven to be innovative, opportunistic, and flexible, learning from experience and modifying tactics and targets to exploit perceived vulnerabilities. Current analysis of terrorist goals and motivations points to domestic and international critical infrastructure and key resources (CI/KR) as potentially prime targets for terrorist attacks (DHS, 2006).

In a recent decision, the U.S. Court of Appeals for the 9th Circuit (*San Luis Obispo Mothers for Peace, et. al v. Nuclear Regulatory Commission*) held that failure to address the environmental impacts of a terrorist attack on a nuclear power facility in an Environmental Impact Statement (EIS) prepared under the National Environmental Policy Act (NEPA) was not reasonable (9th Circuit, 2006). In this ruling, the Court held that the numeric probability of a terrorist attack need not be precisely quantifiable in order for its potential environmental impacts to be considered. Rather, the Court found, the proper inquiry is whether the risk of an attack is significant. If so, then NEPA requires taking a "hard look" at the environmental consequences of a terrorist attack. While the CEQA guidelines do not specifically address the issue of terrorism, CEQA was developed as a California counterpart to NEPA. Therefore, given recent court rulings and public concern regarding terrorist attacks on regional infrastructure, this section has been developed to qualitatively address environmental consequences that could result from a potential terrorist attack.

It should be noted that given the uncertain nature of terrorist attacks (i.e., location, timing, and other factors), there are challenges in determining reasonable thresholds for the likelihood of an attack or the associated environmental consequences. However, the following discussion attempts to present the potential scenarios and associated consequences as they relate to the likelihood of the proposed TRTP becoming the target of a terrorist attack.

5.3.2.2 Background

The United States Department of Homeland Security (DHS) has developed the National Infrastructure Protection Plan (NIPP) to provide an approach for integrating the country's many CI/KR protection initiatives into a single national effort. The NIPP does not provide or recommend specific measures to protect individual resources; however, it does establish national priorities, goals, and requirements for CI/KR protection to direct federal funding and resource application.

The NIPP considers a broad range of terrorist objectives, intentions, and capabilities to assess the threat to various components of CI/KR. Based on that assessment, terrorists may contemplate attacks against CI/KR to achieve three general types of effects:

- **Direct Infrastructure Effects**: Disruption or arrest of critical functions through direct attacks on an asset, system or network, such as an attack on a substation or transmission tower.
- **Indirect Infrastructure Effects**: Cascading disruption and financial consequences for the government, society, and economy through public and private sector reactions to an attack. An operation could reflect an appreciation of interdependencies between different elements of CI/KR. This type of effect could occur if the disruption of electrical service resulting from an attack on the proposed TRTP consequently resulted in adverse impacts to a sensitive facility such as a hospital, airport, security facility, etc.
- **Exploitation of Infrastructure**: Exploitation of elements of a particular infrastructure to disrupt or destroy another target or produce cascading consequences. Such attacks use CI/KR elements as a weapon to strike other targets, thereby allowing terrorist organizations to magnify their capabilities far beyond what could be achieved using their own limited resources.

The NIPP delineates domestic infrastructure and resources into specific sectors such as Agriculture, Defense, Energy, etc. The Energy Sector includes the "production, refining, storage, and distribution of oil, gas, and electric power, except for commercial nuclear power facilities" (DHS, 2006). While electrical transmission lines are not specifically referred to in this plan, they would generally fall into the category of distribution of electric power and are therefore considered a potential target of terrorist attack. Potential consequences of a terrorist attack on the proposed TRTP could include:

- Disruption of electrical service,
- Physical damage to system features and surrounding facilities, and
- Personal injury or loss of human life.

5.3.2.3 Potential Environmental Consequences

The proposed TRTP would include a series of new and upgraded high-voltage electric transmission lines (T/Ls) and substations to deliver electricity from new wind farms in eastern Kern County, California, to the Los Angeles Basin. The purpose of the proposed TRTP is to provide the electrical facilities necessary to interconnect and integrate up to approximately 4,500 megawatts (MW) of new wind generation in the Tehachapi Wind Resource Area (TWRA) currently being planned or expected in the future 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); to address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and to address the South of Lugo transmission constraints.

