BEFORE THE PUBLIC UTILITIES COMMISSION OF THE

STATE OF CALIFORNIA

In the Matter of the Application of SOUTHERN CALIFORNIA EDISON COMPANY (U 338-E) for a Permit to Construct Electrical Facilities With Voltages Between 50 kV and 200 kV: Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project	Application No. ___________________

PROPONENT'S ENVIRONMENTAL ASSESSMENT

CIRCLE CITY SUBSTATION AND MIRA LOMA-JEFFERSON 66 kV SUBTRANSMISSION LINE PROJECT

VOLUME 1 of 6

(Executive Summary through Attachment 4.3-A)

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SOUTHERN CALIFORNIA EDISON COMPANY

CIRCLE CITY SUBSTATION AND MIRA LOMA-JEFFERSON SUBTRANSMISSION LINE PROJECT PROPONENT'S ENVIRONMENTAL ASSESSMENT

Prepared for:

Prepared by:

December 2015

- Construction of approximately six new underground 12 kV distribution getaways exiting the proposed Circle City Substation.
- Relocation of approximately 1.9 miles of an existing overhead 33 kV distribution line to an underground position.
- Installation of telecommunications facilities to connect the Proposed Project to SCE's existing telecommunications system.

Project Location

The Proposed Project is located in portions of northwestern Riverside County, including the cities of Corona, Eastvale, and Norco; and in portions of San Bernardino County, including the cities of Chino and Ontario. The Electrical Needs Area (ENA) is depicted in Figure 1-1: Electrical Needs Area in Chapter 1 – Project Purpose and Need. The proposed substation and subtransmission lines are depicted in Figure 3-3: Source Line Route Description and Figure 3-4: Mira Loma-Jefferson 66 kV Subtransmission Line Route Description in Chapter 3 – Project Description.

Project Need and Alternatives

As described further in Chapter 1 – Purpose and Need, the Proposed Project is being proposed to meet the following objectives:

- Serve current and long-term peak electrical demand requirements in the ENA as soon as possible after receipt of applicable permits
- Enhance electrical system reliability by adding transformation and circuitry to serve increased electrical demand and by increasing operational flexibility
- Construct the new electrical facilities in close proximity to the electrical demand to effectively and efficiently serve the ENA
- Meet the Proposed Project need while minimizing environmental impacts
- Meet the Proposed Project need in a cost-effective manner
- Design and construct the Proposed Project in conformance with SCE's current engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects

Although various substation site alternatives, subtransmission line route alternatives, and system alternatives were considered during the development of the Proposed Project, the Proposed Project was ultimately selected because it best meets the Proposed Project objectives while resulting in the fewest potential environmental impacts.

EXECUTIVE SUMMARY

In accordance with California Public Utilities Commission (CPUC) General Order (G.O.) 131-D, Southern California Edison (SCE) is submitting this Proponent's Environmental Assessment (PEA) as part of its application for a Permit to Construct for the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project).

Project Components

The Proposed Project consists of the following major components:

- Construction of a new 66/12 kilovolt (kV) substation (Circle City Substation). The proposed Circle City Substation would be an unstaffed, automated, low-profile 56 megavolt-ampere (MVA), substation with a potential capacity of 112 MVA at final build out.

- Construction of four new 66 kV subtransmission source lines, including:

    - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction.[1] Each would be approximately 1.2 miles in length and would be created by connecting to the existing Chase-Corona-Databank 66 kV Subtransmission Line to form the new Circle City-Corona No. 2 66 kV Subtransmission Line and the new Chase-Circle City-Databank 66 kV Subtransmission Line.

    - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction. Each would be approximately 3.5 miles in length and would be created by connecting to the existing Mira Loma-Corona-Pedley 66 kV Subtransmission Line to form the Mira Loma-Circle City-Pedley and the Circle City-Corona No. 1 66 kV subtransmission lines.

- Construction of a new 66 kV subtransmission line, which would be a combination of both overhead and underground construction. The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be approximately 10.9 miles in length and would be constructed from SCE's existing Mira Loma Substation to a location adjacent to SCE's existing Corona Substation.

- Upgrade Mira Loma Substation to accommodate the new Mira Loma-Jefferson 66 kV Subtransmission Line.

[1] A double-circuit configuration consists of two independent 66 kV lines routed on the same support structures. In overhead construction, both 66 kV subtransmission lines would be routed on the same poles. In underground construction, both 66 kV subtransmission lines would be routed down from a single pole and then continue underground through a single underground system.

Agency Coordination

SCE has consulted with representatives from the CPUC, Riverside County, City of Chino, City of Corona, City of Eastvale, City of Norco, and City of Ontario. Communications with these agencies occurred primarily between 2009 and 2013. In March 2010, SCE hosted an agency workshop to help determine potential sites for the Circle City Substation. Agencies and interested parties in attendance included Riverside County, the City of Corona, the California Department of Transportation (Caltrans), and BNSF Railway Company (BNSF). Summaries of these communications are presented in the following subsections.

California Public Utilities Commission

In early 2012, SCE provided the CPUC with an Administrative Draft PEA. At that time, the CPUC staff provided comments.

Riverside County

SCE conducted initial briefings about the Proposed Project with Supervisor John Tavaglione and his staff in November 2009 during route selection. Staff from Riverside County Flood Control participated in the March 2010 agency workshop and expressed no major concerns with the study area. SCE conducted additional briefings in May 2010 after the preferred routes were selected. The county expressed support for the Proposed Project. SCE has not briefed the county in detail since the City of Eastvale became incorporated in 2010.

City of Chino

SCE conducted briefings about the Proposed Project with Mike Hitz (Associate Planner), Jim Hill (City Engineer), and Nick Ligouri (Principal Planner) in August 2012 after the preferred route was selected. At that time, the city had concerns about the Lewis Group developing Homecoming Luxury Apartments at Hellman Avenue and Schleisman/Pine Avenue in the near future. The community boundaries are Schleisman/Pine Avenue, Hellman Avenue, Market Street, and East Preserve Loop. Another concern was that Hellman Avenue and Schleisman/Pine Avenue would create a significant intersection once developed, and the city requested that SCE avoid crossing diagonally. The most recent briefing occurred in November 2015. The city expressed no concerns about the Proposed Project.

City of Corona

SCE conducted initial briefings about the Proposed Project with each member of the City Council and various members of city staff in the summer of 2009 during route selection. The city expressed a desire to have portions of the subtransmission lines placed underground, citing the local underground ordinance. City staff participated in the March 2010 agency workshop. City staff again reiterated a desire to have portions of the subtransmission lines placed underground. SCE conducted additional briefings in August 2012 after the preferred route was selected. The city expressed approval for the preferred substation location, citing its proximity to commercial and industrial uses. SCE has briefed city staff and elected officials on a regular basis, with the most recent briefing occurring in October 2015. The City of Corona expressed an interest in the Proposed Project due to the location of the proposed substation and subtransmission lines.

City of Eastvale

Prior to Eastvale incorporating on June 8, 2010, briefings were conducted with Riverside County. SCE most recently conducted briefings with Carol Jacobs (City Manager) and George Alvarez (City Engineer) in early 2012. SCE conducted additional individual briefings with the City Manager, city staff, and City Council members in July 2012. The most recent briefing occurred in August 2015. The city wanted to ensure the route would be on the west side of Hellman Avenue, where it is undeveloped, compared to the east side of Hellman Avenue where the curb, gutter, and landscaping have been for 4 years.

City of Norco

SCE conducted initial briefings about the Proposed Project with Kathy Azevedo (Mayor) and city staff in the summer of 2009 during route selection. SCE conducted additional briefings in August 2012 after the preferred route was selected, and in September 2013 after SCE added additional scope to the Proposed Project. The most recent meeting with city officials was in August 2015. The city expressed a desire to know where the alignment crosses city property versus private property, and requested information about whether wood pole replacements will require any widening along the right-of-way (ROW). The city mentioned that it is planning a number of commercial developments adjacent to the Proposed Project. SCE will continue to work with the city regarding those development activities.

City of Ontario

SCE conducted initial briefings about the Proposed Project with the City Manager and city staff in July 2012 during route selection. SCE conducted additional briefings in August 2012 after the preferred route was selected. The most recent briefing occurred in September 2013 after SCE added additional scope to the Proposed Project. The city expressed no concerns about the Proposed Project.

California Department of Transportation

Staff from Caltrans participated in the March 2010 agency workshop. They expressed a desire for SCE to take the future expansion of Interstate 15 and State Route (SR-) 91 into consideration when siting the project.

BNSF Railway Company

Representatives from BNSF participated in the March 2010 agency workshop and expressed no major concerns with the study area.

PEA Contents

This PEA is divided into six sections. Chapter 1 – Purpose and Need outlines the Proposed Project's objectives.

Chapter 2 – Project Alternatives evaluates alternatives to the Proposed Project and describes justification for the preferred alternative.

A detailed description of the Proposed Project is provided in Chapter 3 – Project Description. This discussion includes specifics regarding the Proposed Project location, the existing system, the Proposed Project components, permanent and temporary land/ROW requirements, construction methods, the construction schedule, anticipated operations and maintenance activities, and federal and local permits that would be obtained for the Proposed Project.

Chapter 4 – Environmental Impact Assessment includes an environmental impact assessment summary and a discussion of the existing conditions and potential anticipated impacts of the Proposed Project for each of the resource areas identified by the California Environmental Quality Act (CEQA) Guidelines. The November 24, 2008 Working Draft PEA Checklist for Transmission Line and Substation Projects indicates that the environmental setting section can be provided separately or combined with the impacts and applicant-proposed measures (APMs). SCE has elected to combine the environmental setting, impacts, and APMs for each resource area in Chapter 4 – Environmental Impact Assessment.

Chapter 5 – Comparison of Alternatives and Chapter 6 – Other CEQA Considerations identify the potentially significant impacts resulting from the Proposed Project, evaluate alternatives to the Proposed Project, and analyze the potential cumulative and growth-inducing impacts related to the Proposed Project.

Throughout this PEA, SCE has addressed all items in the CPUC PEA Checklist. To facilitate confirmation of this and review of the PEA, Table ES-1: PEA Checklist Key has been included at the end of this Executive Summary and identifies the section where each checklist item is addressed.

PEA Conclusions

This PEA analyzes the potential environmental impacts associated with construction, operation, and maintenance of the Proposed Project. The following 11 resource areas would not be impacted by the Proposed Project or nor would they experience less-than-significant impacts:

- Agriculture and Forestry Resources
- Geology and Soils
- Greenhouse Gas (GHG) Emissions
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Utilities and Service Systems

Although the Proposed Project would result in potentially significant impacts to five resource areas, impacts to these resource areas would be reduced with the implementation of APMs. The APMs that would be implemented to reduce impacts are discussed in detail in the relevant sections in Chapter 4 – Environmental Impact Assessment. The following resource areas would have impacts that would be reduced to less-than-significant levels:

- Aesthetics – Temporary impacts from construction lighting, if needed.
- Biological Resources – Temporary and permanent impacts to biological resources.
- Cultural Resources – Potential for discovery and damage to unknown cultural resources resulting from grading and excavation activities.
- Hazards and Hazardous Materials – Temporary impacts associated with the transport and use of hazardous materials during construction, and temporary fire risk during construction for a portion of the subtransmission line.
- Transportation and Traffic – Temporary impacts to SR-91 during grading of the proposed Circle City Substation.

The APMs that would be implemented to reduce impacts to less-than-significant levels are discussed in detail in their relevant sections in Chapter 4 – Environmental Impact Assessment, and are summarized in Table 3-8: Applicant-Proposed Measures in Chapter 3 – Project Description.

While the APMs would reduce the environmental impacts resulting from the Proposed Project, impacts to one resource area are expected to remain significant and unavoidable. The expected significant and unavoidable impacts are summarized as follows:

- Air Quality – Temporary impacts to air quality during construction—specifically peak emissions of particulate matter less than 10 microns in diameter and nitrogen oxides—would exceed corresponding South Coast Air Quality Management District daily significance thresholds.

Public Outreach

Public outreach and communications are critical elements of SCE's planning process. SCE identified and reached out to key stakeholders in the Proposed Project area to solicit input and provide information about the Proposed Project. SCE's outreach efforts focus on educating stakeholders about the need for the Proposed Project and identifying their concerns about the Proposed Project through written notification, newspaper advisements, website, public meetings, and a Proposed Project hotline.

In 2009, SCE initiated the Proposed Project. In 2009, before the route selection was complete, SCE conducted initial briefings with jurisdictions within the Proposed Project study area. SCE has conducted subsequent briefings throughout the development of the Proposed Project. Summaries of these discussions are presented previously in the Agency Coordination section. Several jurisdictions expressed concerns about the siting of the proposed subtransmission line routes. In early August 2012, SCE mailed a Proposed Project information pamphlet to property owners located within 300 feet of the Proposed Project. SCE also conducted two public open house sessions in late August 2012 in the cities of Corona and Eastvale. No major concerns were reported by members of the public at that time.

SCE regularly reevaluates public outreach strategies based on the needs of individual communities, input from key stakeholders and the public, and the needs of the Proposed Project. SCE will continue to maintain the Proposed Project website and hotline throughout the life of the Proposed Project in order to provide the public with timely information, answer questions, and address concerns related to the Proposed Project.

SCE plans to provide in-person briefings to local jurisdictions at key milestones throughout the life of the Proposed Project, such as prior to filing the application, immediately after a final decision, and prior to the start of construction (assuming the Proposed Project is approved).

Controversy and/or Major Issues

The City of Chino expressed concerns about the Proposed Project’s proximity to future development. A luxury apartment community is planned adjacent to the Proposed Project. Hellman Avenue and Schleisman Road/Pine Avenue will be a major intersection in the future. The city requested that the proposed subtransmission line not cross the intersection diagonally.

The City of Corona has expressed a desire to have subtransmission lines placed underground, citing the local underground ordinance.

The City of Eastvale expressed concerns about siting the proposed subtransmission line on the east side of Hellman Avenue, where there is existing development. The city requested that the proposed subtransmission line be placed on the west side of Hellman Avenue, which is currently undeveloped.

Table ES-1: PEA Checklist Key

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
Chapter 1: PEA Summary		
	Include major conclusions of the PEA	Executive Summary: PEA Conclusions (pages ES-5 through ES-6)
	List any areas of controversy.	Executive Summary: Agency Coordination (pages ES-3 through ES-4) Executive Summary: Controversy and/or Major Issues (page ES-7)
	Include a description of public outreach efforts, if any.	Executive Summary: Public Outreach (pages ES-6 through ES-7)
	Include a description of inter-agency coordination, if any	Executive Summary: Agency Coordination (pages ES-3 through ES-4)
	Identify any major issues that must be resolved, including the choice among reasonably feasible alternatives and mitigation measures, if any.	Executive Summary: Project Need and Alternatives (page ES-2) Executive Summary: PEA Conclusions (pages ES-5 through ES-6) Executive Summary: Controversy and/or Major Issues (page ES-7)
Chapter 2: Project Purpose and Need		
2.1 Overview	Include an analysis of Project objectives and purpose and need that is sufficiently detailed so that the Commission can independently evaluate the Project need and benefits in order to accurately consider them in light of the potential environmental impacts.	Section 1.1 Project Purpose Section 1.3 Planning Process Section 1.4 System Needs Section 1.6 Project Objectives
	Explain the objective(s) and/or purpose and need for implementing the Project.	Section 1.1 Project Purpose Section 1.6 Project Objectives

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
2.2 Project Objectives	Include an analysis of the reason why attainment of these objectives is necessary or desirable. Such analysis must be sufficiently detailed to inform the Commission in its independent formulation of Proposed Project objectives which will aid any appropriate CEQA alternatives screening process.	Section 1.3 Planning Process Section 1.4 System Needs Section 1.6 Project Objectives
Chapter 3: Project Description		
3.1 Project Location	Identify geographical location: County, City (provide Proposed Project location map[s]).	Figure 1-1: Electrical Needs Area
	Provide a general description of land uses within the Proposed Project site (e.g., residential, commercial, agricultural, recreation, vineyards, farms, open space, number of stream crossings, etc.).	Section 4.10 Land Use and Planning Table 4.10-2: Proposed Project Land Use Designations Crossed Table 4.10-3: Proposed Project Zoning Designations Crossed
	Describe if the Proposed Project is located within an existing property owned by the Applicant, traverses existing rights-of-way (ROW), or requires new ROW. Provide the approximate area of the property or the length of the Proposed Project that is in an existing ROW or which requires new ROWs.	Section 3.1.1 Circle City Substation Description Section 3.1.1.8 Substation Grading and Drainage Section 3.2.1.1 Staging/Work Areas Section 3.2.3.1 Access Roads Section 3.2.3.7 Wire Stringing Section 3.3 Land Use Rights Section 3.13 Proposed Project Operation and Maintenance
3.2 Existing System	Describe the local system to which the Proposed Project relates. Include all relevant information about substations, transmission lines, and distribution circuits.	Section 1.2 Electrical Needs Area
	Provide a schematic diagram and map of the existing system.	Figure 1-1: Electrical Needs Area Figure 1-2: Existing and Proposed System Configuration
	Provide a schematic diagram that illustrates the system as it would be configured with the implementation of the Proposed Project.	Figure 1-2 Existing and Proposed System Configuration

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.3 Project Objectives	Can refer to Chapter 2 Project Purpose and Need, if already described there.	Section 1.6 Project Objectives
3.4 Proposed Project	Describe the whole of the Proposed Project. Is it an upgrade, a new line, new substations, etc.?	Chapter 2 - Project Alternatives Section 3.1 Proposed Project Components
	Describe how the Proposed Project fits into the regional system. Does it create a loop for reliability, etc.?	Section 1.3 Planning Process Section 1.2 Electrical Needs Area
	Describe all reasonably foreseeable future phases or other reasonably foreseeable consequences of the Proposed Project.	Executive Summary: Project Components (page ES-1 through ES-2)
	Provide the capacity increase in megawatts (MW). If the Proposed Project does not increase capacity, state that.	Table 1-1: Electrical Needs Area Substation Capacity and Peak Demand
	Provide geographic information system (GIS) (or equivalent) data layers for the Proposed Project preliminary engineering, including estimated locations of all physical components of the Proposed Project, as well as those related to construction.	Provided under separate cover
3.5 Project Components 3.5.1 Transmission Line	Describe what type of line exists and what type of line is proposed (e.g., single-circuit, double-circuit, upgrade 69 kV to 115 kV).	Section 3.1.3 Subtransmission Line Description
	Identify the length of the upgraded alignment, the new alignment, etc.	Section 3.1.3 Subtransmission Line Description
	Describe whether construction would require one-for-one pole replacement, new poles, steel poles, etc.?	Section 3.1.3 Subtransmission Line Description
	Describe what would occur to other lines and utilities that may be collocated on the poles to be replaced (e.g., distribution, communication, etc.).	Section 3.1.3 Subtransmission Line Description
3.5.2 Poles/Towers	Provide information for each pole/tower that would be installed and for each pole/tower that would be removed.	Section 3.1.3.3 Subtransmission Pole Description
	Provide a unique identification number to match GIS database information.	Provided under separate cover

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.5.2 Poles/Towers (cont.)	Provide a structural diagram and, if available, photos of existing structure. Preliminary diagram or "typical" drawings and, if possible, photos of proposed structure. Also provide a written description of the most common types of structures and their use (e.g., tangent poles would be used when the run of poles continues in a straight line, etc.). Describe if the pole/tower design meets raptor safety requirements.	Figure 3-5: Subtransmission Structures
	Provide the type of pole (e.g., wood, steel, etc.) or tower (e.g., selfsupporting, lattice, etc.).	Section 3.1.3.3 Subtransmission Pole Description
	Identify typical total pole lengths, the approximate length to be embedded, and the approximate length that would be above ground surface; for towers, identify the approximate height above ground surface and approximate base footprint area.	Table 3-2: Subtransmission Structure Quantity and Dimensions
	Describe any specialty poles or towers; note where they would be used (e.g., angle structures, heavy angle lattice towers, stub guys, etc.); make sure to note if any guying would likely be required across a road.	Section 3.1.3.3 Subtransmission Pole Description
	If the Proposed Project includes pole-for-pole replacement, describe the approximate location of where the new poles would be installed relative to the existing alignment.	Section 3.1.3.2 Mira Loma-Jefferson Subtransmission Line Route Description Section 3.1.3.3 Subtransmission Pole Description
	Describe any special pole types (e.g., poles that require foundations, transition towers, switch towers, microwave towers, etc.) and any special features.	Section 3.1.3.3 Subtransmission Pole Description
3.5.3 Conductor/Cable 3.5.3.1 Above-Ground Installation	Describe the type of line to be installed on the poles/tower (e.g. single-circuit with distribution, double circuit, etc.).	Chapter 3 – Project Description Section 3.1.3 Subtransmission Line Description
	Describe the number of conductors required to be installed on the poles or tower and the number on each side, including applicable engineering design standards.	Section 3.1.3.3 Subtransmission Pole Description
	Provide the size and type of conductor (e.g., aluminum conductor, steel reinforced, non-specular, etc.) and insulator configuration.	Section 3.1.3.3 Subtransmission Pole Description
	Provide the approximate distance from the ground to the lowest conductor and the approximate distance between the conductors (i.e., both horizontally and vertically). Provide specific information at highways, rivers, or special crossings.	Section 3.1.3.3 Subtransmission Pole Description Figure 3-4 Subtransmission Structures

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.5.3 Conductor/Cable 3.5.3.1 Above-Ground Installation (cont.)	Provide the approximate span lengths between poles or towers, note where different if distribution is present or not if relevant.	Section 3.1.3.3 Subtransmission Pole Description
	Determine whether other infrastructure would likely be collocated with the conductor (e.g., fiber optics, etc.); if so, provide conduit diameter of other infrastructure.	Section 3.1.4 Telecommunications Description
3.5.3.2 Below Ground Installation	Describe the type of line to be installed (e.g., single circuit crosslinked polyethylene-insulated solid-dielectric, copper-conductor cables).	Section 3.2.3.9 Underground Subtransmission
	Describe the type of casing the cable would be installed in (e.g., concrete-encased duct bank system); provide the dimensions of the casing.	Section 3.1.3.3 Subtransmission Pole Description Section 3.2.3.9 Underground Subtransmission
	Provide an engineering 'typical' drawing of the duct bank and describe what types of infrastructure would likely be installed within the duct bank (e.g., transmission, fiber optics, etc.).	Figure 3-8: Typical Subtransmission Duct Bank
3.5.4 Substation	Provide "typical" plan and profile views of the proposed substation and the existing substation if applicable.	Figure 3-2: Circle City Substation Profile View
	Describe the types of equipment that would be temporarily or permanently installed and provide details as to what the function/use of said equipment would be. Include information such as, but not limited to mobile substations, transformers, capacitors, and new lighting.	Section 3.1.1 Circle City Substation Description
	Provide the approximate or "typical" dimensions (width and height) of new structures including engineering and design standards that apply.	Section 3.1.1 Circle City Substation Description
	Describe the extent of the Proposed Project. Would it occur within the existing fence line, existing property line or would either need to be expanded?	Section 3.1.1 Circle City Substation Description Section 3.3 Land Use Rights
	Describe the electrical need area served by the distribution substation.	Section 1.2 Electrical Needs Area
3.6 Right-of-Way Requirements	Describe the ROW location, ownership, and width. Would the existing ROW be used or would new ROW be required?	Section 3.3 Land Use Rights
	If a new ROW is required, describe how it would be acquired and approximately how much land would be required (length and width).	Section 3.3 Land Use Rights
	List the properties likely to require acquisition.	Section 3.3 Land Use Rights

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7 Construction 3.7.1 For All Projects 3.7.1.1 Staging Areas	Where would the main staging area(s) likely be located?	Section 3.2.1.1 Staging/Work Areas
	Approximately how large would the main staging area(s) be?	Section 3.2.1.1 Staging/Work Areas
	Describe any site preparation required, if known, or generally describe what might be required (i.e., vegetation removal, new access road, installation of rock base, etc.).	Section 3.2.1.1 Staging/Work Areas
	Describe what the staging area would be used for (e.g., material and equipment storage, field office, reporting location for workers, parking area for vehicles and equipment, etc.).	Section 3.2.1.1 Staging/Work Areas
	Describe how the staging area would be secured; would a fence be installed? If so, describe the type and extent of the fencing.	Section 3.2.1.1 Staging/Work Areas
	Describe how power to the site would be provided if required (e.g., tap into existing distribution, use of diesel generators, etc.).	Section 3.2.1.1 Staging/Work Areas
	Describe any grading activities and/or slope stabilization issues.	Section 3.2.1.1 Staging/Work Areas
3.7.1.2 Work Areas	Describe known work areas that may be required for specific construction activities (i.e., pole assembly, hill side construction, etc.).	Section 3.2.1.1 Staging/Work Areas
	For each known work area, provide the area required (include length and width) and describe the types of activities that would be performed.	Table 3-4: Estimated Temporary and Permanent Land Disturbance
	Identify the approximate location of known work areas in the GIS database.	Provided under separate cover
	Describe how the work areas would likely be accessed (e.g., construction vehicles, walk-in, helicopter, etc.).	Section 3.2.1.1 Staging/Work Areas
	If any site preparation is likely required, generally describe what and how it would be accomplished.	Section 3.2.1.1 Staging/Work Areas
	Describe any grading activities and/or slope stabilization issues.	Section 3.2.1.1 Staging/Work Areas
	Based on the information provided, describe how the site would be restored.	Section 3.7.1.2 Work Areas

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.1.3 Access Roads and/or Spur Roads	Describe the types of roads that would be used and/or would need to be created to implement the Proposed Project. Road types may include, but are not limited to: new permanent road; new temporary road; existing road that would have permanent improvements; existing road that would have temporary improvements; existing paved road; existing dirt/gravel road; and overland access.	Section 3.2.3.1 Access Roads
	For road types that require preparation, describe the methods and equipment that would be used.	Section 3.2.3.1 Access Roads
	Identify approximate location of all access roads (by type) in the GIS database.	Provided under separate cover
	Describe any grading activities and/or slope stabilization issues.	Section 3.2.3.1 Access Roads
3.7.1.4 Helicopter Access	Identify which proposed poles/towers would be removed and/or installed using a helicopter.	Not applicable (NA)
	If different types of helicopters are to be used, describe each type (e.g., light, heavy, or sky crane) and what activities they would be used for.	NA
	Provide information as to where the helicopters would be staged, where they would refuel, and where they would land within the Proposed Project site.	NA
	Describe any Best Management Practices (BMPs) that would be employed to avoid impacts caused by use of helicopters, for example: air quality and noise considerations.	NA
	Describe flight paths, payloads, hours of operations for known locations, and work types.	NA
3.7.1.5 Vegetation Clearance	Describe the types of vegetation clearing that may be required (e.g., tree removal, brush removal, flammable fuels removal) and why (e.g., to provide access, etc.).	Section 3.2.1.1 Staging/Work Areas Section 3.2.2.1 Site Preparation and Grading Section 3.2.3.1 Access Roads Section 3.2.1.6 Vegetation Clearance
	Identify the preliminary location and provide an approximate area of disturbance in the GIS database for each type of vegetation removal.	Provided under separate cover
	Describe how each type of vegetation removal would be accomplished.	Section 3.2.1.6 Vegetation Clearance

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.1.5 Vegetation Clearance (cont.)	For removal of trees, distinguish between tree trimming as required under GO-95 and tree removal.	Section 3.2.1.6 Vegetation Clearance
	Describe the types and approximate number and size of trees that may need to be removed.	Unknown at this time
	Describe the type of equipment typically used.	Table 3-6: Equipment Description 3.2.1.6 Vegetation Clearance
3.7.1.6 Erosion and Sediment Control and Pollution Prevention during Construction	Describe the areas of soil disturbance including estimated total areas and associated terrain type and slope. List all known permits required. For project sites of less than one acre, outline the BMPs that would be implemented to manage surface runoff. Things to consider include, but are not limited to: Erosion and sedimentation BMPs, vegetation removal and restoration, and/or hazardous waste, and spill prevention plans.	Section 3.2.1.2 Storm Water Pollution Prevention Plan
	Describe any grading activities and/or slope stabilization issues.	Section 3.1.1.8 Substation Grading and Drainage Section 3.2.1.1 Staging/Work Areas Section 3.2.2.1 Site Preparation and Grading
	Describe how construction waste (i.e., refuse, spoils, trash, oil, fuels, poles, pole structures, etc.) would be disposed.	Section 3.7 Reusable, Recyclable, and Waste Material Management
3.7.1.7 Cleanup and Post-Construction Restoration	Describe how cleanup and post-construction restoration would be performed (i.e., personnel, equipment, and methods). Things to consider, but are not limited to, restoration of natural drainage patterns, wetlands, vegetation, and other disturbed areas (i.e. staging areas, access roads, etc.).	Section 3.5 Post-Construction Cleanup
3.7.2 Transmission Line Construction (Above Ground 3.7.2.1 Pull and Tension Sites	Provide the general or average distance between pull and tension sites.	Section 3.2.3.7 Wire Stringing
	Provide the area of pull and tension sites including the estimated length and width.	Table 3-4: Estimated Temporary and Permanent Land Disturbance
	According to the preliminary plan, identify the number of pull and tension sites that would be required, and their locations. Provide the location information in GIS.	Table 3-4 Estimated Temporary and Permanent Land Disturbance GIS data provided under separate cover

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.2 Transmission Line Construction (Above Ground 3.7.2.1 Pull and Tension Sites (cont.)	Describe the type of equipment that would be required at these sites.	Table 3-5: Construction Equipment and Workforce Estimates
	If conductor is being replaced, describe how it would be removed	Section 3.2.3.8 Removal of Existing Structures
3.7.2.2 Pole Installation and Removal	Describe how the construction crews and their equipment would be transported to and from the pole site locations. Provide vehicle type, number of vehicles, estimated number of trips, and hours of operation.	Section 3.11 Construction Equipment and Personnel
	Describe the process of removing the poles and foundations.	Section 3.2.3.8 Removal of Existing Structures
	Describe what happens to the holes that the poles were in (i.e., reused or backfilled)?	Section 3.2.3.8 Removal of Existing Structures
	If the holes are to be backfilled, what type of fill would be used and where would it come from?	Section 3.2.3.8 Removal of Existing Structures
	Describe any surface restoration that would occur at the pole sites.	Section 3.2.3.8 Removal of Existing Structures Section 3.5 Post-Construction Cleanup
	Describe how the poles would be removed from the sites.	Section 3.2.3.8 Removal of Existing Structures
	If topping is required to remove a portion of an existing transmission pole that would now only carry distribution lines, describe the methodology to access and remove the tops of these poles. Describe any special methods that would be required to top poles that may be difficult to access, etc.	NA
	Describe the process of how the new poles/towers would be installed; specifically identify any special construction methods (e.g., helicopter installation) for specific locations or for different types of poles/towers.	Section 3.2.3.2 Wood Pole Installation Section 3.2.3.3 Lightweight Steel Pole Installation Section 3.2.3.4 H-Frame Hybrid Pole Installation Section 3.2.3.5 Tubular Steel Pole Installation

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.2.2 Pole Installation and Removal (cont.)	Describe the types of equipment and their use as related to pole/tower installation.	Table 3-6 Construction Equipment Description
	Describe the actions taken to maintain a safe work environment during construction (e.g., covering of holes/excavation pits, etc.).	Section 3.10 Worker Environmental Awareness Training
	Describe what would be done with soil that is removed from a hole/foundation site.	Section 3.7 Reusable, Recyclable, and Waste Material Management
	For any foundations required, provide a description of the construction method(s), approximate average depth and diameter of excavation, approximate volume of soil to be excavated, approximate volume of concrete or other backfill required, etc.	Section 3.2.3.5 Tubular Steel Pole Installation
	Describe briefly how poles/towers and associated hardware are assembled.	Section 3.2.3.2 Wood Pole Installation Section 3.2.3.3 Lightweight Steel Pole Installation Section 3.2.3.4 H-Frame Hybrid Pole Installation Section 3.2.3.5 Tubular Steel Pole Installation
	Describe how the poles/towers and associated hardware would be delivered to the site; would they be assembled off site and brought in or assembled on site?	Section 3.2.3.2 Wood Pole Installation Section 3.2.3.3 Lightweight Steel Pole Installation Section 3.2.3.4 H-Frame Hybrid Pole Installation Section 3.2.3.5 Tubular Steel Pole Installation
	Provide the following information about pole/tower installation and associated disturbance area estimates: pole diameter for each pole type (e.g., wood, self-supporting steel, lattice, etc.), base dimensions for each pole type, auger hole depth for each pole type, permanent footprint per pole/tower, number of poles/towers by pole type, average work area around poles/towers by pole type (e.g., for old pole removal and new pole installation), and total permanent footprint for poles/towers.	Table 3-2: Subtransmission Structure Quantity and Dimensions

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.2.3 Conductor/Cable Installation	Provide a process-based description of how new conductor/cable would be installed and how old conductor/cable would be removed, if applicable.	Section 3.2.3.7 Wire Stringing
	Generally describe the conductor/cable splicing process.	Section 3.2.3.7 Wire Stringing
	If vaults are required, provide their dimensions and approximate location/spacing along the alignment.	Section 3.2.3.9 Underground Subtransmission
	Describe in what areas conductor/cable stringing/installation activities would occur.	Section 3.2.3.7 Wire Stringing
	Describe any safety precautions or areas where special methodology would be required (e.g., crossing roadways, stream crossing, etc.).	Section 3.2.3.6 Guard Structures
3.7.3 Transmission Line Construction (Below Ground)	Describe the approximate dimensions of the trench (e.g., depth, width).	Section 3.2.3.9 Underground Subtransmission
	Describe the methodology of making the trench (e.g., saw cutter to cut the pavement, backhoe to remove, etc.).	Section 3.2.3.9 Underground Subtransmission
3.7.3.1 Trenching	Provide the total approximate cubic yardage of material to be removed from the trench, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site.	Section 3.2.3.9 Underground Subtransmission
	Provide off-site disposal location, if known, or describe possible option(s).	Table 4.17-1: Landfills and Recycling Centers near the Proposed Project
	If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., top two feet would be filled with thermal-select backfill).	Section 3.2.3.9 Underground Subtransmission
	Describe if dewatering would be anticipated and, if so, how the trench would be dewatered, what the anticipated flows of the water are, whether there would be treatment, and how the water would be disposed of.	Section 3.2.3.9 Underground Subtransmission
	Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants that could be exposed as a result of trenching operations.	Section 3.2.3.9 Underground Subtransmission
	If pre-existing hazardous waste was encountered, describe the process of removal and disposal.	Section 3.7 Reusable, Recyclable, and Waste Material Management
	Describe any standard BMPs that would be implemented.	Section 3.2.1.2 Storm Water Pollution Prevention Plan

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.3.2 Trenchless Techniques: Microtunnel, Bore and Jack, Horizontal Directional Drilling	Provide the approximate location of the sending and receiving pits.	NA
	Provide the length, width and depth of the sending and receiving pits.	NA
	Describe the methodology of excavating and shoring the pits.	NA
	Describe the methodology of the trenchless technique.	NA
	Provide the total cubic yardage of material to be removed from the pits, the amount to be used as backfill and the amount to subsequently be removed/disposed of off-site.	NA
	Describe the process for safe handling of drilling mud and bore lubricants.	NA
	Describe the process for detecting and avoiding “fracturing-out” during horizontal directional drilling operations.	NA
	Describe the process for avoiding contact between drilling mud/lubricants and streambeds.	NA
	If engineered fill would be used as backfill, provide information as to the type of engineered backfill and the amount that would be typically used (e.g., top two feet would be filled with thermal-select backfill).	NA
	If dewatering is anticipated, describe how the pit would be dewatered, what the anticipated flows of the water are, whether there would be treatment, and how the water would be disposed of.	NA
	Describe the process for testing excavated soil or groundwater for the presence of pre-existing environmental contaminants.	NA
	If a pre-existing hazardous waste was encountered, describe the process of removal and disposal.	NA
	Describe any grading activities and/or slope stabilization issues.	NA
	Describe any standard BMPs that would be implemented.	NA

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.7.4 Substation Construction	Describe any earth-moving activities that would be required; what type of activity and, if applicable, estimate cubic yards of materials to be reused and/or removed from the site for both site grading and foundation excavation.	Section 3.2.2.1 Site Preparation and Grading Table 3-1 Substation Ground Surface Improvement Materials
	Provide a conceptual landscape plan in consultation with the municipality in which the substation is located.	Section 3.1.1.11 Substation Perimeter
	Describe any grading activities and/or slope stabilization issues.	Section 3.1.1.8 Substation Grading and Drainage Section 3.2.2.1 Site Preparation and Grading
	Describe possible relocation of commercial or residential property, if any.	NA
3.7.5 Construction Workforce and Equipment	Provide the estimated number of construction crew members.	Section 3.11 Construction Equipment and Personnel
	Describe the crew deployment, whether crews would work concurrently (i.e., multiple crews at different sites), if they would be phased, etc.	Section 3.7.6 Construction Workforce and Equipment
	Describe the different types of activities to be undertaken during construction, the number of crew members for each activity (i.e., trenching, grading, etc.), and the number and types of equipment expected to be used for said activity. Include a written description of the activity.	Section 3.7.6 Construction Workforce and Equipment
	Provide a list of the types of equipment expected to be used during construction of the Proposed Project as well as a brief description of the use of the equipment.	Section 3.11.1 Equipment Description
3.7.6 Construction Schedule	Provide a preliminary project construction schedule; include contingencies for weather, wildlife closure periods, etc.	Section 3.12 Construction Schedule Table 3-7: Proposed Construction Schedule
3.8 Operation and Maintenance	Describe the general system monitoring and control (i.e., use of standard monitoring and protection equipment, use of circuit breakers and other line relay protection equipment, etc.).	Section 3.13 Proposed Project Operation and Maintenance
	Describe the general maintenance program of the Proposed Project including timing of inspections (i.e., monthly, every July, as needed), type of inspection (i.e., aerial inspection, ground inspection), and a description of how the inspection would be implemented. Things to consider: who/how many crew members, how would they access the site (i.e., walk to site, vehicle, all terrain vehicle), would new access be required, would restoration be required, etc.).	Section 3.13 Proposed Project Operation and Maintenance

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
3.8 Operation and Maintenance (cont.)	If additional full time staff would be required for operation and/or maintenance, provide the number of workers and for what purpose they are required.	NA
3.9 Applicant-Proposed Measures	If there are measures that the Applicant would propose to be part of the Proposed Project, include those measures and reference plans or implementation descriptions.	Section 3.14 Applicant Proposed Measures
Chapter 4: Environmental Setting		
	For each resource area discussion within the PEA, include a description of the physical environment in the vicinity of the Proposed Project (e.g., topography, land use patterns, biological environment, etc.), including the local environment (site-specific) and regional environment.	Chapter 4 –Environmental Impact Assessment
	For each resource area discussion within the PEA, include a description of the regulatory environment/context (federal, state, and local).	Chapter 4 –Environmental Impact Assessment
	Limit detailed descriptions to those resource areas which may be subject to a potentially significant impact.	Chapter 4 –Environmental Impact Assessment

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
Chapter 5: Environmental Impact Assessment Summary		
5.1 Aesthetics	Provide visual simulations of prominent public view locations, including scenic highways, to demonstrate the views before and after project implementation. Additional simulations are highly recommended.	Figure 4.1-5: Existing View and Visual Simulation from Magnolia Avenue near South Promenade Avenue Figure 4.1-6: Existing View and Visual Simulation from Grand Boulevard Figure 4.1-7: Existing View and Visual Simulation from Interstate 15 Figure 4.1-8: Existing View and Visual Simulation from East 6th Street near Magnolia Avenue Figure 4.1-9: Existing View and Visual Simulation from Magnolia Avenue near Sherborn Street Figure 4.1-10: Existing View and Visual Simulation from River Road Park Figure 4.1-11: Existing View and Visual Simulation from Hellman Avenue and Landerwood Drive Figure 4.1-12: Existing View and Visual Simulation from James C. Huber Park
5.2 Agriculture Resources	Identify the types of agricultural resources affected.	Section 4.2 Agriculture Resources
5.3 Air Quality	Provide supporting calculations/ spreadsheets/technical reports that support emission estimates in the PEA.	Attachment 4.3-A: Air Quality Calculations
	Provide documentation of the location and types of sensitive receptors that could be impacted by the Project (e.g., schools, hospitals, houses, etc.). Critical distances to receptors are dependent on type of construction activity.	Section 4.3 Air Quality
	Identify Proposed Project GHG emissions.	Attachment 4.3-A: Air Quality Calculations Section 4.7 Greenhouse Gas Emissions
	Quantify GHG emissions from a business as usual snapshot. That is, what the GHG emissions will be from the Proposed Project if no mitigations were used.	Attachment 4.3-A:Air Quality Calculations Section 4.7 Greenhouse Gas Emissions

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
5.3 Air Quality (cont.)	Quantify GHG emission reductions from every APM that is implemented. The quantifications will be itemized and placed in tabular format.	NA
	Identify the net emissions of the Proposed Project after mitigation have been applied.	NA
	Calculate and quantify GHG emissions (CO2 equivalent) for the Proposed Project, including construction and operation.	Attachment 4.3-A: Air Quality Calculations Section 4.7 Greenhouse Gas Emissions
	Calculate and quantify the GHG reduction based on reduction measures proposed for the Proposed Project.	NA
	Propose APMs to implement and follow to maximize GHG reductions. If sufficient, CPUC will accept them without adding further mitigation measures.	Section 4.7 Greenhouse Gas Emissions
	Discuss programs already in place to reduce GHG emissions on a system-wide level. This includes the Applicant's voluntary compliance with the U.S. Environmental Protection Agency (EPA) SF6 reduction program, reductions from energy efficiency, demand response, long-term procurement plan, etc.	Section 4.7 Greenhouse Gas Emissions
	Ensure that the assessment of air quality impacts is consistent with PEA Section 3.7.5, as well as with the PEA's analysis of impacts during construction, including traffic and all other emissions.	Section 4.3 Air Quality
5.4 Biological Resources	Provide a copy of the Wetland Delineation and supporting documentation (i.e., data sheets). If verified, provide supporting documentation. Additionally, GIS data of the wetland features should be provided as well.	Attachment: 4.4-E: Jurisdictional Delineation Report GIS data provided under separate cover
	Provide a copy of special-status surveys for wildlife, botanical and aquatic species, as applicable. Any GIS data documenting locations of special-status species should be provided.	Attachment 4.4-B: Habitat Assessment Attachment 4.4-C: Biological Technical Report Attachment 4.4-D: Additional Focused Species Survey Reports GIS data provided under separate cover

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
5.5 Cultural Resources	Cultural Resources Report documenting a cultural resources investigation of the Proposed Project. This report should include a literature search, pedestrian survey, and Native American consultation.	Provided under separate confidential cover
	Provide a copy of the records found in the literature search.	Provided under separate confidential cover
	Provide a copy of all letters and documentation of Native American consultation.	Attachment 4.5-A: Native American Correspondence
5.6 Geology, Soils, and Seismic Potential	Provide a copy of the geotechnical investigation if completed, including known and potential geologic hazards such as ground shaking, subsidence, liquefaction, etc.	Attachment 4.6-A: Geotechnical Investigation Report
5.7 Hazards and Hazardous Materials	Include an Environmental Data Resources report.	Attachment 4.8-A: Phase I Environmental Site Assessment
	Include a Hazardous Substance Control and Emergency Response Plan, if required.	NA
	Include a Health and Safety Plan, if required.	NA
	Describe the Worker Environmental Awareness Program.	Section 3.10 Worker Environmental Awareness Training
	Describe which chemicals would be used during construction and operation of the Proposed Project. For example, fuels for construction, naphthalene to treat wood poles before installation, etc.	Section 4.8 Hazards and Hazardous Materials
5.8 Hydrology and Water	Describe impacts to groundwater quality including increased runoff due to construction of impermeable surfaces, etc.	Section 4.9 Hydrology and Water
	Describe impacts to surface water quality including the potential for accelerated soil erosion, downstream sedimentation, and reduced surface water quality.	Section 4.9 Hydrology and Water
5.9 Land Use and Planning	Provide GIS data of all parcels within 300 feet of the Proposed Project with the following data: APN number, mailing address, and parcel's physical address.	Provided under separate cover
5.10 Mineral Resources	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	Section 4.11 Mineral Resources
5.11 Noise	Provide long-term noise estimates for operational noise (e.g., corona discharge noise, and station sources such as substations, etc.).	Section 4.12 Noise

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
5.12 Population and Housing	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	Section 4.13 Population and Housing
5.13 Public Services	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	Section 4.14 Public Services
5.14 Recreation	Data needs already specified under Chapter 3 would generally meet the data needs for this resource area.	Section 4.15 Recreation
5.15 Transportation and Traffic	Discuss traffic impacts resulting from construction of the Proposed Project including ongoing maintenance operations.	Section 4.16 Transportation and Traffic
	Provide a preliminary description of the traffic management plan that would be implemented during construction of the Proposed Project.	Section 4.16 Transportation and Traffic
5.16 Utilities and Services Systems	Describe how treated wood poles would be disposed of after removal, if applicable.	Section 4.17 Utilities and Services
5.17 Cumulative Analysis	Provide a list of projects (i.e., past, present, and reasonably foreseeable future projects) within the Proposed Project area that the applicant is involved in.	Section 6.1 Cumulative Impacts
	Provide a list of projects that have the potential to be proximate in space and time to the Proposed Project. Agencies to be contacted include, but are not limited to, the local planning agency, Caltrans, etc.	Section 6.1 Cumulative Impacts
5.18 Growth-Inducing Impacts, If Significant	Provide information on the Proposed Project's growth- inducing impacts, if any.	Section 6.2 Growth-Inducing Impacts
	Provide information on any economic or population growth in the surrounding environment that will, directly or indirectly, result from the Proposed Project.	Section 6.2 Growth-Inducing Impacts
	Provide information on any increase in population that could further tax existing community service facilities (e.g., schools, hospitals, fire, police, etc.), that will directly or indirectly result from the Proposed Project.	Section 6.2 Growth-Inducing Impacts
	Provide information on any obstacles to population growth that the Proposed Project would remove.	Section 6.2 Growth-Inducing Impacts
	Describe any other activities, directly or indirectly encouraged or facilitated by the Proposed Project that would cause population growth that could significantly affect the environment, either individually or cumulatively.	Section 6.2 Growth-Inducing Impacts

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
Chapter 6: Detailed Discussion of Significant Impacts		
6.1 Mitigation Measures Proposed to Minimize Significant Effects	Discuss each mitigation measure and the basis for selecting a particular mitigation measure should be stated.	Section 3.14 Applicant-Proposed Measures Table 3-8: Applicant-Proposed Measures
6.2 Description of Project Alternatives and Impact Analysis	Provide a summary of the alternatives considered that would meet most of the objectives of the Proposed Project and an explanation as to why they were not chosen as the Proposed Project.	Section 1.5.1 Electrical System Alternatives Chapter 2 – Project Alternatives Chapter 5 – Comparison of Alternatives
	Alternatives considered and described by the Applicant should include, as appropriate, system or facility alternatives, route alternatives, route variations, and alternative locations.	Section 1.5.1 Electrical System Alternatives Chapter 2 – Project Alternatives Chapter 5 – Comparison of Alternatives
	A description of a “No Project Alternative” should be included.	Section 1.5.1 Electrical System Alternatives
	If significant environmental effects are assessed, the discussion of alternatives shall include alternatives capable of substantially reducing or eliminating any said significant environmental effects, even if the alternative(s) substantially impede the attainment of the Proposed Project objectives and are more costly.	Chapter 5 – Comparison of Alternatives
6.3 Growth-Inducing Impacts	Discuss if the Proposed Project would foster economic or population growth, either directly or indirectly, in the surrounding environment.	Section 6.2 Growth-Inducing Impacts
	Discuss if the Proposed Project would cause an increase in population that could further tax existing community services (e.g., schools, hospitals, fire, police, etc.).	Section 6.2 Growth-Inducing Impacts
	Discuss if the Proposed Project would remove obstacles to population growth.	Section 6.2 Growth-Inducing Impacts
	Discuss if the Proposed Project would encourage and facilitate other activities that would cause population growth that could significantly affect the environment, either individually or cumulatively.	Section 6.2 Growth-Inducing Impacts

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions	Include a menu of suggested APMs that applicants can consider to address GHG emissions. Suggested APMs include, but are not limited to:	NA
	1. If suitable park-and-ride facilities are available in the Project vicinity, construction workers will be encouraged to carpool to the job site to the extent feasible. The ability to develop an effective carpool program for the Proposed Project would depend upon the proximity of carpool facilities to the job site, the geographical commute departure points of construction workers, and the extent to which carpooling would not adversely affect worker show-up time and the Project's construction schedule.	
	2. To the extent feasible, unnecessary construction vehicle and idling time will be minimized. The ability to limit construction vehicle idling time is dependent upon the sequence of construction activities and when and where vehicles are needed or staged. Certain vehicles, such as large diesel powered vehicles, have extended warm-up times following start-up that limit their availability for use following startup. Where such diesel powered vehicles are required for repetitive construction tasks, these vehicles may require more idling time. The Proposed Project will apply a "common sense" approach to vehicle use; if a vehicle is not required for use immediately or continuously for construction activities, its engine will be shut off. Construction foremen will include briefings to crews on vehicle use as part of pre-construction conferences. Those briefings will include discussion of a "common sense" approach to vehicle use.	
	3. Use low-emission construction equipment. Maintain construction equipment per manufacturing specifications and use low emission equipment described here. All offroad construction diesel engines not registered under the California Air Resources Board (CARB) Statewide Portable Equipment Registration Program shall meet at a minimum the Tier 2 California Emission Standards for Off-Road Compression-Ignition Engines as specified in California Code of Regulations, Title 13, Sec. 2423(b)(1).	
	4. Diesel Anti-Idling: In July 2004, the CARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.	
	5. Alternative Fuels: CARB would develop regulations to require the use of one to four percent biodiesel displacement of California diesel fuel.	
	6. Alternative Fuels: Ethanol, increased use of ethanol fuel	

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
6.4 Suggested Applicant-Proposed Measures to address GHG Emissions (cont.)	7. Green Buildings Initiative.	NA
	8. Facility wide energy efficiency audit.	
	9. Complete GHG emissions audit. The audit will include a review of the GHG emitted from those facilities (substations), including carbon dioxide, methane, CFC, and HFC compounds (SF_6).	
	10. There is an EPA approved SF_6 emissions protocol (http://www.epa.gov/electricpowersf6/resources/index.html#three).	
	11. SF_6 program wide inventory. For substations, keep inventory of leakage rates.	
	12. Increase replacement of breakers once leakage rates exceed one percent within 30 days of detection.	
	13. Increased investment in current programs that can be verified as being in addition to what the utility is already doing.	
	14. The SF_6 Emission Reduction Partnership for the Electric Power Systems was launched in 1999 and currently includes 57 electric utilities and local governments across the U.S.	
	15. SF_6 is used by this industry in a variety of applications, including that of dielectric insulating material in electrical transmission and distribution equipment, such as circuit breakers. Electric power systems that join the Partnership must, within 18 months, establish an emission reduction goal reflecting technically and economically feasible opportunities within their company. They also agree to, within the constraints of economic and technical feasibility, estimate their emissions of SF_6, establish a strategy for replacing older, leakier pieces of equipment, implement SF_6 recycling, establish and apply proper handling techniques, and report annual emissions to the EPA. The EPA works as a clearinghouse for technical information, works to obtain commitments from all electric power system operators and will be sponsoring an international conference in 2000 on SF_6 emission reductions.	
	16. Quantify what comes into the system and track programmatically SF_6.	
	17. Applicant can propose other GHG reducing mitigations.	