The electrical grid of which TRTP would be a part is a looped system with substations configured to permit electrical loads to flow across various paths from the source substation at all times. This allows for an alternate path to immediately absorb the entire load of a substation in the event that another path is interrupted. A terrorist attack on the proposed TRTP would likely result in reduced or disrupted electricity transmission to the regional electric grid (i.e., to the substations that distribute electricity to customers). As is common practice when a line is down, the utility would have to re-route power around the affected substation or transmission line to serve the southern California load, and an outage could occur for some period of time while the system was modified to provide service from other substations. Therefore, the regional transmission system is interconnected in such a way that it is not possible to say that a single line outage would cause an outage at a specific sensitive facility, such as a hospital, airport, security facility, etc. In addition, although most facilities of this type may receive electric power from substations supplied by the proposed TRTP, major facilities

would also have back up power/generators to prevent electricity interruptions in the event of an outage, such as would occur with a terrorist attack on a transmission line.

Full-time operational staff at the substations associated with the TRTP would range from zero to five, and work crews of one to five persons would periodically visit the station to perform routine maintenance and inspection activities. Therefore, an attack on one or all of the Project substations is unlikely to result in a high incidence of human injury or mortality.

A terrorist attack on the transmission line could also result in downed towers. Transmission line towers would range in height from 65 to 255 feet. Portions of the proposed transmission line route would be located in residential areas with residential structures as close as 75 feet from the transmission line towers. It is possible that transmission line towers could fall and strike a residential structure as a result of a terrorist attack, resulting in property damage and potential injury or mortality to residents.

By nature the purpose of terrorism is to create and promote fear among populations, as well as (and through) death, destruction, and disruption of a targeted population's or facility's ability to effectively carry out its intended function and/or to eliminate or limit peaceful living and commerce. While the possibility of a terrorist attack on the proposed TRTP exists, the proposed Project is not considered to be a high level or likely target for attack, because consequences of a potential attack while serious and adverse would not result in catastrophic consequences to the regional electric grid. Any human injury or death resulting from a terrorist attack would be serious, tragic, and difficult to prevent; however, the overall risk of an attack on the proposed TRTP is not considered likely.

5.3.3 Energy Conservation

Pursuant to Appendix F (Energy Conservation) of the State CEQA Guidelines, an EIR must address potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

The purpose of the proposed TRTP is to provide the electrical facilities necessary to interconnect and integrate up to approximately 4,500 megawatts (MW) of new wind generation in the Tehachapi Wind Resource Area (TWRA) 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); to address the reliability needs of the CAISO-controlled grid due to projected load growth in the Antelope Valley; and to address the South of Lugo transmission constraints, an ongoing source of concern for the Los Angeles Basin.

CPUC has been actively promoting conservation for over 30 years, with an intensified effort since the California power crisis in late 2000. The effort in 2001 to expand the State's energy efficiency programs was seen as an emergency measure to reduce supply shortages and was not meant to be a long-term solution. However, the programs instituted during this period contributed to significant energy savings in California and were extended. The CPUC adopted new energy efficiency goals for 2006 and beyond, and SCE has incorporated these efficiency goals in its long-term procurement plan as well as in the Proponent's Environmental Assessment for TRTP. However, the ability to achieve incremental savings beyond the baseline level is not known.

The proposed transmission project is planned to support renewable energy projects in the TWRA. Renewable projects typically do not involve the use of fossil fuels, such as natural gas, for generation of electricity. The nature of proposed Project increases the opportunities for utilizing passive sources for energy production;

thereby reducing emissions and providing additional opportunities for cleaner sources of energy to be delivered to the consumer. The use of a passive source for energy production thus produces a net overall reduction in fossil fuel use and emissions to generate electricity.

As stated in Section 5.1.2, Irreversible Changes and Irretrievable Commitments of Resources, implementation of the proposed Project or any of the alternatives would result in the consumption of energy through fuel needed for construction activities. Fuel would be needed for construction vehicles, construction equipment, construction operations, and helicopter use.