Location in CPUC Checklist	Checklist Item	Location in PEA and any Associated Notes
Chapter 7: Other Process-Related Data Needs		
Noticing	Include an excel spreadsheet that identifies all parcels within 300 feet of any Proposed Project component with the following data: APN number, owner mailing address, and parcels physical address.	Provided under separate cover

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CHAPTER 3 – PROJECT DESCRIPTION

CHAPTER 4 – ENVIRONMENTAL IMPACT ASSESSMENT

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LIST OF ABBREVIATIONS AND ACRONYMS

°C	degrees Celsius
1987 Wetlands Manual	*Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region*
3-D	three-dimensional
A.D.	Anno Domini
AAI	All Appropriate Inquiries
AAQS	ambient air quality standards
AB	Assembly Bill
ACSR	aluminum conductor steel-reinforced
ANSI	American National Standards Institute
APLIC	Avian Power Line Interaction Committee
APM	applicant-proposed measure
APN	assessor's parcel number
AQMP	Air Quality Management Plan
Arid West Supplement	*Corps of Engineers Wetlands Delineation Manual*
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BMP	best management practice
BP	before present
Burrtec	Burrtec Waste Industries, Inc.
C-CAP	Corona Climate Action Plan
ca.	circa
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAL FIRE	California Department of Forestry and Fire Protection
Cal/OSHA	California Division of Occupational Safety and Health
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDA	Chino Basin Desalter Authority
CDFG	California Department of Fish and Game
CDFW	California Department of Fish and Wildlife
CEHS	Corporate Environmental Health and Safety
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CGC	California Government Code
CGS	California Geological Survey

CH_4	methane
CIWMP	Riverside Countywide Integrated Waste Management Plan
cmil	circular mil
CMP	Congestion Management Plan
CMS	Congestion Management System
CNDDB	California Natural Diversity Database
CNEL	Community Noise Equivalent Level
CNF	Cleveland National Forest
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CO_2	CO_2 equivalent
COD	chemical oxygen demand
COLE	coefficient of linear extensibility
CPUC	California Public Utilities Commission
CRHR	California Register of Historical Resources
CRPR	California Rare Plant Rank
CUPA	Certified Unified Program Agency
CWA	Clean Water Act
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
DBESP	Determination of Biologically Equivalent of Superior Preservation
DLRP	Division of Land Resource Protection
DOC	Department of Conservation
DOT	Department of Transportation
DPM	Diesel Particulate Matter
DSFF	Delhi Sands flower-loving fly
DTSC	Department of Toxic Substances Control
EMS	emergency medical services
EMS	Energy Management System
ENA	Electrical Needs Area
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
ESA	environmentally sensitive area
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FESA	federal Endangered Species Act
FLP	Forest Legacy Program
FMMP	Farmland Mapping and Monitoring Program
FRAP	Fire and Resource Assessment Program
FRC	fault return conductor
FTA	Federal Transit Administration
g	gravity
G.O.	General Order
GHG	greenhouse gas

GIS .... gas-insulated switchgear
GIS .... geographic information system
GPS .... Global Positioning System
GWP .... global warming potential
HCP .... Habitat Conservation Plan
HFC .... hydrofluorocarbon
HMBP .... hazardous material business plan
HMMP .... Hazardous Materials Management Plan
HMTA .... Hazardous Materials Transportation Act
HSC .... Health and Safety Code
HWCL .... Hazardous Waste Control Law
I- .... Interstate
ICF .... ICF International, Inc.
IEEE .... Institute of Electrical and Electronic Engineers
IEUA .... Inland Empire Utilities Agency
INA .... Information Not Available
IPCC .... Intergovernmental Panel on Climate Change
ITP .... Incidental Take Permit
JCSD .... Jurupa Community Services District
KOP .... key observation point
kV .... kilovolt
L_{dn} .... Day-Night Average Sound Level
LEPC .... Local Emergency Planning Committee
L_{eq} .... equivalent noise level
LOS .... Level of Service
LWS .... light-weight steel
MAST .... Mountain Area Safety Taskforce
MBTA .... Migratory Bird Treaty Act
MEER .... Mechanical and Electrical Equipment Room
MLD .... Most Likely Descendant
mm/yr .... millimeters per year
$MMTCO_2e$ .... million metric tons of CO_2e
mph .... miles per hour
MRZ .... Mineral Resource Zone
MSDS .... Material Safety Data Sheets
MSHCP .... Multiple Species Habitat Conservation Plan
$MTCO_2e$ .... metric tons per year of CO_2e
MVA .... megavolt-ampere
MVAR .... megavar
MW .... megawatt
M_w .... moment magnitude
N_2O .... nitrous oxide
NA .... not applicable
NAAQS .... National Ambient Air Quality Standards
NAHC .... Native American Heritage Commission
NCCP .... Natural Communities Conservation Plan

NEMA .... National Electrical Manufacturers Association
NESC .... National Electrical Safety Code
NFIP .... National Flood Insurance Program
NMC .... New Model Colony Specific Plan area
NO_2 .... nitrogen dioxide
NOAA .... National Oceanic and Atmospheric Administration
NO_x .... nitrogen oxides
NPDES .... National Pollutant Discharge Elimination System
NPS .... National Park Service
NRCS .... Natural Resource Conservation Service
NRHP .... National Register of Historic Places
O_3 .... ozone
O&M .... operation and maintenance
OES .... Office of Emergency Services
OHP .... Office of Historic Preservation
OHWM .... ordinary high water mark
OMR .... Office of Mine Reclamation
OPGW .... optical ground wire
OSHA .... Occupational Safety and Health Administration
PEA .... Proponent's Environmental Assessment
Pechanga .... Pechanga Band of Luiseño Indians
PERP .... Portable Equipment Registration Program
PFC .... perfluorocarbon
PLC .... Programmable Logic Controller
PM .... particulate matter
$PM_{2.5}$ .... PM less than 2.5 microns in diameter
PM_{10} .... PM less than 10 microns in diameter
ppm .... parts per million
PPV .... peak particle velocity
PRC .... Public Resources Code
PRD .... Planned Residential Development
Proposed Project .. Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project
PSE .... Participating Special Entity
PSHA .... Probabilistic Seismic Hazard Assessment
PVC .... polyvinyl chloride
Q .... quarter
RCA .... Regional Conservation Authority
RCFD .... Riverside County Fire Department
RCRA .... Resource Conservation and Recovery Act
RCTC .... Riverside County Transportation Commission
REC .... Recognized Environmental Condition
ROG .... reactive organic compound
ROW .... right-of-way
RQ .... reportable quantities
RTA .... Riverside Transit Agency
RWQCB .... Regional Water Quality Control Board

SAC .... stranded aluminum conductor
SANBAG .... San Bernardino Associated Governments
SARA .... Superfund Amendments and Reauthorization Act
SAS .... Substation Automation System
SB .... Senate Bill
SBCFD .... San Bernardino County Fire Department
SCAG .... Southern California Association of Governments
SCAQMD .... South Coast Air Quality Management District
SCE .... Southern California Edison
SDC .... seismic design category
SDWA .... Safe Drinking Water Act
SF_6 .... sulfur hexafluoride
SIP .... State Implementation Plan
SMARA .... California Surface Mining and Reclamation Act of 1975
SMGB .... State Mining and Geology Board
SO_2 .... sulfur dioxide
Soboba .... Soboba Band of Luiseño Indians
SoCAB .... South Coast Air Basin
SO_x .... sulfur oxides
SPCC .... Spill Prevention Control and Countermeasures
SR- .... State Route
SSC .... Species of Special Concern
SWCA .... SWCA Environmental Consultants
SWP .... State Water Project
SWPPP .... Storm Water Pollution Prevention Plan
SWRCB .... State Water Resources Control Board
TAC .... toxic air contaminant
TCAP .... Temescal Canyon Area Plan
TDS .... total dissolved solids
TMDL .... Total Maximum Daily Load
TPZ .... timberland production zone
TQ .... threshold quantity
TSP .... tubular steel poles
U.S. .... United States
U.S.C. .... U.S. Code
USACE .... U.S. Army Corps of Engineers
USDA .... U.S. Department of Agriculture
USFS .... U.S. Forest Service
USFWS .... U.S. Fish and Wildlife Service
USGS .... U.S. Geological Survey
UST .... underground storage tank
V/C .... volume to capacity
VOC .... volatile organic compound
VP .... viewpoint
WDID .... Wastewater Discharge Identification
WDR .... Waste Discharge Requirement

WEAP ....Worker Environmental Awareness Plan
WMWD...Western Municipal Water District
WRCRWA .... Western Riverside County Regional Wastewater Authority

CHAPTER 1 – PURPOSE AND NEED

Southern California Edison (SCE) proposes to construct the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project) to serve current and projected demand for electricity and to maintain electric system reliability in portions of northwestern Riverside County, including the cities of Corona and Norco, and the surrounding areas of unincorporated Riverside County. This area is known as the Electrical Needs Area (ENA) and is depicted in Figure 1-1: Electrical Needs Area. The Proposed Project would include the following major components:

- Construction of a new 66/12 kilovolt (kV) substation (Circle City Substation). The proposed Circle City Substation would be an unstaffed, automated, low-profile 56 megavolt-ampere (MVA) substation with a potential capacity of 112 MVA at final build out.

- Construction of four new 66 kV subtransmission source lines, including:

  - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction.[1] Each source line would be approximately 1.2 miles in length and would be created by connecting to the existing Chase-Corona-Databank 66 kV Subtransmission Line to form the new Circle City-Corona No. 2 66 kV Subtransmission Line and the new Chase-Circle City-Databank 66 kV Subtransmission Line.

  - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction. Each source line would be approximately 3.5 miles in length and would be created by connecting to the existing Mira Loma-Corona-Pedley 66 kV Subtransmission Line to form the Mira Loma-Circle City-Pedley and the Circle City-Corona No. 1 66 kV subtransmission lines.

- Construction of a new 66 kV subtransmission line, which would be a combination of both overhead and underground construction. The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be approximately 10.9 miles in length and would be constructed from SCE's existing Mira Loma 220/66 kV Substation to a location adjacent to SCE's existing Corona 66/12 kV Substation.

- Upgrade Mira Loma Substation to accommodate the new Mira Loma-Jefferson 66 kV Subtransmission Line.

- Construction of approximately six new underground 12 kV distribution getaways exiting the proposed Circle City Substation.

[1] A double-circuit configuration consists of two independent 66 kV lines routed on the same support structures. In overhead construction, both 66 kV subtransmission lines would be routed on the same poles. In an underground construction, both 66 kV subtransmission lines would be routed down from a single pole and then continue underground through a single underground system.

- Relocation of approximately 1.9 miles of an existing overhead 33 kV distribution line to a new underground duct bank.

- Installation of telecommunications facilities to connect the Proposed Project to SCE's existing telecommunications system.

The Proposed Project is planned to be operational by 2021 to ensure that safe and reliable electrical service is available to serve customer demand in the ENA.

1.1 Project Purpose

Under the rules, guidelines, and regulations of several agencies—including the Federal Energy Regulatory Commission, the North American Electric Reliability Corporation, the Western Electricity Coordinating Corporation, and the California Public Utilities Commission—electrical transmission, subtransmission, and distribution systems must have sufficient capacity to maintain safe, reliable, and adequate service to customers. System safety and reliability must be maintained under normal system conditions, when all facilities are in service, and under abnormal system conditions. Abnormal system conditions result from equipment or line failures; maintenance outages; or outages that cannot be predicted or controlled due to weather, earthquakes, traffic accidents, and other unforeseeable events. The purpose of the Proposed Project is to ensure the availability of safe and reliable electric service to meet customer demand in the ENA.

1.2 Electrical Needs Area

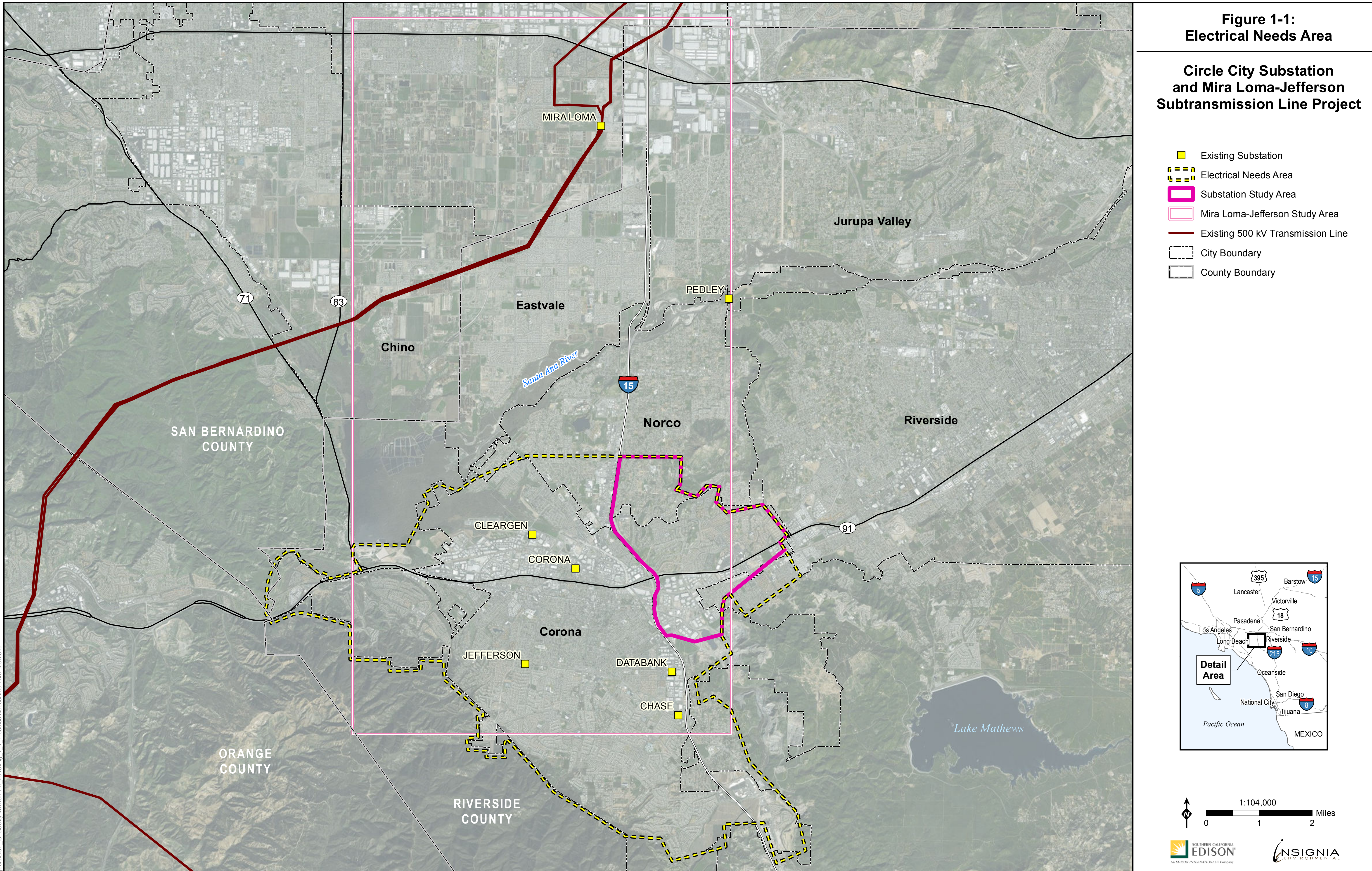
The ENA for the Proposed Project is served by a portion of SCE's Mira Loma 220 kV System. The Mira Loma 220 kV System is primarily comprised of 220/66 kV transformers, 66 kV subtransmission lines, 66/12 kV transformers, and 12 kV distribution lines. At Mira Loma Substation, electrical transmission voltage is transformed from 220 kV to 66 kV and distributed by 66 kV subtransmission lines to 66/12 kV distribution substations within the Mira Loma System.

Figure 1-1: Electrical Needs Area depicts SCE's distribution substations that currently serve the ENA, which are Corona, Chase, and Jefferson substations. The Corona, Chase, and Jefferson substations provide electrical service to approximately 59,000 metered customers within the ENA.

The SCE 66 kV subtransmission lines that currently serve the ENA are the Mira Loma-Corona, Mira Loma-Corona-Jefferson, Mira Loma-Corona-Pedley, Cleargen-Jefferson, and Archibald-Chino-Corona subtransmission lines. These lines form a network of 66 kV subtransmission lines, which ultimately originate at Mira Loma Substation and terminate at the various distribution substations within the ENA. Figure 1-2: Existing and Proposed System Configuration depicts the existing and proposed subtransmission line configuration.

Figure 1-1: Electrical Needs Area

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project



Sources: Insignia, 2015; SCE, 2015

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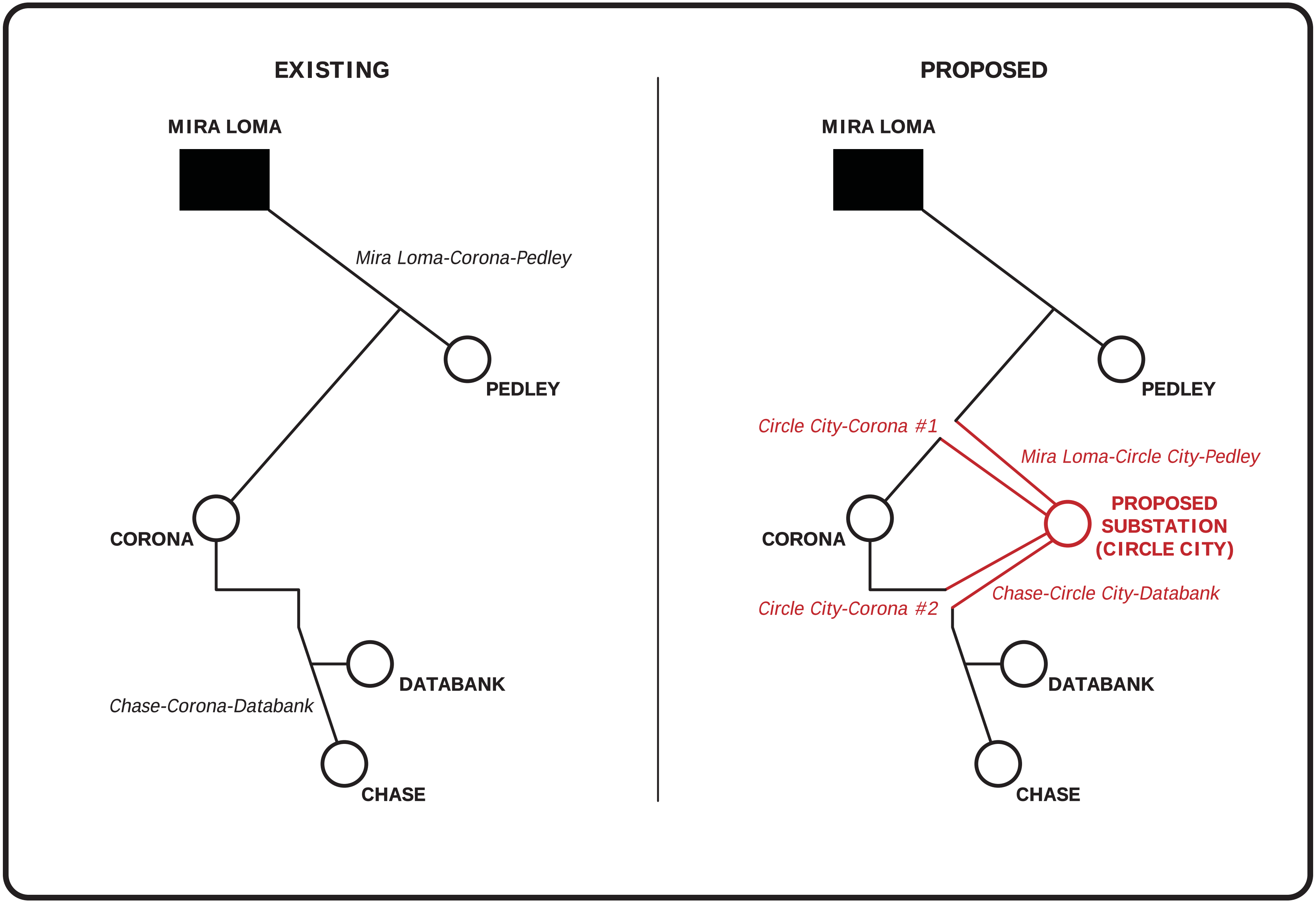

Figure 1-2: Existing and Proposed System Configuration

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1.3 Planning Process

The Proposed Project has three main components: a 66/12 kV substation, four 66 kV subtransmission source lines to the new substation, and a 66 kV subtransmission line. As described in Section 1.4.3 Project Need, the 66 kV subtransmission line is needed independently of the substation. Constructing only the substation would not entirely serve the electrical demands of the ENA and would only address the projected distribution substation capacity deficiency. Due to overload conditions that would occur on two existing subtransmission lines, the subtransmission line capacity required to serve the ENA substations would be inadequate. Accordingly, the Proposed Project includes both the subtransmission line component and the substation component (with the associated subtransmission source lines component).

Each of the Proposed Project components have specific planning processes and address different needs; the planning process and need for each component are described in the following subsections.

1.3.1 Distribution System Planning Process

SCE's annual distribution system planning process is designed to ensure that the required capacity and operational flexibility of the distribution system is available to safely and reliably meet the projected peak electrical demands under normal and abnormal system configurations.

The planning process evaluates recorded peak electrical demand values as a starting point for the 10-year forecast. From this starting point, annual values of projected growth in electrical demand are established through analysis of data, such as historical load growth values, near-term known future load growth projects, energy efficiency programs, distributed energy resources, and economic conditions. Once a starting point and load growth forecast is established, the projected peak electrical demand values are adjusted to represent the expected demand during periods of extreme heat. These occur when temperatures exceed the 10-year average peak temperature. SCE establishes this value by forecasting the value of electrical demand for when the temperature would equal the 10-year average peak temperature. SCE then adjusts this value to represent the forecasted peak electrical demand during 1-in-10-year heat storm conditions, known as the criteria projected demand.

SCE then evaluates the performance of the distribution system using the criteria projected demand value with all electrical facilities in-service and then again with single elements of the electrical system out-of-service; these are known as normal and abnormal system configurations, respectively. When the criteria projected demand value exceeds the maximum operating limits of the existing electrical facilities, a project is identified to keep the electrical system within the specified loading limits.

1.3.2 Subtransmission System Planning Process

SCE's annual subtransmission system planning process is designed to ensure that there is adequate capacity and operational flexibility to provide electrical service to the distribution substations during peak electrical demand periods both under normal system conditions (when all subtransmission lines are in-service) and under specific abnormal system conditions (when any one subtransmission line is out-of-service). Power flow studies of a network of subtransmission lines evaluate the specific power flows that occur on the lines within the network. The power flow values that result are dictated by the electrical demand values of the distribution substations served by the subtransmission lines and the characteristics of the power lines themselves (e.g., impedance of the lines). The peak electrical demand values for the ENA used for the subtransmission planning process also occur during periods of extreme heat and use the distribution substation planning process as input values.

When studies determine there is insufficient capacity to provide service while preventing overloads from occurring, a project is identified to keep the electrical system within specified loading limits.

1.4 System Needs

1.4.1 Distribution System Need

The amount of electrical power that can be distributed throughout the ENA is limited to the amount of electrical demand that the Corona, Chase, and Jefferson substations can serve before exceeding the maximum operating limits. The combined operating capacity[2] of these substations is limited to 434.6 MVA under a normal system configuration. In 2021, the projected electrical demand is forecasted to be 435.2 MVA and without the Proposed Project, it would exceed the maximum operating limits.

Table 1-1: Electrical Needs Area Substation Capacity and Peak Demand and Figure 1-3: Electrical Needs Area Substation Capacity and Peak Demand show the combined values of Corona, Chase, and Jefferson substations for the maximum operating limit, historical peak demand, and forecasted peak demand. Figure 1-3: Electrical Needs Area Substation Capacity and Peak Demand is a chart of the data in Table 1-1: Electrical Needs Area Substation Capacity and Peak Demand. The projected peak demand value is forecasted to exceed the maximum operating limit of the substations in 2021. Unaddressed, this overload condition would prevent SCE from safely and reliably serving all of the electrical demand within the ENA. Therefore, a substation project is needed to supply additional transformer capacity and distribution circuitry to provide service to the ENA. Section 1.5 Electrical System Evaluation proposes system alternatives to address this distribution substation capacity deficiency.

[2] Throughout this Proponent's Environmental Assessment (PEA), SCE utilizes MVA as the unit of measure rather than megawatt (MW), which represents electrical facility capacity ratings and electrical demand values. Most major electrical facilities have capacity ratings and electrical demand values provided in units that are either MVA and/or amps. Alternating current power has two components: MW and megavars (MVAR) which together represent the total power (or burden on electrical facilities) in MVA. At a specific system operating voltage, power can be represented by MVA and can be easily converted to amps for use in comparing electrical facility capacity ratings to electrical demand values. The unit MVA was selected to represent all electrical facility capacity ratings and electrical demand values as it captures the MVAR component, whereas, the MW unit does not. Use of only MW to represent capacity ratings or electrical demand is understating the true capacity of the electrical facility or burden of the electrical demand.

Table 1-1: Electrical Needs Area Substation Capacity and Peak Demand

Historical	2010	2011	2012	2013	2014
	All Values in MVA				
Maximum Operating Limit	420	420	435	435	435
Peak Demand - Normal Weather	363	377	364	369	364
Peak Demand - Criteria Projected	398	413	399	404	397
Reserve (Max. Oper. Limit - Criteria Proj.)	57	43	71	66	71
% Utilization (Criteria Proj. ÷ Max. Oper. Limit)	86%	90%	84%	85%	84%
Forecasted	**2015**	**2016**	**2017**	**2018**	**2019**
	All Values in MVA				
Maximum Operating Limit	435	435	435	435	435
Peak Demand - Normal Weather	368	373	379	384	389
Peak Demand - Criteria Projected	401	407	413	419	424
Reserve (Max. Oper. Limit - Criteria Proj.)	33	28	21	16	10
% Utilization (Criteria Proj. ÷ Max. Oper. Limit)	92%	94%	95%	96%	98%
Forecasted	**2020**	**2021**	**2022**	**2023**	**2024**
	All Values in MVA				
Maximum Operating Limit	435	435	435	435	435
Peak Demand - Normal Weather	394	399	405	410	415
Peak Demand - Criteria Projected	430	435	441	447	452
Reserve (Max. Oper. Limit - Criteria Proj.)	5	(0.7)	(6)	(12)	(18)
% Utilization (Criteria Proj. ÷ Max. Oper. Limit)	99%	100%	101%	103%	104%

Notes: In 2012, an upgrade was performed at Jefferson Substation bringing it to its ultimate design capacity. Chase and Corona substations are also each currently at ultimate design capacity.

1.4.2 Subtransmission System Need

The amount of electrical power that can be delivered to the distribution substations in the ENA is limited to the maximum amount of electrical demand that the Mira Loma-Corona-Jefferson, Mira Loma-Corona, Mira Loma-Corona-Pedley, Cleargen-Jefferson, and Archibald-Chino-Corona 66 kV subtransmission lines can provide before any individual subtransmission line operating limit is exceeded. Each of the 66 kV subtransmission lines providing service to the ENA has operating limits of 125 MVA under normal system conditions and 168 MVA under abnormal system conditions.[3]

1.4.2.1 Abnormal System Conditions

In 2016, under peak electrical demand conditions and an abnormal system configuration, the operating limit of the Mira Loma-Corona-Jefferson 66 kV Subtransmission Line is projected to

[3] Under abnormal system conditions of the 66 kV subtransmission system, the remaining 66 kV lines are permitted to operate at a higher rating (termed "N-1 capacity limit") for a limited period of time to allow for continuity of electrical service while repairs are performed on the out-of-service line.

be exceeded during an N-1 outage to the Mira Loma-Cleargen-Delgen 66 kV Subtransmission Line.

As the overload under abnormal conditions is projected to occur in 2016 and prior to the planned operational date of 2021 for the Proposed Project, SCE proposes to mitigate the projected abnormal system condition overload by implementing a temporary system operating procedure that would minimize the projected abnormal system condition overload, were it to occur, for the years 2016 through 2020.

The proposed temporary mitigation plan would not involve any construction activities and would consist of SCE system operators implementing an operating procedure, which would result in a short-term system reconfiguration of the 66 kV lines. This would cause the redirection of power flow for the duration of the projected overload and would address the projected overload condition. Without a mitigation plan, system operators would plan to turn off electrical service to customers to reduce the burden on the overloaded line until it was back within maximum operating limits. This temporary mitigation plan would minimize the amount of electrical demand at risk of being interrupted to keep the subtransmission lines within maximum operating limits.

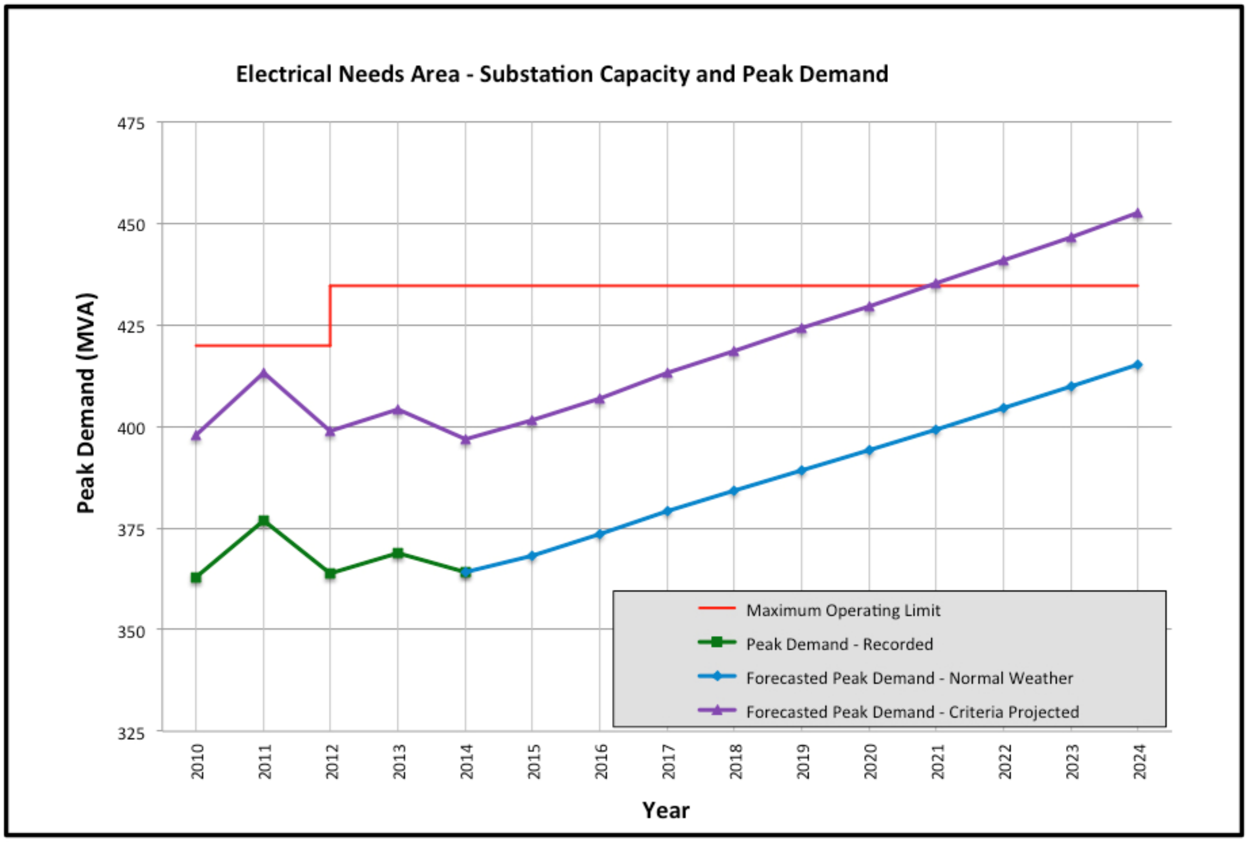
SCE’s subtransmission system is designed to be a network of lines serving the distribution substations within the system. In general, several lines emanate from the transmission source substation and connect to the nearby distribution substations. Lines from those substations then connect to the other substations forming a network of lines similar to a network of freeways connecting multiple cities. The principal behind the use of a networked design is that it provides reliability and operational flexibility so that in the event there is an outage of one of the lines (planned or unplanned), none of the customers within the network are left without electrical service as the power has multiple routes available to provide service to the distribution substations.

During the unplanned outage of one subtransmission line, the proposed operating procedure would separate the subtransmission network by temporarily taking a second subtransmission line out-of-service which would redirect the power flow, preventing the projected overload from occurring. As a result however, there would be a corresponding reduction in reliability and operational flexibility and the introduction of the possibility of the loss-of-service to two substations. The proposed mitigation would result in two subtransmission lines no longer being networked with other lines. The first line would be the only source line to two substations and the other line would be the only source line to one substation. During this configuration, an outage to either of those two lines would result in the complete loss of power of up to two entire substations.

SCE’s planning analysis and system design considers normal conditions (all facilities in-service) and abnormal conditions (any one facility out-of-service). With the mitigation plan in effect, there would be the risk of the loss-of-service to a significant number of customers; however, this would require the unlikely event of the concurrent outage of two subtransmission lines.

This mitigation plan, and its associated risks, would only be acceptable because it is temporary, it limits the load-at-risk under standard planning conditions, and there is a planned permanent solution (the Proposed Project) that is projected to be completed by 2021.

Figure 1-3: Electrical Needs Area Substation Capacity and Peak Demand



1.4.2.2 Normal System Conditions

In 2019, under peak electrical demand conditions and a normal system configuration, the operating limit of the Mira Loma-Corona 66 kV Subtransmission Line is projected to be exceeded. As the overload under normal conditions is projected to occur in 2019 and prior to the planned operational date of the Proposed Project, SCE proposes to mitigate the projected normal system condition overload by implementing a temporary operating procedure, similar to that for the abnormal condition described previously. This mitigation would minimize the projected normal system condition overload for the years 2019 and 2020.

The proposed temporary mitigation plan would not involve any construction activities and would consist of SCE system operators performing a short-term system reconfiguration of the 66 kV lines, which would result in the redirection of power flow for the duration of the projected overload. This temporary mitigation plan would minimize the normal system condition overload and limit the amount of electrical demand at risk of being interrupted to keep the subtransmission lines within maximum operating limits. This operating procedure temporarily reduces the number of subtransmission lines serving Corona Substation from five to four. This mitigation plan is acceptable only because it is temporary, it limits the load-at-risk, and there is a planned permanent solution (the Proposed Project) that is projected to be completed by 2021.

Upon completion of the Proposed Project, the projected overloads of the subtransmission lines identified under both abnormal and normal system conditions would be addressed throughout the remainder of the planning horizon.

Table 1-2: Mira Loma-Corona-Jefferson Subtransmission Line Capacity and Peak Demand – Abnormal System Conditions shows the maximum operating limit and projected demand value for the Mira Loma-Corona 66 kV Subtransmission Line with all facilities in-service. Table 1-3: Mira Loma-Corona Subtransmission Line Capacity and Peak Demand – Normal System Conditions shows the maximum operating limit and projected demand value for the Mira Loma-Corona-Jefferson and Mira Loma-Corona 66 kV subtransmission lines during an outage of the Cleargen-Jefferson 66 kV Subtransmission Line Figure 1-4: Subtransmission Line Capacity and Peak Demand shows the maximum operating limit and projected peak demand values under abnormal and normal system conditions for the Mira Loma-Corona-Jefferson 66 kV and Mira Loma-Corona subtransmission lines.

Unaddressed, these overload conditions would prevent SCE from safely and reliably serving the electrical demand to the ENA. Therefore, a project is needed to provide additional 66 kV subtransmission line capacity to the ENA. Section 1.5 Electrical System Evaluation proposes system alternatives to address this subtransmission line capacity deficiency.

1.4.3 Project Need

As described previously, the projected electrical demand within the ENA is forecasted to exceed the maximum operating capacities of both the subtransmission lines and the distribution substations serving the ENA. To resolve these capacity deficiencies, additional subtransmission line capacity and a distribution substation is required and would be provided by the Proposed Project.