Additionally, construction would require the manufacture of new materials, some of which would not be recyclable at the end of the proposed Project's lifetime, and the energy required for the production of these materials would also result in an irretrievable commitment of natural resources. The anticipated equipment, vehicles, and materials required for construction of the proposed Project are detailed in Chapter 2 (Description of Alternatives, including the Proposed Project).

Maintenance and operations and inspection of the proposed Project would not change appreciably from SCE's existing activities in Project area, and thus would not cause a substantial increase in the consumption or use of nonrenewable resources. SCE has proposed to improve energy efficiency throughout the construction phase of the proposed Project through Applicant-proposed measures APM AQ-3, APM AQ-4 and APM AQ-9. These Applicant-proposed measures address the minimization of vehicle use through an effective carpool program, and the minimization of unnecessary construction vehicle and idling time. Such measures would increase the energy efficiency of the Project while lowering air emissions. Further information on emissions can be found in Section 3.3.

The proposed Project is not intended to supply power for any particular development project, either directly or indirectly, and would not result in direct growth-inducing impacts. It would, however, facilitate growth indirectly by removing obstacles to population growth through the additional increased capacity of the electrical transmission system that it would make available. Socioeconomics Section 3.12.2 (Affected Environment for Alternative 2) provides a description of the existing populations within the Project area. Growth in the Project area is expected to occur with or without implementation of the proposed Project. Therefore, the proposed Project would increase energy consumption above what population growth itself would do.

Energy conservation measures are included in the EIR/EIS as components of the SCE's proposed Project. SCE would voluntarily implement measures to reduce wasteful, inefficient, and unnecessary consumption of energy. No increases in inefficiencies or unnecessary energy consumption are expected to occur as a direct or indirect consequence of the Project. Therefore, no mitigation measures above those already present in this EIR/EIS would be necessary.

5.3.4 21st Century Green Partnership Proposal Analysis

In August 2008, an organization called the 21st Century Green Partnership (21st Century) presented a proposal in support of Alternative 4 (Chino Hills Alternatives). Specifically, 21st Century supports Route 4C, which would route Segment 8A along the northern edge of Chino Hills State Park (CHSP), terminating at a new switching station that would be constructed adjacent to the CHSP boundary. This alternative would also involve re-alignment of existing 220-kV and 500-kV transmission lines within CHSP, and the relocation of a portion of a 220-kV transmission line to an area outside the CHSP boundary. The 21st Century Green

Partnership was co-founded by the City of Chino Hills and a local citizen's group known as Citizens for Alternate Routing of Electricity (CARE).

According to its website (www.21stcenturygreen.net), 21st Century supports the development of renewable energy, but opposes the routing of the Tehachapi Renewable Transmission Project (TRTP) through a populated portion of the City of Chino Hills as proposed by SCE in Alternative 2. As indicated above, 21st Century supports Alternative 4C, which it believes is preferable to Alternative 2 because it would avoid proximity to residences, parks, and schools in Chino Hills that are located near Segment 8A of the proposed TRTP.

The proposal developed by 21st Century in support of Alternative 4C calls for various improvements and enhancements to CHSP to help offset impacts to CHSP that would be caused by the implementation of Alternative 4C. The components of this enhancement package proposed by 21st Century are described in Section 5.3.4.1 below. 21st Century estimates the total cost for the proposed improvements and enhancements to CHSP to be about $50 million. According to 21st Century's proposal, this cost would be paid by SCE and, if allowed by the CPUC, SCE would recover those costs by increasing electricity rates to its customers. Please note that the costs for constructing the TRTP would also be recovered through electrical rates.

5.3.4.1 21st Century Green Partnership Proposal

21st Century's proposal for improving and enhancing CHSP has four components:

- Land acquisition to expand CHSP (referred to by 21st Century as Bio-Corridor Expansion);
- Removal of certain existing transmission lines in CHSP (referred to as View Shed Enhancements);
- Habitat restoration within CHSP (referred to as Habitat Enhancements); and
- Improvements to CHSP entrance facilities (referred to as Operational Enhancements).

The components of 21st Century's proposal are described below. 21st Century calls its proposal a "mitigation and recovery plan"; however, the Lead Agencies do not consider this proposal to constitute mitigation as defined by CEQA and NEPA because it is not needed to reduce or avoid any significant adverse impacts caused by the implementation of Alternative 4.