Table 1-2: Mira Loma-Corona-Jefferson Subtransmission Line Capacity and Peak Demand – Abnormal System Conditions

			Year				
			2015	2016	2017	2018	2019
			Line Capacity (MVA)				
66 kV Line	Line Outage	N-1	168	168	168	168	168
Mira Loma-Corona-Jefferson	Mira Loma-Cleargen Delgen	Line Loading (MVA)	166	168	175	177	180
		Utilization	99%	100%	104%	105%	107%
Mira Loma-Corona	Mira Loma-Cleargen Delgen	Line Loading (MVA)	151	153	156	158	160
		Utilization	90%	91%	93%	94%	96%

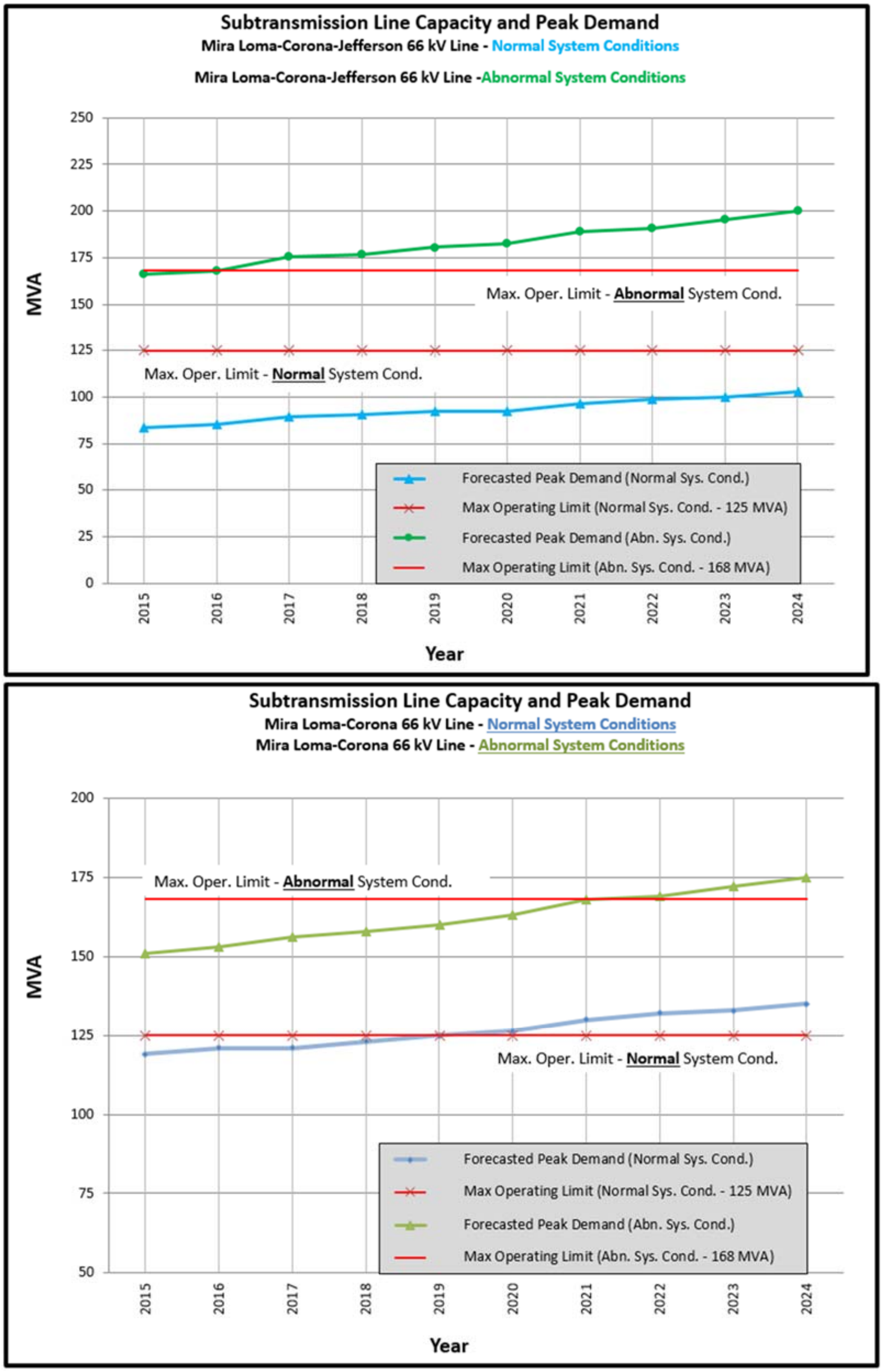
			Year				
			2020	2021	2022	2023	2024
			Line Capacity (MVA)				
66 kV Line	Line Outage	N-1	168	168	168	168	168
Mira Loma-Corona-Jefferson	Mira Loma-Cleargen Delgen	Line Loading (MVA)	183	189	191	195	200
		Utilization	109%	112%	114%	116%	119%
Mira Loma-Corona	Mira Loma-Cleargen Delgen	Line Loading (MVA)	163	168	169	172	175
		Utilization	97%	100%	101%	102%	104%

Table 1-3: Mira Loma-Corona Subtransmission Line Capacity and Peak Demand – Normal System Conditions

		Year				
		2015	2016	2017	2018	2019
		Line Capacity (MVA)				
66 kV Line	Base Case	125	125	125	125	125
Mira Loma-Corona	Line Loading (MVA)	119	121	121	123	125
	Utilization	95%	97%	97%	99%	100%

		Year				
		2020	2021	2022	2023	2024
		Line Capacity (MVA)				
66 kV Line	Base Case	125	125	125	125	125
Mira Loma-Corona	Line Loading (MVA)	126.3	130	132	133	135
	Utilization	101.0%	104%	106%	106%	108%

Figure 1-4: Subtransmission Line Capacity and Peak Demand



The Mira Loma-Jefferson 66 kV Subtransmission Line is needed independently of the proposed Circle City Substation in order to address the capacity deficiency of the Mira Loma-Corona 66 kV Subtransmission Line under normal system conditions and the capacity deficiency of the Mira Loma-Corona-Jefferson and Mira Loma-Corona 66 kV subtransmission lines under abnormal system configurations. These projected overload conditions would occur regardless of whether the proposed Circle City Substation is constructed.

As described previously, constructing only the proposed Circle City Substation would not entirely serve the electrical demands of the ENA. It would address the projected distribution substation capacity deficiency, but due to the overload conditions that would occur on both the Mira Loma-Corona-Jefferson and the Mira Loma-Corona 66 kV subtransmission lines, the required subtransmission line capacity to the ENA substations would be inadequate. Because construction of the proposed Circle City Substation would not have independent utility from the subtransmission line, SCE defined the Proposed Project to include both Circle City Substation and the Mira Loma-Jefferson 66 kV Subtransmission Line.

1.5 Electrical System Evaluation

Due to the projected distribution substation and 66 kV subtransmission line overloads in the ENA, which were described previously, SCE evaluated several system modification alternatives for the ability to provide the required capacity to the ENA. SCE uses a four-step process to develop system modification alternatives, which is summarized as follows:

1. Perform technical engineering analyses to determine whether modifying electrical equipment at existing facilities could accommodate the forecasted peak electrical demand.

2. If the forecasted peak electrical demand cannot be accommodated by modifying existing electrical facilities, then develop system alternatives that consider new facilities.

3. Evaluate each system alternative with the following considerations:

   – The extent to which the alternative would substantially meet the forecasted peak electrical demand.
   – The feasibility of an alternative, that considers capacity limits, the ability to upgrade the system at existing sites, and economic viability.

4. If an alternative is not feasible, eliminate it from further consideration.

1.5.1 Electrical System Alternatives

1.5.1.1 System Alternative 1: No Project

Under System Alternative 1, no action would be taken. System Alternative 1 would involve no construction of new facilities and no modifications to the existing system.

1.5.1.2 System Alternative 2: Add Capacity at Existing Substations/Existing Subtransmission Lines

System Alternative 2 evaluated any potential upgrades to the existing Corona, Chase, and Jefferson substations to increase the capacity to serve the distribution system needs. It would also include upgrades to the existing 66 kV subtransmission system, where appropriate, to address the projected overloads on the Mira Loma-Corona-Jefferson and Mira Loma-Corona 66 kV subtransmission lines.

Potential upgrades to the substations were evaluated and included activities such as transformer additions and replacements, as well as the addition and replacement of related substation equipment to increase capacity. Potential upgrades to the 66 kV subtransmission system were also evaluated to increase the capacity of the 66 kV subtransmission lines to the ENA.

1.5.1.3 System Alternative 3: Add Distributed Energy Resources

System Alternative 3 evaluated the installation of distributed energy resources, specifically battery storage, within the ENA to reduce the amount of peak electrical demand and to offset future load growth. To address the needs of both the distribution system and the subtransmission system, the analysis was centered on two primary objectives. The first objective was the location of the installation, and the second was the amount and duration of energy that the installation would have to provide to satisfy the electrical needs of the ENA for the 10-year planning horizon.

1.5.1.4 System Alternative 4: Construct a New Substation/New Subtransmission Line

System Alternative 4 evaluated the construction of a new 66/12 kV distribution substation, associated 66 kV subtransmission source lines, distribution circuit getaways, and telecommunication facilities. In addition, System Alternative 4 evaluated the construction of a new 66 kV subtransmission line, which would be a combination of both overhead and underground construction and upgrades at Mira Loma Substation to accommodate the new 66 kV subtransmission line.

1.6 Project Objectives

The California Environmental Quality Act (CEQA) and CEQA Guidelines (Section 15126.6(a)) require consideration of a reasonable range of alternatives to a proposed project, or the location of a proposed project, which would feasibly attain most of the basic objectives but would avoid or substantially lessen any of the significant effects. As described previously in this chapter, SCE has identified the following basic objectives to meet the Proposed Project's purpose and need:

- Serve current and long-term peak electrical demand requirements in the ENA as soon as possible after receipt of applicable permits

- Enhance electrical system reliability by adding transformation and circuitry to serve increased electrical demand and by increasing operational flexibility

- Construct the new electrical facilities in close proximity to the electrical demand to effectively and efficiently serve the ENA
- Meet the Proposed Project need while minimizing environmental impacts
- Meet the Proposed Project need in a cost-effective manner
- Design and construct the Proposed Project in conformance with SCE's current engineering, design, and construction standards for substation, transmission, subtransmission, and distribution system projects

SCE considered these objectives in developing a reasonable range of alternatives. Chapter 2 – Project Alternatives describes the development process and the selection of alternatives for analysis in this PEA.

1.7 System Alternatives Comparison

System Alternative 1 is not a feasible option, because it would prevent SCE from providing safe and reliable electrical service to all of its customers in the ENA. This alternative would result in a reduced level of reliability and could lead to involuntary electrical service interruptions to prevent overload conditions. Therefore, System Alternative 1 would not meet the Proposed Project's objectives. However, CEQA requires an evaluation of the No Project Alternative so that decision makers can compare the impacts of approving the Proposed Project with the impacts of not approving the Proposed Project (CEQA Guidelines, Section 15126.6[e]).

System Alternative 2 is not a feasible option because there are no opportunities for capacity increases or equipment upgrades at Corona, Chase, and Jefferson substations that would satisfy the forecasted substation electrical demand requirements of the distribution system. Additionally, there are no opportunities for capacity increases or equipment upgrades within the 66 kV subtransmission system that would meet the long-term electrical demand within the ENA. Each of the distribution substations and the 66 kV subtransmission lines serving the ENA have been constructed to their ultimate design limit and no further capacity can be achieved through upgrades to existing equipment.

System Alternative 3 was determined not to be feasible because SCE's analysis found that the amount of battery storage that would be required to meet the needs of both the distribution and subtransmission systems would be very substantial and extremely cost-prohibitive. In addition, the locations for the installation would be very site-specific, potentially presenting significant challenges in realizing the required installations by the specific need dates identified for both the distribution and subtransmission systems. Further, in spite of the substantial amount of battery storage that would be required to meet the near-term electrical needs within the ENA, the installations would not be a substitute for the Proposed Project and would not satisfy the Proposed Project objective to serve the long-term peak electrical demand requirement.

System Alternative 4 would provide the required additional distribution system and subtransmission system capacity to serve the existing and forecasted electrical demand requirements of the ENA on a long-term basis. A new substation and a new 66 kV subtransmission line would provide the ability to serve the current and forecasted electrical demand in the ENA for the foreseeable future and would be in conformance with SCE's current engineering and construction standards. System Alternative 4 would also increase electrical service reliability and system operational flexibility in the ENA. Therefore, System Alternative 4 has been selected to provide the increased capacity required to serve the distribution and subtransmission systems that provide electrical service to the ENA.

CHAPTER 2 – PROJECT ALTERNATIVES

The California Environmental Quality Act (CEQA) and the CEQA Guidelines (Section 15126.6(a)) require that an environmental impact report describes a reasonable range of alternatives to a proposed project or the location of the proposed project that would feasibly attain most of the basic objectives and would avoid or substantially lessen any of the significant effects. CEQA Guidelines Section 15126.6(d) requires that sufficient information about each alternative must be included to allow for meaningful evaluation and analysis. The following subsections describe the development of alternatives and the selection of the substation site and subtransmission source line routes.

2.1 Study Area Determination

In order to meet the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project) objectives, which are defined in Section 1.6 Project Objectives in Chapter 1 – Purpose and Need, a Substation Study Area and a Mira Loma-Jefferson 66 kilovolt (kV) Subtransmission Line Route Study Area were determined and are described in the following subsections.

2.1.1 Circle City Substation Study Area Determination

The Substation Study Area is contained within the Electrical Needs Area (ENA), which is described in Section 1.2 Electrical Needs Area in Chapter 1 – Purpose and Need, and was determined by analyzing a set of boundaries within which the placement of a new substation would effectively and efficiently serve the ENA. The analysis determination of the Substation Study Area included the review of the limits of new distribution circuitry, which is capable of effectively transferring electrical demand from the existing substations to the new substation, as well as serving new electrical demand. In addition, geographical boundaries (e.g., water bodies, mountains, roadways, railroads, flood channels, and electrical service territory limits) were considered when determining the Substation Study Area.

After analyzing the available data, Southern California Edison (SCE) determined that the Substation Study Area for the Proposed Project was constrained by Interstate (I-) 15 to the west and the Riverside Public Utilities service territory to the east. To the north and south, the Substation Study Area is constrained by the distances in which the distribution circuitry could extend and effectively serve the electrical demand while maintaining adequate voltage levels. As a result, SCE determined that the Substation Study Area would need to be located within the northeast portion of the ENA, as shown in Figure 1-1: Electrical Needs Area in Chapter 1 – Purpose and Need.

2.1.2 Mira Loma-Jefferson 66 kV Subtransmission Line Route Study Area Determination

The Mira Loma-Jefferson 66 kV Subtransmission Line Route Study Area was determined by analyzing a set of boundaries within which the placement of a new subtransmission line from Mira Loma Substation to the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Source Line would effectively serve the electrical demand. The location of the Mira Loma-

Jefferson 66 kV Subtransmission Line Route Study Area was determined by reviewing the area served by Mira Loma Substation, the length of potential line routes, and electrical service territory limits. After analyzing the available data, SCE determined that the Mira Loma-Jefferson 66 kV Subtransmission Line Route Study Area was constrained by the area surrounding Mira Loma Substation to the north, the area surrounding Jefferson Substation to the south, the Riverside Public Utilities service territory to the east, and the extent of the area served by Mira Loma Substation to the west, as shown in Figure 1-1: Electrical Needs Area in Chapter 1 – Purpose and Need.

2.2 Circle City Substation Site and Route Evaluation Methodology

Once a Substation Study Area was determined, potential substation locations were developed using the following considerations:

- The substation should be located in an area where existing and future electrical demand would be efficiently and effectively served.
- The substation should be located in an area where it would maximize system reliability and operational flexibility with adjacent substations and circuits.
- When possible, the substation should be located at a site that would maximize the use of existing 66 kV subtransmission lines and would minimize the need to construct new 66 kV subtransmission facilities.

Potential sites within the Substation Study Area were analyzed to determine whether the Proposed Project requirements would be met, and to evaluate environmental and constructability factors. Some, but not all, of the environmental factors reviewed included aesthetics, biological resources, cultural resources, geology, and land use. A few of the constructability factors evaluated included soil conditions, drainage patterns, ground surface topography, and roadway access.

In order to find a potentially feasible substation site, SCE searched the entire Substation Study Area. After a comprehensive review of potential sites, none were found in the northern portion of the Substation Study Area due to lack of available sites and potential contamination on those that were available. As a result, SCE focused on the southern portion of the Substation Study Area. After a comprehensive review of potentially suitable sites located within the southern portion of the Substation Study Area, SCE identified and focused on two substation locations that had the greatest capability to meet the Proposed Project objectives.

Following the selection of feasible sites, the source line routes necessary to energize the potential substation were evaluated. The potential source line routes were analyzed by first evaluating for possible use of the existing subtransmission source line routes. Where new routes were necessary, SCE considered system reliability, constructability, and environmental factors.

SCE determined that the two closest 66 kV subtransmission lines that best served the potential substation sites were the existing Mira Loma-Corona-Pedley and Chase-Corona-Databank 66 kV subtransmission lines. Potential source line routes that would connect the potential substation sites to these subtransmission lines were then evaluated.

2.3 Mira Loma-Jefferson Subtransmission Line Route Evaluation Methodology

Once the Mira Loma-Jefferson 66 kV Subtransmission Line Route Study Area was determined, potential Mira Loma-Jefferson 66 kV Subtransmission Line routes were developed using the consideration that the route should maximize the use of existing 66 kV subtransmission lines and existing easements. SCE used the same evaluation methodology to identify the Mira Loma-Jefferson 66 kV Subtransmission Line routes and the source line routes, as previously described. The Mira Loma-Jefferson 66 kV Subtransmission Line route alternatives are depicted in Figure 2-1: Alternative Mira Loma-Jefferson 66 kV Subtransmission Line Routes Map.

2.4 Substation Site Alternatives Considered

The following subsections describe the evaluation of site alternatives and the selection of the preferred substation site and subtransmission/source line routes. The substation design and specifications would be similar regardless of whether the substation is constructed on Substation Site Alternative A or Substation Site Alternative B. However, orientation of the equipment within each site would depend on the specific characteristics of each site. The substation site alternatives are depicted in Figure 2-2: Alternative Substation Sites and Source Line Routes Map.

2.4.1 Substation Site Alternative A

Substation Site Alternative A would be located on an approximately 13.7-acre portion of 19.504-acres of SCE fee-owned parcels. The parcels are located south of Leeson Lane, northeast of All American Way, and west of Temescal Street in the City of Corona in Riverside County. The parcels have been previously disturbed and are surrounded by parcels that are currently used for industrial and commercial activities. The parcels are designated General Industrial on the City of Corona General Plan map and are zoned Heavy Manufacturing (M-3). The parcels are generally flat with a gradual slope to the north. SCE would establish vehicular access to Substation Site Alternative A from Leeson Lane.

2.4.2 Substation Site Alternative B

Substation Site Alternative B would be located on an approximately 12.5-acre, privately owned parcel. The parcel is located south of Leeson Lane, east of All American Way, and west of Temescal Street in the City of Corona in Riverside County. The parcel is currently vacant and is bounded by All American Way on the west, mixed vacant land and an asphalt production facility to the south, and vacant land to the east. A Waste Management facility, the terminus of Temescal Street, and a mobile home park border the parcel to the north. The parcel is designated General Industrial on the City of Corona General Plan map and is zoned Light Manufacturing (M1). The site is generally flat, and SCE would establish vehicular access to Substation Site Alternative B from Temescal Street or an easement to Leeson Lane.

2.4.3 Substation Site Alternative Recommendation

Although both sites meet the project objectives and would be suitable locations, Substation Site Alternative A was selected as the preferred substation site alternative because it has easy access for distribution and subtransmission circuits, and is owned by SCE. Unlike Substation Site Alternative A, Substation Site Alternative B would have limited access for new distribution circuits, requires a new access road, and is located within close proximity to a mobile home park.

2.5 Source Line Route Alternatives Considered

Once the potential sites for the new substation were identified, power flow analysis studies were performed to determine the required configuration of the 66 kV source lines to serve the electrical demand and meet design criteria. This analysis consisted of reviewing the existing electrical system facilities and configuration in the area to determine its adequacy under both normal and abnormal conditions.

The nearest 66 kV subtransmission lines to Substation Site Alternative A and Substation Site Alternative B are the Mira Loma-Corona-Pedley and the Chase-Corona-Databank 66 kV subtransmission lines. Each of these two 66 kV subtransmission lines would be routed in and out of the proposed new substation. SCE identified two source line segments (Segments 1 and 2) that would accommodate the connection of either of the substation site alternatives to the Mira Loma-Corona-Pedley 66 kV Subtransmission Line and two source line segments (Segments 3 and 4) that would accommodate the connection of either of the substation site alternatives to the Chase-Corona-Databank 66 kV Subtransmission Line. The segments are described in the following subsections. Various combinations of the segments constitute the source line route alternatives, which are depicted in Figure 2-2: Alternative Substation Sites and Source Line Routes Map.

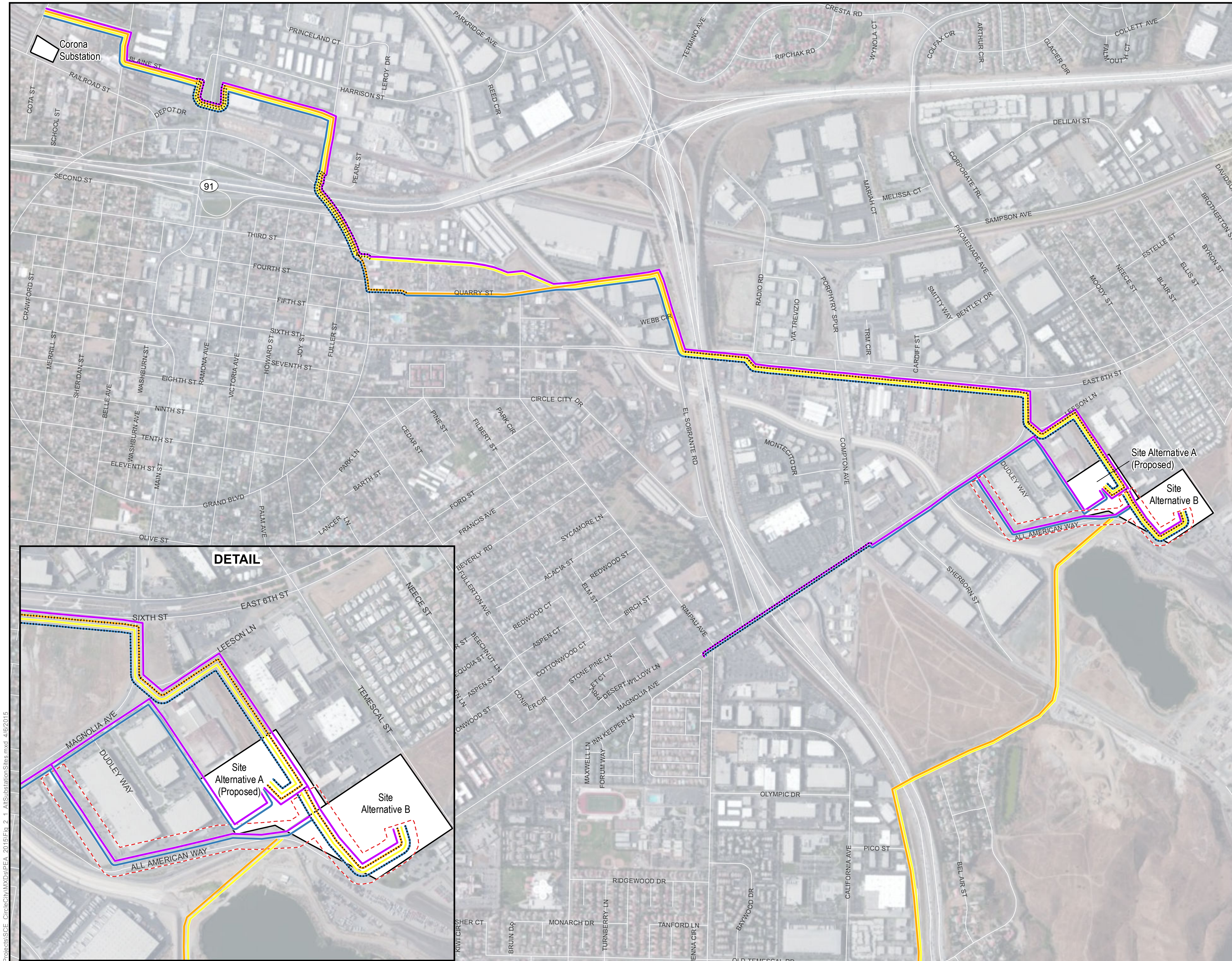
Substation Site Alternative A and Substation Site Alternative B are within close proximity to each other; therefore, the four source line segments described in the following subsections are suitable for either of the substation site alternatives.

2.5.1 Source Line Segment 1

Source Line Segment 1 would connect to the southern portion of the Mira Loma-Corona-Pedley 66 kV Subtransmission Line at the intersection of West Harrison Street and North Cota Street. The new 66 kV segment would then extend as follows: east along Harrison Street to Sheridan Street; south along Sheridan Street to West Blaine Street; and east along West Blaine Street to the west side of Main Street, where the new 66 kV segment would extend underground along West Blaine Street to cross the Main Street overpass. After crossing the Main Street overpass, Segment 1 would rise and extend overhead along West Blaine Street to Joy Street, and south along Joy Street to East Grand Boulevard, at which point the new 66 kV segment would extend underground in a southeasterly direction along East Grand Boulevard to East 3rd Street. Segment 1 would then rise and extend overhead along East 3rd Street, crossing vacant land in a southeasterly direction until Quarry Street dead-ends on the west side of the flood control channel. Segment 1 would then span the flood control channel and extend as follows, east along Quarry Street to El Sobrante Road, then south along El Sobrante Road to East 6th Street. The new segment would then cross over I-15 and extend easterly along East 6th Street to Magnolia

Figure 2-1: Alternative Substation Sites and Source Line Routes Map

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project



- Substation
- Undergrounding
- Source Line Route Alternative 1 (Proposed)
- Source Line Route Alternative 2
- Source Line Route Alternative 3
- Source Line Route Alternative 4
- Source Line Route Alternative Extensions to Substation Site Alternative B

1:14,000

0 1,000 2,000 Feet

SOUTHERN CALIFORNIA EDISON — An EDISON INTERNATIONAL Company

INSIGNIA ENVIRONMENTAL

Sources: Insignia, 2015; SCE, 2015

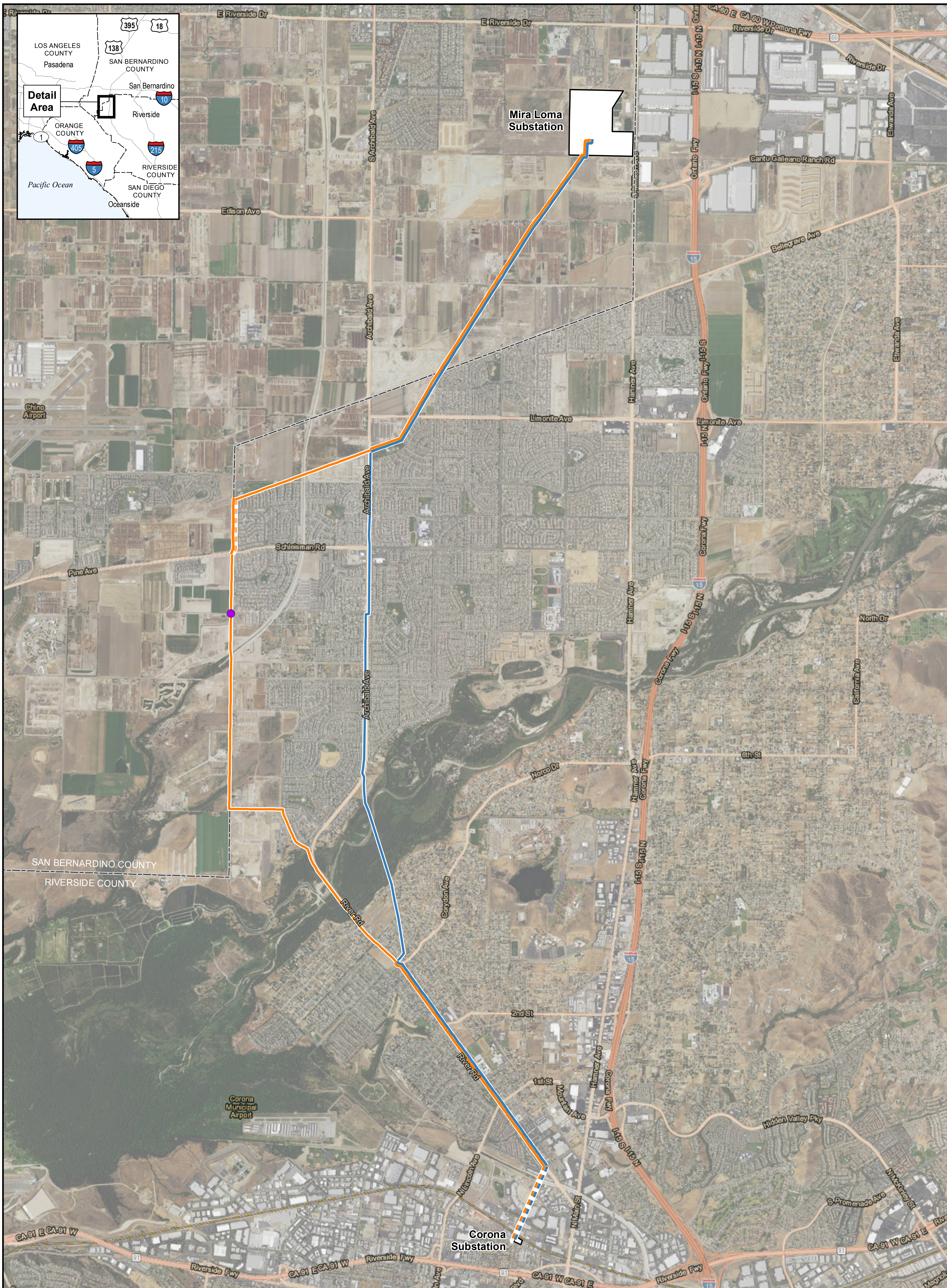


Figure 2-2: Alternative Mira Loma-Jefferson 66 kV Subtransmission Line Routes Map

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

- Subtransmission Line Route Alternative 1 - Overhead (Proposed)
- Subtransmission Line Route Alternative 1 - Underground (Proposed)
- Subtransmission Line Route Alternative 2 - Underground*
- Subtransmission Line Route Alternative 3 - Overhead
- Subtransmission Line Route Alternative 3 - Underground
- Subtransmission Line - Underground Crossing
- County Boundary
- Substation

1:46,000

0 0.5 1 Miles

*Note: Except for the underground portion indicated, Alternative Route 2 would utilize the same route as the Alternative Route 1/Proposed Route.

Sources: Insignia, 2015; SCE, 2015

Z:\Projects\SCE_CircleCity\MXDs\PEA_2015\Fig_2_2_Alt_MLJ_SubtransRoutes.mxd 11/9/2015

Avenue, where it would turn south along Magnolia Avenue and then east along Leeson Lane to Substation Site Alternative A or continue south through private property to enter Substation Site Alternative B. Source Line Segment 1 would be approximately 3.4 miles in length (3.0 miles aboveground and 0.4 mile underground) to Substation Site Alternative A, and approximately 3.6 miles in length (3.2 miles aboveground and 0.4 mile underground) to Substation Site Alternative B.

2.5.2 Source Line Segment 2

Source Line Segment 2 would connect to the southern portion of the Mira Loma-Corona-Pedley 66 kV Subtransmission Line at the intersection of West Harrison Street and North Cota Street. The new 66 kV segment would then extend as follows: east along Harrison Street to Sheridan Street; south along Sheridan Street to West Blaine Street; and east along West Blaine Street to the west side of Main Street, where Segment 2 would extend underground along West Blaine Street to cross the Main Street overpass. After crossing the Main Street overpass, Segment 2 would rise and extend overhead along West Blaine Street, then south along Joy Street to East Grand Boulevard, at which point the new 66 kV segment would extend underground in a southeasterly direction along East Grand Boulevard to Quarry Street. Segment 2 would continue underground along Quarry Street for approximately 500 feet then rise and extend overhead along Quarry Street to where Quarry Street dead-ends on the west side of the flood control channel. The new 66 kV segment would then span the flood control channel and extend as follows: east along Quarry Street, then south along El Sobrante Road to East 6th Street. The new subtransmission facilities would then travel underground within East 6th Street under I-15 in an easterly direction, where it would turn south along Magnolia Avenue and then east along Leeson Lane to Substation Site Alternative A or continue south through private property to enter Substation Site Alternative B. Source Line Segment 2 would be approximately 3.5 miles in length (1.6 miles aboveground and 1.9 miles underground) to Substation Site Alternative A, and approximately 3.6 miles in length (1.6 miles aboveground and 2.0 miles underground) to Substation Site Alternative B.

2.5.3 Source Line Segment 3

Source Line Segment 3 would connect to the Chase-Corona-Databank 66 kV Subtransmission Line at the intersection of Magnolia Avenue and Rimpau Avenue. The new underground 66 kV segment would then extend easterly along Magnolia Avenue, cross I-15 within existing bridge cells, and continue underground to the eastern side of the BNSF Railway Company right-of-way (ROW), at which point Segment 3 would rise and extend overhead along Magnolia Avenue to Leeson Lane where the segment would enter Substation Site Alternative A. Alternatively, approximately 0.3 mile after Segment 3 rises to an overhead position, the segment would turn south and traverse the boundary of an industrial park to All American Way and enter Substation Site Alternative B. Source Line Segment 3 would be approximately 1.2 miles in length (0.7 mile aboveground and 0.5 mile underground) to Substation Site Alternative A, and approximately 1.4 miles in length (0.9 mile aboveground and 0.5 mile underground) to Substation Site Alternative B.

2.5.4 Source Line Segment 4

Source Line Segment 4 would connect to the Chase-Corona-Databank 66 kV Subtransmission Line at the intersection of Old Temescal Road and Compton Avenue. Segment 4 would then extend north along Compton Avenue to Pico Street, and continue north along existing facilities within private commercial property to a proposed I-15 crossing. Segment 4 would then cross I-15 and extend in a northeasterly direction across vacant land to Sherborn Street, where the segment would curve north, paralleling the flood control channel on the property bordering the eastern side. Where the flood control channel turns west, the proposed segment would continue northeasterly across the north side of a small body of water. Segment 4 would continue across All American Way and either terminate at Substation Site Alternative A or Substation Site Alternative B. Source Line Segment 4 would be approximately 1.5 miles in length to Substation Site Alternative A, and approximately 1.5 miles in length to Substation Site Alternative B.

2.5.4.1 Source Line Route Alternative 1

Source Line Route Alternative 1 combines Source Line Segment 1 and Source Line Segment 3. Source Line Route Alternative 1 would be approximately 4.7 miles in length (3.8 miles aboveground and 0.9 mile underground) to Substation Site Alternative A, and approximately 5.0 miles in length (4.1 miles aboveground and 0.9 mile underground) to Substation Site Alternative B.

2.5.4.2 Source Line Route Alternative 2

Source Line Route Alternative 2 combines Source Line Segment 2 and Source Line Segment 4. Source Line Route Alternative 2 would be approximately 5.1 miles in length (3.2 miles aboveground and 1.9 miles underground) to Substation Site Alternative A, and approximately 5.2 miles in length (3.2 miles aboveground and 2.0 miles underground to Substation Site Alternative B.

2.5.4.3 Source Line Route Alternative 3

Source Line Route Alternative 3 combines Source Line Segment 1 and Source Line Segment 4. Source Line Route Alternative 3 would be approximately 5.1 miles in length (4.7 miles aboveground and 0.4 mile underground) to Substation Site Alternative A, and approximately 5.2 miles in length (4.8 miles aboveground and 0.4 mile underground) to Substation Site Alternative B.

2.5.4.4 Source Line Route Alternative 4

Source Line Route Alternative 4 combines Source Line Segment 2 and Source Line Segment 3. Source Line Route Alternative 4 would be approximately 4.7 miles in length (2.4 miles aboveground and 2.3 miles underground) to Substation Site Alternative A, and approximately 5.1 miles in length (2.6 miles aboveground and 2.5 miles underground) to Substation Site Alternative B.

2.5.5 Source Line Route Recommendation

Each source line route alternative would have the ability to serve the proposed substation. However, Source Line Route Alternative 1 is preferable because Source Line Segment 1 would travel through an area with both commercial/industrial buildings and residences, and it would require the least amount of underground construction. SCE prefers overhead subtransmission lines because they are easier to maintain and/or repair, whereas underground subtransmission lines have higher installation costs and are encased in concrete, which often results in significantly longer outage durations because it can take much longer to both locate and then repair any problems. In addition, Source Line Segment 3 is the shortest route, and it would avoid residential areas and potential biological sensitivities, such as least Bell's vireo (*Vireo bellii pusillus*) and special-status plants. For these reasons, Source Line Route Alternative 1 was selected as the preferred route alternative.

Unlike Source Line Route Alternative 1, Source Line Route Alternative 2 would travel through an area that is predominantly residential and along a public park, and it would require approximately 1.0 mile of additional underground construction. In addition, Source Line Segment 4 would travel through potential habitat for least Bell's vireo and special-status plants.

Unlike Source Line Route Alternative 1, Source Line Route Alternative 3 is slightly longer and would travel through potential habitat for least Bell's vireo and special-status plants.

Unlike Source Line Route Alternative 1, Source Line Route Alternative 4 would travel through an area that is predominantly residential and along a public park, and it would require approximately 1.4 miles of additional underground construction.

2.6 Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternatives Considered

SCE identified three subtransmission line route alternatives that would originate at SCE's existing Mira Loma Substation and connect to the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near SCE's existing Corona Substation.

2.6.1 Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 1

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 1 (Alternative 1) would originate at Mira Loma Substation. The new route would then follow SCE's existing ROW in a southwesterly direction to Hellman Avenue, then turn south along Hellman Avenue to River Road. At River Road, the route would turn east, following the roadway to its intersection with Archibald Avenue before crossing the Santa Ana River. Once across the river, the route would continue southeast along River Road through a predominantly residential area. Upon intersecting North Cota Street, the proposed route would travel underground in a southerly direction along North Cota Street, then rise and attach at the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near the intersection of Railroad Street and North Cota Street, adjacent to Corona Substation. Alternative 1 would be approximately 10.9 miles in length (10.3 miles aboveground and 0.6 mile underground).

2.6.2 Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2 (Alternative 2) would originate at Mira Loma Substation. The new route would follow SCE's existing ROW in a southwesterly direction to Hellman Avenue, then convert to underground and turn south to Schleisman Road, where it would rise and continue south along Hellman Avenue aboveground to River Road. At River Road, the route would travel overhead and turn east, following the roadway to its intersection with Archibald Avenue and cross the Santa Ana River. Once across the river, the route would continue southeast along River Road through a predominantly residential area. Upon intersecting North Cota Street, Alternative 2 would travel underground in a southerly direction along North Cota Street, then rise and attach at the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near the intersection of Railroad Street and North Cota Street, adjacent to Corona Substation. Alternative 2 would be approximately 10.9 miles in length (9.9 miles aboveground and 1.0 mile underground).

2.6.3 Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3 (Alternative 3) would originate at Mira Loma Substation. The new route would follow SCE's existing ROW in a southwesterly direction to Archibald Avenue, then extend south along Archibald Avenue, cross the Santa Ana River in southerly direction, and continue south on the SCE ROW to River Road. The route would continue in a southeasterly direction along River Road through a predominantly residential area. Upon intersecting North Cota Street, Alternative 3 would travel underground in a southerly direction, then rise and attach at the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near the intersection of Railroad Street and North Cota Street, adjacent to Corona Substation. Alternative 3 would be approximately 9.5 miles in length (8.9 miles aboveground and 0.6 mile underground).

2.6.4 Mira Loma-Jefferson 66 kV Subtransmission Line Route Recommendation

Each of the Mira Loma-Jefferson 66 kV Subtransmission Line route alternatives would provide additional 66 kV subtransmission source line capacity to the ENA; however, Alternative 1 is preferable because it would have less potential impacts to biological resources than Alternative 3 and would require the least amount of underground construction. As stated in Section 2.5.5 Source Line Route Recommendation, SCE prefers to construct subtransmission lines overhead. For this reason, Alternative 1 was selected as the preferred Mira Loma-Jefferson 66 kV Subtransmission Line route alternative.

Unlike Alternative 1, Alternative 2 would require an additional 0.4 mile of underground construction which would have a greater impact to air quality due to the increased ground disturbance.

Unlike Alternative 1, Alternative 3 would have a greater aesthetic impact to residential areas along Archibald Avenue and would have a greater potential to impact biological resources at the Santa Ana River crossing, as further discussed in Chapter 4 – Environmental Impact Analysis.

2.7 Alternatives Eliminated from Further Consideration

The alternatives listed in the following paragraphs are those that have been eliminated from detailed analysis. These alternatives were not included for consideration for the Proponent's Environmental Assessment (PEA) because they would not meet the basic Proposed Project objectives, would not be feasible, and/or would not avoid or substantially reduce potential environmental effects of the Proposed Project.

Eleven additional substation sites were analyzed using the methodology described in Section 2.2 Circle City Substation Site and Route Evaluation Methodology. Of the 11 substation sites, five were located within the City of Norco, the northern portion of the Substation Study Area, and six were located within the City of Corona, the southern portion of the Substation Study Area. The five substation sites located within the City of Norco were eliminated due to the concern about hazardous materials from the former land use and remaining contamination despite the remediation underway, the presence of bedrock and the possibility that blasting would be required, and one of the sites was located within least Bell's vireo habitat with a jurisdictional drainage traversing the site. All seven substation sites located within the City of Corona were eliminated for the following reasons: four were eliminated due to constraints in providing adequate means of exiting distribution circuits from the substation sites; one was eliminated due to the potential for Orange-throated whiptail to occur on the site, a drainage with riparian habitat traversed the site, and the limitations of exiting distribution circuits; one was eliminated because it was under construction; and one was eliminated because it was a closed city park located on a hilltop which would create a visual change to the area.

Using the methodology described in Section 2.2 Circle City Substation Site and Route Evaluation Methodology, 15 additional segments were identified between Circle City Substation and the two 66 kV subtransmission lines that would be utilized to energize the proposed new substation. One segment was eliminated due to the proposed Riverside County Transportation Commission's State Route (SR-) 91 Improvement Project, making the crossing at SR-91 infeasible. Eleven segments were eliminated due to the heavy residential nature of the area and to avoid traversing the historic "Circle" district. Three segments were eliminated due to the proximity to residences and the increase in length of the source line route.

Using the methodology described in Section 2.3 Mira Loma-Jefferson Subtransmission Line Route Evaluation Methodology, five additional segments were identified between Mira Loma Substation and Corona Substation. Four segments were eliminated because they were located within Zones B1 and C of the Corona Municipal Airport Land Use Plan and one of the segments traversed United States Army Corps of Engineers property, which is part of the Prado Flood Control Basin. One segment was eliminated due to the heavy residential nature of the area.

2.8 Proposed Project

SCE proposes to construct Circle City Substation on Substation Site Alternative A and utilize Source Line Route Alternative 1 and Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 1. The Proposed Project would meet its objectives and is described in detail in Chapter 3 – Project Description.

Substation Site Alternative B, Source Line Route Alternative 2, Source Line Route Alternative 3, Source Line Route Alternative 4, Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2, Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3, and the No Project Alternative (which is described in Chapter 1 – Purpose and Need) are evaluated in this PEA as alternatives to the Proposed Project.

2.9 References

Corona Redevelopment Agency. 2011. Five Year Implementation Plan. http://discovercorona.com/CityOfCorona/media/Media/REDD/CRZ%20Documents/15_RTC-Appendix-A-Implementation-Plan-(5-31-11).pdf. Site visited May 15, 2012.

CHAPTER 3 – PROJECT DESCRIPTION

This chapter provides a detailed description of Southern California Edison Company's (SCE) Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project).

The Proposed Project consists of the following major components:

- Construction of a new 66/12 kilovolt (kV) substation (Circle City Substation). The proposed Circle City Substation would be an unstaffed, automated, low-profile 56 megavolt-ampere (MVA), substation with a potential capacity of 112 MVA at final build out.

- Construction of four new 66 kV subtransmission source lines, including:

  - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction.[1] Each source line would be approximately 1.2 miles in length and would be created by connecting to the existing Chase-Corona-Databank 66 kV Subtransmission Line to form the new Circle City-Corona No. 2 66 kV Subtransmission Line and the new Chase-Circle City-Databank 66 kV Subtransmission Line.

  - Two source lines in a double-circuit configuration, which would be a combination of overhead and underground construction. Each source line would be approximately 3.5 miles in length and would be created by connecting to the existing Mira Loma-Corona-Pedley 66 kV Subtransmission Line to form the Mira Loma-Circle City-Pedley 66 kV and the Circle City-Corona No. 1 66 kV subtransmission lines.

- Construction of a new 66 kV subtransmission line, which would be a combination of both overhead and underground construction. The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be approximately 10.9 miles in length and would be constructed from SCE's existing Mira Loma Substation to a location adjacent to SCE's existing Corona Substation.

- Upgrade Mira Loma Substation to accommodate the new Mira Loma-Jefferson 66 kV Subtransmission Line.

- Construction of approximately six new underground 12 kV distribution getaways exiting the proposed Circle City Substation.

[1] A double-circuit configuration consists of two independent 66 kV lines routed on the same support structures. In overhead construction, both 66 kV subtransmission lines would be routed on the same poles. In underground construction, both 66 kV subtransmission lines would be routed down from a single pole and then continue underground through a single underground system.

- Relocation of approximately 1.9 miles of an existing overhead 33 kV distribution line to an underground position.
- Installation of telecommunications facilities to connect the Proposed Project to SCE's existing telecommunications system.

3.1 Proposed Project Components

The components of the Proposed Project are described in further detail in the subsections that follow.

3.1.1 Circle City Substation Description

As described previously, the proposed Circle City Substation would be a new 66/12 kV unstaffed, automated, low-profile 56 MVA substation. The dimensions of the substation would be approximately 420 feet by 387 feet. The substation capacity would have the potential to expand to 112 MVA as necessary. The substation would encompass approximately 4.0 acres of a 19.504-acre area comprised of two parcels located in the City of Corona. The substation site has been previously disturbed and is located within an industrial area. Gas, water, sewer, and existing electrical power are all located within Leeson Lane, which is adjacent to the northwest side of the substation property.

SCE considers the California Building Code and the Institute of Electrical and Electronic Engineers (IEEE) 693, Recommended Practices for Seismic Design of Substations when designing such structures and equipment.

The substation components are described in the subsections that follow. Figure 3-1: Proposed Project Substation Layout shows the placement and orientation of the major components that would be included in the construction of the proposed Circle City Substation. Figure 3-2: Circle City Substation Profile provides a profile view of the proposed Circle City Substation.

3.1.1.1 66 kV Switchrack

The proposed low-profile 66 kV steel switchrack would be approximately 45 feet high, 156 feet long and 120 feet wide. The switchrack would have a north operating bus and a south operating bus. The switchrack would consist of four approximately 22-foot-wide positions, each connecting to the north and to the south operating buses and designed to support four subtransmission lines, two transformer banks, and two vacant positions for future use. The operating buses would each be approximately 120 feet long, and consist of two approximately 2,156 kcmil aluminum conductor steel-reinforced (ACSR) for each of the three electrical phases.[2]

[2] A circular mil (cmil) is a unit equal to the area of a circle with a diameter of 1 millimeter (0.001 inch), and is used chiefly in specifying cross-sectional areas of round conductors. One kcmil is 1,000 circular millimeters.

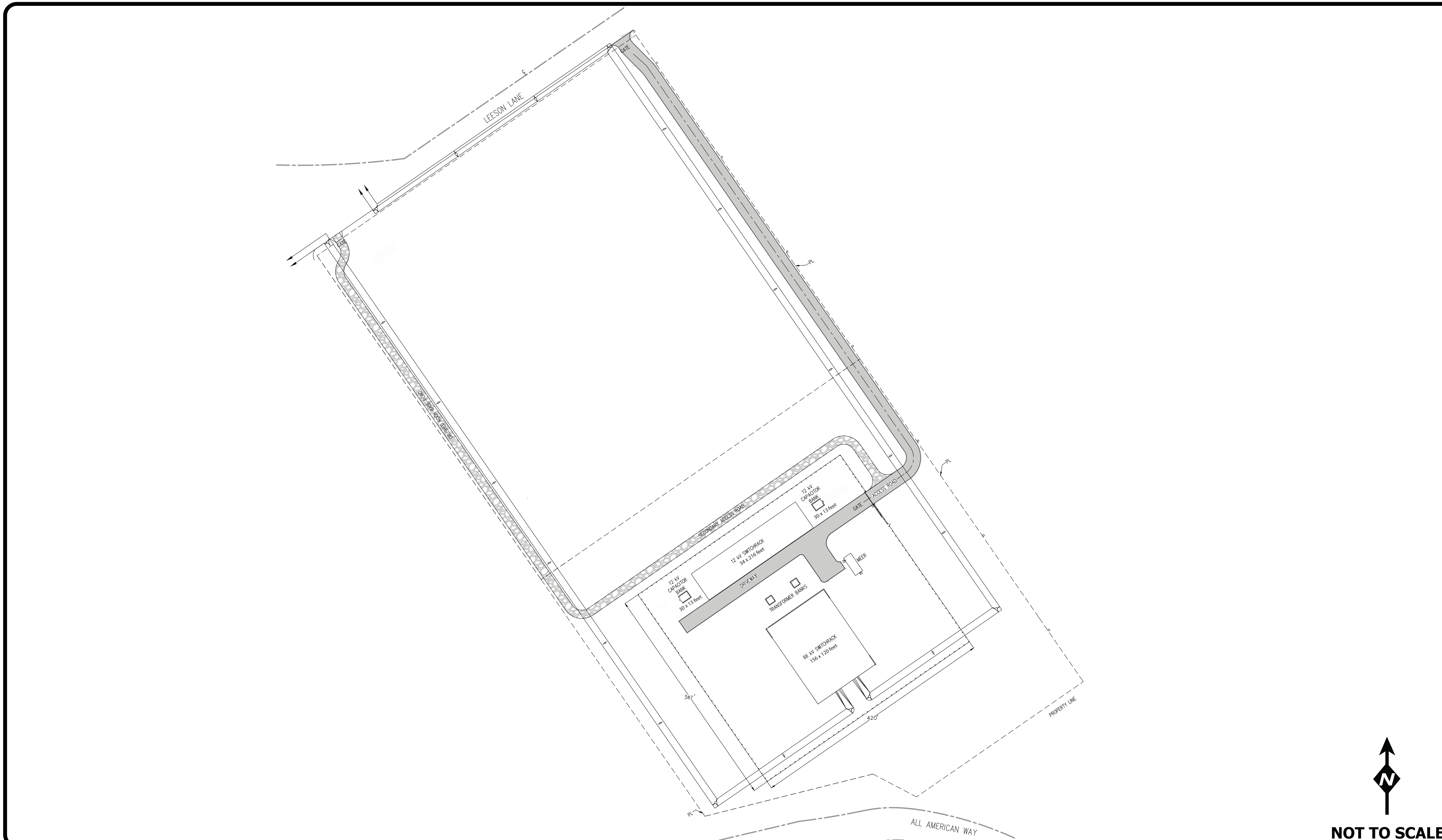


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Figure 3-1: Proposed Project Substation Layout

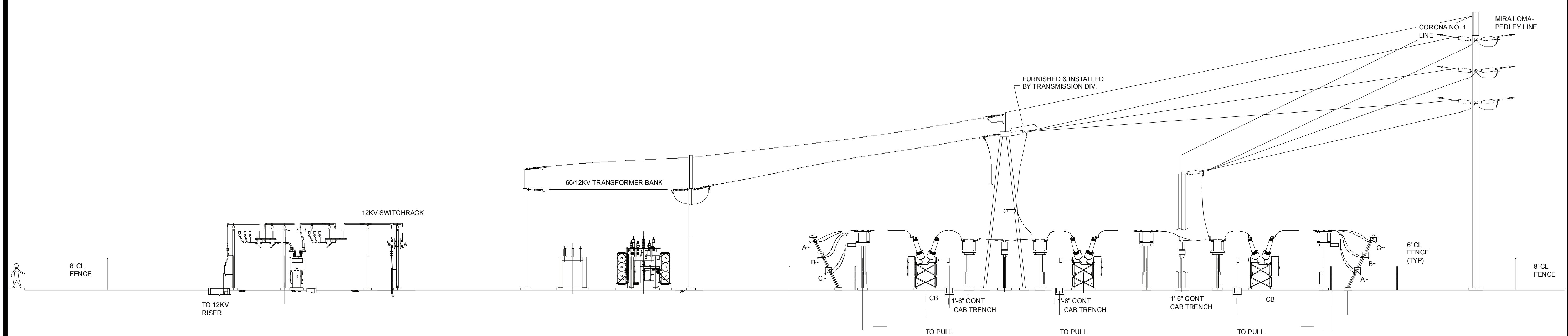

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Figure 3-2: Circle City Substation Profile View

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Two of the 66 kV switchrack positions would each be equipped with two circuit breakers and four group-operated horizontal mounted disconnect switches. Two 66 kV switchrack positions would be equipped with three circuit breakers, six group-operated, horizontal mounted disconnect switches, and two potential transformers per line position.

3.1.1.2 66/12 kV Transformers

Transformation would consist of two 28 MVA, 66/12 kV transformers with adjacent group-operated disconnect switches on the high-voltage and low-voltage side. The transformer area dimensions would be approximately 25 feet high, 67 feet long and 109 feet wide.

3.1.1.3 12 kV Switchrack

The 12 kV low-profile steel switchrack would be approximately 15 feet tall, 34 feet long and 216 feet wide, and would have an operating and transfer bus. The switchrack would consist of 13 positions, including four positions for 12 kV circuits, two positions for transformer banks, and one position for a bus tie between the operating bus and transfer bus, while five positions would be vacant for future use.

3.1.1.4 Capacitor Banks

There would be two 12 kV, 4.8 MVA reactive capacitor banks installed at the substation. Each 12 kV capacitor bank area would be approximately 17 feet tall, 30 feet long and 13 feet wide.

3.1.1.5 Mechanical and Electrical Equipment Room

A Mechanical and Electrical Equipment Room (MEER) is a prefabricated structure that is typically made of steel. SCE anticipates that the MEER would have a desert tan roof and sidewalls, and that the roofline, wall joints, and doorway would have a roman bronze trim. The MEER would be equipped with air-conditioning units and would house equipment, such as protective relaying equipment, telecommunications equipment, substation automation and control equipment, batteries, and associated equipment. Control cable trenches would be installed to connect the MEER to the 66 kV and 12 kV switchracks. The MEER dimensions would be approximately 11 feet tall, 60 feet long and 15 feet wide.

3.1.1.6 Restroom Facilities

A stand-alone, permanent restroom would be installed within the substation perimeter. SCE would apply to the City of Corona for sewer and water service. The restroom enclosure would be approximately 10 feet tall, 14 feet long and 14 feet wide.

3.1.1.7 Substation Access

Primary access to the substation would be from Leeson Lane along the eastern corridor of the substation property. It would be paved and would measure approximately 24 feet wide and 1,000 feet long. In addition, secondary access to the substation would be from Leeson Lane along the western corridor of the substation property. It would have a crushed rock base and would measure approximately 16 feet wide and 1,400 feet long. The automated substation entry gate would measure approximately 8 feet tall and 26 feet wide. In addition to the substation entry gate, an approximately 4-foot wide walk-in gate would be installed within the substation fence for personnel access.

3.1.1.8 Substation Grading and Drainage

The proposed Circle City Substation site is relatively flat. The substation pad would be graded to maintain a minimum of 1-percent slope to drain toward the north. The existing watershed area includes properties to the southeast and passes through the substation property; this water would drain to the north on surface swales through both the eastern and western corridors, discharging onto Leeson Lane. If required by the City of Corona, an approximately 700-foot extension of the existing storm drain system may be constructed to accept site flow onto Leeson Lane. In addition, a standard catch basin would be installed in the Leeson Lane right-of-way (ROW). An alternative to the surface swales would include the installation of an approximately 1,300-foot long buried drain pipe through the eastern access corridor. A collection basin or headwall would be required in the substation property’s southeast corner to direct off site drainage into the applicable drainage improvements. Prior to construction, SCE would prepare final engineering drawings for grading and drainage, and submit these drawings to the City of Corona to obtain a ministerial grading permit if required. SCE would include a detention or retention basin just north and/or south of the substation perimeter block wall if needed.

Because the anticipated volume of aboveground storage of oil, in use at the site would be in excess of 1,320 gallons, a Spill Prevention Control and Countermeasures (SPCC) Plan would be required in accordance with Title 40 Sections 112.1-112.7 of the Code of Federal Regulations (CFR). Typical SPCC secondary containment features include curbs designed and installed to contain spills, should they occur. These features would be part of SCE’s final engineering design for the Proposed Project.

3.1.1.9 Ground Surface Improvements

The enclosed substation surface would be covered with permeable material (e.g., crushed rock) in areas where no paving or structures would be placed. Table 3-1: Substation Ground Surface Improvement Materials and Volumes lists the approximate square footage and volumes of materials to be used.

3.1.1.10 Substation Lighting

Lighting at the proposed Circle City Substation would consist of light-emitting diode, low-intensity lights located in the switchracks around the transformer banks and in areas of the yard where operation and maintenance (O&M) activities may take place during evening hours for emergency and scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the “off” position. A light, indicating the operation of the rolling gate, would automatically turn on once the gate begins to open and would turn off shortly after the gate is closed.

Table 3-1: Substation Ground Surface Improvement Materials and Volumes

Element	Material	Approximate Surface Area (square feet)[3]	Approximate Volume (cubic yards [CY])[2]
Site Grading, Cut	Soil	267,568	9,000
Site Grading, Fill	Soil	327,027	12,500
Import	Soil	327,027	3,500
Waste Removal	Soil	131,290	22,400
	Asphalt Concrete[4]	39,590	490
Clearing and Grubbing	Vegetation[5]	160,000	500
Drainage Swales	Concrete	17,065	316
Substation Equipment Foundations	Concrete	3,050	250
Cable Trenches	Concrete	6,500	240
Block Wall Foundation	Concrete	1,615 feet long	300
Chain-link Fence Around Property[6]	Metal	16,000 (long by 8 feet tall)	2,000 feet in length
Internal Driveway	Asphalt Concrete Class II Aggregate Base	11,930 11,930	150 300
External Driveway	Asphalt Concrete Class II Aggregate Base	23,600 23,600	290 580
Secondary Access Road	Crushed Rock	20,150	250
Substation Rock Surfacing	Rock, per SCE standard, 4-inch depth	162,200	2,005
Distribution Duct Banks/Vaults	Concrete	13,500	750
66 kV Bus Enclosure	Asphalt Concrete[3]	4,295	80

[3] All areas of disturbance are subject to revision based on final engineering.
[4] The type of asphalt concrete to be removed and/or installed is asphalt concrete or Portland Cement concrete
[5] A 1-inch thickness is assumed for vegetation that would need to be cleared.
[6] The chain-link fence around the property would be installed in areas that are not already fenced.

3.1.1.11 Substation Perimeter

The proposed Circle City Substation would be enclosed on all sides by an 8-foot-tall block wall. Five strands of barbed wire would be affixed near the top of the perimeter enclosure inside the substation. Landscaping and irrigation would be established around the perimeter of the substation if needed. These perimeter enclosure requirements are based on current SCE substation standards for employee and facility safety and security. Should homeland security requirements increase, more conservative perimeter enclosure standards may be needed, such as increasing the height of the wall by a couple feet.

3.1.2 Distribution Getaways

A total of six distribution getaway duct bank systems would be installed upon initial construction. These distribution getaways would extend from the power cable trench within the substation to Leeson Lane, where they would then be capped. Each duct bank system would also have two vaults installed within the substation property line. The details of each getaway duct bank system are as follows:

- Getaway 1 would extend approximately 970 feet from the power cable trench within the substation to Leeson Lane, where it would be capped. It would include two vaults inside the substation property line.

- Getaway 2 would extend approximately 950 feet from the power cable trench within the substation to Leeson Lane, where it would be capped. It would include two vaults inside the substation property line.

- Getaway 3 would extend approximately 930 feet from the power cable trench within the substation to the substation property fence line. These ducts would be capped for future use. It would include two vaults inside the substation property line.

- Getaway 4 would extend approximately 960 feet from the power cable trench within the substation to Leeson Lane, where it would be capped. It would include two vaults inside the substation property line.

- Getaway 5 would extend approximately 980 feet from the power cable trench within the substation to Leeson Lane, where it would be capped. It would include two vaults inside the substation property line.

- Getaway 6 would extend approximately 1,000 feet from the power cable trench within the substation to the substation property line. These ducts would be capped for future use. It would include two vaults inside the substation property line.

Distribution circuits would be placed in an underground conduit system. At ultimate build out, the proposed Circle City Substation could accommodate sixteen 12 kV distribution circuits. Additional electrical distribution circuits would be constructed from the proposed Circle City

Substation to serve electrical demand on an as-needed basis. These circuits would be constructed with consideration of the following guidelines:

- the location of the current load growth,
- existing electrical distribution facilities in the area, and
- the location of roads and existing SCE ROWs.

The exact locations and routing of these proposed 12 kV distribution circuits have yet to be determined. These 12 kV distribution circuits cannot be designed at this time due to the uncertainty of where electrical demand relief would be needed and where future load growth would occur precisely, as well as unforeseen changes in the physical and environmental conditions of the surrounding area. In addition, detailed design of the circuit routes requires the most complete and comprehensive details that can be provided by other utilities regarding their existing and planned infrastructure in the area, as the locations of these facilities would impact the ultimate electrical distribution line routes. This information must be provided as close to the operating date as possible to minimize design conflicts and construction delays due to additional changes. The detailed design of the initial 12 kV distribution circuits would be completed approximately 18 months prior to the operating date of the Proposed Project.

3.1.3 Subtransmission Line Description

The Proposed Project would include a new Source Line Route consisting of four new 66 kV subtransmission lines along two diverse routes, as well as the new Mira Loma-Jefferson 66 kV Subtransmission Line Route.

The Source Line Route would connect the existing Corona Substation to the proposed Circle City Substation and the existing Pedley and Mira Loma substations to the proposed Circle City Substation, creating the Circle City-Corona No. 1 and Mira Loma-Circle City-Pedley 66 kV subtransmission lines, which would be located along the same poles and within the same underground duct banks. The Source Line Route would also connect the existing Corona Substation to the proposed Circle City Substation and the existing Chase and Data Bank substations to the proposed Circle City Substation, creating the Circle City-Corona No. 2 and the Chase-Circle City-Databank 66 kV subtransmission lines, which would be located along the same poles and within the same underground duct banks. The Circle City-Corona No. 1, Mira Loma-Circle City-Pedley, Circle City-Corona No. 2, and Chase-Circle City-Databank 66 kV Subtransmission Line are referred to as the Source Line Route, which is depicted in Figure 3-3: Source Line Route Description.

The new Mira Loma-Jefferson 66 kV Subtransmission Line would connect the existing Mira Loma Substation to the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near Corona Substation, creating the Mira Loma-Jefferson and the Mira Loma-Corona No. 2 66 kV subtransmission lines. The Mira Loma-Jefferson and the Mira Loma-Corona No. 2 66 kV

Subtransmission lines are referred to as the Mira Loma-Jefferson 66 kV Subtransmission Line Route, which is depicted in Figure 3-4: Mira Loma-Jefferson 66 kV Subtransmission Line Route Description.

3.1.3.1 Source Line Route Description

The Circle City-Corona No. 1 66 kV Subtransmission Line and the Mira Loma-Circle City-Pedley 66 kV Subtransmission Line route would consist of approximately two new wood poles, 76 new light weight steel (LWS) poles, 23 new tubular steel poles (TSPs), four underground vaults, and approximately 2,000 linear feet of new underground duct bank containing six conduits and six cables.

The Circle City-Corona No. 1 66 kV Subtransmission Line and the Mira Loma-Circle City-Pedley 66 kV Subtransmission Line route would begin at the intersection of North Cota Street and Harrison Street by connecting to an existing 66 kV subtransmission line. The new source line route facilities would head easterly along the south side of Harrison Street then the route would turn south on Sheridan Street and continue south along the east side of Sheridan Street to Blaine Street. The route would then turn east on Blaine Street and continue east along the south side of Blaine Street to the west side of Main Street. At the west side of Main Street, the route would convert to underground and travel approximately 790 linear feet following the Blaine Street undercrossing of Main Street. On the east side of Main Street, the underground facilities would convert to overhead facilities and travel easterly along the north side of Blaine Street to Joy Street, where the route would turn south on Joy Street and continue along the east side of Joy Street until just north of Pearl Street. The route would then convert to underground and head southerly on Joy Street to Grand Boulevard, where the underground facilities would travel southeasterly along Grand Boulevard, under State Route (SR-) 91, to East 3rd Street. At the intersection of Grand Boulevard and 3rd Street, the underground facilities would turn and travel east on 3rd Street for approximately 100 feet, then convert to overhead facilities. The route would then continue easterly along the south side of East 3rd Street, replacing the existing distribution poles with new subtransmission poles and transferring the existing distribution circuits onto the new subtransmission poles. At the end of East 3rd Street, the route would enter privately owned property and continue easterly to the west side of the existing Temescal Wash flood control channel. The route would span the existing Temescal Wash flood control channel to reach Quarry Street, where the route would continue east along the north side of Quarry Street to El Sobrante Avenue. At El Sobrante Avenue, the route would turn and head south along the east side to 6th Street, where the route would turn and head east along the north side of 6th Street, and cross over Interstate (I-) 15 Radio Road, where the route would cross 6th Street and continue heading east along the south side of 6th Street to Magnolia Avenue. The route would then turn on Magnolia Avenue and continue south along the east side, cross over Leeson Lane, enter private property, and terminate at the proposed Circle City Substation. The Circle City-Corona No. 1 66 kV Subtransmission Line and the Mira Loma-Circle City-Pedley 66 kV Subtransmission Line route would be approximately 3.5 miles in length.

The Circle City-Corona No. 2 66 kV Subtransmission Line and the Chase-Circle City-Databank 66 kV Subtransmission Line route would consist of approximately 18 new LWS poles, seven new TSPs, three underground vaults, and approximately 2,500 linear feet of new underground duct bank containing six conduits and six cables.

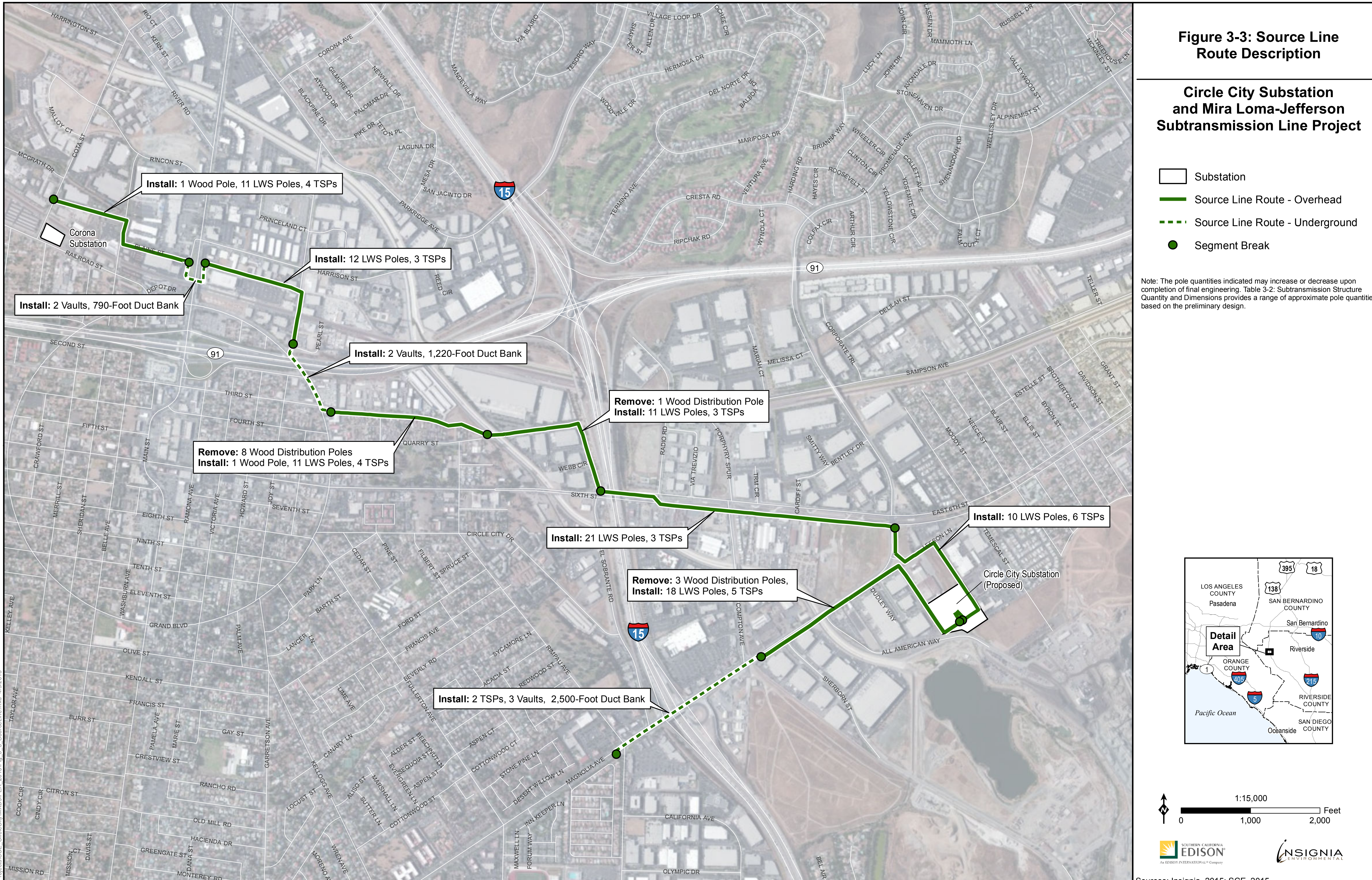

Figure 3-3: Source Line Route Description

Sources: Insignia, 2015; SCE, 2015

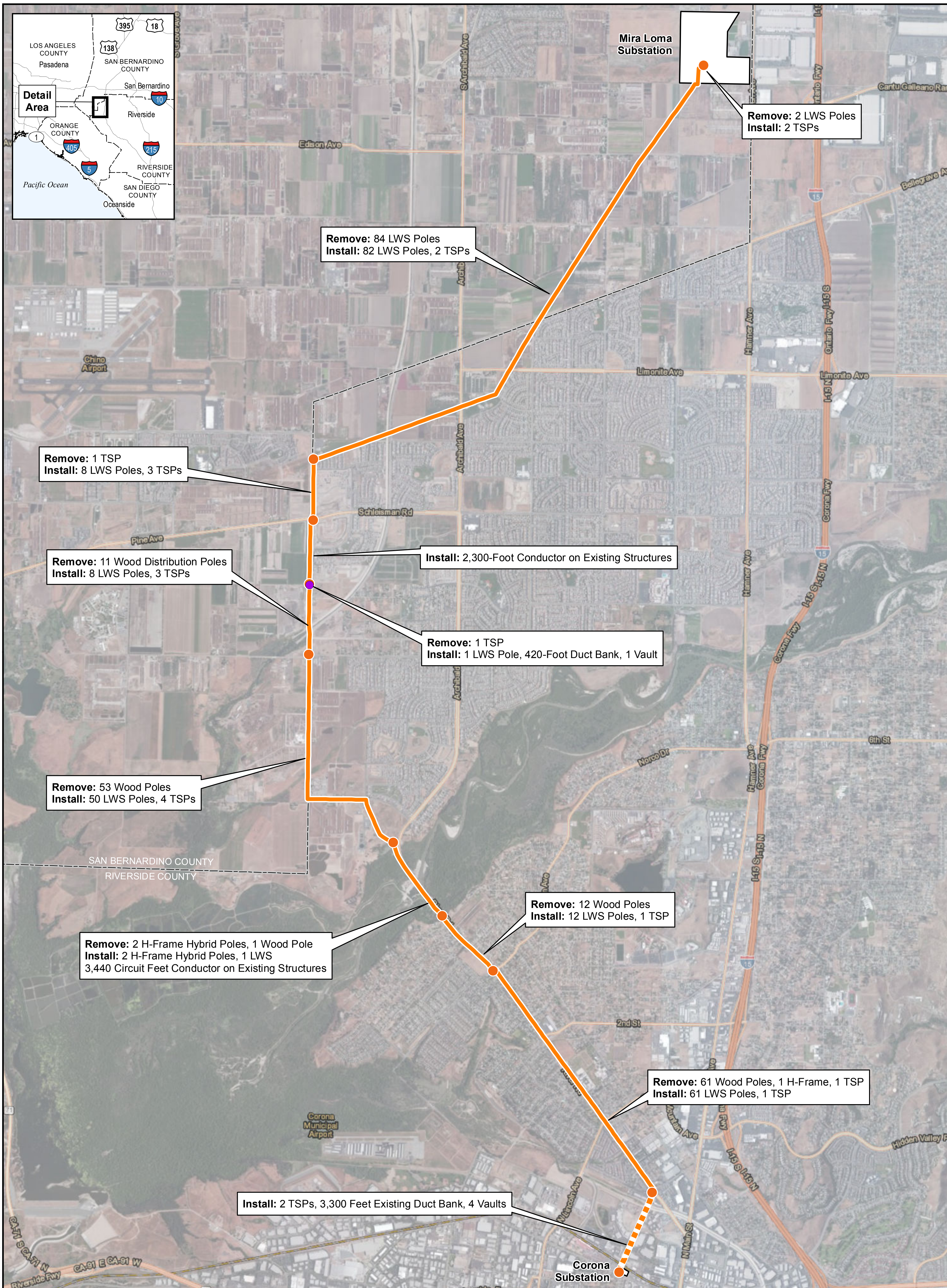

Figure 3-4: Mira Loma-Jefferson 66 kV Subtransmission Line Route Description

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

*Segment breaks are identified along the subtransmission line route to facilitate describing the removal and installation activities at different locations along the line.

Note: The pole quantities indicated may increase or decrease upon completion of final engineering.
Table 3-2: Subtransmission Structure Quantity and Dimensions provides a range of approximate pole quantities based on the preliminary design.

Sources: Insignia, 2015; SCE, 2015

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The Circle City-Corona No. 2 66 kV Subtransmission Line and the Chase-Circle City-Databank 66 kV Subtransmission Line route would connect to an existing 66 kV subtransmission line approximately 100 feet west of Rimpau Avenue on the south side of Magnolia Avenue. A tubular steel riser pole would be installed to accommodate the overhead connection to the existing 66 kV subtransmission line and allow for the line route to be placed underground. On Magnolia Avenue, the route would head easterly underground, cross over I-15 through an existing utility bridge cell located within the Magnolia Avenue bridge, cross under existing BNSF Railroad Company ROW, then convert to overhead.[7] The route would then continue easterly along the south side of Magnolia Avenue to Leeson Lane and continue easterly along Leeson Lane, then turn and travel southerly into private property to the proposed Circle City Substation. The Circle City-Corona No. 2 66 kV Subtransmission Line and the Chase-Circle City-Databank 66 kV Subtransmission Line route would be approximately 1.2 miles in length.

3.1.3.2 Mira Loma-Jefferson Subtransmission Line Route Description

The Mira Loma-Jefferson 66 kV Subtransmission Line Route would consist of approximately 223 LWS poles, 18 TSPs, two H-frame hybrid poles, 420 linear feet of new underground duct bank containing six conduits, one underground vault, and approximately 3,300 feet of underground cable installation within existing duct bank.

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line route would originate at Mira Loma Substation on existing structures from the Mira Loma-Corona-Jefferson 66 kV Subtransmission Line, which would include replacing two existing LWS poles within Mira Loma Substation with two TSPs to accommodate the new Mira Loma-Jefferson and Mira Loma-Corona No. 2 66 kV subtransmission lines. The new subtransmission lines would then extend southwesterly on existing structures from the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line, paralleling the existing Mira Loma-Serrano No. 1 and No. 2 500 kV and the Mira Loma-Olinda 220 kV Transmission Line to Hellman Avenue and would replace 84 LWS poles with 82 LWS poles and two TSPs to accommodate a double circuit. At Hellman Avenue, the route would then travel south along the east side of Hellman Avenue on eight new LWS poles and three TSPs to Schleisman Road. At Schleisman Road, the route would cross to the west side and continue south along Hellman Avenue utilizing existing LWS poles for approximately 2,300 feet. At Hellman Avenue, approximately 470 feet south of Outback Way, the existing Archibald-Chino-Corona 66 kV Subtransmission Line would convert to underground for approximately 420 feet in order to accommodate the subtransmission line crossing. The route would then continue heading south to Chino Corona Road, replacing approximately 11 distribution wood poles with eight LWS poles and three TSPs. At the intersection of Chino Corona Road and Hellman Avenue, the route would continue south along east side of Hellman Avenue to River Road then head east along the south side of River Road to Baron Drive, then turn south along the west side of Baron Drive to River Road replacing existing structures (Archibald-Chino-Corona 66 kV Subtransmission Line), which would require the removal of approximately 54 wood poles and installation of approximately 50 LWS poles and four TSPs; the new poles would accommodate the new Mira Loma-Jefferson 66 kV Subtransmission Line and the transfer of the existing conductor. The subtransmission line would then head

[7] A bridge cell is a pre-casted concrete tunnel located below bridge deck (sub-deck) that allows for utility facility crossings, such as gas, electrical, and communication facilities.

southeasterly along the southwesterly side of River Road, replacing one wood pole with one LWS pole, and cross the Santa Ana River. At the Santa Ana River crossing, the existing H-frames would be replaced with engineered hybrid H-frames. The route would continue southeast along the southwest side of River Road on existing structures from the Archibald-Chino-Corona 66 kV Subtransmission Line, replacing 12 wood poles with 12 LWS poles and one TSP. At the intersection of River Road and Corydon Avenue, the Mira Loma-Jefferson 66 kV Subtransmission Line would cross River Road and continue on the northeasterly side of River Road in a southerly direction, replacing existing wood poles (Archibald-Chino-Corona 66 kV Subtransmission Line) with 61 LWS poles and one TSP; the new poles would accommodate the new Mira Loma-Jefferson 66 kV Subtransmission Line and the transfer of the existing conductor. The existing 33 kV distribution line would convert to underground along River Road between Corydon Avenue and North Cota Street to accommodate the new subtransmission line. At the intersection of North Cota Street and River Road, the Mira Loma-Jefferson 66 kV Subtransmission Line would convert to underground on a new tubular steel riser pole and attach to an existing duct bank within North Cota Street, and would then continue along North Cota Street to a location just outside of Corona Substation, where the Mira Loma-Jefferson 66 kV Subtransmission Line would convert to an overhead configuration at a new tubular steel riser pole and tap into an existing 66 kV subtransmission line.

3.1.3.3 Subtransmission Pole Description

The subtransmission segments of the Proposed Project would utilize LWS poles, H-frame hybrids, wood poles, TSPs, and underground vaults. Each structure would support, at a minimum, polymer post insulators and dead-end insulators, 954 kcmil stranded aluminum conductor (SAC), and 4/0 ACSR fault return conductor (FRC). The subtransmission conductor would be a minimum of 30 feet aboveground as measured at the point where is connected to the pole. The vertical distance between the conductors would be a minimum of five feet. The span length between poles would range between 80 feet to 600 feet. The approximate dimensions of the proposed structure types are shown in Figure 3-5: Subtransmission Structures, and are summarized in Table 3-2: Subtransmission Structure Quantity and Dimensions. All 66 kV subtransmission line structures would be designed consistent with the Avian Power Line Interaction Committee’s (APLIC’s) Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006.[8]

Approximately two to three wood poles would be used for the Proposed Project. Wood poles would be direct buried to a depth of approximately 10 to 11 feet below the ground surface and extend approximately 65 to 70 feet aboveground. The diameter of the wood poles would be approximately 2 to 3 feet at ground level and would taper to the top of the pole.

[8] Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 2006 published by the Edison Electric Institute and the Avian Power Line Interaction Committee in collaboration with the Raptor Research Foundation. This document can be found at http://www.Aplic.org/SuggestedPractices2006(LR).pdf.

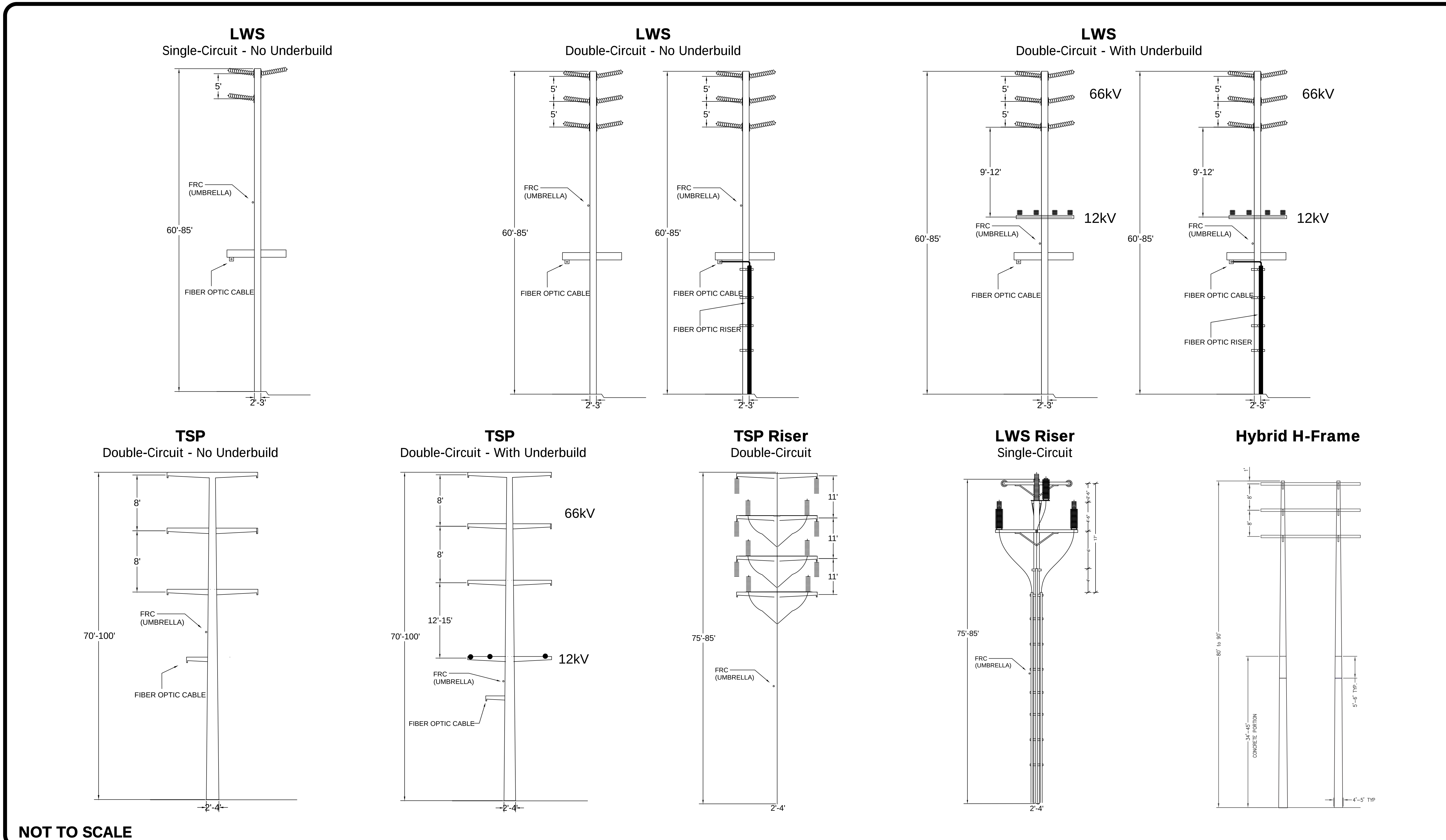

Figure 3-5: Subtransmission Structures

Table 3-2: Subtransmission Structure Quantity and Dimensions

Pole/Structure Type	Approximate Quantity	Approximate Diameter (feet)	Approximate Height Above Ground (feet)	Approximate Auger Hole Depth (feet)	Approximate Auger Diameter (feet)
Wood Pole	2 to 3	2 to 3	65 to 70	10 to 11	2 to 4
LWS Pole	316 to 350	2 to 3	60 to 85	8 to 11	2 to 4
TSP	48 to 55	3 to 6	70 to 105	Not Applicable (NA)	NA
TSP Concrete Foundation	48 to 55	4 to 8	Subgrade to 2	20 to 40	5 to 9
H-Frame Hybrid	2	4 to 5	80 to 90	25 to 50	6 to 8
Wood Guy Stub	2	1 to 2	29 to 39	6 to 8	2 to 3

Notes:
1 Specific pole height and spacing would be determined upon final engineering and would be constructed in compliance with California Public Utilities Commission (CPUC) General Order (G.O.) 95.
2 Preliminary pole locations are shown in the geographic information system (GIS) data. Because the final design has not been completed for the Proposed Project, Table 3-2: Subtransmission Structure Quantity and Dimensions includes additional poles that may be required under a worst-case scenario to construct the Proposed Project that are not depicted in the GIS data. SCE anticipates that the pole count and locations shown in the GIS data would be closer to the final design than the maximum pole counts provided in Table 3-2: Subtransmission Structure Quantity and Dimensions; however, for the purpose of assessing the worst-case environmental impacts from the Proposed Project, the maximum pole counts were used.

Approximately 316 to 350 LWS poles would be used for the Proposed Project and would be direct buried and extend approximately 60 to 85 feet aboveground. The diameter of LWS poles would typically be 2 to 3 feet at ground level and would taper to the top of the pole.

Approximately two H-frame hybrid poles would be used for the Proposed Project. The H-frame hybrids would be direct buried and would extend approximately 80 to 90 feet aboveground. The diameter of the H-frame hybrid poles would typically be 4 to 5 feet at ground level and would taper to the top of the pole.

An FRC would be installed on all LWS poles, including where the structures support distribution circuits. The FRC is attached to the substation ground grid from the 66 kV source substation and to all the LWS poles on the line. A clamp attachment would bond the FRC to all of the LWS poles at approximately 25 feet to 35 feet above ground level.

Approximately two wood guy stubs would be used for the Proposed Project. Wood guy stubs consist of a wood pole with a steel wire known as a “down guy,” which attaches to a 1-inch-diameter anchor at ground level located at the back side of the wood pole and a steel span guy that attaches to the top of the wood pole and the subtransmission poles (wood and LWS). Wood guy stubs would be direct buried and extend approximately 30 feet aboveground. The diameter of wood guy stubs would typically be 1 to 2 feet at ground level and would taper to the top of the pole.

Approximately 48 to 55 TSPs would be used for the Proposed Project. The TSPs would be approximately 3 to 6 feet in diameter at the base and extend approximately 70 feet to 105 feet aboveground. The TSPs would be attached to concrete foundations that would be approximately 4 to 8 feet in diameter and would extend underground by approximately 20 to 40 feet, with up to approximately 2 feet of concrete visible aboveground. Each TSP would use approximately 13 to 80 CY of concrete.

Approximately eight subtransmission vaults and approximately 4,910 linear feet of new six-conduit duct bank would be used for the Proposed Project. Subtransmission vaults would be approximately 11 feet wide, 11 feet deep, and 21 feet long. Subtransmission six-conduit concrete-encased duct banks would be approximately 2 feet wide by 2 feet high and would be placed in a 5-foot deep trench to allow for a minimum of 36 inches of cover.

3.1.3.4 Relocation of Existing Distribution Facilities

In order to accommodate the proposed 66 kV subtransmission line facilities, some of the existing 33 kV, 12 kV, and 4 kV distribution facilities would need to be modified. The following modifications are based on preliminary engineering and the facilities as they currently exist in the field.

Source Line Route

- Location 1: Approximately eight distribution poles would be removed from the intersection of East 3rd Street and Grand Boulevard in the City of Corona, heading easterly along East 3rd Street. Existing 33 kV and 12 kV distribution facilities would be transferred to new proposed subtransmission facilities. The existing 4 kV distribution circuit would be removed along East 3rd Street. The remaining portion of the 4 kV distribution system on Arroyo Avenue and Quarry Street would be tied into the existing 12 kV distribution system along East 3rd Street. This consists of extending existing 12 kV distribution lines in three locations for a total of approximately 1,540 feet and replacing 15 wood distribution poles with 15 new wood distribution poles.

- Location 2: One distribution pole would be removed at the end of Quarry Street, east of the Temescal Wash flood control channel. Existing distribution facilities would be transferred to a new proposed TSP. In addition, an existing underground distribution duct bank would be extended approximately 100 feet to the new TSP

- Location 3: Approximately three distribution poles would be removed from the southeast corner of Magnolia Avenue and Leeson Lane, heading easterly along Leeson Lane. Existing distribution facilities would be transferred to the new subtransmission facilities.

- Location 4: Just outside of the proposed substation and within Leeson Lane, a new distribution vault, measuring approximately 7 feet wide, 18 feet long, and 8 feet deep, would be installed with approximately 80 feet of duct bank to connect to existing underground distribution facilities

Mira Loma-Jefferson 66 kV Subtransmission Line Route

- Location 1: On Hellman Avenue, starting at Schleisman Road to a point immediately south of Outback Way, the distribution facilities currently located on the existing subtransmission line would be lowered to accommodate the second subtransmission circuit.

- Location 2: Approximately 11 distribution poles would be removed from the intersection of Hellman Avenue and Outback Way heading south along Hellman Avenue. Existing distribution facilities would be transferred to new proposed subtransmission facilities.

- Location 3: Approximately 54 subtransmission poles with 12 kV distribution underbuild would be removed from the intersection of Hellman Avenue and Chino Corona Road and southerly along Hellman Avenue/River Road. Existing distribution facilities would be transferred to new proposed subtransmission facilities; one 12 kV distribution pole would be installed for the existing capacitor bank.

- Location 4: Approximately 12 wood subtransmission poles with 12 kV distribution underbuild would be removed along River Road from just south of the Santa Ana River to Corydon Avenue. Existing distribution facilities would be transferred to new proposed subtransmission facilities.

- Location 5: At the intersection of River Road and Corydon Avenue, approximately 62 wood subtransmission poles with 33 kV and 12 kV distribution underbuild would be replaced with new subtransmission poles. To accommodate the proposed Mira Loma-Jefferson 66 kV Subtransmission Line, the 33 kV distribution facilities would be placed in a new underground system within River Road, and the 12 kV distribution facilities would be transferred to the new subtransmission poles. The new underground facilities would consist of 13 distribution vaults measuring approximately 7 feet wide, 18 feet long, and 8 feet deep and would be installed with approximately 10,050 feet of duct bank to connect to existing overhead distribution facilities.

3.1.4 Telecommunications Description

Electrical equipment at the proposed Circle City Substation would be monitored through SCE’s existing telecommunications system. Telecommunications infrastructure would be added to connect the proposed Circle City Substation to SCE’s telecommunications system and would provide supervisory control and data acquisition, protective relaying, data transmission, and telephone services for the proposed Circle City Substation and associated facilities.

Circle City Substation would include a MEER, as described in Section 3.1.1.5 Mechanical and Electrical Equipment Room, which would contain telecommunications equipment, such as light wave optic equipment, channel bank equipment, and equipment to provide voice, data, and protection circuits. Additional light wave and channel bank equipment would be installed at Mira Loma, Pedley, Corona, Chase, and Jefferson substations to provide protection circuits. This additional equipment would be installed within the existing MEERs; therefore, no additional ground disturbance is associated with the proposed telecommunications work.

The new telecommunications infrastructure would include additions and modifications to the existing system. One new fiber optic cable would connect the proposed Circle City Substation to the existing Corona Substation and one new fiber optic route would connect the proposed Circle City Substation to the existing Corona-Pedley fiber optic cable. Figure 3-6: Proposed Telecommunication Route depicts the proposed fiber optic cable routes.

The proposed fiber optic routes are described as follows:

- The fiber optic cable route that would connect to Corona and Circle City substations would begin inside the MEER in the proposed Circle City Substation. Inside the substation, the cable would be placed in a new underground duct bank system that would head north toward Leeson Lane, continue west on Leeson Lane for approximately 650 feet to Magnolia Avenue, then continue north on Magnolia Avenue for approximately 200 feet to a proposed subtransmission LWS pole. One new manhole would be located near the proposed LWS riser pole. Typical manhole dimensions are approximately 4 feet long, 4 feet wide and 6 feet deep. The fiber optic cable would then convert to overhead at the proposed subtransmission LWS riser pole located along proposed the Source Line Route. In an overhead position, the fiber optic cable would then continue along proposed Source Line Route for approximately 200 feet to 6th Street. The Source Line Route would then head west on 6th Street for approximately 4,300 feet, turn north on El Sobrante Road and continue for approximately 1,000 feet and turn west along Quarry Street and continue for approximately 1,300 feet to Temescal Channel, where the line would turn northwest for approximately 700 feet. The fiber optic cable would then head west on East 3rd Street for approximately 1,600 feet to Grand Boulevard, where the fiber optic cable would convert to underground. The fiber optic cable would then proceed northwest along Grand Boulevard for approximately 1,500 feet to Joy Street, following the underground segment of the Source Line Route. To accommodate this underground segment, two manholes would be installed on Grand Boulevard. At Joy Street, the fiber optic cable would convert to overhead at the proposed LWS pole along the Source Line Route. In an overhead position, the fiber optic cable would continue north on Joy Street for approximately 600 feet along proposed the Source Line Route to Blaine Street. The fiber optic cable would continue west on Blaine Street for approximately 1,400 feet to Main Street, where the fiber optic cable would convert to underground. The fiber optic cable would then proceed underground for approximately 1,200 feet and two manholes would be installed in this underground segment. The fiber optic cable would then convert to overhead and continue along the Source Line Route for approximately 800 feet to Sheridan Street, where the cable would convert to underground. Approximately 200 feet of new conduit and one manhole would be required to connect to an existing conduit and continue south on Sheridan Street for approximately 500 feet to Railroad Street, then west on Railroad Street approximately 1,000 feet, then north for approximately 100 feet to Corona Substation. The entire route would be approximately 17,000 feet in length.