CHSP Land Acquisition

21st Century proposes the acquisition of undeveloped land adjacent to eastern boundary of CHSP in order to expand the CHSP and provide connectivity to natural habitat areas in nearby Prado Basin. The City of Chino Hills has identified certain undeveloped parcels of land east of CHSP totaling 2,517 acres that would be acquired for CHSP expansion under 21st Century's proposal. This easterly expansion of CHSP would also include the construction of a wildlife crossing under State Route (SR) 71 to provide a passage way for wildlife movement between Prado Basin and CHSP, thereby creating an enhanced wildlife movement corridor. The City of Chino Hills has offered to provide assistance to the CHSP with the acquisition of these properties.

21st Century estimates that the total cost for the land acquisition and SR-71 wildlife crossing would be $20,000,000. The Lead Agencies have not attempted to verify this cost estimate.

Removal of Existing Transmission Lines in CHSP

21st Century proposes the removal of certain existing transmission lines that currently traverse CHSP. According to 21st Century, staff from the City of Chino Hills worked with SCE to identify transmission facilities that are either no longer in use and can be dismantled and removed from CHSP or could be relocated in order to improve the view sheds within CHSP. 21st Century has indicated that there are currently 10.45

miles of de-energized 220-kV line and 1.2 miles of 500-kV line within CHSP that could be considered for removal. SCE has acknowledged that there are transmission facilities within CHSP that are no longer in use and could be dismantled and removed, but has not confirmed the specific amount and locations of transmission facilities that can be removed at this time. 21st Century has also proposed that the transmission lines that remain in CHSP be relocated away from ridgelines and other prominent areas to improve views within CHSP. 21st Century proposes that the removal and relocation plan be reviewed and approved by the Department of Parks and Recreation and made a part of the CPUC's approval of the TRTP.

Please note that Alternative 4C includes the relocation of certain existing 220-kV and 500-kV transmission lines within CHSP, including the relocation of a portion of an existing 220-kV line to an alignment outside the CHSP boundary.

21st Century estimates that the total cost for the removal of the existing transmission lines would be $5,000,000. The Lead Agencies have not attempted to verify this cost estimate.

Habitat Restoration in CHSP

The CHSP General Plan identifies a core wildlife habitat within the CHSP and several critical bio-corridors connecting CHSP to the surrounding open space. The bio-corridors consist of: (1) Coal Canyon, linking CHSP to the Cleveland National Forest; (2) Sonome Canyon, linking CHSP to Tonner Canyon; and (3) the Prado Basin Area to the east of CHSP.

21st Century has proposed a habitat restoration program that is intended to target and rank areas within CHSP for restoration based on several criteria, including:

- Location relative to core habitat;
- Location relative to bio-corridors;
- Existing condition of habitat;
- Presence of target species indicating viability of the site; and
- Potential to support special-status species.

Areas with the three bio-corridors that meet the criteria would be buffered 300 feet to delineate approximate restoration areas. According to 21st Century, the 300-foot buffer is based upon functional assessment standards that consider an aquatic feature with a 300-foot buffer of native habitat as high functioning.

21st Century has identified three potential habitat restoration areas with CHSP:

- Water Canyon - totaling approximately 14 acres, including 4 acres of riparian habitat and 10 acres of sage scrub habitat;
- Brush Canyon - totaling approximately 7 acres, including 1 acre of riparian habitat and 6 acres of sage scrub habitat; and
- Lower Aliso Canyon - totaling approximately 39 acres, including 8 acres of riparian habitat and 31 acres of sage scrub habitat.

The restoration proposed by 21st Century would include eradication of invasive plant species, such as tamarisk, and the supplemental planting of riparian oak woodland and cottonwood willow riparian species within and adjacent to the canyon bottoms. 21st Century also proposes supplemental planting of scrub species and native grass species in adjacent upland areas that currently support non-native grassland. In addition, the 21st Century proposal includes funding for monitoring and maintenance of the restoration areas for a period of ten years. The City of Chino Hills has indicated that it would seek to establish a partnership with California Polytechnic

State University, Pomona, to help monitor the success of the restoration areas and provide oversight of maintenance and management activities. The intent of this partnership is to provide a long-term educational and research opportunity that would also serve to reduce initial and ongoing maintenance costs for the restoration project.