- The fiber optic cable that would connect Circle City Substation to the existing Corona-Pedley fiber optic cable would begin inside the new MEER in the proposed Circle City Substation. Inside the substation, the cable would be placed in a new underground duct bank system that would head north toward Leeson Lane, then continue southwest on

Figure 3-6: Proposed Telecommunications Route

Leeson Lane approximately 150 feet to a proposed LWS riser pole. There would be one new manhole located near the proposed LWS pole. The fiber optic cable would then convert to overhead at the proposed LWS pole located along the Source Line Route. In an overhead position, the fiber optic cable would then continue for approximately 2,100 feet along the Source Line Route to Sherborn Street, where the fiber optic cable would convert to underground. The fiber optic cable would then proceed southwest in new underground conduit along Magnolia Avenue for approximately 200 feet to an existing underground vault, then continue southwest along Magnolia Avenue in existing underground conduit for approximately 2,500 feet to Rimpau Avenue. The entire route would be approximately 5,000 feet in length.

3.2 Proposed Project Construction Plan

The following subsections describe the construction activities associated with the Proposed Project.

3.2.1 General Construction

3.2.1.1 Staging/Work Areas

Construction of the Proposed Project would require the establishment of temporary staging yards. Staging yards would be used as a reporting location for workers, vehicle and equipment parking, and material storage. The yards may also have construction trailers for supervisory and clerical personnel. Staging yards may be lit for staging and security. Normal maintenance and refueling of construction equipment would also be conducted at these yards. All refueling and storage of fuels would be in accordance with the Storm Water Pollution Prevention Plan (SWPPP).

SCE anticipates using one or more of the possible locations listed in Table 3-3: Potential Staging Yard Locations and depicted in Figure 3-7: Potential Staging Areas as the staging yard(s) for the Proposed Project. Typically, each yard would be approximately 1 to 5 acres in size, depending on land availability and intended use. Preparation of the staging yard would include temporary perimeter fencing and, depending on existing ground conditions at the site, the application of gravel or crushed rock. Any land that may be disturbed at the staging yards would be restored to near pre-construction conditions or to the landowner’s requirements following the completion of the Proposed Project construction.

The temporary power source would be determined based on the type of equipment/facilities being used at the staging yards. If existing distribution facilities are available, a temporary service and meter may be used for electrical power at one or more of the yards. If it is determined that temporary power at the staging yards is not needed full time or not available, a portable generator may be used intermittently for electrical power at one or more of the staging yards.

Materials commonly stored at the substation construction staging yard include, but are not limited to: portable sanitation facilities; electrical equipment, such as circuit breakers, disconnect switches, lightning arresters, transformers, vacuum switches, steel beams, rebar, foundation cages, conduit, insulators, conductor, and cable reels; pull boxes; and line hardware.

Table 3-3: Potential Staging Yard Locations

Staging Yard Number	Location	Condition	Approximate Size (acres)
1	Circle City Substation	Graded Property	5 - 8
2	Mira Loma Substation	Previously Disturbed	3
3	Hamner Avenue	Vacant Field	3
4	Hellman Avenue	Vacant Field	5
5	South Temescal Street	Vacant Field	5
6	Ontario Service Center	Previously Disturbed	1
7	Jefferson Substation	Previously Disturbed	0.5

Materials commonly stored at the subtransmission, and/or telecommunications construction staging yards would include, but not be limited to: construction trailers, construction equipment, portable sanitation facilities, steel bundles, steel/wood poles, conductor reels, overhead ground wire or overhead optical ground wire (OPGW) reels, hardware, insulators, cross arms, signage, consumables, such as fuel and filler compound, waste materials for salvaging, recycling, or disposal, and best management practice (BMP) materials, such as straw wattles, gravel, and silt fences.

A majority of materials associated with the construction efforts would be delivered by truck to the designated staging yards, while some materials may be delivered directly to the temporary subtransmission line construction work areas.

Subtransmission line construction work areas would serve as temporary work areas for crews and as sites where Proposed Project-related equipment and/or materials would be placed at or near each structure location within SCE ROW or franchise. Table 3-4: Estimated Temporary and Permanent Land Disturbance, identifies the approximate land disturbance for these construction areas. The new structure pad locations and laydown/work areas would first be graded and/or cleared of vegetation as required to provide a reasonably level and vegetation-free surface for structure installation. Sites would be graded such that water would run toward the direction of the natural drainage. In addition, drainage would be designed to prevent ponding and erosive water flows that could cause damage to the structure footings. The graded area would be compacted to at least 90 percent relative density, and would be capable of supporting heavy vehicular traffic.

Erection of the structures may also require establishment of a temporary crane pad. The crane pad would occupy an area of approximately 50 feet by 50 feet and would be located adjacent to each applicable structure within the laydown/work area used for structure assembly. The pad may be cleared of vegetation and/or graded as necessary to provide a level surface for crane operation. The decision to use a separate crane pad would be determined during final engineering of the Proposed Project and during the selection of the appropriate construction methods to be used by SCE or its contractor.

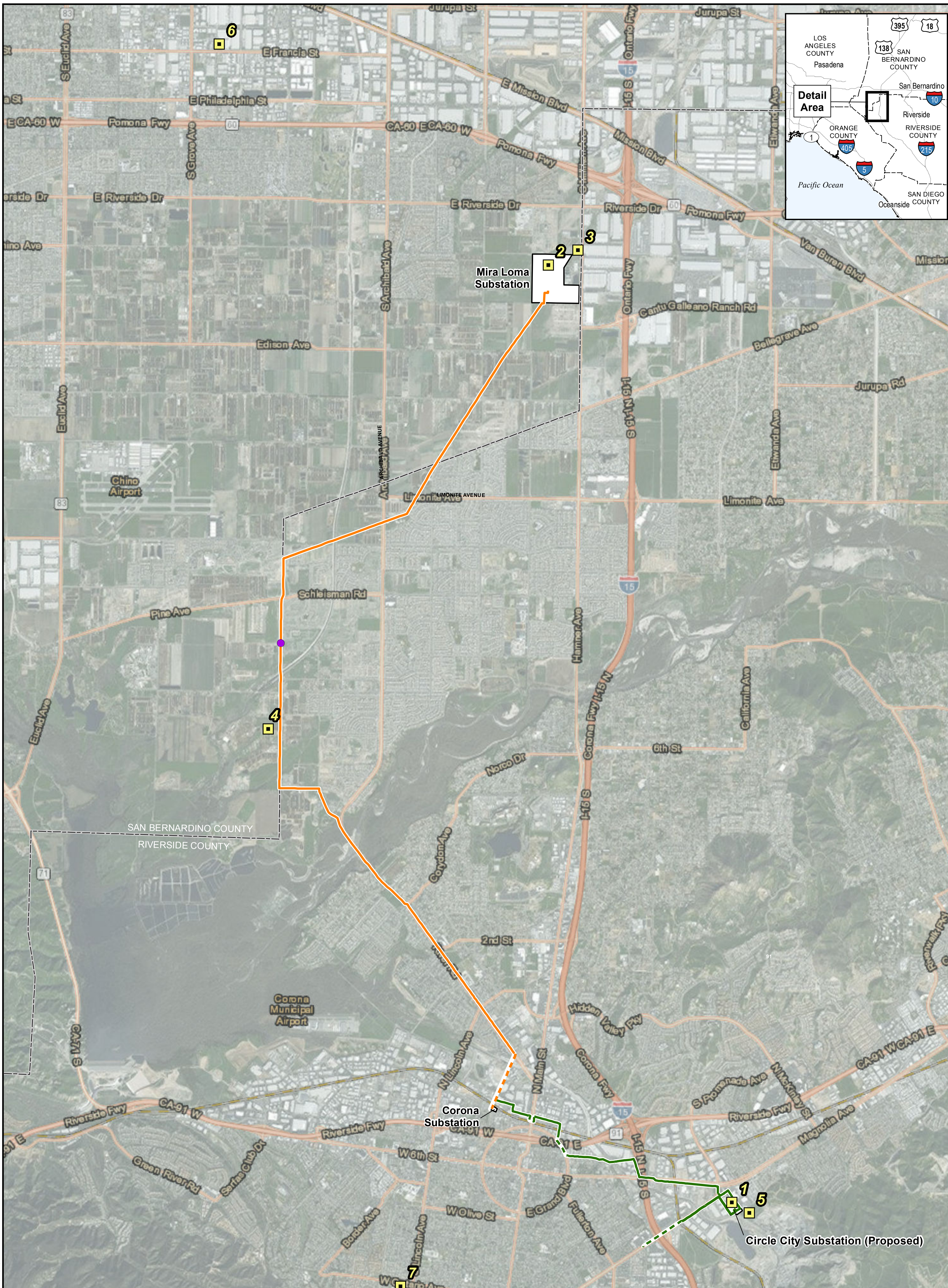

Figure 3-7: Potential Staging Yards

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Sources: Insignia, 2015; SCE, 2015

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3.2.1.2 Storm Water Pollution Prevention Plan

Construction of the Proposed Project would disturb a surface area greater than one acre. Therefore, SCE would be required to obtain coverage under the Statewide Construction General Permit (Order No. 2009-0009-DWQ) from the State Water Resources Control Board as described in Section 4.9 Hydrology and Water Quality. Commonly used BMPs include storm water runoff quality control measures (boundary protection), dewatering procedures, and concrete waste management. The SWPPP would be based on final engineering design and would cover all Proposed Project components.

3.2.1.3 Dust Control

During construction, migration of fugitive dust from the construction sites would be limited by control measures set forth by the South Coast Air Quality Management District (SCAQMD) Rule 403. These measures may include the use of water trucks and other dust control measures.

3.2.1.4 Construction Work Hours

Construction activities would generally adhere to the allowable construction work hours specific in the noise ordinances of local jurisdictions. In the event that construction activities are necessary on days or hours outside of what is specified by a noise ordinance, SCE would obtain variances, as necessary, from the appropriate jurisdiction where the work would take place.[9]

3.2.1.5 Traffic Control

Construction activities completed within public street ROWs would require the use of a traffic control service, and all lane closures would be conducted in accordance with applicable requirements. These traffic control measures would be consistent with those published in the *California Joint Utility Traffic Control Manual.*

3.2.1.6 Vegetation Clearance

Vegetation communities present within the Proposed Project area are depicted in Attachment 4.4 A: Vegetation Communities Map and are quantified in Table 4.4 6: Vegetation Communities and Potential Impacts. SCE utilizes work areas that minimize impacts to trees and other vegetation. When vegetation removal is necessary, SCE utilizes multiple methods. For brush and weed abatement, SCE would typically hand clear the area with power brush cutters and, as required, by mechanical equipment with a grading blade. To ensure that proper line clearances are consistent with CPUC G.O. 95 and G.O. 128, tree trimming may be required. Tree trimming activities typically require power and hand tools such as chain saws, pole pruners, and hand saws. Debris may be mulched on site or removed to a permitted disposal location.

3.2.2 Circle City Substation Construction

The following subsections describe the construction activities associated with installing the components of the proposed Circle City Substation.

[9] In order for work to be performed safely and to maintain system reliability, possible activities include, but are not limited to, transformer delivery, filling substation transformers, and taking line outages at night.

3.2.2.1 Site Preparation and Grading

The substation site would be prepared by clearing existing vegetation, superfluous utilities, equipment, and asphalt paving within the boundaries of the Circle City Substation property. Once clearance is completed, the site would be graded in accordance with approved grading plans. Approximately 44,500 CY of soil and asphalt concrete would be exported.

3.2.2.2 Below-Grade Construction

After the substation site is graded, below-grade facilities would be installed. Below-grade facilities include, for example, a ground grid, cable trenches, equipment foundations, substation perimeter foundations, conduits, duct banks, and vaults. Approximately 730 CY of soil would be exported.

3.2.2.3 Above-Grade Construction

Above-grade installation of substation facilities such as buses, capacitor banks, switchracks, disconnect switches, circuit breakers, transformers, steel support structures, perimeter chain-link fence, restroom facilities, and the MEER would commence after the below-grade structures are in place.

The transformers would be delivered by heavy-transport vehicles and installed on the transformer foundation. If necessary, traffic control would be conducted as described in Section 3.2.1.5 Traffic Control.

3.2.2.4 Temporary Power during Construction

Prior to construction, SCE would select a nearby 12 kV distribution circuit to serve as the temporary power source during construction activities at the Circle City Substation site. The wood poles installed for temporary power would be approximately 20 feet tall and would be placed approximately 20 feet apart. It is estimated that 8 to 10 wood poles would extend from a nearby 12 kV distribution circuit to the substation construction site. Wood poles would be installed using a work truck with an auger and placed at a depth of approximately 4 feet. Conductor would be strung from the nearby 12 kV distribution circuit and attached to the wood poles. Temporary power would be in place for the duration of construction at the substation site.

3.2.2.5 Modifications at Other Substations

In order to accommodate the Mira Loma-Jefferson, Circle City-Corona No. 1, Circle City-Corona No. 2, Mira Loma-Circle City-Pedley, and Chase-Circle City-Databank 66 kV Subtransmission Line connections at Mira Loma, Jefferson, Corona, Pedley, Chase, and Databank substations, the following work would be conducted:

- Equip an existing position of the 66 kV switchrack with one circuit breaker, two horizontal-mounted group operated disconnect switched, and one transformer at Mira Loma Substation.

- Upgrade protection scheme as needed at Mira Loma, Jefferson, Corona, Pedley, Chase and Databank substations.

3.2.3 Subtransmission Line Installation

The following subsections describe the construction activities associated with installing the subtransmission lines for the Proposed Project.

3.2.3.1 Access Roads

Access to the proposed 66 kV subtransmission lines for temporary construction activities would be accomplished by utilizing a network of existing and newly constructed temporary and permanent roads within existing SCE ROW, public ROW, and public and private lands. Access to the proposed 66 kV subtransmission lines for permanent maintenance activities would be accomplished by utilizing a network of existing and new access roads.

Property owner approval would be obtained prior to construction activities for temporary access to areas outside of SCE's ROW. During construction, the Proposed Project would utilize, to the maximum extent practicable, existing public roads and existing subtransmission and transmission line access roads. Rehabilitation and improvements to existing roads and construction of temporary and permanent roads may be required to facilitate construction access.

The typical transmission access road consists of a network of dirt roads accessed from paved public and private roads. The existing network of access roads along the Proposed Project routes are a combination of paved and unpaved surfaces, which include dirt, gravel base, asphalt concrete, and cement concrete.

Typical construction activities associated with the rehabilitation of existing unpaved access roads include vegetation clearing, blade-grading, over-excavation, and re-compacting of soils to remove potholes, ruts, and other road surface irregularities in order to provide a smooth, dense riding surface capable of supporting heavy construction and maintenance equipment. Rehabilitated roads may also require additional improvements, such as protection for underground utilities, widening existing road widths, accommodating site drainages, installing/replacing access gates, and installing paved driveway approaches for ingress/egress between paved and unpaved roads.

Typical construction activities associated with new temporary and permanent new access roads generally include similar activities described for the rehabilitation and improvements of existing unpaved roads, but may also include additional construction requirements, depending on the existing terrain. These construction activities may include the following:

- For existing flat terrain with up to a 4-percent grade; construction activities would be generally similar to rehabilitation activities to existing dirt roads.

- For existing rolling terrain with an approximately 5- to 12-percent grade, construction activities would generally include rehabilitation and additional road improvement activities, and may require significant cut and fill slopes, benched grading, drainage and erosion control improvements, and slope stability improvements.

Where required, existing access roads would be improved and new roads would be constructed using current SCE standard practices to support the safe operation of vehicles for construction, O&M. New roads would typically have circular turnaround areas near the structure locations.

Generally, temporary and permanent dirt access roads would have a drivable surface that would be at least 14 feet wide with 2 feet of shoulder on each side, as required by the existing land terrain. Typical portions of the drivable surface would be widened along curved sections of the access road, creating a maximum drivable surface that would measure up to 22 feet wide. Access road gradients would be leveled so that sustained grades generally would not exceed 12 percent. Typically, a minimum radius of 50-foot curvature, measured at the centerline of the usable road surface, is required along curves in the road.

The Proposed Project would extend through lands primarily used for agricultural purposes and would require construction activities for the rehabilitation of existing unpaved access roads traversing over flat terrain, as described previously. As shown in Attachment 3-A: Proposed Stringing Sites and Access Roads, it is anticipated that the construction and rehabilitation of access roads for the Proposed Project would require approximately 5 miles of permanent and temporary access roads at the following locations:

- Widening of an existing access road south of Mira Loma Substation, which would be accessed from South Milliken Avenue, and bearing southwesterly along a new access road that ends at an existing earth drainage channel.

- From Edison Avenue, a temporary access road bearing northeasterly and ending at an existing earth drainage channel would be used.

- Use of existing access roads and temporary access roads would continue south of Edison Avenue heading southwesterly through a dairy with ponds to the intersection of Haven/Sumner Avenue and Eucalyptus Avenue.

- Primarily temporary access roads would be used southwesterly of Eucalyptus Avenue through current and former dairy farm land to the intersection of Remington/Bellgrave Avenue and Harrison Avenue with the exception of an existing access road to be widened which is accessed from Sumner/Haven Avenue.

- Existing access roads and a temporary access road would be used southwesterly through former dairy land between Remington/Bellgrave Avenue and Limonite Avenue accessed from Harrison Avenue.

- An existing access road would be used southwesterly from Limonite Avenue to Archibald Avenue.

- Existing access roads and temporary access roads would be used southwesterly from Archibald Avenue to an existing flood control channel.

- Existing access roads and temporary access roads would be used northeasterly from Hellman Avenue to an existing flood control channel.

- New access roads and temporary access roads would be used along River Road between Baron Drive and Bluff Street to access structures within close vicinity to the Santa Ana River.

- An existing access road would be used at the end of East 3rd Street and would continue east to an existing flood control channel.

3.2.3.2 Wood Pole Installation

Each wood pole would require a hole to be excavated by using an auger, backhoe, or hand digging. Excavated material would be used as described in Section 3.7 Reusable, Recyclable, and Waste Material Management. The wood poles would be placed in temporary laydown areas at each pole location. While on the ground, the wood poles may be configured (if not pre-configured) with the necessary cross arms, insulators, and wire-stringing hardware before being set in place. The wood poles would then be installed in the holes, typically by a line truck with an attached boom. Wood guy stub pole installation would be installed similarly to wood pole installation.

3.2.3.3 Lightweight Steel Pole Installation

Each LWS pole would require a hole to be excavated by using either an auger or a backhoe. Excavated material would be used as described in Section 3.7 Reusable, Recyclable, and Waste Material Management. LWS poles consist of separate base and top sections and may be placed in temporary laydown areas at each pole location. Depending on the conditions at the time of construction, the top sections may be pre-configured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. The LWS poles would then be installed in the holes, typically by a line truck with an attached boom. When the base section is secured, the top section would be installed on top of it. Depending on the terrain and available equipment, the pole sections could also be assembled into a complete structure on the ground prior to setting the poles in place within the holes.

3.2.3.4 H-Frame Hybrid Pole Installation

Each H-frame hybrid pole would consist of a pre-fabricated concrete base that would require a hole to be excavated by using either an auger or a backhoe. Excavated material would be used as described in Section 3.7 Reusable, Recyclable, and Waste Material Management. The poles consist of separate base and top sections and may be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top LWS pole sections may be pre-configured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. Depending on soil conditions, a steel caisson may be set in the hole prior to the concrete base. The pre-fabricated concrete base is then set inside of the caisson and backfilled. When the base section is secured, the LWS pole sections would be installed by slipping them onto the concrete base. Typically, a crane and a line truck are used for the installation of hybrid poles. The poles are set one section at a time, and once the pole is completely assembled, the sections are jacked together. The final engineering design would determine the appropriate backfill material to fill the annular space around the foundation, but typically, a granular backfill or slurry backfill material is used.

3.2.3.5 Tubular Steel Pole Installation

Each TSP would require a drilled, poured-in-place, concrete footing that would form the structure foundation. The hole would be drilled using truck or track-mounted excavators. Excavated material would be used as described in Section 3.7 Reusable, Recyclable, and Waste Material Management. Following excavation of the foundation footings, steel-reinforced cages would be set, survey positioning would be verified, and concrete would then be poured. Foundations in soft or loose soil, or that extend below the groundwater level, may be stabilized with drilling mud slurry. In this instance, mud slurry would be placed in the hole after drilling to prevent the sidewalls from sloughing. Concrete would then be pumped to the bottom of the hole, displacing the mud slurry. Depending on site conditions, the mud slurry brought to the surface would typically be collected in a pit adjacent to the foundation or vacuumed into a truck, and then pumped out to be reused or discarded at an appropriate off-site disposal facility.

TSPs consist of separate base and top sections. The pole sections would be placed in temporary laydown areas at each pole location. Depending on conditions at the time of construction, the top sections may be pre-configured, be configured on the ground, or be configured after pole installation with the necessary cross arms, insulators, and wire-stringing hardware. A crane would then be used to set each steel pole base section on top of the previously prepared foundations. If existing terrain around the TSP location is not suitable to support crane activities, a temporary crane pad would be constructed within the laydown area. When the base section is secured, the top section of the TSP would be set into place onto the base section and the two sections would be slipped or bolted together. The two sections may also be spot welded together for additional stability. Depending on the terrain and available equipment, the pole sections could also be pre-assembled into a complete structure prior to setting the poles.

3.2.3.6 Guard Structures

Guard structures are temporary facilities that would typically be installed at transportation, flood control, and utility crossings for conductor stringing activities. These structures are designed to stop the movement of a conductor, should it momentarily drop below a conventional stringing height. Temporary netting could also be installed to protect some types of under-built infrastructure. Approximately 90 guard structures may need to be constructed along the proposed route.

Typical guard structures are standard wood poles. Depending on the overall spacing of the conductors being installed, two to four guard poles would be required on either side of a crossing. The guard structures would be removed after the conductor is secured into place. In some cases, the wood poles could be substituted with the use of specifically equipped boom trucks.

For highway, railroad, and open channel water crossings, SCE would work closely with the applicable jurisdiction to secure the necessary permits to string conductor over the applicable infrastructure.

3.2.3.7 Wire Stringing

Wire stringing activities would be in accordance with SCE common practices and would be similar to process methods detailed in the IEEE Standard 524-2003, Guide to the Installation of Overhead Transmission Line Conductors. To ensure the safety of workers and the public, safety devices such as traveling grounds, guard structures, radio-equipped public safety roving vehicles and linemen would be in place prior to the initiation of wire stringing activities. Advanced planning is required to determine circuit outages, pulling times, and safety protocols to ensure that the safe installation of wire is accomplished.

Wire stringing includes all activities associated with the installation of the primary conductors onto subtransmission line structures. These activities include the installation of conductor, ground wire, insulators, stringing sheaves (rollers or travelers), vibration dampeners, weights, suspension and dead-end hardware assemblies for the entire length of the route.

The following five steps describe typical wire stringing activities:

- Step 1 – Planning: Develop a wire stringing plan to determine the sequence of wire pulls and the set-up locations for the wire pulling/tensioning/splicing equipment.

- Step 2 – Sock Line Threading: A bucket truck is typically used to install a light-weight sock line from structure to structure. The sock line would be threaded through the wire rollers in order to engage a camlock device that would secure the pulling sock in the roller. This threading process would continue between all structures through the rollers of a particular set of spans selected for a conductor pull.

- Step 3 – Pulling: The sock line would be used to pull in the conductor pulling rope and/or cable. The pulling rope or cable would be attached to the conductor using a special swivel joint to prevent damage to the wire and to allow the wire to rotate freely to prevent complications from twisting as the conductor unwinds off the reel.

- Step 4 – Splicing: Sagging, and Dead-Ending: Once the conductor is pulled in, if necessary, all mid-span splicing would be performed. Once the splicing has been completed, the conductor would be sagged to proper tension and dead-ended to structures.

- Step 5 – Clipping-In: After the conductor is dead-ended, the conductors would be secured to all tangent structures; a process called clipping in. Once this is complete, spacers would be attached between the bundled conductors of each phase to keep uniform separation between each conductor.

Wire stringing and pull sites may be slightly offset and/or angled to extend outside of the ROW to clear unavoidable obstructions. Also, at deflection points along the subtransmission line routes, wire stringing and pull sites typically extend beyond the ROW as well. Proposed stringing sites are shown in Attachment 3-A: Proposed Stringing Sites and Access Roads. The puller, tensioner, and splicing set-up locations associated with the Proposed Project would be temporary and the sites would be restored to near pre-construction conditions following completion of pulling and splicing activities. The set-up locations require level areas to allow for maneuvering of the equipment and, when possible, these locations would be located on existing roads and level areas to minimize the need for grading and cleanup. Approximately 59 set-up locations are currently proposed. The final number and location of these sites would be determined upon final engineering. The approximate area needed for stringing set-up locations associated with wire installation is variable and depends upon terrain. See Table 3-4: Estimated Temporary and Permanent Land Disturbance provides the approximate size of pulling, tensioning, and splicing equipment set-up areas, as well as laydown dimensions.

Wire pulls are the length of any given continuous wire installation process between two selected points along the line. Wire pulls are selected based on a variety of factors, including availability of dead-end structures, conductor size, geometry of the line as affected by points of inflection, terrain, and suitability of stringing and splicing equipment set-up locations. On relatively straight alignments, typical wire pulls occur approximately every 4,000 to 6,000 feet on flat terrain. When the line route alignment contains multiple deflections or is situated in rugged terrain, the length of the wire pull is typically diminished. Generally, pulling locations and equipment set-ups would be in direct line with the direction of the overhead conductors and established at a distance equal to approximately three times the height of the adjacent structure.

Each stringing operation consists of a puller set-up positioned at one end, and a tensioner set-up with a wire reel stand truck positioned at the other end of the wire pull. Pulling and wire tensioning locations may also be utilized for splicing and field snubbing (i.e., anchoring and dead-end hardware) of the conductors. Temporary splices may be necessary since permanent splices that join the conductor together cannot travel through the rollers. Splicing set-up locations are used to remove temporary pulling splices and install permanent splices once the conductor is strung through the rollers located on each structure. Field snubs would be temporarily installed to sag conductor wire to the correct tension at locations where stringing equipment cannot be positioned behind a dead-end structure.

3.2.3.8 Removal of Existing Structures

Prior to removal of existing structures, the existing subtransmission lines, distribution lines, and telecommunication lines would be transferred to the new structures, where applicable. The existing conductor would be removed using wire pulling equipment. Upon placement of the wire pulling equipment, the subtransmission conductor would be pulled out with a pulling rope and/or cable attached to the trailing end of the conductor; guard structures or the equivalent might be used during the removal process. All subtransmission, distribution, and telecommunication lines that would not be reused by SCE would be removed and delivered to a facility for disposal as described in Section 3.7 Reusable, Recyclable, and Waste Material Management.

The existing wood poles and LWS poles would be completely removed once the subtransmission, distribution, and telecommunication lines are transferred to the new poles. The removal would consist of the above and belowground portions of the pole, and the holes left from removing the poles would be backfilled with spoils that may be available as a result of the excavation for new poles and using imported fill, as needed. Once the holes are filled, the area would be compacted and smoothed to match the surrounding grade.

The existing H-frame hybrid poles would be completely removed once the subtransmission, distribution, and telecommunication lines are transferred to the new poles. The existing LWS pole sections would be slipped off the pre-fabricated concrete base and pre-fabricated concrete base would be completely removed aboveground and belowground. The holes left from removing the pre-fabricated concrete base would be backfilled with spoils that may be available as a result of the excavation for new poles and using imported fill, as needed.

The existing TSPs would be completely removed once the subtransmission, distribution, and telecommunication lines are transferred to the new poles. The existing TSP would be taken off of the foundation base and dismantled. The foundation base above the ground and typically two feet below the ground would be removed. The holes left from removing the foundation would be backfilled with spoils which may be available as a result of the excavation for new poles or with imported fill as needed. Once the holes are filled, the area would be compacted and smoothed to match surrounding grade.

3.2.3.9 Underground Subtransmission

The following subsections describe the construction activities associated with installing the underground 66 kV subtransmission lines for the Proposed Project.

Survey

Construction activities would begin with the survey of existing underground utilities along the proposed underground Mira Loma-Jefferson 66 kV Subtransmission Line Route. SCE would notify all applicable utilities via Underground Service Alert to locate and mark existing utilities. SCE would conduct exploratory excavations (i.e., potholing) as necessary to verify the location of existing utilities. SCE would secure encroachment permits for potholing in public streets as required.

Trenching

The Proposed Project includes a total of approximately 4,980 feet of new underground 66 kV subtransmission lines and associated transition and support structures. An approximately 20-to 24-inch wide by 60-inch deep trench would be required to place the 66 kV subtransmission line underground. This depth is required to meet the minimum 36 inches of cover above the duct bank and may vary to avoid other existing utilities. Trenching would be performed by using the following general steps, including, but not limited to: mark the location and applicable underground utilities, lay out trench line, saw cut asphalt or concrete pavement as necessary, dig to the appropriate depth with a backhoe or similar equipment, and install the new duct bank. Once the duct bank has been installed, the trench would be backfilled with a sand slurry mix. Approximately 27,161 CY of material would be removed from the trenches. Approximately one-third (896.13 CY) of excavated materials would be reused as fill for the Proposed Project, and the remainder (approximately 26,264 CY) would be disposed of at an off-site disposal facility in accordance with applicable laws if necessary. A list of likely off-site disposal facilities within a 30 mile radius of the Proposed Project is provided in Table 4.17-1: Landfills and Recycling Centers near the Proposed Project in Section 4.17 Utilities and Service Systems. Should groundwater be encountered, it would be pumped into a tank and disposed of at an off-site disposal facility in accordance with applicable laws.

The trench for underground construction would be widened and shored where appropriate to meet California Occupation and Safety Health Administration requirements. Trenching would be staged so that open trench lengths would not exceed that which is required to install the duct banks. Where needed, open trench sections would have steel plates placed over them in order to maintain vehicular and pedestrian traffic. Provisions for emergency vehicle access would be arranged with local jurisdictions in advance of construction activities. Standard BMPs, including plastic sheeting and straw wattles, would be implemented in accordance with the Proposed Project's SWPPP.

Duct Bank Installation

As trenching for the underground 66 kV subtransmission line is completed, SCE would begin to install the underground duct bank. Collectively, the duct bank is comprised of cable conduit, spacers, ground wire, and concrete encasement. The duct bank typically consists of six 6-inch diameter polyvinyl chloride (PVC) conduits fully encased with a minimum of 3 inches of concrete all around. Typical 66 kV subtransmission duct bank installations would accommodate six cables. The Proposed Project would utilize six cable conduits pursuant to SCE's current standards for 66 kV underground construction, as depicted in Figure 3-8: Typical Subtransmission Duct Bank for standard duct bank configuration.

The majority of the 66 kV duct banks would be installed in a vertically stacked configuration and each duct bank would be approximately 21 inches tall and 20 inches wide. In areas where underground utilities are highly congested or areas where it is necessary to fan out the conduits to reach termination structures, a flat configuration duct bank may be required. However, for the Proposed Project, it is not anticipated that a flat underground duct bank configuration would be required.

In instances where a subtransmission duct bank would cross or run parallel to other substructures that operate at normal soil temperature (e.g., gas lines, telephone lines, water mains, storm drains, and sewer lines), a minimal radial clearance of 6 inches for crossing and 12 inches for paralleling these substructures would be required. Where duct banks cross or run parallel to substructures that operate at temperatures significantly exceeding normal soil temperature (e.g., other underground transmission circuits, primary distribution cables, steam lines, and heated oil lines), additional radial clearance may be required. Clearances and depths would meet the requirements set forth in Rule 41.4 of CPUC G.O. 128.

Vault Installation

Vaults are below-grade concrete enclosures where the duct banks terminate. The vaults are constructed out of pre-fabricated, steel-reinforced concrete and are designed to withstand heavy truck traffic loading. The inside dimensions of the underground vaults would be approximately 10 feet wide, 20 feet long, and 9.5 feet deep. The vaults would be placed approximately 300 to 800 feet apart along the underground portion of the subtransmission lines.

Initially, the vaults would be used as pulling and feed locations to pull cable through the conduits. After the cable is installed, the vaults would be utilized to splice the cables together. During operation, the vaults would provide access to the underground cables for maintenance, inspections, and repairs.

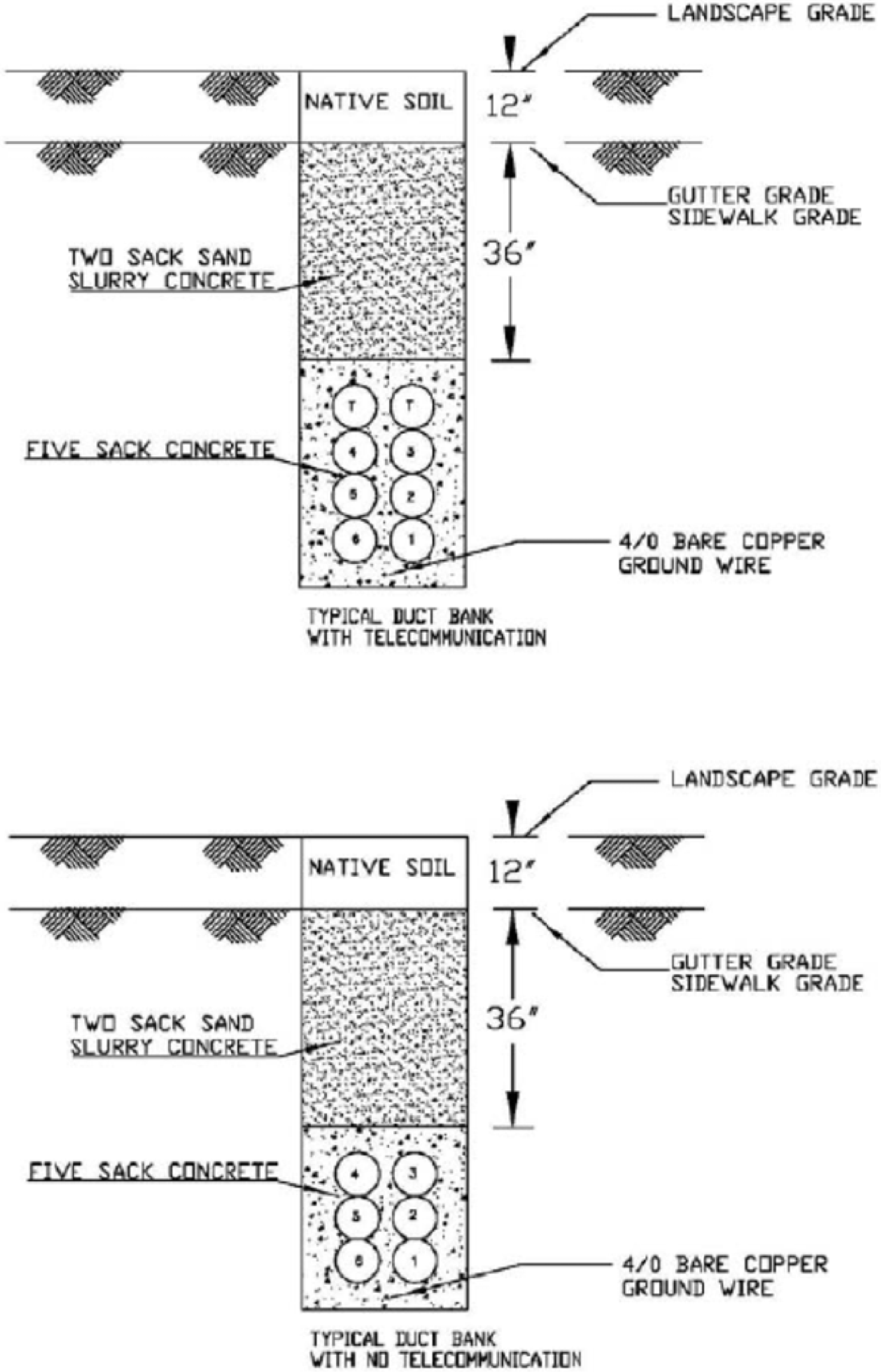

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Figure 3-8: Typical Subtransmission Duct Bank

Installation of each vault would typically take place over a one-week period, depending on soil and traffic conditions. First, the vault pit would be excavated and shored; a minimum of 6 inches of mechanically compacted aggregate base would be placed to cover the entire bottom of the pit, followed by delivery and installation of the vault. Once the vault is set, grade rings and the vault casting would be added and set to match the existing grade. The excavated area would be backfilled with a sand slurry mix to a point just below the top of the vault roof. Excavated materials, if suitable, or imported fill material would be used to backfill the remainder of the excavation and any excess spoils would be disposed of at an off-site disposal facility in accordance with all applicable laws. Finally, the excavated area would be restored as required. Figure 3-9: Typical Subtransmission Vault depicts a typical subtransmission vault.

Cable Pulling, Splicing, Termination

Following vault and duct bank installation, SCE would utilize the new vaults and duct banks, as well as existing vaults and duct banks, to pull the electrical cables through the duct banks, splice the cable segments at each vault, and terminate cables at the transition structures where the subtransmission lines would transition from underground to overhead. To pull the cables through the duct banks, a cable reel would be placed at one end of the conduit segment, and a pulling rig would be placed at the opposite end. The cable from the cable reel would be attached to a rope in the duct bank, and the rope would be linked to the pulling rig, which would pull the rope and the attached cable through the duct banks. A lubricant would be applied as the cable enters the ducts to decrease friction and facilitate travel through the PVC conduits. The electrical cables for the subtransmission line circuits would be pulled through the individual conduits in the duct bank at a rate of two to three segments between vaults per day.

After cable pulling is completed, the electrical cables would be spliced together. A splice crew would conduct splicing operations at each vault location and continue until all splicing is completed.

Transition Structure Construction

At each end of an underground segment, the cables would rise out of the ground at transition structures, which accommodate the transition from underground to overhead subtransmission lines. Transition structures constructed as part of the Proposed Project would consist of engineered TSP structures. The transition structure would support cable terminations, lightning arresters, and dead-end hardware for overhead conductors. Construction methods for these structures would be similar to those described in Section 3.2.3.5 Tubular Steel Pole Installation.

3.2.3.10 Energizing 66 kV Subtransmission Lines

Energizing the new subtransmission lines is the final step in completing the 66 kV subtransmission construction. The existing Mira Loma-Corona-Jefferson and Archibald-Chino-Corona 66 kV subtransmission lines would be de-energized in order to connect the new 66 kV subtransmission line segments to the existing system. To reduce the need for electric service interruption, de-energizing and re-energizing the existing subtransmission lines may occur at night when electrical demand is low. De-energizing and re-energizing would be conducted in accordance with California Independent System Operator’s requirements.

3.2.4 Telecommunications Construction

Installation of the telecommunications system would include new or upgraded telecommunications equipment that would be installed within Circle City, Mira Loma, Pedley, Corona, Chase, Jefferson, Cleargen, and Bain substations. Overhead and underground fiber optic cables would be installed on or in new and existing structures.

Installation of telecommunications equipment within new and existing substations would be performed with the MEER. Telecommunications equipment is installed into the rack, wired, and placed into service.

Overhead fiber optic cable would be installed on overhead structures, as described in Section 3.2.3.7 Wire Stringing. A truck with a cable reel would be set up at one end of the section to be pulled, and a truck with a winch would be set up at the other end. Typically, fiber optic cable pulls vary between 6,000 feet and 10,000 feet in length. Cable would be pulled into the pole and permanently secured. Fiber strands in the cable from one reel would be spliced to fiber strands in the cable from the next reel to form one continuous path.

New underground conduit and structures would typically be installed with a backhoe. The trench would be excavated to a width of approximately 12 to 24 inches and a minimum depth of approximately 36 inches. PVC conduit would be placed in the trench and covered with approximately 30 inches of concrete slurry, then backfilled and compacted. For manholes and pull boxes, a hole is excavated between approximately 6 and 9 feet deep, 7 and 8 feet long and 6 and 7 feet wide. The manhole or pull box would be lowered into place, connected to the conduits, and backfilled with concrete slurry.

The fiber optic cable would be installed throughout the length of the underground conduit and structures through an innerduct, which provides protection and identification for the cable. The innerduct would be pulled in the conduit from structure to structure using a pull rope and pulling machine or truck-mounted hydraulic capstan. The fiber optic cable would then be pulled inside the innerduct using the same procedure.

3.2.5 Distribution Getaway and Underground 33 kV Installation

Typical excavation for distribution duct bank installation would encompass construction of a trench approximately 2 feet wide and 4.5 feet deep. The ground disturbance for trenching and vault installation would be caused by activities associated with the conduit and structure installation and concrete encasement. Construction activities would typically include the use of a backhoe, dump trucks, concrete trucks, and a crane. Soil excavated would be used to refill the trench and area surrounding the vaults, and excess soil would be trucked to an approved off-site disposal facility in accordance with all applicable laws.

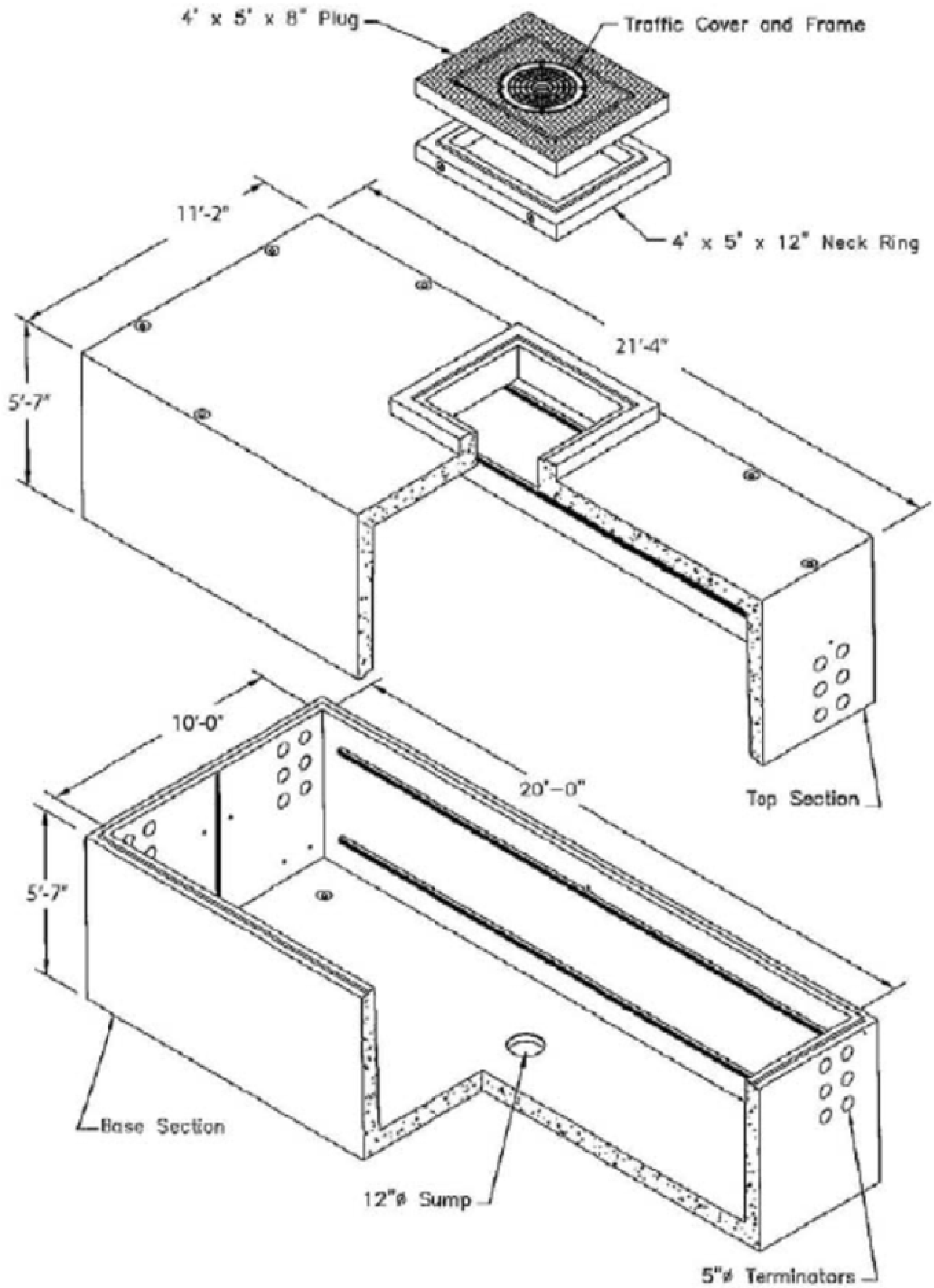

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Figure 3-9: Typical Subtransmission Vault

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3.3 Land Use Rights

Upon final engineering and receipt of Proposed Project approvals, SCE would confirm the necessary land rights and acquire the same for the Proposed Project, in addition, certain land rights may need to be acquired and/or amended as follows:

- **Substation:** The proposed Circle City Substation would be located south of Leeson Lane, northeast of All American Way, and west of Temescal Street in the City of Corona, in Riverside County. SCE acquired approximately 19.5 acres for the substation footprint as well as a setback supporting future road improvements, landscaping, access, parking, transmission and subtransmission tie-in, and distribution get-away routes.

- **Access:** The proposed SCE fee-owned substation access would be provided directly from Leeson Lane, with a possible alternate access from All American Way. Access to the majority of all Proposed Project components would be provided from existing public roads and/or existing access roads. Upon final engineering and Proposed Project approval, new or amended access road rights for the Mira Loma-Jefferson Subtransmission Line between Mira Loma Substation and the proposed SCE fee owned substation may be required. For more details on these access roads, see Section 3.2.3.1.

- **Subtransmission:** The proposed 66 kV source lines would tie into the proposed substation from the existing Mira Loma-Corona-Pedley 66 kV Subtransmission Line at the intersection of West Harrison Street and North Cota Street and from the existing Chase-Corona-Databank 66 kV Subtransmission Line at the intersection of Magnolia Avenue and Rimpau Avenue. These 66 kV source lines would be located within public ROW where SCE holds franchise. The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would originate at SCE's existing Mira Loma Substation and connect to the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line near the existing Corona Substation. SCE would install the proposed subtransmission facilities within existing SCE fee-owned ROW, easements, and public ROW where SCE is in franchise; however, approximately 110 private properties would require new or upgraded land rights and agency permits (87 private property and 23 agency) based on final engineering.

- **Distribution:** The distribution getaways would exit the proposed SCE fee-owned substation, but remain on the substation property until they exit the property. SCE would install the proposed distribution facilities within existing SCE fee-owned ROW, easements, public ROW where SCE is in franchise. Any proposed and existing distribution lines along the proposed route would be collocated on the same structures and/or placed underground within the franchise position and should not require additional land rights.

- **Telecommunications:** SCE would install the proposed and existing telecommunications facilities within existing SCE fee-owned ROW, easements, and/or public ROW where SCE is in franchise. Any proposed and existing telecommunications lines along the proposed route would be collocated on the same structures and/or placed underground within the franchise position and should not require additional land rights.

- **Construction Support:** Based on final engineering and construction requirements, temporary land rights (e.g. temporary construction easements [TCE], permits, leases, and licenses) may be required for access roads, laydown areas, pulling sites, staging and work areas for any approved Proposed Project component.

To support the Proposed Project, SCE will utilize approximately 0.2 mile of SCE fee-owned property; approximately 3.9 miles of existing easements of variable widths, measuring up to 130 feet wide; approximately 7.6 miles of franchise rights; and approximately 4.1 miles of proposed new or upgraded easements that are sufficient to contain the proposed facilities and provide safety and access, which is estimated to be 25 to 30 feet wide. Easement widths are based on facility types, final design and type of right to be acquired; therefore, approximate widths have been provided. Upgrading easements may include adding land rights, adding width to existing easements, improving or clarifying access or maintenance rights, etc.

3.4 Land Disturbance

Land disturbance would include all areas affected by construction of the Proposed Project. It is estimated that the total permanent land disturbance for the Proposed Project would be approximately 22.28 acres. It is estimated that the Proposed Project would temporarily disturb approximately 371.72 acres. The estimated amount of land disturbance for each Proposed Project component is summarized in Table 3-4: Estimated Temporary and Permanent Land Disturbance.

3.5 Post-Construction Cleanup

SCE would clean up all areas that would be temporarily disturbed by construction of the Proposed Project (which may include the material staging yard, construction setup areas, stringing sites, and splicing sites) to as close to pre-construction conditions as feasible, or to the conditions agreed upon between the landowner and SCE following the completion of the Proposed Project construction. If restoration and/or revegetation occur within sensitive habitats, a habitat restoration and/or revegetation plan(s) would be developed by SCE with the appropriate resource agencies and implemented after construction is complete. Additional information pertaining to the habitat restoration and/or revegetation plan(s) can be found in Section 4.4 Biological Resources.

3.6 Hazardous Materials

Construction of the Proposed Project would require the limited use of hazardous materials, such as fuels, lubricants, and cleaning solvents. All hazardous materials would be stored, handled, and used in accordance with applicable regulations. Material Safety Data Sheets (MSDS) would be made available at the construction site for all crew members. The SWPPP prepared for the Proposed Project would provide the locations for storage of hazardous materials during construction, as well as protective measures, notifications, and cleanup requirements for any incidental spills or other potential releases of hazardous materials.

Table 3-4: Estimated Temporary and Permanent Land Disturbance

Facility or Activity	Quantity	Approximate Area Disturbed per Facility or Activity	Total Approximate Area to be Disturbed During Construction (acres)	Approximate Temporary Disturbance (acres)	Approximate Permanent Disturbance (acres)
Circle City Substation					
Street encroachment (sewer, water, and driveway)	1	8,700 square feet	0.2	0.2	0.0
Street encroachment (possible storm drain extension)	1	17,800 square feet	0.4	0.4	0.0
Circle City Substation and Laydown Yard	1	485,580 square feet	14.1	0.4	13.7
Subtotal: Circle City Substation (12)			**14.7**	**1.0**	**13.7**
Source Line Routes					
Guard structures	30	50 feet by 75 feet	2.6	2.6	0.0
Remove existing wood pole and replace with LWS pole (1, 2, 3)	13	200 feet by 100 feet	5.5	5.5	0.0
Construct new wood pole (2)	3	200 feet by 100 feet	0.9	0.9	< 0.1
Construct new LWS pole (2)	90	200 feet by 100 feet	41.32	40.42	0.9
Construct new TSP (2)	28	200 feet by 100 feet	12.86	11.18	1.7
Construct new LWS pole (4)	13	200 feet by 100 feet	5.9	5.9	0.0
Construct new TSP (4)	5	200 feet by 100 feet	2.3	2.3	0.0
Conductor stringing set-up area – puller/tensioner (5)	28	600 feet by 100 feet	38.6	38.6	0.0
Install new underground vault (6)	7	175 feet by 100 feet	2.8	2.8	< 0.1
Install new underground duct bank (6, 7)	4,490	Linear feet by 15 feet wide	1.6	1.6	0.0

Facility or Activity	Quantity	Approximate Area Disturbed per Facility or Activity	Total Approximate Area to be Disturbed During Construction (acres)	Approximate Temporary Disturbance (acres)	Approximate Permanent Disturbance (acres)
Access and spur roads (8, 9)	0.4	Linear miles by 18 feet wide	1.0	0.4	0.6
Material and equipment staging area (near Circle City Substation) (11)	1	5 acres	5.0	5.0	0.0
Subtotal: Source Lines (12)			**120.38**	**117.2**	**3.2**
Mira Loma-Jefferson 66 kV subtransmission line					
Guard structures	60	50 feet by 75 feet	5.2	5.2	0.0
Remove existing wood pole (1)	2	100 feet by 75 feet	0.3	0.3	< 0.1
Remove existing wood pole and replace with LWS pole (1, 2)	140	200 feet by 100 feet	64.3	64.3	0.0
Remove existing LWS pole and replace with LWS pole (1, 2)	92	200 feet by 100 feet	42.2	42.2	0.0
Construct new LWS pole (2)	12	200 feet by 100 feet	5.5	5.39	0.1
Remove existing LWS pole and replace with TSP (1, 2)	3	200 feet by 100 feet	1.4	1.2	0.2
Construct new TSP (2)	6	200 feet by 100 feet	2.8	2.4	0.4
Remove existing TSP and replace with TSP (1, 2)	3	200 feet by 100 feet	1.4	1.2	0.2
Remove existing TSP and replace with LWS pole (1, 2)	1	200 feet by 100 feet	0.5	0.5	< 0.1
Remove existing wood pole and replace with TSP (1, 2)	10	200 feet by 100 feet	4.6	4.1	0.5
Remove existing wood H-Frame and replace with LWS pole (1, 2)	1	200 feet by 100 feet	0.5	0.5	< 0.1

Facility or Activity	Quantity	Approximate Area Disturbed per Facility or Activity	Total Approximate Area to be Disturbed During Construction (acres)	Approximate Temporary Disturbance (acres)	Approximate Permanent Disturbance (acres)
Remove existing H-frame hybrid and replace with H-frame hybrid (1, 2)	2	200 feet by 100 feet	0.9	0.9	0.0
Conductor stringing set-up area – puller/tensioner (5)	31	600 feet by 100 feet	42.7	42.7	0.0
Install new underground vault (6)	1	175 feet by 100 feet	0.4	0.4	< 0.1
Install new underground duct bank (6, 7)	420	Linear feet by 15 feet wide	0.1	0.1	0.0
Install new cable into existing vaults and duct bank (6, 7)	4	175 feet by 100 feet	1.6	1.6	0.0
Access and spur roads (8, 9)	5.8	Linear miles by 18 feet wide	12.6	0	12.6
Construction areas for access roads (10)	6.1	Linear miles by 10-foot-wide minimum buffer on each side	14.8	14.8	0.0
Material and equipment staging area (Hellman Avenue) (11)	1	5 acres	5.0	5.0	0.0
Mira Loma Vacant Lot – material and equipment staging area (11)	1	3.0 acres	3.0	3.0	0.0
Jefferson Substation - material and equipment staging area (11)	1	0.5 acre	0.5	0.5	0.0
Mira Loma Substation – material and equipment staging area (11)	1	3 acres	3.0	3.0	0.0

Facility or Activity	Quantity	Approximate Area Disturbed per Facility or Activity	Total Approximate Area to be Disturbed During Construction (acres)	Approximate Temporary Disturbance (acres)	Approximate Permanent Disturbance (acres)
Subtotal Mira Loma-Jefferson 66 kV subtransmission line (12)			**213.3**	**199.3**	**14**
Telecommunications					
Underground conduit installation	1,200 feet	Linear feet by 24 feet	0.7	0.7	0.0
Manhole installation	7	40 feet by 50 feet	0.3	0.3	0.0
Subtotal: Telecommunications (12)			**1.0**	**1.0**	**0.0**
Distribution					
Install new underground vault	29	40 feet by 51 feet	1.36	1.36	< 0.1
Install new underground duct bank	15,840 feet	Linear feet by 32 feet	11.6	11.6	0.0
Remove existing pole	4	100 feet by 200 feet	1.84	1.84	0.0
Remove existing wood pole and replace with wood pole	15	100 feet by 200 feet	6.89	6.89	0.0
Install wood pole	6	100 feet by 200 feet	2.75	2.75	< 0.1
Subtotal: Distribution (12)			**24.44**	**24.44**	**0.0**
Total			**373.82**	**342.94**	**30.88**

Notes:
1. Includes the removal of existing conductor, teardown of existing structure, and removal of foundation 2 feet below ground surface.
2. Includes foundation installation, structure assembly and erection, conductor installation; area would be restored after construction. A portion of the ROW beneath and within 25 feet of the structure would remain permanently disturbed and cleared of vegetation.
3. The structure would be replaced with the same or similar sized/type of structure; therefore, the disturbance is negligible or cancelled out.
4. Includes foundation installation, structure assembly and erection, conductor installation all located on Circle City Substation; property would be restored to a condition that meets the needs of the operation and maintenance of the Proposed Project.
5. Based on 6,400-foot conductor reel lengths, the number of circuits, and the route design.

6. Includes all underground civil construction activities associated with vault, duct bank, and cable installations; area would be restored and/or repaved after construction.
7. Based on 1,650-foot conductor reel lengths, the number of circuits, and the route design.
8. Based on the length of road in “miles x road width,” which varies from 14 to 22 feet, curve-widening, intersections, and miscellaneous transitional areas.
9. May include, but is not limited to, areas for slope cuts/fills, and drainages outside of the 18-foot access road width.
10. Temporary disturbance for access road construction areas include a minimum of 10 feet of buffer on each side of the access roads to accommodate for BMPs and/or potential environmental resource protection devices during construction.
11. The disturbed acreage for the material storage yards would be restored upon completion of the Proposed Project.
12. The disturbed acreage calculations are subject to revision based upon final engineering.
13. All data provided in this table is based on planning level assumptions and may change following completion of final engineering, using SCE’s design and construction practices, standards and specifications, identification of field conditions, availability of material, and equipment, and compliance with applicable environmental and/or permitting requirements.
14. Wood and LWS Pole Information: average depth 11 feet and average diameter 4 feet, earth removed per hole = 5.12 CY, average surface area = 12.56 square feet per pole.
15. TSP Foundation Information: average depth 30 feet and average diameter 8 feet, earth removed per foundation = 55.82 CY, average surface area = 50.24 square feet per TSP.
16. H-frame Hybrid: depth 18 feet and 5-foot-diameter, quantity 2 per H-frame, earth removed for footing = 18.17 CY each, 36.34 CY total; surface area = 19.63 square feet each, 39.26 square feet total.
17. Portion of ROW within 25 feet of a Tubular Steel Pole or Hybrid Pole, and 10 feet of a Light Weight Steel or Wood Pole, are to remain cleared of vegetation and would be permanently disturbed (approximately 0.06 acre per TSP and Hybrid pole, and 0.01 acre per LWS and Wood Pole).
18. Underground Vault Excavation Information: average 12 feet deep, 12 feet wide, and 24 feet long = 128 CY, average surface area = 288 square feet per vault.
19. Underground Duct Bank Trenching Information for Mira Loma Jefferson Source Line Route: average 5 feet deep, 2 feet wide, and 420 feet long = 155.55 CY, average surface area = 840 square feet.
20. Underground Duct Bank Trenching Information Source Line: average 5 feet deep, 2 feet wide, and 4,490 feet long = 1,662.96 CY, average surface area = 8,980 square feet.

SCE has completed a Phase I Environmental Site Assessment (ESA) evaluation for the Proposed Circle City Substation site. Phase I ESAs are conducted in accordance with American Society for Testing and Materials (ASTM) International Practice E 1527-05 and Title 40 Part 312 of the CFR covering the "All Appropriate Inquiries" (AAI) standard. Phase I ESAs include a comprehensive and detailed record review and site reconnaissance, but exclude any intrusive sampling activities.

In a Phase I ESA, Proposed Project areas would also be examined for obvious signs of chemical contamination, such as oil slicks or staining and petroleum odors. The Phase I ESA is provided in Attachment 4.8-A: Phase I Environmental Site Assessment and Addendum Letter in Section 4.8 Hazards and Hazardous Materials.

3.7 Reusable, Recyclable, and Waste Material Management

Construction of the Proposed Project would result in generation of various waste materials, including wood, metal, soil, vegetation, and sanitation waste (e.g., portable toilets). Sanitation waste (i.e., human-generated waste) would be disposed of in accordance with applicable sanitation waste management practices. Material from existing infrastructure that would be removed as part of the Proposed Project such as conductor, steel, concrete, and debris, would be temporarily stored in one or more staging yards as the material awaits salvage, recycling, and/or disposal.

The existing wood poles removed for the Proposed Project would be returned to a staging yard, and either reused by SCE, returned to the manufacturer, disposed of in a Class I hazardous waste landfill, and/or disposed of in the lined portion of a Regional Water Quality Control Board (RWQCB)-certified municipal landfill.

Material excavated for the Proposed Project would either be used as fill; backfill for new wood, LWS, TSP, H-frame, and hybrid poles installed for the Proposed Project; made available for use by the landowner; or disposed of at an appropriately licensed, off-site waste facility. If contaminated material is encountered during excavation, work would stop at that location and SCE's Spill Response Coordinator would be called to the site to make an assessment and notify the proper authorities. Work would continue at that location only when given clearance by the Spill Response Coordinator. The potentially contaminated soil would be segregated into lined stockpiles or, placed in dump trucks or roll-off containers, sampled, and tested to determine appropriate handling, treatment and disposal options. If the soil is classified as hazardous, it would be properly managed on location and transported in accordance with United States Department of Transportation regulations using a Uniform Hazardous Waste Manifest to a Class I Landfill or other appropriate soil treatment or recycling facility. All hazardous materials would be transported, used, and disposed of in accordance with applicable rules, regulations, and SCE protocols designed to protect the environment, workers, and the public.

3.8 Geotechnical Studies

A geotechnical site assessment and a field investigation, which is included in Attachment 4.6-A: Geotechnical Investigation Report, was conducted at the Circle City Substation site. An additional geotechnical investigation would be performed for the proposed Source Line Route and the proposed Mira Loma-Jefferson 66 kV Subtransmission Line prior to the start of construction. The geotechnical studies would include an evaluation of water table depth, evidence of faulting, liquefaction potential, physical properties of subsurface soils, soil resistivity, slope stability, and the presence of hazardous materials. The information collected would be used to determine final design of the Proposed Project.

3.9 Environmental Surveys

SCE has conducted initial biological, hydrologic, cultural, and paleontological resources evaluations and would continue to conduct further focused environmental surveys after the approval of the Proposed Project, but prior to the start of construction. These surveys identify and/or address any potential sensitive biological, hydrologic, cultural, and paleontological resources that may be impacted by the Proposed Project, including the substation site, subtransmission, distribution, and telecommunication lines; access roads; construction work areas; and staging yards. Where feasible, the information gathered from these surveys may be used to finalize the Proposed Project design in order to avoid sensitive resources, or to minimize the potential impact to sensitive resources from Proposed Project-related activities. The results of these surveys would also determine the extent to which environmental specialist construction monitors would be required.

Biological resources in the vicinity of the Proposed Project are presented in detail in Section 4.4 Biological Resources. The following biological surveys have been conducted or would be conducted prior to construction:

- Fairy shrimp surveys (ongoing)
- Protocol-level least Bell's vireo (*Vireo bellii pusillus)* and southwestern willow flycatcher (*Empidonax traillii extimus*) surveys
- Burrowing owl (*Athene cunicularia hypugaea*) surveys
- Special-status plant species surveys
- Special-status mammal surveys
- Vegetation mapping and general biological surveys
- Protocol-level Delhi sands flower-loving fly surveys (ongoing)
- Unsurveyed Areas: For unsurveyed areas that may be disturbed by the Proposed Project, potential biological resources that may occur would be identified, and a qualified wildlife biologist would conduct a field survey of the areas directly impacted by construction.

Thirty days prior to the start of ground-disturbing activity, the following surveys would be conducted:

- Clearance Surveys: A clearance survey would be conducted no more than 30 days prior to the start of construction in a particular area to identify potential plant and animal species that may be impacted by construction activities. Clearance surveys include a field survey by a qualified botanist and wildlife biologist and would be limited to areas directly impacted by construction activities.

- Active nests: Work near nests would be scheduled to take place outside the nesting season when feasible. Within 1 week prior to the start of construction in a particular area during nesting season (generally February 1 to August 31), a qualified wildlife biologist would conduct a pre-construction-focused nesting survey. If occupied nests are present during the nesting season, SCE biologists would determine appropriate nesting buffers based on a Proposed Project-specific nesting bird management plan or consultation with the appropriate agencies.

A Jurisdictional Delineation Report has been completed. Hydrologic resources in the vicinity of the Proposed Project are presented in detail in Section 4.9 Hydrology and Water Quality.

A Cultural Resources Inventory Report and a Paleontological Inventory Assessment have been completed. Cultural and paleontological resources in the vicinity of the Proposed Project are described in detail in Section 4.5 Cultural Resources. If there are changes to the Proposed Project scope (engineering, additional work locations, etc.), or new cultural or paleontological resources are discovered during construction, the following best management practices would be implemented as appropriate:

- Prior to construction all areas within the Proposed Project study area shall be reviewed for cultural and paleontological resources.

- All cultural resources potentially affected by construction of the Proposed Project would be evaluated for eligibility for listing in the California Register of Historical Resources (CRHR) and/or National Register of Historic Places (NRHP).

- Eligible CRHR or NRHP resources would be avoided and preserved in place, if feasible. If avoidance is not feasible, appropriate treatment would be implemented to address Proposed Project impacts/effects.

- An Unanticipated Discovery Plan (independent, or part of another plan) would be created prior to construction and would detail processes/procedures for managing unanticipated discoveries, including but not limited to stop work and avoidance protocols, notification and reporting procedures, resource assessment time frames, resource evaluation processes, stakeholder roles and responsibilities, and management of significant resources that cannot be avoided.

- If human remains are discovered, a halt work order would be enacted in the area of the find, no construction activities would be allowed within a 100-foot radius of the discovery, the area would be secured and protected to ensure that no additional disturbance occurs, and the SCE Proposed Project Archaeologist would be notified immediately. In accordance with California Health and Safety Code (HSC) Section 7050.5, the SCE Proposed Project Archaeologist would notify the Riverside or San Bernardino county coroner immediately of the find. The coroner would have 2 working days to examine the remains after being notified in accordance with California Health and Safety Code (HSC) Section 7050.5. If the coroner determines that the remains are Native American, not subject to the coroner's authority, and are located on private or state land, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC) of the determination. The NAHC is required (Public Resources Code Section 5097.98) to identify a Most Likely Descendant (MLD), notify that person, and request that they inspect the remains and make recommendations for treatment and/or disposition. The MLD would have 48 hours to inspect the find and make recommendations for treatment of the human remains. Work would be suspended in the area of the find until the MLD and landowner confer on the mitigation and treatment of the human remains. If the NAHC is unable to identify a descendent, or the descendent identified fails to make a recommendation, or the recommendation of the MLD is rejected and the mediation provided for in Public Resources Code Section 5097.94 subdivision (k) fails to provide measures acceptable to the landowner, the human remains and associated burial items would be reburied, with appropriate dignity, on the property in a location not subject to further subsurface disturbance.

3.10 Worker Environmental Awareness Training

Prior to construction, a Worker Environmental Awareness Plan (WEAP) would be developed, and a presentation would be prepared by SCE, which would be used to train all site personnel prior to the commencement of work. A record of all trained personnel would be kept. In addition to instruction on compliance with any site-specific environmental resource protection measures and Proposed Project mitigation measures, all construction personnel would also receive the following:

- A list of phone numbers of SCE environmental specialist personnel associated with the Proposed Project (e.g., the archaeologist, biologist, environmental compliance coordinator, and regional spill response coordinator).

- Instruction on the SCAQMD fugitive dust rules.

- A description of applicable noise construction time and/or noise level limits.

- A review of applicable federal, state and local ordinances, laws and regulations pertaining to historic and paleontological preservation; a discussion of disciplinary and other actions that could be taken against persons violating historic and paleontological preservation laws and SCE policies; and a review of paleontology, archaeology, history, prehistory and Native American cultures associated with historical and paleontological resources in the Proposed Project vicinity. Instruction on these resources would cover what typical cultural and paleontological resources look like, and direction that if any are discovered during construction, work is to be suspended in the vicinity of any find and the site foreman and SCE Proposed Project Archaeologist or environmental compliance coordinator is to be contacted for further direction.

- Instruction on the roles of environmental monitors (biological, cultural, and paleontological), if present, and the appropriate treatment by on-site personnel of areas designated as environmentally sensitive areas (ESAs).
- Instruction on the importance of maintaining the construction site, such as ensuring all food scraps, wrappers, food containers, cans, bottles, and other trash from the Proposed Project area are deposited in closed trash containers. Trash containers would be removed from the Proposed Project as required and would not be permitted to overfill.
- Instruction on the individual responsibilities under the Clean Water Act, the Proposed Project SWPPP, site-specific BMPs, and the location of MSDSs for the Proposed Project.
- Instructions to notify the foreman and regional spill response coordinator in case of a hazardous materials spill or leak from equipment, or upon the discovery of soil or groundwater contamination.
- Instructions to cover all holes/trenches at the end of each day.
- A copy of the truck routes to be used for material delivery.
- Instruction that non-compliance with any laws, rules, regulations, or mitigation measures could result in being barred from participating in any remaining construction activities associated with the Proposed Project.

3.11 Construction Equipment and Personnel

The estimated number of personnel and equipment required for construction of the Proposed Project are summarized in Table 3-5: Construction Equipment and Workforce Estimates.

Construction would be performed by either SCE construction crews or contractors. If SCE construction crews are used, they typically would be based at SCE’s local facilities, such as the existing Mira Loma Substation. Contractor construction personnel would be managed by SCE construction management personnel. SCE anticipates a total of approximately 100 construction personnel would be working on any given day. SCE anticipates that crews would work concurrently whenever possible; however, the estimated deployment and number of crew members would vary depending on factors such as material availability, resource availability, and construction scheduling.

Table 3-5: Construction Equipment and Workforce Estimates

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Circle City Substation				
Survey	2	45	1 Survey Truck	8
Grading	7	60	2 Earth Movers 2 Water Trucks 1 Tracker 2 Dump Trucks 1 Water Tower	8 8 8 8 8
Soil Import/Export	1 person per truck	20	10 Haul Trucks	8
Fencing	6	20	1 Bobcat 1 Flatbed Truck 1 Crewcab Truck	8 8 8
Temporary Power-Pole Installation	2	3	1 Work Truck with Attached Auger	8
Civil	30	95	1 Excavator 1 Dump truck 1 Skip Loader 2 Forklift 2 17-TonCrane 1 Concrete Pump Truck 2 Drill Rig 3 Bobcat 2 Backhoe Tracker 2 Tool Trailer 2 Pickup Truck 2 Crew Truck 2 Water Truck	8 6 8 6 4 4 8 8 8 8 4 4 4
MEER	6	30	1 Carry-all Truck 1 Stake Truck	2 2

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Electrical	25	80	2 Scissor Lifts 2 15-Ton Crane 1 20-Ton Crane 1 50-Ton Crane 1 Flatbed Truck 2 Tool Trailer 1 Commander Truck 2 Pickup Truck 2 Crew Truck 3 Reach Manlift 2 Forklift	8 8 6 6 4 8 8 8 8 8 8
Wiring	6	40	2 Manlift 2 Tool Trailer	4 2
Transformers	4	30	2 15-Ton Crane 1 Forklift 2 Manlift 2 Crew Trucks 1 Low Bed Truck	4 6 6 2 2
Maintenance Crew Equipment Check	4	30	2 Maintenance Truck	8
Testing	4	60	2 Crew Truck	8
Asphalting	8	15	1 Paving Roller 1 Asphalt Paver 2 Dump Trucks 1 Crew Truck 1 Asphalt Curb Machine 1 Tractor	8 8 8 8 8 8
Mira Loma Substation Work to Accommodate Mira Loma-Jefferson 66 kV subtransmission line				
Civil	8	20	1 Drill Rig 1 Backhoe 1 Bobcat 1 Crew Truck 1 Pickup Truck	4 8 8 2 2
Electrical	7	20	1 Crew Truck 1 Crane/Boom Truck 2 Manlift	2 8 6
Maintenance Commission	2	5	1 Maintenance Truck	1
Test	2	20	1 Test Truck	1

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Source Line Construction				
Marshaling Yard	4	Duration	1 1-Ton Crew Cab, 4x4 1 Boom/Crane Truck 1 Rough Terrain Forklift 1 Truck, Semi-Tractor	4 2 6 2
ROW Clearing	5	1	1 1-Ton Crew Cab, 4x4 1 Road Grader 1 Water Truck 1 Backhoe/Front Loader 1 Track Type Dozer 1 Lowboy Truck/Trailer	8 6 8 4 6 4
Road Work	5	1	1 1-Ton Crew Cab, 4x4 1 Road Grader 1 Water Truck 1 Backhoe/Front Loader 1 Drum Type Compactor 1 Track Type Dozer 1 Excavator 1 Lowboy Truck/Trailer	8 6 8 4 4 4 4 3
Survey	4	5	2 1-Ton Trucks, 4x4	8
Guard Structure Installation	6	6	1 3/4-Ton Truck, 4x4 1 1-Ton Crew Cab, 4x4 1 Bucket Truck 1 Boom/Crane Truck 1 Auger Truck 1 Compressor Trailer 1 Extendable Flat Bed Pole Truck	8 8 4 6 4 4 8
Wood/H-Frame/LWS Pole Removal	6	2	1 1-Ton Truck, 4x4 1 Compressor Trailer 1 Manlift/Bucket Truck 1 Boom/Crane Truck 1 Flat Bed Pole Truck	8 4 6 6 8
Install TSP Foundation	7	60	1 1-Ton Crew Cab, 4x4 1 Boom/Crane Truck 1 Auger Truck 1 Water Truck 1 Backhoe/Front Loader 1 Dump Truck 3 Concrete Mixer Trucks	4 4 6 8 4 6 2

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
TSP Haul	4	8	1 3/4-Ton Truck, 4x4 1 Boom/Crane Truck 1 Flat Bed Pole Truck	4 6 8
TSP Assembly	8	30	2 3/4-Ton Trucks, 4x4 2 1-Ton Crew Cabs, 4x4 1 Compressor Trailer 1 Boom/Crane Truck	4 4 4 6
TSP Erection	8	30	2 3/4-Ton Trucks, 4x4 2 1-Ton Crew Cabs, 4x4 1 Compressor Trailer 1 30-Ton Rough Terrain Crane	4 4 4 6
Install Wood/LWS Pole	6	16	1 1-Ton Crew Cab, 4x4 1 Bucket Truck 1 Boom/Crane Truck 1 Auger Truck 1 Backhoe/Front Loader 1 Extendable Flat Bed Pole Truck	8 6 6 4 8 8
Install Conductor	20	11	3 1-Ton Crew Cabs, 4x4 4 Bucket/Trucks 1 Boom/Crane Truck 2 Wire Trucks/Trailers 1 Dump Truck 1 3-Drum Sock Line Puller 1 Bull Wheel Puller 1 Static Truck/Tensioner 1 Backhoe/Front Loader 2 Lowboy Trucks/Trailers	4 8 8 6 2 6 6 6 2 4
Guard Structure Removal	6	8	1 3/4-Ton Truck, 4x4 1 1-Ton Crew Cab, 4x4 1 Bucket Truck 1 Boom/Crane Truck 1 Compressor Trailer 1 Extendable Flat Bed Pole Truck	8 8 4 6 4 8
Restoration	7	5	2 1-Ton Crew Cabs, 4x4 1 Road Grader 1 Water Truck 1 Backhoe/Front Loader 1 Drum Type Compactor 1 Lowboy Truck/Trailer	4 6 8 2 4 3

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Vault Installation	6	22	2 1-Ton Crew Cabs, 4x4 1 Backhoe/Front Loader 1 Excavator 2 Dump Trucks 1 Water Truck 1 165-Ton Crane 3 Concrete Mixer Trucks 1 Lowboy Truck/Trailer 3 Flat Bed Trucks/Trailers	6 6 6 6 8 6 2 4 4
Duct Bank Installation	6	19	2 1-Ton Crew Cabs, 4x4 1 Backhoe/Front Loader 2 Dump Trucks 1 Pipe Truck/Trailer 1 Water Truck 3 Concrete Mixer Trucks 1 Compressor Trailer 1 Lowboy Truck/Trailer	4 6 6 6 8 2 4 4
Mira Loma-Jefferson 66 kV subtransmission line construction				
Survey	4	12	2 1-Ton Trucks, 4x4	8
Marshaling Yard	4	Duration	1 1-Ton Crew Cab, 4x4 1 Boom/Crane Truck 1 Rough Terrain Forklift 1 Truck, Semi-Tractor 1 Water Truck	4 2 6 2 8
ROW Clearing	5	21	1 1-Ton Truck, 4x4 1 Backhoe/Front Loader 1 Track Type Dozer 1 Motor Grader 1 Water Truck 1 Lowboy Truck/Trailer	8 6 6 6 8 4
Road Work	5	6	1 1-Ton Crew Cab, 4x4 1 Backhoe/Front Loader 1 Track Type Dozer 1 Motor Grader 1 Water Truck 1 Drum Type Compactor 1 Excavator 1 Lowboy Truck/Trailer	8 4 4 6 8 6 4 4

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Guard Structure Installation	6	12	1 3/4-Ton Truck, 4x4 1 1-Ton Truck, 4x4 1 Compressor Trailer 1 Manlift/Bucket Truck 1 Boom/Crane Truck 1 Auger Truck 1Extendable Flat Bed Pole Truck	8 8 4 4 6 4 8
Remove Exiting Conductor and Ground Wire	14	1	2 1-Ton Trucks, 4x4 2 Manlift/Bucket Trucks 2 Boom/Crane Trucks 1 Bull Wheel Puller 1 Sock Line Puller 1 Static Truck/Tensioner 2 Lowboy Trucks/Trailers	4 8 8 6 6 6 4
Wood/H-Frame/LWS Pole Removal	6	25	2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Manlift/Bucket Truck 1 Boom/Crane Truck 1 Flat Bed Pole Truck	8 4 6 6 8
H-Frame Hybrid Pole Structure Removal	8	8	2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Rough Terrain Crane (Medium) 1 Boom/Crane Truck 1 Flat Bed Truck/Trailer	4 8 6 6 4
TSP Removal	8	4	2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Rough Terrain Crane (Medium) 1 Boom/Crane Truck 1 Flat Bed Truck/Trailer	4 8 6 6 4
TSP Foundation Removal	4	14	1 3/4-Ton Truck, 4x4 1 Compressor Trailer 1 Backhoe/Front Loader 1 Dump Truck 1 Excavator	4 8 6 6 4

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Install TSP Foundations	6	40	1 3/4-Ton Truck, 4x4 1 Boom/Crane Truck 1 Backhoe/Front Loader 1 Auger Truck 1 Water Truck 1 Dump Truck 3 Concrete Mixer Trucks	4 4 6 6 8 4 2
TSP Haul	4	4	1 3/4-Ton Truck, 4x4 1 Boom/Crane Truck 1 Flat Bed Pole Truck	8 6 8
TSP Assembly	8	18	2 3/4-Ton Trucks, 4x4 2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Boom/Crane Truck	4 4 6 8
TSP Erection	8	18	2 3/4-Ton Trucks, 4x4 2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Boom/Crane Truck	4 4 4 8
Wood/LWS Pole Haul	4	37	1 3/4-Ton Truck, 4x4 1 Boom/Crane Truck 1 Flat Bed Pole Truck	8 6 8
Wood/LWS Pole Assembly	8	56	2 3/4-Ton Trucks, 4x4 2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Boom/Crane Truck	4 4 6 8
Hybrid Pole Haul	4	4	1 3/4-Ton Truck, 4x4 1 Boom/Crane Truck 1 Flat Bed Pole Truck	8 6 8
Install H-frame Hybrid Pole Structure	6	16	1 1-Ton Truck, 4x4 1 Manlift/Bucket Truck 1 Boom/Crane Truck 1 Auger Truck 1 Backhoe/Front Loader 1 Extendable Flat Bed Pole Truck	8 6 6 4 8 8

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Transfer and Install Conductor	20	33	3 1-Ton Trucks, 4x4 4 Manlift/Bucket Trucks 1 Boom/Crane Truck 1 Dump Truck 2 Wire Trucks/Trailers 1 Sock Line Puller 1 Bull Wheel Puller 1 Static Truck/Tensioner 1 Backhoe/Front Loader 2 Lowboy Trucks/Trailers	4 8 8 2 6 6 6 6 2 4
Guard Structure Removal	6	9	1 3/4-Ton Truck, 4x4 1 1-Ton Crew Cab, 4x4 1 Compressor Trailer 1 Manlift/Bucket Truck 1 Boom/Crane Truck 1 Extendable Flat Bed Pole Truck	8 8 4 4 6 8
Restoration	7	11	2 1-Ton Trucks, 4x4 1 Backhoe/Front Loader 1 Motor Grader 1 Water Truck 1 Drum Type Compactor 1 Lowboy Truck/Trailer	4 8 6 8 4 4
Vault Installation	6	3	2 1-Ton Trucks, 4x4 1 Backhoe/Front Loader 1 Excavator 2 Dump Trucks 1 Water Truck 1 Crane (Large) 3 Concrete Mixer Trucks 1 Lowboy Truck/Trailer 3 Flat Bed Trucks/Trailers	4 8 6 8 8 6 2 4 4
Duct Bank Installation	6	2	2 1-Ton Trucks, 4x4 1 Compressor Trailer 1 Backhoe/Front Loader 2 Dump Trucks 1 Pipe Truck/Trailer 1 Water Truck 3 Concrete Mixer Trucks 1 Lowboy Truck/Trailer	4 4 6 6 6 8 2 4

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Install Underground Cable	8	2	2 1-Ton Trucks, 4x4 1 Manlift/Bucket Truck 1 Boom/Crane Truck 2 Wire Trucks/Trailers 1 Puller 1 Static Truck/Tensioner	4 6 6 6 6 6
Telecommunications Construction				
Fiber Optic Cable Installation	7	25	2 1-Ton Pickup Trucks 2 Bucket Trucks 1 Flatbed Truck 1 Arrow Board Trailer	8 8 4 8
Fiber Optic Cable Splicing	2	10	1 1-Ton Pickup Truck 2 Medium-Duty Splicing Lab Trucks	8 8
Underground Conduit	5	15	1 Dump Truck 1 Flatbed Truck 1 Backhoe 1 1-Ton Pickup Truck 1 Water Truck 1 Cement Truck	8 8 8 4 4 4
Distribution Construction – Getaways				
Vault Installation	7	48	1 Backhoe 1 Dump Truck with Triple-Axle Trailer 1 1-Ton Pickup Truck with Single-Axle Trailer 1 Water Truck 2 Cement Trucks 1 40-Ton Crane 1 Flatbed Truck	8 8 8 8 8 8 8
Trench/Duct Installation	4	20	1 Backhoe 1 Dump Truck with Triple-Axle Trailer 1 1-Ton Pickup Truck with Single-Axle Trailer 1 Water Truck 2 Cement Trucks	8 8 8 8 8

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Distribution Construction – Relocation of Existing Structures (Mira Loma-Jefferson 66 kV subtransmission line)				
Location 1 – Construction Line	9	11	2 Bucket Trucks 1 Single-Axle Trailer 1 1-Ton Pickup Truck 1 1/2-Ton Pickup Truck	8 8 8 4
Location 1 – Stringing Crew	4	4	1 Truck Pulling Stinging Dolly 1 Truck Pulling Reel Dolly 1 1/2-Ton Pickup Truck	8 8 4
Location 2 – Construction Line	9	57	2 Bucket Trucks 1 Single-Axle Trailer 1 1-Ton Pickup Truck 1 1/2-Ton Pickup Truck	8 8 8 4
Location 2 – Stringing Crew	4	10	1 Truck Pulling Stinging Dolly 1 Truck Pulling Reel Dolly 1 1/2-Ton Pickup Truck	8 8 4
Location 3 – Construction Line	9	13	2 Bucket Trucks 1 Single-Axle Trailer 1 1-Ton Pickup Truck 1 1/2-Ton Pickup Truck	8 8 8 4
Location 3 – Stringing Crew	4	5	1 Truck Pulling Stinging Dolly 1 Truck Pulling Reel Dolly 1 1/2-Ton Pickup Truck	8 8 4
Location 4 – Construction Line	9	83	2 Bucket Trucks 1 Single-Axle Trailer 1 1-Ton Pickup Truck 1 1/2-Ton Pickup Truck	8 8 8 4
Location 4 – Stringing Crew	4	11	1 Truck Pulling Stinging Dolly 1 Truck Pulling Reel Dolly 1 1/2-Ton Pickup Truck	8 8 4
Location 5 – Vault Installation	7	96	1 Backhoe 1 Dump Truck with Triple-Axle Trailer 1 1-Ton Pickup Truck with Single-Axle Trailer 1 Water Truck 2 Concrete Mixer Trucks 1 40-Ton Crane 1 Flatbed Truck	8 8 8 8 8 8 8

Activity	Number of Personnel	Number of Workdays	Equipment and Quantity	Duration of Use (Hours/Day)
Location 5 – Trench/Duct Installation	4	165	1 Backhoe 1 Dump Truck with Triple-Axle Trailer 1 1-Ton Pickup Truck with Single-Axle Trailer 1 Water Truck 2 Cement Trucks	8 8 8 8 8
Distribution Construction – Relocation of Existing Structures (Source Line Route 1)				
Location 1	9	45	2 Bucket Trucks 1 Single-Axle Trailer 2 1-Ton Pickup Trucks 1 1/2-Ton Pickup Truck	8 8 8 4
Location 2	5	3	2 Bucket Trucks 1 Single-Axle Trailer 1 1-Ton Pickup Truck	8 8 8
Distribution Construction – Relocation of Existing Structures (Source Line Route 2)				
Location 1	5	10	2 Bucket Trucks 1 1-Ton Pickup Truck 1 Splicing Van 2 Cable-Pulling Trucks with Single-Axle Cable Dolly 1 Cable Chopping Truck 1 Dump Truck 1 Backhoe 1 Arrow Board Trailer	8 8 8 8 8 8 8 8
Location 2	7	34	1 Backhoe 1 Dump Truck with Triple-Axle Trailer 1 1-Ton Pickup Truck with Single-Axle Trailer 1 Water Truck 2 Concrete mixer truck 1 40-Ton Crane 1 Flatbed Truck	8 8 8 8 8 8 8

In general, construction efforts would occur in accordance with accepted construction industry standards. To the extent possible, SCE would comply with local ordinances for construction activities. Should the need arise to work outside the local ordinances, SCE would request a variance from the cities of Corona, Norco, and Eastvale, as well as Riverside County. For example, it may be necessary to work during at night or outside of normal work hours when loads on the lines are reduced.

3.11.1 Equipment Description

Table 3-6: Construction Equipment Description lists the equipment SCE expects to use during construction and includes a brief description of the equipment's use.

3.12 Construction Schedule

SCE anticipates that construction of the Proposed Project would take approximately 18 months, as detailed in Table 3-7: Proposed Construction Schedule.[10] Construction would commence following the CPUC's approval, final engineering, procurement activities, and receipt of all applicable permits.

3.13 Proposed Project Operation and Maintenance

The proposed Circle City Substation would be unstaffed and would function as a remotely controlled substation. SCE maintains an Energy Management System (EMS) that allows it to monitor and respond to alarms as the system status changes. All workstation users have the ability to perform supervisory control of remote station equipment within their jurisdictional area.

Remote substations with Supervisory control are equipped with a Programmable Logic Controller (PLC) integrated with Substation Automation System (SAS). All automatic functions and data acquisition is performed by the SAS. When a station is supervisory controlled, controllable points can be initiated from the switching center with operational jurisdiction.

Substation personnel perform station inspections in unmanned substation when there is an indication of trouble. Routine circuit breaker and disconnect switching operations at remotely controlled stations would normally be performed by remote control on orders by the responsible switching center. Substation personnel are responsible for maintaining the correct status of all lines and equipment under their jurisdiction.

Maintenance personnel are responsible for substation equipment routine scheduled maintenance and repairs of malfunctioning equipment. A separate group of Testmen performs testing, setting and maintaining protective relays and control wirings including test procedures for new or relocated equipment prior to placing equipment in service.

[10] The proposed construction schedule does not account for unforeseen Project delays, including but not limited to those due to inclement weather and/or stoppage necessary to protect biological resources (e.g., nesting birds).

Table 3-6: Construction Equipment Description

Equipment Type	Use Description
1-Ton Truck, 4x4	Transports workers and material
3/4-Ton Truck, 4x4	Transports workers and material
Arrow Board Trailer	Traffic control sign
Auger Truck	Light/medium duty digs holes for poles
Backhoe/Front Loader	Medium duty grades soil, loads dirt into dump trucks
Boom/Crane Truck	Light/medium duty lifts/places material
Bucket Truck	Lifts and transports workers
Bull Wheel Puller	Provides tension on conductor/ground wire during stringing operation
Compressor Trailer	Provides compressed air for pneumatic tools
Concrete Mixer Truck	Delivers and mixes concrete for job site
Crane (L)	Heavy duty lifts/places material
Crew Truck	Transports workers and materials
Drum Type Compactor	Compacts soil
Dump Truck	Imports/exports material
Excavator	Excavates and/or moves native soil
Extendable Flat Bed Pole Truck	Hauls poles
Flat Bed Pole Truck	Hauls poles
Flat Bed Truck/Trailer	Hauls material
Lowboy Truck/Trailer	Hauls material
Manlift/Bucket Truck	Lifts and transports workers
Material Handling Truck	Hauls material
Motor Grader	Medium duty - grades terrain
Pick-up Truck	Transports workers and material
Pipe Truck/Trailer	Hauls material
Puller	Pulls conductor/ground wire during stringing operation
Rodder Truck	Cable installation
Reel Truck	Cable and wire hauling
Rough-Terrain Forklift	Lifts and transports material in rough terrain
Sock Line Puller	Pulls sock line during stringing operation
Static Truck/ Tensioner	Provides tension on conductor/ground wire during stringing operation
Track Type Dozer	Heavy duty - grades terrain

Equipment Type	Use Description
Truck, Semi-Tractor	Transports material
Van	Transport workers and material
Water Truck	Wets access roads to mitigate fugitive dust/ improve compaction
Wire Truck/Trailer	Hauls conductor/ground wire to job site, hold conductor/ground wire during stringing operation

Table 3-7: Proposed Construction Schedule

Project Activity	Approximate Duration (Months)	Approximate Start Date
Permit to Construct		Quarter (Q) 1, 2018
Final Engineering	12 months	Q1, 2018
ROW/Property Acquisition	17 months	Q2. 2018
Acquisition of Required Permits	18 months	Q3, 2018
Substation Construction	12 months	Q3, 2019
Subtransmission Line Construction	18 months	Q3, 2020
Telecommunications Construction	6 months	Q4, 2020
Distribution Construction	11 months	Q3, 2019
Project Operational		Q2, 2021

A utility person handles non-operation activities within the switch center and act as handyman in maintaining non-electrical facilities including bathroom cleanups, changing air conditioning filters and general yard housekeeping.