21st Century estimates that the total cost for the habitat restoration would be $8,000,000. The Lead Agencies have not attempted to verify this cost estimate.

Improvements to CHSP Entrance Facilities

21st Century also proposes for the reconstruction of the Chino Hills entrance to the CHSP. Improvements would include the construction of a guard shack, gate improvements, and installation of an informational kiosk and message board, as well as other enhancements to be recommended by the Department of Parks and Recreation. Funding would also be provided for unspecified long-term operational expenses. According to 21st Century, the improvements to the CHSP entrance would enhance the Department's ability to monitor, limit, and collect user fees at this entrance. 21st Century also states that the proposed informational kiosk would enable improved communication and outreach to CHSP users.

21st Century estimates that the total cost for the improvements to the CHSP entrance facilities would be $17,000,000. This includes $2,000,000 for construction costs and $15,000,000 to be placed in an interest-bearing trust to fund on-going operational expenses. The Lead Agencies have not attempted to verify this cost estimate.

5.3.4.2 Environmental Impacts Associated with the 21st Century Green Partnership Proposal

CHSP Land Acquisition

Land acquisition, by itself, does not result in any physical changes to the environment and, therefore, does not cause any direct environmental impacts. However, plans for intended future uses of the acquired land can result in impacts to the environment. In the case of 21st Century's proposal, the stated intent is for the land to remain as natural open space, with the intent of maintaining an undeveloped corridor for wildlife movement between the Chino Hills and Prado Basin. Presumably, some recreational use may be allowed within the acquired land, similar to current recreational uses of CHSP, including hiking, biking, and horse riding. Management of the acquired land would be expected to be similar to management of CHSP and would likely include maintenance of trails, minor trimming and clearing of vegetation, curbing of erosion, and similar activities that have effects that are generally not significant, and may be beneficial. In general, changes between existing and future conditions would be minor within the proposed land acquisition area.

Long-term effects of the proposed land acquisition would be beneficial for wildlife as it would preserve a natural open space corridor for wildlife movement, including construction of a wildlife crossing under SR-21 that would further enhance wildlife movement. The land acquisition would preserve open space and support the conservation of native vegetation communities and the wildlife species dependent on those communities. It would also reduce future habitat fragmentation, and decrease mortality due to wildlife-vehicle collisions. More detailed studies and coordination with federal and State wildlife agencies would need to be conducted to better define the wildlife benefits of the proposed land acquisition.

Construction of the proposed wildlife crossing beneath SR-71 would result in various short-term construction-related impacts. These would include noise from construction activities, air pollutant emissions from

construction equipment, traffic from construction vehicle trips, and ground disturbance, which can result in vegetation loss, dust generation, soil erosion, and degradation of water quality. These would all be short-term effects. Because no specific plans have been formulated for the proposed wildlife crossing and no location has been specified, it is not possible at this time to characterize these impacts in a specific way or determine their severity or magnitude. However, it is possible that at least some of the construction-related impacts could be significant. Standard measures for reducing noise and air pollutants, as well as best management practices for controlling erosion, would need to be employed to reduce impacts. Disturbed ground surfaces would also need to be revegetated after construction to minimize erosion and the establishment of invasive weeds.

Removal of Existing Transmission Lines in CHSP

Removal of transmission lines within CHSP would produce short-term impacts associated with removing the conductors, dismantling the structures, and hauling away the dismantled components of the transmission lines. Over the long-term, the removal of the transmission lines would produce a beneficial effect, resulting in an improved visual condition and a more natural landscape with CHSP.