The subtransmission and distribution lines would be maintained in a manner consistent with CPUC G.O. 95 and G.O. 128 as applicable, and the National Electrical Safety Code (NESC) for those circuits that are located outside of California. Normal operation of the lines would be controlled remotely through SCE control systems, and manually in the field as required. SCE inspects the subtransmission and distribution overhead facilities in a manner consistent with CPUC G.O. 165 a minimum of once per year via ground and/or aerial observation, but usually occurs more frequently based on system reliability. Maintenance would occur as needed and could include activities such as repairing conductors, washing or replacing insulators, repairing or replacing other hardware components, replacing poles and towers, tree trimming, brush and weed control, and access road maintenance. Most regular Operations and Maintenance (O&M) activities of overhead facilities are performed from existing access roads with no surface disturbance. Repairs done to existing facilities, such as repairing or replacing existing poles and towers, could occur in undisturbed areas. Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

Routine access road maintenance is conducted on an annual and/or as-needed basis. Road maintenance includes maintaining a vegetation-free corridor (to facilitate access and for fire prevention) and blading to smooth over washouts, eroded areas, and washboard surfaces as needed. Access road maintenance could include brushing (i.e., trimming or removal of shrubs) approximately 2-5 feet beyond berms or road’s edge when necessary to keep vegetation from intruding into the roadway. Road maintenance would also include cleaning ditches, moving and establishing berms, clearing and making functional drain inlets to culverts, culvert repair, clearing and establishing water bars, and cleaning and repairing over-side drains. Access road maintenance includes the repair, replacement and installation of storm water diversion devices on an as-needed basis.

Insulators could require periodic washing with water to prevent the buildup of contaminants (dust, salts, droppings, smog, condensation, etc.) and reduce the possibility of electrical arcing which can result in circuit outages and potential fire. Frequency of insulator washing is region specific and based on local conditions and build-up of contaminants. Replacement of insulators, hardware, and other components is performed as needed to maintain circuit reliability.

Some pole locations and/or lay down areas could be in previously undisturbed areas and could result in ground and/or vegetation disturbance, though attempts would be made to utilize previously disturbed areas to the greatest extent possible. In some cases new access is created to remove and replace an existing pole. Wood pole testing and treating is a necessary maintenance activity conducted to evaluate the condition of wood structures both above and below ground level. Intrusive inspections require the temporary removal of soil around the base of the pole, usually to a depth of approximately 12 to 18 inches, to check for signs of deterioration. Roads and trails are utilized for access to poles. For impact prevention, all soil removed for intrusive inspections would be reinstalled and compacted at completion of the testing.

Existing conductors could require re-stringing to repair damages. Some pulling site locations could be in previously undisturbed areas and at times, conductors could be passed through existing vegetation on route to their destination.

Regular tree pruning must be performed to be in compliance with existing state and federal laws, rules, and regulations and is crucial for maintaining reliable service, especially during severe weather or disasters. Tree pruning standards for distances from overhead lines have been set by the CPUC (G. O. 95, Rule 35), California Public Resource Code 4293, California Code of Regulations Title 14, Article 4, and other government and regulatory agencies. SCE’s standard approach to tree pruning is to remove at least the minimum required by law plus one years’ growth (species dependent).

In addition to maintaining vegetation-free access roads, helipads and clearances around electrical lines, clearance of brush and weeds around poles, and as may be required by applicable regulations on fee-owned ROWs, is necessary for fire protection. A 10-foot radial clearance around non-exempt poles (as defined by California Code of Regulations Title 14, Article 4) and a 25-50 foot radial clearance around non-exempt towers (as defined by California Code of Regulations Title 14, Article 4) are maintained in accordance with Public Resource Code 4292.

In some cases, poles do not have existing access roads and are accessed on foot, by helicopter, or by creating temporary access areas. O&M related helicopter activities could include transportation of transmission line workers, delivery of equipment and materials to structure sites, structure placement, hardware installation, and conductor stringing operations. Helicopter landing areas could occur where access by road is infeasible. In addition, helicopters must be able to land within SCE ROWs, which could include landing on access or spur roads.

In addition to regular O&M activities, SCE conducts a wide variety of emergency repairs in response to emergency situations such as damage resulting from high winds, storms, fires, and other natural disasters, and accidents. Such repairs could include replacement of downed poles, or lines or re-stringing conductors. Emergency repairs could be needed at any time.

The telecommunications equipment would be subject to maintenance and repair activities on an as needed or emergency basis. Activities would include replacing defective circuit boards, damaged radio antennas or feedlines and testing the equipment. Telecommunication equipment would also be subject to routine inspection and preventative maintenance such as filter change-outs or software and hardware upgrades. Most regular O&M activities of telecommunications equipment are performed at substation or communication sites and inside the equipment rooms and are accessed from existing access roads with no surface disturbance; helicopter transportation may be required to access remote Communications Sites for routine or emergency maintenance activities. Access road maintenance is performed as mentioned previously.

The telecommunications cables would be maintained on an as needed or emergency basis. Maintenance activities would include patrolling, testing, repairing and replacing damaged cable and hardware. Most regular maintenance activities of overhead facilities are performed from existing access roads with no surface disturbance. Repairs done to existing facilities, such as repairing or replacing existing cables and re-stringing cables, could occur in undisturbed areas. Access and habitat restoration, as mentioned previously, may be required for routine or emergency maintenance activities.

3.14 Applicant-Proposed Measures

As part of the Proposed Project SCE has identified 18 Applicant-Proposed Measures (APMs) that it plans to implement during construction and/or operation of the Proposed Project to reduce or avoid impacts. SCE would conduct the design, construction, operation, and maintenance of the Proposed Project in accordance with its APMs. The proposed APMs are listed in Table 3-8: Applicant-Proposed Measures.

Table 3-8: Applicant-Proposed Measures

APMs	Description	Applicable Proposed Project Components
APM-AES-01: Construction Lighting	If temporary construction lighting is required, SCE would use shielded construction light fixtures and lighting would be directed away from nearby residences.	All
APM-AIR-01: Fugitive Dust	During construction, surfaces disturbed by construction activities would be covered or treated with a dust suppressant until completion of activities at each site of disturbance. On-site unpaved roads and off-site unpaved access roads utilized during construction within the Proposed Project area would be effectively stabilized (e.g., using water or chemical stabilizer/suppressant) to control dust emissions. On-road vehicle speeds on unpaved roadways would be restricted to 15 miles per hour.	All
APM-AIR-02: Tier 3 Engines	Off-road diesel construction equipment with a rating between 100 and 750 horsepower would be required to use engines compliant with United States (U.S.) Environmental Protection Agency Tier 3 non-road engine standards. In the event that a Tier 3 engine is not available, the equipment would be equipped with a Tier 2 engine and documentation would be provided from a local rental company stating that the rental company does not currently have the required diesel-fueled off-road construction equipment or that the vehicle is specialized and is not available to rent. Similarly, if a Tier 2 engine is not available, that equipment would be equipped with a Tier 1 engine and documentation of the unavailability would be provided.	All
APM-BIO-01: Implement Biological Monitoring	Biological Monitors would be utilized during construction of the Proposed Project within areas encompassing sensitive biological resources or habitats suitable for any special-status species. The Biological Monitors in coordination with the SCE Lead Biologist would be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and unique resources are avoided to the extent feasible. Biological Monitors would flag the boundaries of areas where activities need to be restricted to protect native plants and wildlife and/or special-status species. These restricted areas would be monitored for their protection during construction. If non-listed sensitive fauna are found within the impact area and could be harmed, the Biological Monitor would relocate the individual out of the Proposed Project impact area. If listed species are found within the impact area, only a biologist with the appropriate permit to handle that species would be allowed to relocate the individual. The Biological Monitor would have the authority to suspend any operation that is, in the qualified biologist's opinion, not consistent with regulations or approved mitigation plans related to the protection of biological resources.	All

APMs	Description	Applicable Proposed Project Components
APM-BIO-02: Avoid, Minimize, and/or Mitigate Impacts to Special-Status Plant Species	If any special-status plant species are discovered within the impact area, the Proposed Project impact boundary would be adjusted to avoid impacts on observed special-status plant species unless the adjustment would impact worker or public safety. If avoidance is not possible, a qualified biologist would prepare and implement a mitigation plan, which would include a detailed description of the appropriateness of the mitigation site, monitoring requirements, and annual reporting requirements. Measures may involve soil salvage, seed collection, and/or transplantation to establish the species in a suitable mitigation site. Should SCE opt to participate in the Western Riverside County Multi Species Habitat Conservation Plan (MSHCP) for areas within Riverside County and for locations with positive survey results for narrow-endemic plant species, 90 percent of those portions of the property that provide for long-term conservation value would be avoided until it is demonstrated that conservation goals for the particular species are met. If the 90-percent threshold cannot be met, SCE would prepare the mitigation plan in the format of a Determination of Biologically Equivalent of Superior Preservation (DBESP) document. The Regional Conservation Authority (RCA) would request U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) concurrence with the MSHCP “findings of consistency” and DBESP approval. Subsequent coordination on relevant biological issues would be handled through consultation with the RCA. The RCA would determine the need for additional consultation with the USFWS and the CDFW. It should also be noted that, assuming all focused plant surveys are current at the time of the Participating Special Entity (PSE) and DBESP review, any MSCHP-covered plant species not observed during surveys, but is observed at a later date prior to or during construction, would not require additional mitigation.	Mira Loma Substation Corona Substation Circle City Substation Mira Loma-Jefferson 66 kV Subtransmission Line Route Staging Yards Access Roads Guard Structures Stringing Sites

APMs	Description	Applicable Proposed Project Components
APM-BIO-03: Avoid, Minimize, and/or Mitigate Impacts to Fairy Shrimp	Impacts to listed fairy shrimp would be avoided to the extent feasible. Habitat areas with listed fairy shrimp would be marked as "off limits" in construction plans and/or maps and in the field. Should SCE opt to participate in the Western Riverside County MSHCP, pursuant to Section 6.1.2 of the MSHCP and/or if the Proposed Project design is determined to impact vernal pool resources, avoidance and minimization measures would be implemented in accordance with the species-specific objectives for Riverside fairy shrimp and vernal pool fairy shrimp. If avoidance is not feasible, an alternative that minimizes direct and indirect effects to vernal pools and associated functions and values would be selected. Those impacts that are unavoidable would be mitigated such that the lost functions and values would be replaced, as set forth under a DBESP. The RCA would request USFWS and CDFW concurrence with the MSHCP "findings of consistency" and DBESP approval. Subsequent coordination on any biological issues would be handled through consultation with the RCA. The RCA would determine the need for additional consultation with the USFWS and CDFW. It should also be noted that, assuming all fairy shrimp surveys are current and have been conducted pursuant to approved protocols at the time of the PSE and DBESP review, any MSHCP-covered fairy shrimp species not observed during surveys, but which are observed at a later date prior to or during construction, would not require additional mitigation. For areas within San Bernardino County, or if SCE opts out of the MSHCP in Riverside County, SCE would prepare a Habitat Conservation Plan (HCP) and seek take authorization through Section 7 or Section 10 of the FESA for impacts to listed fairy shrimp. Prior to construction, SCE would obtain a Biological Opinion issued from the USFWS authorizing the removal of applicable resources (i.e., listed fairy shrimp habitat). It is anticipated that the USFWS Biological Opinion would contain conservation recommendations to avoid or reduce impacts.	Mira Loma-Jefferson 66 kV Subtransmission Line Route

APMs	Description	Applicable Proposed Project Components
APM-BIO-04: Avoid, Minimize, and/or Mitigate Impacts to Delhi Sands Flower-Loving Fly	Impacts to DSFF would be avoided to the extent practicable. Should avoidance be infeasible, SCE would seek take authorization through Section 7 or Section 10 of the FESA for impacts to occupied habitat of DSFF in San Bernardino County, or if SCE did not opt to become a PSE in the MSHCP in Riverside County. Prior to construction, SCE would prepare an HCP and seek a Biological Opinion issued from the USFWS that would authorize the removal of applicable resources (i.e., DSFF habitat). It is anticipated that the USFWS Biological Opinion would contain conservation recommendations to avoid or reduce impacts. Should SCE opt to participate in the MSHCP, and if DSFF are found full avoidance through on-site preservation would be preferred. However, should on-site preservation be infeasible, purchase of suitable DSFF habitat at a 3:1 ratio in specifically designated areas could be required by the RCA.	Mira Loma-Jefferson 66 kV Subtransmission Line Route Staging Yard at the north end of the study area (portions that encompass Delhi series soils and that would be within the SCE Ontario Recovery Unit)
APM-BIO-05: Avoid or Minimize Impacts to Special-Status Fish Species	Should Proposed Project work occur within open water (i.e., in the Santa Ana River), impacts to special-status fish species would be avoided to the extent feasible. Should SCE opt to participate in the MSHCP, avoidance/minimization measures are not specifically required by the MSHCP. Should SCE not opt to participate in the MSHCP, the following avoidance/minimization measures shall be required to ensure that special-status fish species are not present within the construction area: • Work would be conducted during the dry season when there would be less potential to impact special-status fish species. • Prior to the initiation of construction activities within the Santa Ana River, barrier nets would be installed upstream and downstream from the work area in open water, allowing sufficient space for construction crews to operate. These nets are intended to exclude fish from the work area. • Any fish that may appear inside the netted area after the barrier nets are established would be captured and relocated outside the work area by a qualified Biologist. • Daily monitoring of the nets would be performed to ensure the nets are in-place and free of debris.	Mira Loma-Jefferson 66 kV Subtransmission Line Route

APMs	Description	Applicable Proposed Project Components
APM-BIO-06: Avoid, Minimize, and/or Mitigate Impacts to Least Bell's Vireo	For areas in Riverside County, SCE may choose to mitigate potential impacts to the least Bell's vireo and the western yellow billed cuckoo by participation in the Western Riverside County MSHCP. SCE would prepare a DBESP to cover permanent impacts that would include conservation recommendations for least Bell's vireo and western yellow billed cuckoo pursuant to the MSHCP. The DBESP would also include a discussion of avoidance and minimization of temporary impacts (i.e., exclusion buffers during construction). The RCA would request USFWS and CDFW concurrence with the MSHCP "findings of consistency" as well as DBESP approval. For areas within San Bernardino County, or if SCE opts out of the Western Riverside MSHCP, temporary and permanent impacts to least Bell's vireo, western yellow billed cuckoos, and their habitat would be mitigated by obtaining a take permit under the FESA and CESA. The conditions of the take permit would include acreages of disturbance, mitigation ratios for permanent and temporary disturbance, locations for restoration and/or potential mitigation banks for payment. Conservation recommendations may include the following at the discretion of the USFWS: • In areas of occupied habitat for the least Bell's vireo and western yellow billed cuckoo, SCE would conduct non-protocol preconstruction clearance surveys no more than 7 days prior to construction to determine the location of nests and territories. • In areas of occupied habitat for the least Bell's vireo and western yellow billed cuckoo, a buffer area around active nest(s) would be established by the SCE biologist and provided to FWS and CDFW for concurrence. The buffer would be established based on construction activities, potential noise levels and behavior of the species. • Construction activities in occupied habitat for the least Bell's vireo and western yellow billed cuckoo would be monitored by a Qualified Biologist.	Mira Loma-Jefferson 66 kV Subtransmission Line Route

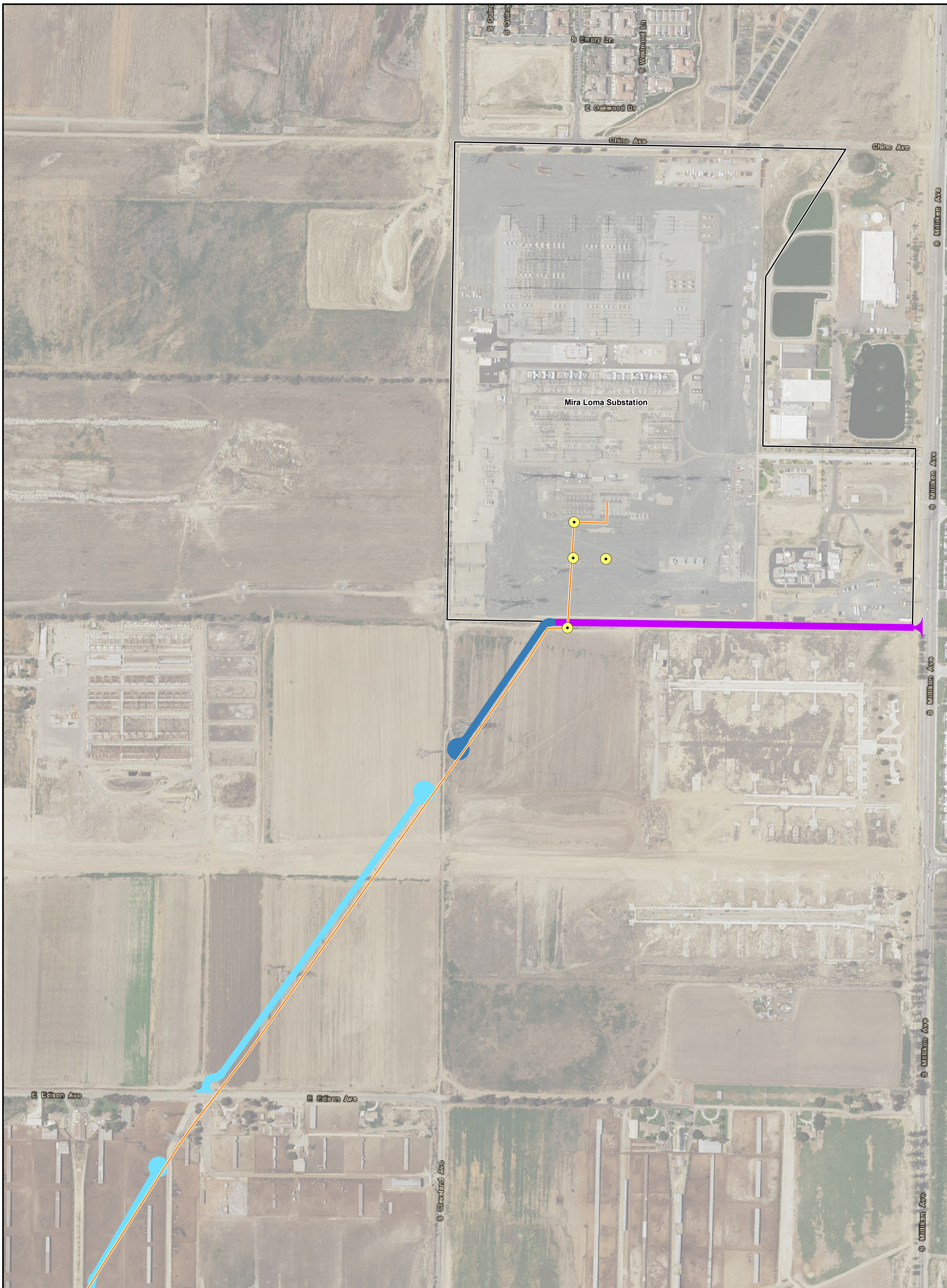
APMs	Description	Applicable Proposed Project Components
APM-BIO-07: Avoid and/or Minimize Impacts to Special-Status Vegetation – Non-Riparian	Impacts to special-status vegetation communities that may support special-status species and provide foraging habitat for sensitive raptors and other bird species would be avoided to the extent feasible. Non-riparian special-status vegetation, which includes Riversidean sage scrub, would be marked as "off limits" in construction plans and/or maps, and flagged prior to construction by a qualified Biological Monitor. If significant impacts to special-status vegetation are unavoidable, mitigation may be necessary depending on the quality of vegetation and the ability to support habitat for special-status species. Should SCE opt to participate in the Western Riverside County MSHCP, impacts to special-status vegetation communities within Riverside County are fully covered through payment of mitigation fees. Should SCE choose to opt out of the MSHCP PSE process, a restoration plan would be prepared in consultation with the USFWS and CDFW. The restoration plan would include, but is not limited to, identification of responsible parties, restoration details and schedule, monitoring and maintenance, and success criteria.	Mira Loma Substation Circle City Substation Mira Loma-Jefferson 66 kV Subtransmission Line Route Staging Yards Access Roads Guard Structures Stringing Sites
APM-BIO-08: Avoid, Minimize, and/or Mitigate Impacts to Burrowing Owl	Should SCE opt to participate in the MSHCP for areas within Riverside County, then avoidance/minimization would be preferred However, if avoidance/minimization would not be possible (i.e., 90 percent of the areas with long-term conservation value were conserved), then a DBESP would be prepared that would include suitable burrowing owl habitat creation and translocation. The RCA would request USFWS and CDFW concurrence with the MSHCP "findings of consistency" and DBESP approval. For areas within San Bernardino County, a Burrowing Owl Management Plan would be created for the Proposed Project. The plan would include information related to construction monitoring, relocation strategy, and exclusionary devices. • A preconstruction non-protocol burrowing own survey shall be conducted no more than 14 days prior to commencement of ground disturbing activities with suitable habitat to determine if any occupied burrows are present. • If occupied burrows are found, adequate buffers would be established around burrows. Adequate buffers would be 160 feet from wintering burrows (i.e., from December 1-January 31) and 250 feet from breeding burrows during the breeding season (i.e., from February 1 to August 31). • Biological monitors would monitor all construction activities that could potentially impact active burrows.	Mira Loma Substation Circle City Substation Mira Loma-Jefferson 66 kV Subtransmission Line Route Staging Yards Access Roads Guard Structures Stringing Sites

APMs	Description	Applicable Proposed Project Components
APM-BIO-09: Avoid Impacts to Nesting Birds	SCE would conduct pre-construction clearance surveys no more than 7 days prior to construction to determine the location of nesting birds and territories during the nesting bird season (typically February 1 to August 31, or earlier for species such as raptors). An avian biologist would establish a buffer area around active nest(s) and would monitor the effects of construction activities to prevent failure of the active nest. The buffer would be established based on construction activities, potential noise disturbance levels, and behavior of the species. Monitoring of construction activities that have the potential to affect active nest(s) would continue until the adjacent construction activities are completed or until the nest is no longer active.	All
APM-BIO-10: Avoid, Minimize, and/or Mitigate Impacts to MSHCP covered Riparian Vegetation/Riverine Habitat	Pursuant to MSHCP Section 6.1.2, impacts to riparian/riverine habitat would be avoided to the extent feasible. In areas where avoidance is not possible, permanent impacts to riparian vegetation, which includes willow riparian forest vegetation and/or riverine habitat would be mitigated to ensure no net loss of habitat. Prior to construction, the limits of grading would be clearly marked around any such habitat. SCE would also prepare a mitigation plan in the format of a DBESP as part of the PSE review process. The RCA would request USFWS and CDFW concurrence with the MSHCP “findings of consistency” and DBESP approval. Subsequent coordination on any biological issues would be handled through consultation with the RCA. The RCA would determine the need for additional consultation with the USFWS and CDFW.	Mira Loma-Jefferson 66 kV Subtransmission Line Route

APMs	Description	Applicable Proposed Project Components
APM-BIO-11: Mitigation for Impacts to Jurisdictional Waters	Impacts to potential USACE-, RWQCB-, and CDFW-jurisdictional areas would be avoided to the extent feasible. These areas would be marked as “off limits” in construction plans and/or maps and in the field. If avoidance is not feasible, permits from the USACE, RWQCB, and CDFW would be obtained for direct and indirect impacts on areas within these agencies’ jurisdictions. It is anticipated that the regulatory permit requirements would contain measures to avoid, reduce, and/or mitigate for impacts in their respective jurisdictions. In areas where avoidance is not possible, impacts to jurisdictional waters would be mitigated to ensure no net loss of habitat. SCE would pay into a mitigation bank, pay into an in-lieu fee program, or work with a local RCD to establish appropriate mitigation within the same watershed as the area of impact. On-site restoration back to existing conditions would implemented where possible; however, on-site mitigation with conservation easements and deed restrictions is rarely possible within SCE work easements. Subject to the approval of the resource agencies (i.e., USACE, RWQCB, and CDFW), SCE would submit the required materials and mitigation proposal as part of the regulated waters application processes. SCE would comply with all conditions as set forth in the regulated water permits.	Mira Loma Substation Source Line Route Mira Loma-Jefferson 66 kV Subtransmission Line Route
APM-BIO-12: Avoid, Minimize, and/or Mitigate Protected Trees	The Proposed Project would be designed to avoid protected trees to the extent feasible. Should SCE need to trim, encroach into protected root zone, relocate, or remove any protected trees as identified during pre-construction surveys, a ministerial permit would be required by the local jurisdiction’s applicable ministerial tree ordinances. Due to the varying jurisdictions within the survey areas, measures would be implemented depending on the location of the protected trees, as well as conditions stated in each approved ministerial tree permit.	All Proposed Project components within the cities of Chino, Corona, Eastvale, Norco, and Ontario, and in unincorporated San Bernardino County
APM-PAL-01: Paleontological Resources Management Plan.	A Paleontological Resources Management Plan would be developed for construction within areas that have been identified as having a moderate and high sensitivity for paleontological resources, and would identify monitoring and treatment requirements for sensitive paleontological resources of significance. The Paleontological Resources Management Plan would be prepared by a professional paleontologist in accordance with the recommendations of the Society of Vertebrate Paleontology.	All

APMs	Description	Applicable Proposed Project Components
APM-HAZ-01: Implement a Hazardous Materials Management Plan.	SCE would prepare and implement a Hazardous Materials Management Plan (HMMP) during construction of the Proposed Project. The plan would outline hazardous material handling, use, storage, and disposal requirements, as well as hazardous waste management practices. The plan would be developed to ensure that all hazardous materials and wastes would be handled and disposed of according to applicable rules and regulations. The HMMP would include procedures to address hazardous material storage, employee training requirements, hazard recognition, fire safety, first aid/emergency medical procedures, hazardous material release containment/control procedures, hazard communication training, Personal Protective Equipment training, and release reporting requirements.	All
APM-HAZ-02: **Fire Management Plan.**	SCE would prepare and implement a Fire Management Plan during construction of the Proposed Project. The plan would provide guidance for prevention, control, and extinguishment of fires. The plan would also provide smoking and fire-related rules, storage and parking areas, usage of spark arrestors on construction equipment, and fire-suppression tools and equipment. The plan would also include the following measure: • Cease work during Red Flag Warning events in areas where grassland or other vegetation would be susceptible to accidental ignition by Proposed Project activities that could ignite a fire (such as welding or use of equipment that could create a spark). During Red Flag Warning events, as issued by the National Weather Service, all non-emergency construction and maintenance activities would cease in affected areas.	All
APM-TRA-01: Minimize Use of SR-91.	Heavy-duty construction vehicles and equipment would not utilize SR-91 within the City of Corona (from the Green River Road exit to the Pierce Street exit) to access the proposed Circle City Substation site during peak traffic hours throughout the approximately 9-week-long grading period at the substation site. On weekdays between 7:00 a.m. and 9:00 a.m., heavy-duty construction vehicles and equipment would not utilize SR-91 heading west, and would not utilize SR-91 heading east between 4:00 p.m. and 6:00 p.m. Alternate travel routes, such as East 6th Street or Magnolia Avenue, would be used instead during these times.	All

ATTACHMENT 3-A: PROPOSED STRINGING SITES AND ACCESS ROADS



Attachment 3-A: Proposed Stringing Sites and Access Roads Map 1 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

- Subtransmission Line Route - Overhead
- Subtransmission Line Route - Underground
- Subtransmission Line - Underground Crossing
- Approximate Stringing Site Location
- Substation
- Existing Access Road to be Improved
- New Access Road
- Temporary Access Road

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Sources: Insignia, 2015; SCE, 2015

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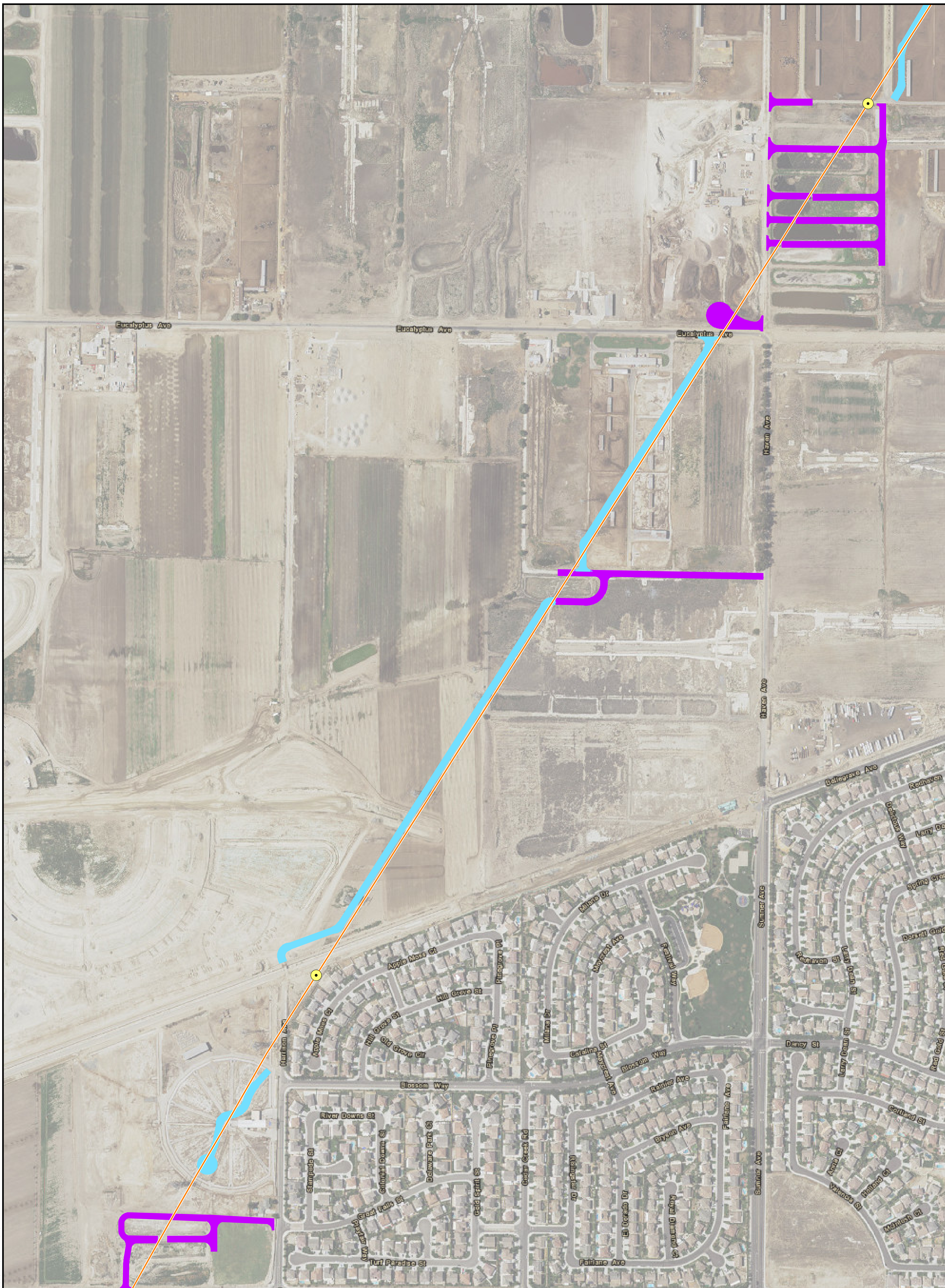

Attachment 3-A: Proposed Stringing Sites and Access Roads Map 2 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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- New Access Road
- Temporary Access Road

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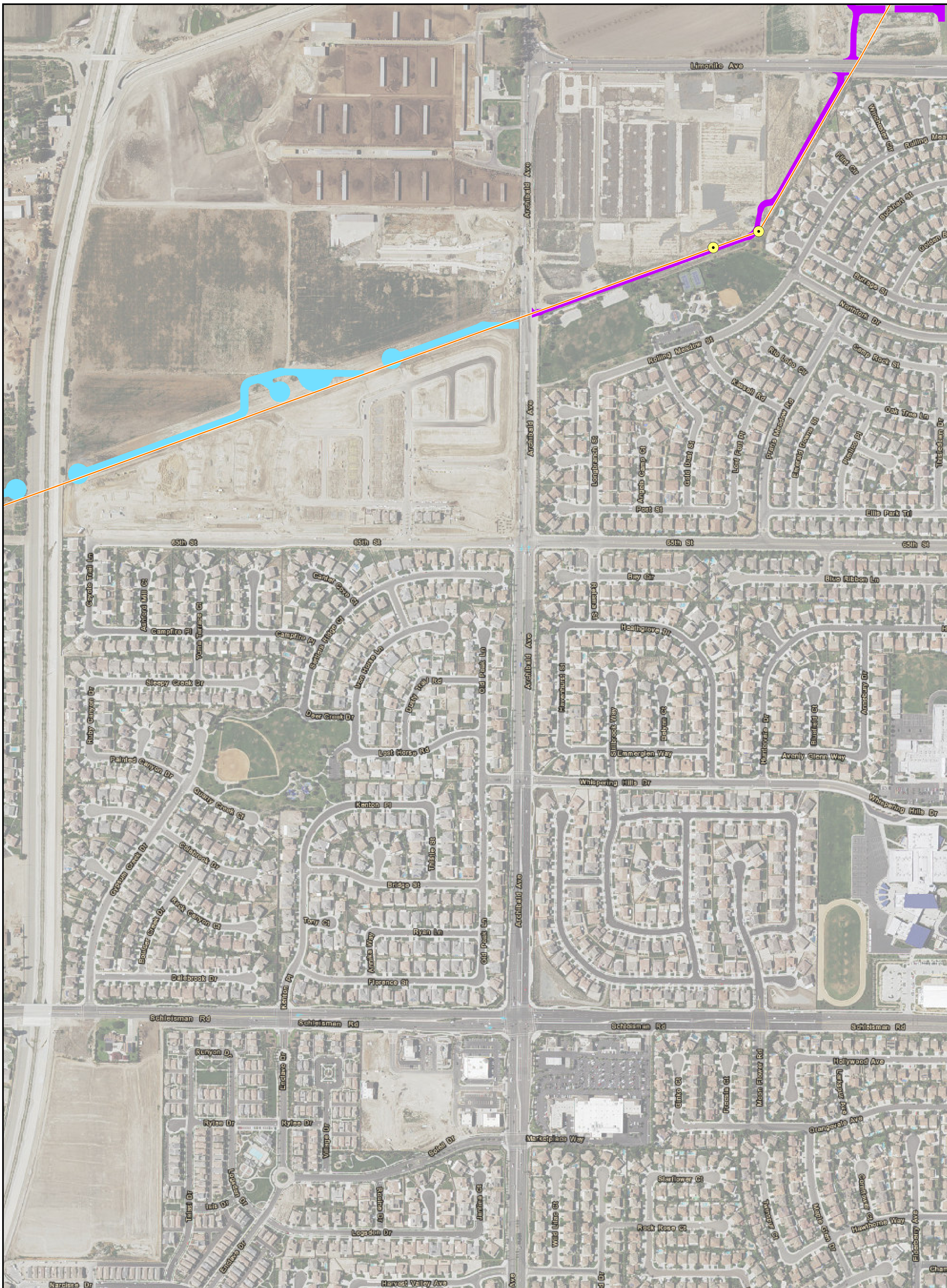

Attachment 3-A: Proposed Stringing Sites and Access Roads Map 3 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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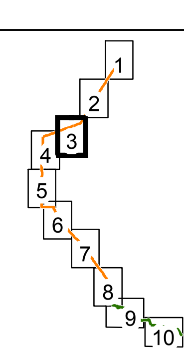

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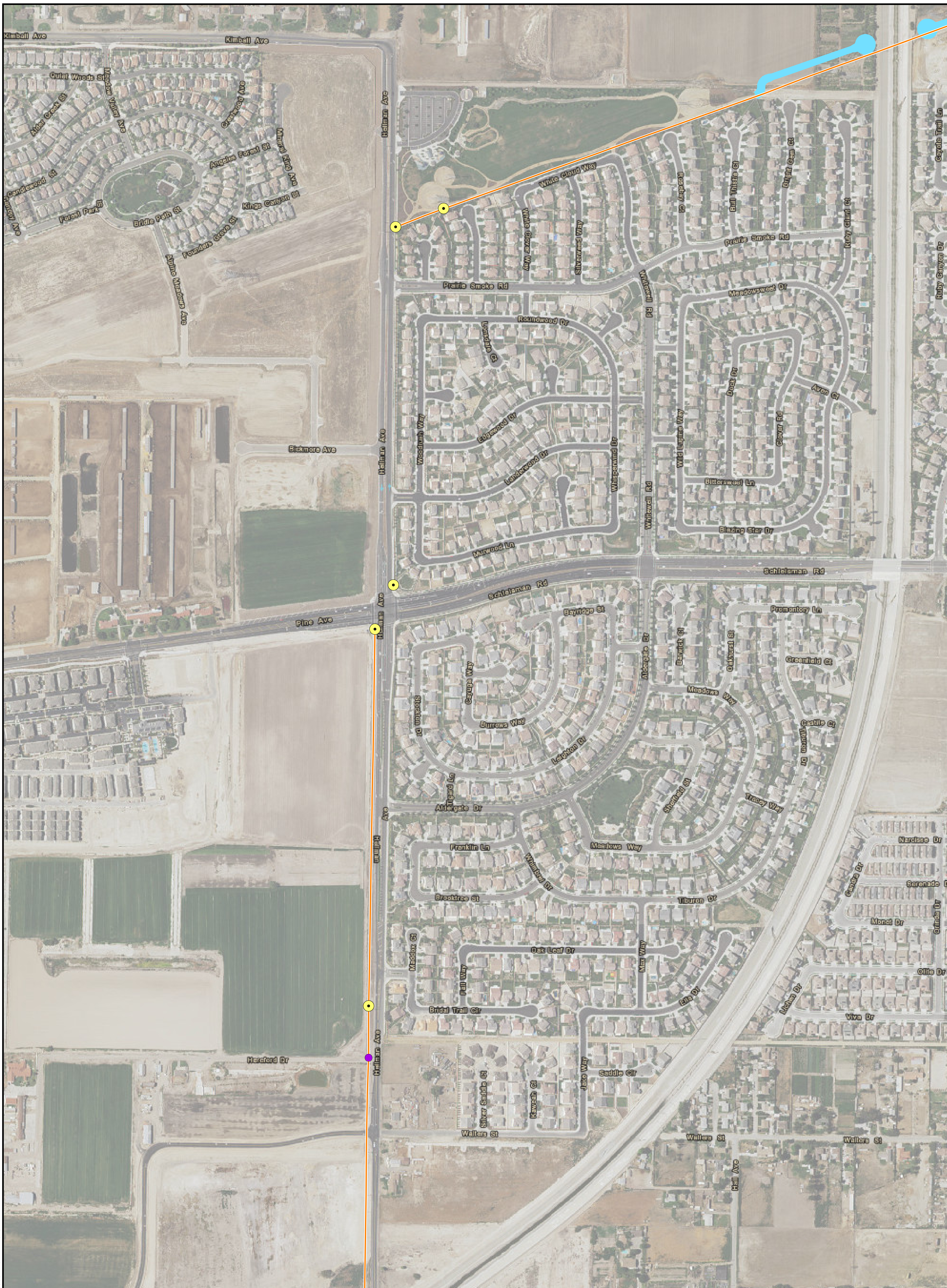

Attachment 3-A: Proposed Stringing Sites and Access Roads Map 4 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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Attachment 3-A: Proposed Stringing Sites and Access Roads Map 5 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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Attachment 3-A: Proposed Stringing Sites and Access Roads Map 6 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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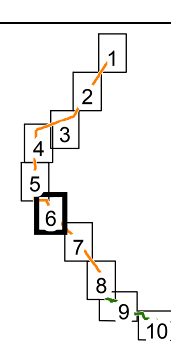

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Sources: Insignia, 2015; SCE, 2015

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Attachment 3-A: Proposed Stringing Sites and Access Roads Map 7 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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- New Access Road
- Temporary Access Road

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Attachment 3-A: Proposed Stringing Sites and Access Roads Map 8 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

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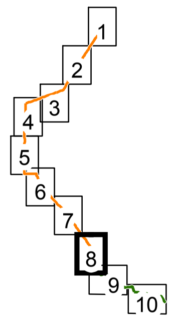

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Attachment 3-A: Proposed Stringing Sites and Access Roads Map 9 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

66 kV Source Line

- Source Line Route - Overhead
- Source Line Route - Underground
- Approximate Stringing Site Location
- Substation
- Existing Access Road to be Improved
- New Access Road
- Temporary Access Road

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INSIGNIA ENVIRONMENTAL

Sources: Corona, 2015; Insignia, 2012; SCE, 2015

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Attachment 3-A:
Proposed Stringing Sites and Access Roads
Map 10 of 10

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

66 kV Source Line

- Source Line Route - Overhead
- Source Line Route - Underground
- Approximate Stringing Site Location
- Substation
- Existing Access Road to be Improved
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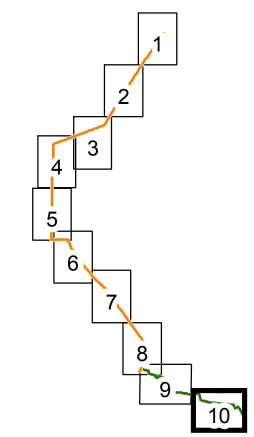

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Sources: Corona, 2015; Insignia, 2012; SCE, 2015

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CHAPTER 4 – ENVIRONMENTAL IMPACT ASSESSMENT

This chapter examines the potential environmental impacts of the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project) and alternatives. The analysis of each resource category begins with an examination of the existing physical setting (i.e., baseline conditions determined pursuant to Section 15125[a] of the California Environmental Quality Act [CEQA] Guidelines) that may be affected by the Proposed Project. The effects of the Proposed Project are defined as changes to the environmental setting that are attributable to construction and operation of the Proposed Project.

Significance criteria are identified for each environmental resource area. The significance criteria serve as a benchmark for determining if a project would result in a significant adverse environmental impact when evaluated against the baseline. According to Section 15382 of the CEQA Guidelines, a significant effect on the environment means “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project.” If significant impacts are identified, feasible mitigation measures are formulated to eliminate or reduce the level of the impacts and focus on the protection of sensitive resources.

Section 15126.4(a)(3) of the CEQA Guidelines states that mitigation measures are not required for effects that are not found to be significant. Therefore, if an impact is less than significant, no mitigation measures have been proposed. In addition, compliance with laws, regulations, ordinances, and standards designed to reduce impacts to less-than-significant levels are not considered mitigation measures under CEQA. If potentially adverse impacts occur, Southern California Edison has provided applicant-proposed measures to minimize the environmental impacts.

4.1 AESTHETICS

This section examines visual resources in the area of the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project) to determine how the Proposed Project activities could affect the aesthetic character of the landscape. Visual resources are generally defined as the natural and built features of the landscape that can be viewed. Landforms, water, and vegetation patterns are among the natural landscape features that define an area's visual character, whereas buildings, roads, and other structures reflect human modifications to the landscape. These natural and built landscape features are considered visual resources that contribute to the public's experience and appreciation of the environment. This section analyzes whether the Proposed Project would alter the perceived visual character of the environment and cause visual impacts. Alternatives to the Proposed Project—including the substation site, Source Line Route, and Mira Loma-Jefferson 66 kilovolt (kV) Subtransmission Line—are also discussed.

4.1.1 Environmental Setting

4.1.1.1 Regional and Local Landscape Setting

Figure 4.1-1: Regional Landscape Context depicts the regional setting of the Proposed Project. Located in Southern California, the Proposed Project is located in the inland valley and is bordered by the San Gabriel Mountains to the north, the Santa Ana Mountains to the south, and the lower Chino Hills and San Jose Hills to the west. The Proposed Project is situated within a relatively flat area between 525 and 750 feet in elevation. Peaks of the San Gabriel Mountains reach elevations of approximately 10,000 feet above sea level and are situated about 10 miles away. The closer Santa Ana Mountains rise to an elevation of approximately 5,600 feet.

The surrounding hills and mountains form a vivid backdrop in views from many locations throughout the area. Originating in the mountains, the Santa Ana River flows southwest, providing the area's major drainage system; the Proposed Project crosses the river, as well as several channels that feed into it.

Much of the Proposed Project area has changed from agricultural to residential uses in the past few decades, transforming an open, rural setting into a more populated, suburban landscape. The Proposed Project area is located in a largely residential setting with some expanses of agricultural land and industrial areas. Portions of the Proposed Project route are located in the Cities of Corona, Norco, and Eastvale in Riverside County, as well as the City of Ontario and the eastern border of the City of Chino in San Bernardino County.

A network of major freeways connects the Proposed Project area with the Los Angeles Basin to the west, San Diego to the south and less populated inland areas to the east and north. The Proposed Project would span Interstate (I-) 15 and State Route (SR-) 91, and would generally run parallel to local arterials for much of its length. Rail corridors also traverse the area, where the Metrolink commuter rail system connects the City of Corona with Riverside to the east and Los Angeles to the west. Throughout the Proposed Project area, transmission structures—including lattice towers and steel poles—along with other vertical structures such as traffic signals and streetlights, are characteristic built elements seen within the landscape setting.