Short-term impacts associated with the removal of transmission lines include demolition-related impacts on air quality, traffic, noise, and biological resources. Equipment used for the removal of transmission lines would produce air pollutant emissions that would temporarily degrade air quality. Traffic would increase in the vicinity of CHSP during demolition activities and cause temporary delays on nearby streets as vehicles enter and leave the CHSP, potentially affecting level of service and road capacity. Demolition activities, including the operation of construction equipment and vehicles, would result in a temporary increase in noise levels in the immediate area. Demolition noise would be limited to days and hours specified by CHSP and would most likely occur during day-time hours and weekdays. There would be a potential for spills and leaks of hazardous materials during demolition activities, which could result in soil or groundwater contamination at the site if proper precautions and procedures are not implemented. An improperly managed spill could result in the exposure of workers and the public to hazardous substances. Additionally, some vegetation clearing and ground disturbance would occur at the demolition sites and along access roads and within staging areas. If not properly managed and revegetated, increased soil erosion and establishment of invasive weed species could occur in the disturbed areas, as non-native plants are often spread by human and vehicle vectors.

The impacts associated with demolition and removal of existing transmission lines would be temporary, but could be significant. Because a demolition plan has not been prepared, it is not possible at this time to characterize these impacts in a specific way or determine their severity or magnitude. Standard measures for reducing noise and air pollutants, as well as best management practices for controlling erosion, would need to be employed to reduce impacts. Disturbed ground surfaces would also need to be revegetated after construction to minimize erosion and the establishment of invasive weeds.

If the transmission infrastructure is removed and disturbed areas are revegetated, there would be a beneficial effect on views within CHSP and in areas outside CHSP where the transmission lines were previously visible. Removal of transmission infrastructure is generally considered an enhancement to the visual quality of an area and, in this case, it would improve visual quality for CHSP users and some Chino Hills residents, resulting in a long-term beneficial effect.

Habitat Restoration

When successful, habitat restoration can result in improved habitat quality and higher functioning streams and wetlands. Restoration in riparian areas can also improve water quality and reduce stream bank erosion and

channel incision. Restoration improves the quality of habitat for wildlife, often providing better habitat conditions for foraging, breeding, and movement/migration.

While successful habitat restoration produces long-term environmental benefits, activities associated with active restoration efforts can cause short-term environmental impacts. Although no specific plans have been developed for the habitat restoration proposed by 21st Century, the general proposal involves eradication of invasive plant species and planting of oak woodland and cottonwood willow riparian species in canyon bottoms, and scrub and native grass species in adjacent upland areas. Eradication of invasive plant species often requires the use of mechanical equipment and, in some cases, the application of herbicides. Removal of vegetation, even though temporary, can disturb the soil and lead to soil erosion and degradation of water quality in nearby water bodies. To avoid adverse effects on wildlife and water quality, herbicides must be used by trained personnel in accordance with manufacturer's specifications and, near water bodies, herbicides must be used that are approved for aquatic application. Noise generated by equipment and workers can disturb wildlife and disrupt nesting. Just the presence of human activity can be disruptive to wildlife, resulting in adverse effects on wildlife use of habitat areas, including temporary dislocation of some species. If stream channel improvements are part of the restoration plan, there can be direct impacts on aquatic habitat, including crushing of vegetation, mortality of fish and aquatic wildlife, and increased water turbidity. After initial restoration actions, periodic habitat monitoring and adaptive management activities can also result in minor land disturbance (e.g., weeding and re-planting) and disruption of wildlife, but typically to a much lesser degree. The impacts associated with active restoration efforts are generally short-term or periodic in nature, and typically produce long-term environmental benefits.

Improvements to CHSP Entrance Facilities

The proposed improvements to the CHSP entrance would result in short-term construction-related impacts. These would include noise from construction activities, air pollutant emissions from construction equipment, traffic from construction vehicle trips, ground disturbance, and potential spills of hazardous materials used in construction. While no specific plans have been formulated for the CHSP entrance improvements, the construction impacts are likely to be minor and insignificant based on the small scale of the proposed improvements. Because the improvements would largely involve the re-construction of existing facilities with new facilities of a similar type, they would most likely be exempt from environmental review under the CEQA.

Standard measures for reducing noise and air pollutants, as well as best management practices for controlling erosion, would need to be employed to reduce impacts. Disturbed ground surfaces would need to be revegetated after construction to minimize erosion and the establishment of invasive weeds.