Nighttime lighting in the area includes highway and streetlights, lighting associated with industrial and commercial facilities, lighting at public and recreational facilities such as parks and schoolyards, and localized lighting sources associated with residences.

4.1.1.2 Proposed Project Viewshed

The Proposed Project viewshed is defined as the general area from which a project is visible or can be seen. The Proposed Project area consists of the proposed Circle City Substation site, Source Line Route, and Mira Loma-Jefferson 66 kV Subtransmission Line. For purposes of describing a project's visual setting and assessing potential visual impacts, the viewshed can be broken down into distance zones of foreground, middle ground, and background. The foreground is defined as the zone within 0.25 mile to 0.50 mile from the viewer. Landscape detail is most noticeable and objects generally appear most prominent when seen in the foreground. The middle ground can be defined as a zone that extends from the 0.25- to 0.5-mile range up to 3 to 5 miles from the viewer, and the background extends from about 3 to 5 miles to the horizon. Analysis of the Proposed Project primarily considers the potential effects on foreground viewshed conditions, although consideration is also given to the potential effects on the middle ground and background views.

4.1.1.3 Potentially Affected Viewers

The potentially affected viewer groups within the Proposed Project area primarily include motorists, nearby residents, and recreational users.

Motorists, the largest viewer group, are people traveling on public roadways, including regional highways such as I-15 and SR-91, as well as local streets such as River Road, Hellman Avenue, and East 6th Street. Motorists include a variety of roadway travelers—both local and regional travelers who are familiar with the visual setting, and travelers who use these streets on a less regular basis. Public roadways in the area are generally well traveled. Affected views are typically brief in duration and generally last less than 1 minute. However, in limited cases, motorist views may last up to 10 minutes or more, depending on traffic conditions. Viewer sensitivity is considered low to moderate.

Residents in the immediate vicinity comprise the second viewer group. Those who may have partial views of the Proposed Project include nearby residents in the cities of Corona, Norco, and Eastvale, and a limited number of residents in Ontario and Chino. Residential views tend to be long in duration and the sensitivity of this viewer group is considered moderate to high.

The third group includes recreational users of the parks and open space facilities that are located along the Proposed Project alignment. These recreational users are people at local parks—such as River Road Park in Corona and James C. Huber Park in Eastvale—as well as hikers, cyclists, and equestrians along the Santa Ana River Trail. Recreational views tend to be brief or moderate in duration, and the sensitivity of this viewer group is considered moderate to high.

Figure 4.1-1:
Regional Landscape Context

Circle City Substation and Mira Loma-Jefferson Subtransmission Project

Proposed Project Route

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4.1.1.4 Visual Character and Representative Views of the Proposed Project Area

The visual character of the Proposed Project area is described in this subsection and those that follow. Figure 4.1-2: Photograph Viewpoint Locations Map (Source Line Route) and Figure 4.1-3: Photograph Viewpoint Locations Map (Subtransmission Line) delineate the locations of Proposed Project components and photograph viewpoints (VP). Figure 4.1-4: Representative Photographs presents a set of 38 photographs that show representative visual conditions and public views within the Proposed Project area.

Table 4.1-1: Summary of Proposed Project Components, Primary Viewers, and Representative Photographs summarizes the four primary components of the Proposed Project in terms of their approximate length (or acreage), potentially affected viewers, and representative photographic views.

Table 4.1-1: Summary of Proposed Project Components, Primary Viewers, and Representative Photographs

Proposed Project Component (Approximate length/size)	Potentially Affected Viewers	Representative Photographs	Visual Simulation
Circle City Substation (4.0 acres)	Motorists and Limited Residents	1 through 6	VP 2 – Figure 4.1-5
Source Line Route (4.7 miles)	Motorists, Residents, and Recreational Users	7 through 20	VP 11 – Figure 4.1-6, VP 14 – Figure 4.1-7, VP 15 – Figure 4.1-8, and VP 19 – Figure 4.1-9
Mira Loma-Jefferson 66 kV Subtransmission Line (10.9 miles)	Motorists, Residents, and Recreational Users	21 through 38	VP 26 – Figure 4.1-10, VP 32 – Figure 4.1-11, and VP 35 – Figure 4.1-12

Circle City Substation (Photographs 1 through 6)

Located in the northeastern portion of the City of Corona, the proposed Circle City Substation site lies in an industrial area that includes warehouses, commercial buildings, truck and equipment yards, light manufacturing, and a quarry. This approximately 19.5-acre site, which formerly contained a warehouse, is generally level and includes a curving earth berm near the center of the property. Photographs 1 and 2 in Figure 4.1-4: Representative Photographs, which were taken from the north side of the site, show portions of the disturbed substation site, as well as one- and two-story neighboring industrial buildings. Hillsides seen in the background include graded terraces of the quarry at the base of El Sobrante de San Jacinto.

The nearest residences to the proposed substation site are located approximately 720 feet to the east. Photographs 3 and 4 in Figure 4.1-4: Representative Photographs provide views from this residential area that show industrial structures, though street trees partially screen views toward the site. Photograph 5 in Figure 4.1-4: Representative Photographs is a view from South Temescal Street near these residences, which includes an unobstructed view of quarry facilities, while Photograph 6 in Figure 4.1-4: Representative Photographs is an open view toward the substation site from All American Way, an adjacent public road that provides access to the quarry.

Source Line Route (Photographs 7 through 20)

The Source Line Route would extend southeast for approximately 4.7 miles from the existing Corona Substation, which is located at the Railroad Avenue/North Cota Street intersection, to the proposed Circle City Substation, then exit the substation and continue along Magnolia Avenue to Rimpau Avenue. As described in the paragraphs that follow, the area's visual character includes a mixture of land uses and development types. Motorists would be the primary viewers in this landscape unit.

From North Cota Street, the Source Line Route would pass through an area characterized by a mix of outdoor storage yards surrounded by chain-link fence and landscaped office/industrial complexes comprised of one- and two-story buildings and surface parking areas, as shown in Photograph 7 in Figure 4.1-4: Representative Photographs. As depicted in Photograph 8 in Figure 4.1-4: Representative Photographs, the route would continue east, crossing North Main Street, a six-lane arterial landscaped with tall palm trees in the median and along the roadside, as well as steel streetlights and traffic signals.

Turning south at Joy Street, the route would span the Metrolink commuter rail line and continue to East Grand Boulevard where it would travel under the SR-91 freeway corridor, as shown in Photographs 9 and 10 in Figure 4.1-4: Representative Photographs. For approximately 1,000 feet, the route would continue along Grand Boulevard. This circular roadway is listed on the National Register of Historic Places due to its significance as the roadway encircling the original city center. The area where the Proposed Project follows Grand Boulevard is characterized by industrial and commercial uses, such as automobile repair shops and a vehicle storage yard, in addition to a limited number of residences. As shown in Photographs 9, 11, and 12 in Figure 4.1-4: Representative Photographs, vertical structures seen along Grand Boulevard include light standards with cobra-style fixtures and traffic signals, as well as ornamental streetlights.

Turning east, the route would continue along East 3rd Street, as seen in Photographs 11 and 12 in Figure 4.1-4: Representative Photographs. In this area, residences face East 3rd Street for approximately two blocks. Photograph 13 shows the landscaped City Park; the Proposed Project would pass within approximately 300 feet of a basketball court located in this park.

Photograph 14 in Figure 4.1-4: Representative Photographs, which was taken from southbound I-15, provides a view toward the Source Line Route. From this location, the route would span the freeway and continue along East 6th Street for approximately 0.80 mile before traveling south onto Magnolia Avenue and continuing to the proposed Circle City Substation. Photographs 15 and 16 in Figure 4.1-4: Representative Photographs, respectively show the character of East 6th Street and Magnolia Avenue—both are four-lane arterial streets with recently landscaped medians and street trees. The area is typified by large, commercial, one- and two-story buildings, including office parks and warehouses with fenced yards. Open views are available from East 6th Street and Magnolia Avenue toward the Santa Ana Mountains to the west. Vertical structures along these roadways include overhead streetlights and traffic signals.

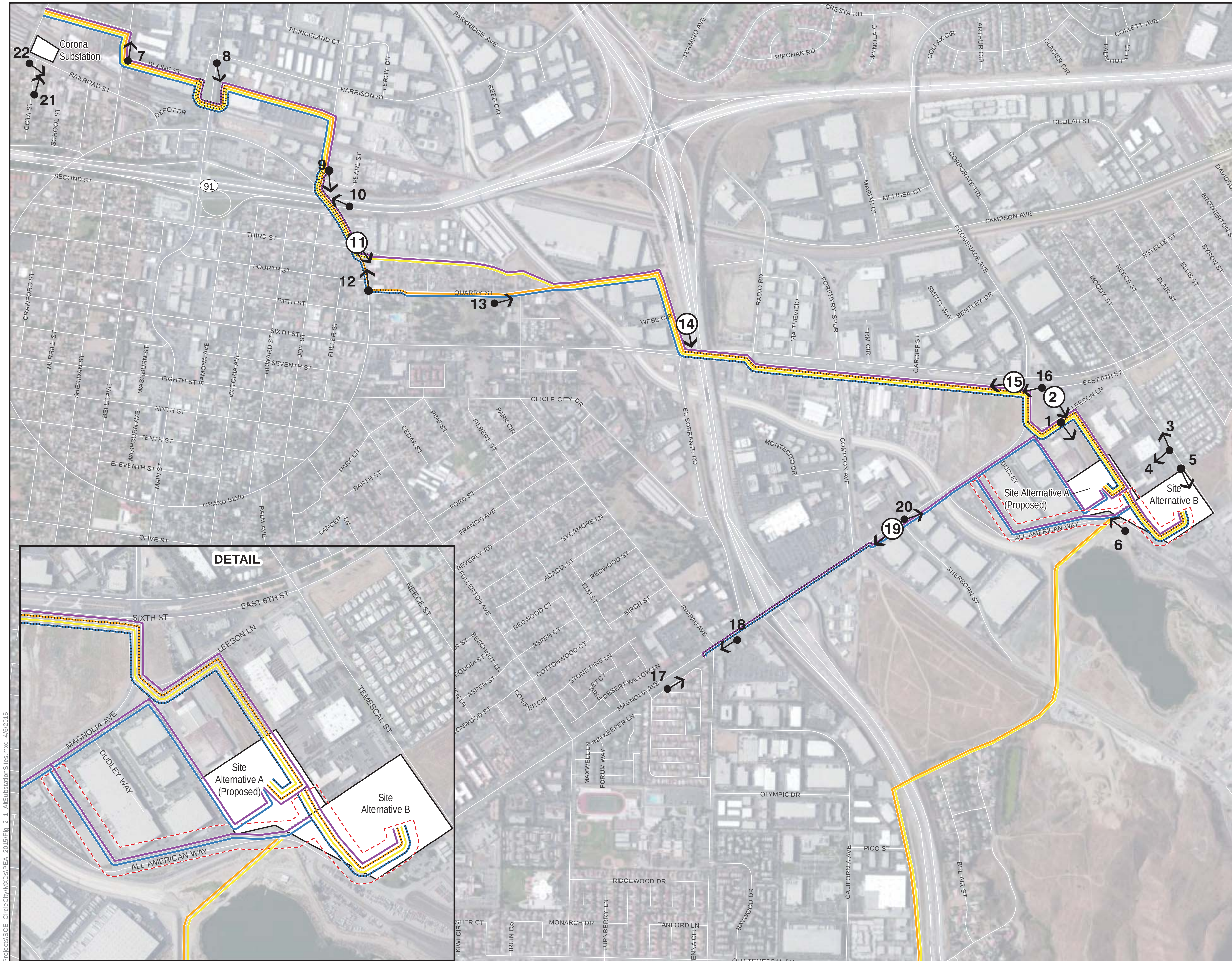

Figure 4.1-2: Photograph Viewpoint Locations Map (Source Line Route)

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

- Substation
- Undergrounding
- Source Line Route Alternative 1 (Proposed)
- Source Line Route Alternative 2
- Source Line Route Alternative 3
- Source Line Route Alternative 4
- Source Line Route Alternative Extensions to Substation Site Alternative B
- Photograph Viewpoint Location and View Direction
- Simulation Viewpoint Location and View Direction

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Sources: Insignia, 2015; SCE, 2015

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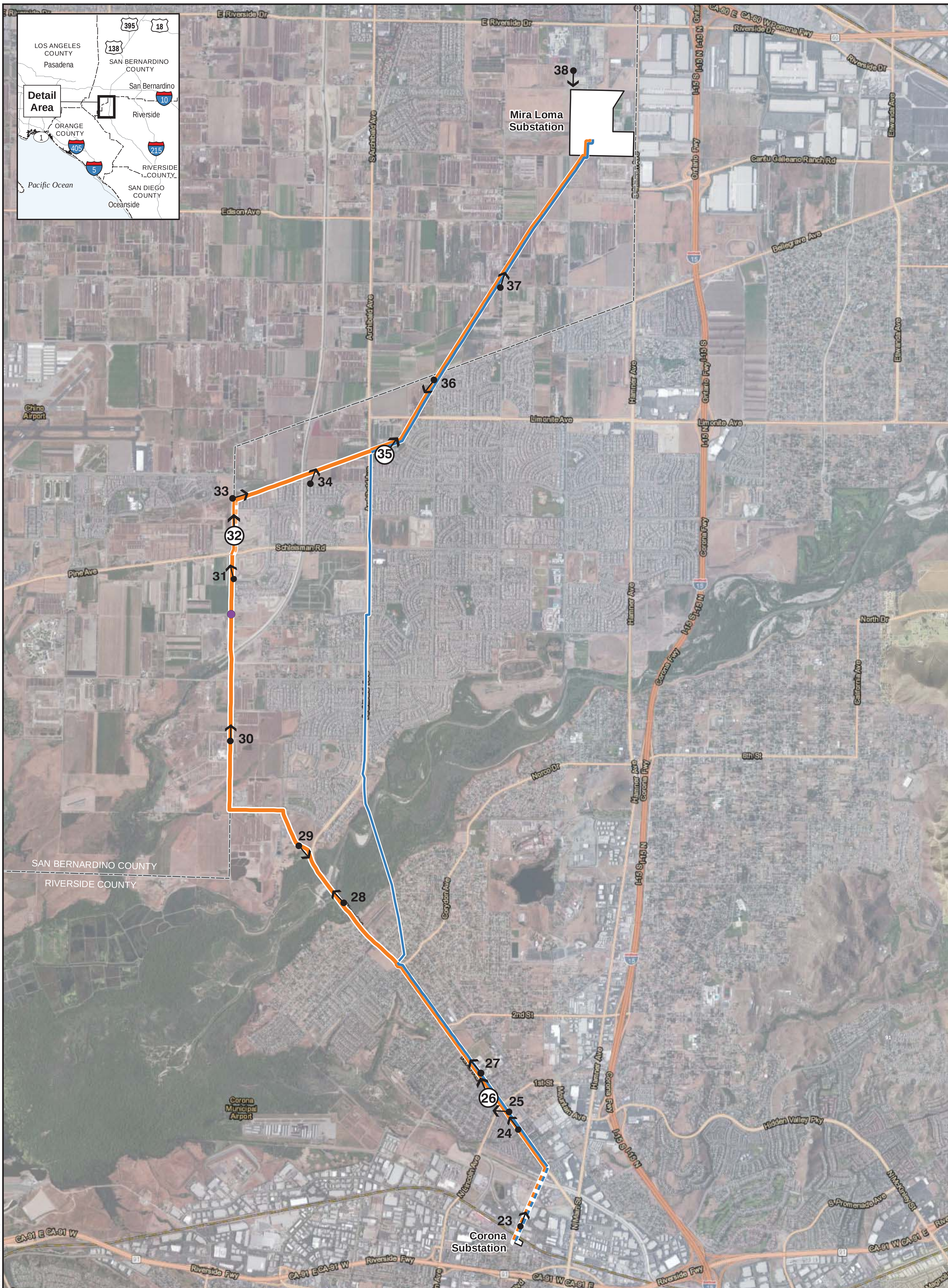

Figure 4.1-3: Photograph Viewpoint Locations Map (Subtransmission Line)

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

- Subtransmission Line Route Alternative 1 - Overhead (Proposed)
- Subtransmission Line Route Alternative 1 - Underground (Proposed)
- Subtransmission Line Route Alternative 2 - Underground*
- Subtransmission Line Route Alternative 3 - Overhead
- Subtransmission Line Route Alternative 3 - Underground
- Subtransmission Line - Underground Crossing
- County Boundary
- Substation
- Photograph Viewpoint Location and View Direction
- Simulation Viewpoint Location and View Direction

*Note: Except for the underground portion indicated, Alternative Route 2 would utilize the same route as the Alternative Route 1/Proposed Route.

Sources: Insignia, 2015; SCE, 2015

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Photograph 1. Leeson Lane looking southeast

Photograph 2. Magnolia Avenue near South Promenade Avenue looking southeast*

Refer to Figure 4.1-2 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 1 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 3. South Temescal Street looking north

Photograph 4. South Temescal Street looking west

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 2 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 5. South Temescal Street looking southeast

Photograph 6. All American Way looking northwest

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 3 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 7. North Sheridan Street at West Blaine Street looking north

Photograph 8. North Main Street at East Harrison Street looking south

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 4 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 9. Grand Boulevard near Joy Street looking south

Photograph 10. SR-91 near Joy Street looking west

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 5 of 19
Circle City Substation and Mira Loma-Jefferson
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Photograph 11. Grand Boulevard near East 3rd Street looking southeast *

Photograph 12. Grand Boulevard near Quarry Street looking north

Refer to Figure 4.1-2 for photograph viewpoint locations

*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 6 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 13. Quarry Street at City Park looking east


Photograph 14. I-15 looking south *

Refer to Figure 4.1-2 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 7 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

Photograph 15. East 6th Street near Magnolia Avenue looking west*

Photograph 16. Magnolia Avenue at 6th Street looking west

Refer to Figure 4.1-2 for photograph viewpoint locations

*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 8 of 19

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Photograph 17. Magnolia Avenue near Rimpau Avenue looking northeast

Photograph 18. Magnolia Avenue near I-5 looking southwest

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 9 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

Photograph 19. Magnolia Avenue near Sherborn Street looking southwest *

Photograph 20. Magnolia Avenue near Sherborn Street looking east

Refer to Figure 4.1-2 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 10 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

Photograph 21. Cota Street near Railroad Street looking north


Photograph 22. Railroad Street near Cota Street looking southeast

Refer to Figure 4.1-2 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 11 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 23. North Cota Street near Harrison Street looking north

Photograph 24. River Road near Redhead Lane looking northwest

Refer to Figure 4.1-3 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 12 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

Photograph 25. Arsenal Way looking west

Photograph 26. River Road Park looking northwest*

Refer to Figure 4.1-3 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 13 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 27. River Road at Auburndale School looking northwest

Photograph 28. River Road at Santa Ana River crossing looking northwest

Refer to Figure 4.1-3 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 14 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

Photograph 29. Baron Drive near River Road looking southeast

Photograph 30. Hellman Avenue near River Road looking north

Refer to Figure 4.1-3 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 15 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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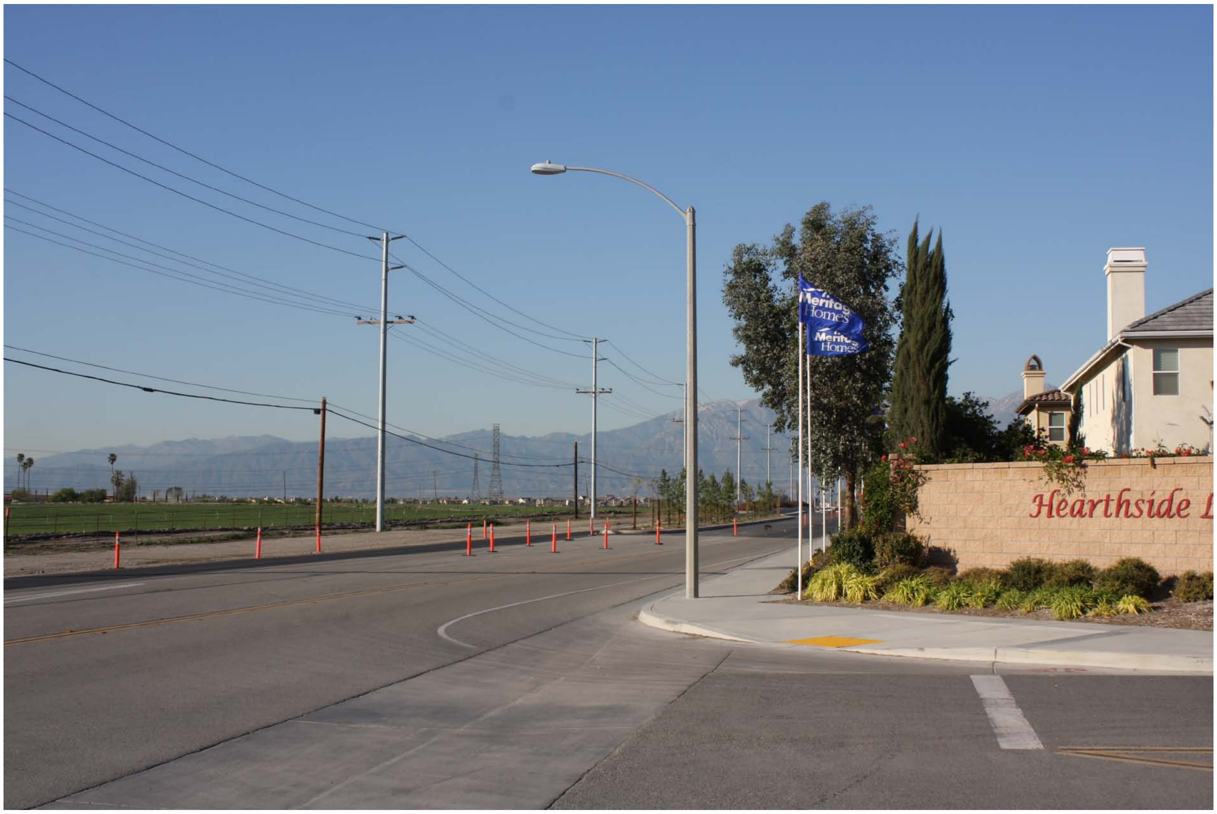

Photograph 31. Hellman Avenue at Maddox Court looking northwest

Photograph 32. Hellman Avenue at Landerwood Drive looking north*

Refer to Figure 4.1-3 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 16 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 33. American Heroes Park looking northeast

Photograph 34. Coyote Trail Lane at 65th Street looking north

Refer to Figure 4.1-3 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 17 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 35. James C. Huber Park looking northeast *

Photograph 36. Dairy at Harrison Avenue near Blossom Way looking southwest

Refer to Figure 4.1-3 for photograph viewpoint locations
*Simulation Photograph

Figure 4.1-4: Representative Photographs Sheet 18 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Photograph 37. Haven Avenue at Eucalyptus Avenue looking north

Photograph 38. South Quincy Way looking south toward Mira Loma Substation

Refer to Figure 4.1-3 for photograph viewpoint locations

Figure 4.1-4: Representative Photographs Sheet 19 of 19
Circle City Substation and Mira Loma-Jefferson
Subtransmission Line Project

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Existing View from Magnolia Avenue near South Promenade Avenue looking southeast (VP 2)

Visual Simulation of Proposed Project (Circle City Substation and Source Line)

Note: Refer to Figure 4.1-2 for photograph viewpoint location.

Figure 4.1-5:
Existing View and Visual Simulation from Magnolia Avenue near South Promenade Avenue
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from Grand Boulevard near East Third Street looking southeast (VP 11)

Visual Simulation of Proposed Project (Source Line Route)

Note: Refer to Figure 4.1-2 for photograph viewpoint location.

Figure 4.1-6:
Existing View and Visual Simulation from Grand Boulevard
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from Interstate 15 looking south (VP 14)

Visual Simulation of Proposed Project (Source Line Route)

Note: Refer to Figure 4.1-2 for photograph viewpoint location.

Figure 4.1-7:
Existing View and Visual Simulation from Interstate 15
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from East 6th Street near Magnolia Avenue looking west (VP 15)

Visual Simulation of Proposed Project (Source Line Route)

Note: Refer to Figure 4.1-2 for photograph viewpoint location.

Figure 4.1-8:
Existing View and Visual Simulation from East 6th Street near Magnolia Avenue
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from Magnolia Avenue near Sherborn Street looking southwest (VP 19)

Visual Simulation of Proposed Project (Source Line Route)

Note: Refer to Figure 4.1-2 for photograph viewpoint location.

Figure 4.1-9:
Existing View and Visual Simulation from Magnolia Avenue near Sherborn Street
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from River Road Park looking northwest (VP 26)

Visual Simulation of Proposed Project (Subtransmission Line)

Note: Refer to Figure 4.1-3 for photograph viewpoint location.

Figure 4.1-10:
Existing View and Visual Simulation from River Road Park
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from Hellman Avenue at Landerwood Drive looking north (VP 32)

Visual Simulation of Proposed Project (Subtransmission Line)

Note: Refer to Figure 4.1-3 for photograph viewpoint location.

Figure 4.1-11:
Existing View and Visual Simulation from Hellman Avenue at Landerwood
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Existing View from James C. Huber Park looking northeast (VP 35)

Visual Simulation of Proposed Project (Subtransmission Line)

Note: Refer to Figure 4.1-3 for photograph viewpoint location.

Figure 4.1-12:
Existing View and Visual Simulation from Huber Park
Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

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Photograph 17 in Figure 4.1-4: Representative Photographs provides a view from Magnolia Avenue near Rimpau Avenue—the interconnection point for the Source Line Route to the existing subtransmission system—that includes a variety of street trees, utility structures, and other vertical elements. Photograph 18 in Figure 4.1-4: Representative Photographs depicts a location near where the Source Line Route would cross the I-15 freeway through a utility bridge cell located within the Magnolia Avenue Bridge. The Source Line Route would cross this eligible state scenic route underground. Photographs 19 and 20 in Figure 4.1-4: Representative Photographs, which were taken from Magnolia Avenue near Sherborn Street, show the location where the Source Line Route would be installed aboveground. Views along this portion of Magnolia Avenue include vertical elements, such as street trees, overhead light fixtures, and traffic signals. Farther east on Magnolia Avenue, utility poles line the road, as depicted in Photograph 20 in Figure 4.1-4: Representative Photographs.

Mira Loma-Jefferson 66 kV Subtransmission Line (Photographs 21 through 38)

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would begin at a connection point just north of the existing Corona Substation, and would extend north to Mira Loma Substation in the southern portion of the City of Ontario. The landscape character along this approximately 10.9-mile line ranges from established and more recently developed suburban residential areas to open pasture, agricultural cropland, and commercial/industrial development. The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would also cross the Santa Ana River and pass near public parks and open space.

The existing Corona Substation is primarily surrounded by industrial development on relatively large parcels; however, single-family residences are also found along the south side of Railroad Street, as shown in Photographs 21 and 22 in Figure 4.1-4: Representative Photographs. From some nearby locations, portions of the Corona Substation can be seen above the concrete perimeter wall. Residential landscaping, streetlights, and steel and wood utility poles can be seen from locations throughout this neighborhood.

As depicted in Photograph 23 in Figure 4.1-4: Representative Photographs, the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route would travel north underground along North Cota Street through an industrial/office park area to River Road. For approximately 2.25 miles, the route would follow River Road, a major four-lane boulevard, aboveground. Photograph 24 in Figure 4.1-4: Representative Photographs shows a portion of River Road with a mixture of street trees along the roadside and within the median. In this area, wood utility poles, overhead lines, and streetlights appear along the street, and landscaped multi-family homes with paved off-street parking face River Road. Photographs 25 and 26 in Figure 4.1-4: Representative Photographs depict the visual character in the residential area along the western portion of River Road, which includes single-family houses, landscaping, and pre-cast concrete or stucco perimeter walls. Photograph 26 shows the wood poles that are located on some residential properties. Open views toward the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route are available from River Road Park, a neighborhood park with lawns, scattered trees, a play structure, and a community center building. Auburndale Intermediate School, which is shown in Photograph 27 in Figure 4.1-4: Representative Photographs, also has open views toward the proposed Mira Loma-Jefferson 66 kV Subtransmission Line. Views from Fairview Park, located to the south, are partially screened by trees and houses. Farther west along the border between the cities of

Corona and Norco, known as “Horsetown USA,” large lots with horse facilities are common and the pattern of single-family residential development is interspersed with larger lots and pastures.

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would cross the Santa Ana River at the southern border of the City of Eastvale. Photograph 28 in Figure 4.1-4: Representative Photographs, taken from River Road where the Proposed Project would cross the river, shows an existing subtransmission line supported on H-frame structures and light-weight steel (LWS) poles along River Road with ornamental light poles on both sides of the bridge. Taken from Baron Drive near River Road, Photograph 29 in Figure 4.1-4: Representative Photographs shows dense vegetation seen along the river corridor and Prado Basin Park—a public open space area with recreation trails, one of which follows the Santa Ana River. In views from roadways and open space areas located near the Santa Ana River, the surrounding mountains appear in the background. West of the river, the Proposed Project passes Cross Roads Riverview Park, a public open space.

The Proposed Project route would then extend north for approximately 5 miles along the western edge of suburban residential areas in the City of Eastvale, and travel north along Hellman Avenue through a mixture of open, agricultural areas and recently developed, single-family residential neighborhoods, as shown in Photograph 30 in Figure 4.1-4: Representative Photographs. In this area, residential development borders the Proposed Project alignment, while open, agricultural fields and dairies are found on the opposite side. Noticeable vertical elements seen in the landscape include utility poles, transmission towers, and streetlights, as seen in Photographs 31 and 32 in Figure 4.1-4: Representative Photographs. Residential developments in the area characteristically include approximately 8- to 10-foot-high, pre-cast perimeter walls along the adjacent arterial streets. The Proposed Project would pass within approximately 600 feet of a recently built residential development in the City of Chino, as shown in Photograph 32 in Figure 4.1-4: Representative Photographs.

Near Prairie Smoke Road, the proposed Mira Loma-Jefferson 66 kV Subtransmission Line would turn northeast at American Heroes Park and follow an existing Southern California Edison (SCE) utility easement, which is approximately 500 feet wide and contains overhead lines and steel-lattice towers, as depicted in Photograph 33 in Figure 4.1-4: Representative Photographs. Utility poles, overhead lines, and overhead streetlights are characteristic landscape elements in this vicinity. As depicted in Photograph 34 in Figure 4.1-4: Representative Photographs, views from this residential area include open pastures with overhead transmission lines, steel-lattice towers, and poles, with mountains seen in the background. Photograph 35 in Figure 4.1-4: Representative Photographs shows the paved James C. Huber Park skateboard area with landscaped open space and overhead transmission lines and structures within the park setting while mountains appear in the background.

At Bellgrave Avenue near Harrison Avenue, the Proposed Project would travel for approximately 2 miles northeast through a rural area within the City of Ontario, to its terminus at the existing Mira Loma Substation. The general landscape is characterized by dairies, with various barn structures, rural residences, and pastures. Photograph 36 in Figure 4.1-4: Representative Photographs shows the existing Mira Loma-Corona-Jefferson 66 kV Subtransmission Line and two existing 220 kV transmission lines crossing one of these dairies. Nearby residential development is located across Harrison Avenue, at the northern border of the

City of Eastvale. Limited vegetation provides intermittent screening in this area, and open vistas are typical across the landscape with the San Gabriel and Santa Ana mountains in the background, as shown in Photograph 37 in Figure 4.1-4: Representative Photographs. The representative photographs from this area illustrate that the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route would be located within an existing utility corridor, with overhead transmission lines, steel poles, and steel-lattice towers. Additional vertical elements in this landscape include wood distribution poles.

Mira Loma Substation lies between a rural area dominated by dairies and an industrial area characterized by low-rise building complexes with landscaped parking and loading areas. Open views are available toward the substation from a multi-family residential area located to the north, as shown in Photograph 38 in Figure 4.1-4: Representative Photographs, as well as from scattered rural residences. Colony High School, located approximately 0.2 mile northwest of the substation, also has relatively unobstructed views of the facility.

4.1.2 Regulatory Setting

Federal, state, and local regulations were reviewed for applicability to the Proposed Project.

4.1.2.1 Federal

Code of Federal Regulations Title 14

All airports and navigable airspace not administered by the United States (U.S.) Department of Defense are under the jurisdiction of the Federal Aviation Administration (FAA). Title 14, Part 77 of the Code of Federal Regulations (CFR) establishes the standards and required notification for obstructions affecting navigable airspace. In general, construction projects exceeding 200 feet in height—or those extending at a ratio greater than 100 to 1 (horizontal to vertical) from a public or military airport runway more than 3,200 feet long out to a horizontal distance of 20,000 feet—are considered potential obstructions and require FAA notification. In addition, construction projects extending at a ratio greater than 50 to 1 (horizontal to vertical) from a public or military airport runway measuring 3,200 feet or less out to a horizontal distance of 10,000 feet are considered potential obstructions and require FAA notification. Title 14, Part 133 of the CFR also requires an operating plan to be developed in coordination with and approved by the local FAA Flight Standards District Office that has jurisdiction over the area where the helicopter use would be conducted.

No FAA policies concerning light and glare are relevant to the Proposed Project.

4.1.2.2 State

California Department of Transportation Scenic Highway Program

California's Scenic Highway Program was created by the state Legislature in 1963 with the purpose to preserve and protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to highways. The State Scenic Highway System includes highways that are either eligible for designation as scenic highways, or have been designated as such. The status of a state scenic highway changes from eligible to officially designated when the local jurisdiction adopts a scenic corridor protection program, applies to the California

Department of Transportation (Caltrans) for scenic highway approval, and receives the designation. A city or county may propose adding routes with outstanding scenic elements to the list of eligible highways; however, state legislation is required for them to become designated.

4.1.2.3 Local

The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the Proposed Project. Pursuant to CPUC General Order 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the county and cities' regulations are not applicable as the county and cities do not have jurisdiction over the Proposed Project. Accordingly, a discussion of local land use regulations is provided in the following subsections and in Attachment 4.1-A: Policies Consistency Analysis for informational purposes only. The general plan documents for Riverside County, including the Eastvale Area Plan, and for the cities of Chino, Corona, Eastvale, Norco, and Ontario were reviewed for relevance to the Proposed Project.

Riverside County

Riverside County General Plan

The Land Use Element of the Riverside County General Plan contains the following policy regarding the visibility of utility lines:

- Policy LU 13.5: Require new or relocated electric or communication distribution lines, which would be visible from Designated and Eligible State and County Scenic Highways, to be placed underground.

Eastvale Area Plan

The Policy Areas section of the Eastvale Area Plan contains the following policy regarding the visibility utility lines within the Santa Ana River Corridor:

- Policy EAP 1.13: Discourage utility lines within the river corridor. If approved, lines shall be placed underground where feasible and shall be located in a manner to harmonize with the natural environment and amenity of the river.

City of Chino

City of Chino General Plan

The Land Use Element of the City of Chino General Plan contains the following policy to improve connections within and between neighborhoods:

- Policy P8: New and existing site features, such as parks, utility easements, and drainage ways, should be improved and used as physical connections within and between neighborhoods

City of Corona

City of Corona General Plan

The Circulation Element of the City of Corona General Plan contains the following policy regarding undergrounding utility lines:

- Policy 6.1.14: Ensure that, to the extent possible, all pipelines and electrical transmission lines are placed underground.

The Infrastructure and Utilities Element of the City of Corona General Plan contains the following policy regarding undergrounding utility lines:

- Policy 7.12.3: Continue to provide for the undergrounding of new and existing electrical distribution lines unless it is determined not to be economically or practically feasible as a result of significant environmental or other constraints.

The Environmental Resources Element of the City of Corona General Plan contains the following policy to preserve view corridors or viewsheds of significant features:

- Policy 10.22.1: Create unobstructed view corridors or viewsheds of the San Bernardino, Santa Ana, and San Gabriel Mountains, the Chino and La Sierra Hills, and other significant natural features from public spaces such as parks, termination of streets and community trails, community centers, and school properties, where feasible, as part of the design of development projects.

City of Eastvale

City of Eastvale General Plan

The Circulation and Infrastructure Element of the City of Eastvale General Plan contains the following policy regarding undergrounding utility lines:

- Policy C-29: Locate new and relocated utilities underground when possible. All remaining utilities shall be located or screened in a manner that minimizes their visibility by the public.

City of Ontario

City of Ontario General Plan

The Image and Identity Element of the City of Ontario General Plan contains the following policy to enhance the city's visual identity:

- Policy CD1-5 View Corridors: We require all major north-south streets be designed and redeveloped to feature views of the San Gabriel Mountains, which are part of the City's visual identity and a key to geographic orientation. Such views should be free of visual clutter, including billboards and may be enhanced by framing with trees.

4.1.3 Significance Criteria

The significance criteria for assessing the impacts to aesthetics come from the California Environmental Quality Act (CEQA) Environmental Checklist. According to the CEQA Checklist, a project causes a potentially significant impact if it would:

- Have a substantial adverse effect on a scenic vista
- Substantially damage scenic resources including, but not limited to: trees, rock outcroppings, and historic buildings within a state scenic highway
- Substantially degrade the existing visual character or quality of the site and its surroundings
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area

4.1.4 Impact Analysis

4.1.4.1 Would the project have a substantial adverse effect on a scenic vista? – No Impact

In general, existing views of the surrounding mountains, as seen from locations throughout the area, are considered scenic. For the purposes of this evaluation, a scenic vista is defined as a distant public view along or through an opening or corridor that is recognized and valued for its scenic quality. As described in further detail in the following sections, the Proposed Project would not interfere with existing views of surrounding hills and mountain ranges, and no specific scenic vistas have been identified within the Proposed Project area. Therefore, the Proposed Project would not result in a substantial adverse effect on a scenic vista, and there would be no impact.

4.1.4.2 Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? – Less-than-Significant Impact

The Proposed Project would not be visible from a Designated State Scenic Highway. The closest designated roadway is a portion of SR-91 in Orange County, located approximately 8 miles to the west.

The Proposed Project would be located near two Eligible State Scenic Highways—I-15 and SR-91. It crosses I-15 twice and SR-91 once, but because the Proposed Project would be installed underground at the SR-91 crossing and at one of the I-15 crossings, it would not substantially affect highway views at these locations. With respect to the other I-15 crossing, as well as general potential effects along the two highway corridors, the Proposed Project-related change would be incremental given the brief duration of affected views and the presence of existing utility structures and other vertical elements, such as light and sign poles along these roadway corridors (as depicted in Figure 4.1-7: Existing View and Visual Simulation from Interstate 15). Therefore, the Proposed Project would not have a substantial visual effect on views of the two highway corridors. The Proposed Project would also cross two scenic roadways in the City of Corona—Grand Boulevard and Magnolia Avenue. The route would be installed underground at Grand Boulevard, and Proposed Project poles would be briefly visible from only a limited portion of Grand Boulevard, where overhead utility lines are already present; therefore, it would not substantially affect the existing visual character or quality of the roadway. Similarly, the existing visual character or quality of Magnolia Avenue would not be substantially affected because about half of the route would be underground and because there are no sensitive receptors located along the aboveground portion. Because any changes would be only minor and incremental, and because none of these roadways are designated as state scenic highways, impacts to state scenic highways would be less than significant.

4.1.4.3 Would the project substantially degrade the existing visual character or quality of the site and its surroundings?

Construction – Less-than-Significant Impact

Construction-related visual impacts would result from the presence of equipment, materials, and work crews in the immediate vicinity of the Proposed Project. Construction activities would take place over an approximately 18-month period. Because the Proposed Project would be constructed in a linear fashion, construction crews would move along the alignment, staying at one pole work area for 1 to 2 days at a time, then revisiting the same area later in the construction process. To varying degrees, construction activity would be seen by motorists, local residents, and recreational users. It is expected that construction would be most noticeable from residential areas located in close proximity to the Proposed Project.

Implementation of Proposed Project construction is not anticipated to require the removal of any trees, and effects on existing vegetation would be limited. Therefore, potential visual effects associated with vegetation removal would be minor and not particularly noticeable to the public. Proposed Project construction would require establishing temporary staging yards for vehicle and equipment parking, as well as material storage. Staging yard preparation would include temporary perimeter fencing. These visual effects would be temporary because SCE would restore any land that may be disturbed at the staging yards to near pre-construction conditions, or to the conditions agreed upon between the landowner and SCE following the completion of Proposed Project construction. Therefore, due to its temporary nature, the construction of the Proposed Project would not substantially degrade the existing visual character or quality of the area and the impact would be less than significant.

Operation – Less-than-Significant Impact

As previously described, construction of the Proposed Project would result in a new low-profile substation on a disturbed site located in an industrial area, as well as a new Source Line Route that would tie into the new Circle City Substation. Construction would also result in a new approximately 10.9-mile Mira Loma-Jefferson 66 kV Subtransmission Line, which would be located primarily within an existing utility easement or street right-of-way (ROW) with existing overhead lines, and which would connect two existing substations. Portions of each new line would be installed underground in visually sensitive areas, and steel riser poles would be located at the end of each underground section. For the most part, the new lines would be supported by new LWS poles that would be approximately 60 to 85 feet tall. Tubular steel poles (TSPs) located at corners or angles may be up to 105 feet tall. As part of the Proposed Project, a number of existing distribution poles would also be removed.

The Proposed Project's appearance is portrayed in a set of before-and-after views, as seen from key public viewpoints within the area. The visual analysis is based on a review of technical data, including Proposed Project maps and drawings provided by SCE, aerial and ground level photographs of the Proposed Project area, local planning documents, and computer-generated visual simulations. Field observations were conducted in February 2012 to document existing visual conditions in the Proposed Project area and to identify potentially affected sensitive viewing locations.

This visual assessment employs methods based partly on those developed by the U.S. Department of Transportation Federal Highway Administration, and other accepted visual analysis techniques as summarized by Smardon, et al. The analysis describes change to existing visual resources and assesses viewers' response to that change. Central to this assessment is an evaluation of representative views from which the Proposed Project would be visible to the public. To document the visual changes that would occur, visual simulations show the Proposed Project from key observation points (KOPs). These changes were assessed, in part, by evaluating the computer-generated visual simulations and comparing them to the existing visual environment.

The simulation images portray the location, scale, and appearance of the Proposed Project as seen from publicly accessible KOPs within the Proposed Project area. The KOP locations were selected to represent views seen by the largest number of viewers, primarily within residential or public recreation areas and along scenic routes or other public roadways. The set of simulations illustrates the representative visual change associated with the Proposed Project.

Technical methods employed for producing the computer-generated simulation images include high-resolution digital site photography using a single-lens reflex camera with a 50-millimeter lens or equivalent that represents a horizontal-view angle of 40 degrees. The systematic documentation of photographic viewpoints employed Global Positioning System (GPS) recording and photograph log sheet and basemap annotation. Three-dimensional (3-D) computer modeling for proposed structures, which was developed using engineering design data supplied by SCE, was combined with geographic information system and engineering data, as well as digital aerial photographs of the existing site, to produce digital modeling for visual analysis and simulation. Simulation viewpoint locations were incorporated based on GPS field data, using 5 feet as the assumed eye level.

To verify scale and viewpoint locations, computer "wireframe" perspective plots were overlaid on the KOP photographs. Digital visual simulation images were then produced based on computer renderings of the 3-D modeling combined with selected photographs. The final "hard-copy" visual simulation images contained in this visual analysis were printed from the digital image files and produced in color on 11-inch by 17-inch sheets. As shown in Figure 4.1-5: Existing View and Visual Simulation from Magnolia Avenue near South Promenade Avenue through Figure 4.1-9: Existing View and Visual Simulation from Magnolia Avenue near Sherborn Street, the simulation figures present two images per sheet—an existing view with a simulation below that portrays the Proposed Project from the corresponding KOP.

Table 4.1-2: Summary of Visual Effects at Key Observation Points presents an overview of the visual simulations, including the view location, the Proposed Project component portrayed, Proposed Project-related change, and visual effects that were prepared for the Proposed Project.

Table 4.1-2: Summary of Visual Effects at Key Observation Points

Location	VP Number/Figure	Proposed Project Component	Proposed Project-Related Change and Visual Effect
Magnolia Avenue near South Promenade Avenue (Corona)	VP 2/Figure 4.1-5	Circle City Substation Source Line Route	• Introduction of new substation facility, surrounded by a tan-colored block wall, on a disturbed site in an industrial area; substation would be set back from a public street and seen against a graded quarry and hillside backdrop. • Introduction of new TSPs and overhead conductors. • Proposed Project would not substantially alter the character of this industrial setting.
Grand Boulevard near East 3rd Street (Corona)	VP 11/Figure 4.1-6	Source Line Route	• Replacement of a wood pole with a taller steel pole. • Introduction of a new riser pole and overhead conductors. • Proposed Project would not substantially alter the character of the existing visual setting.
I-15 (Corona)	VP 14/Figure 4.1-7	Source Line Route	• Introduction of new steel poles and overhead conductors crossing the freeway. • Visual change is noticeable; however, seen only briefly and in the context of existing overhead structures.
East 6th Street near Magnolia Avenue (Corona)	VP 15/Figure 4.1-8	Source Line Route	• Introduction of new steel poles and overhead conductors, along an arterial road in an industrial/office park neighborhood. • Visual change is noticeable at this location; given the lack of sensitive receptors, it would not substantially alter the existing character of the urban landscape setting.

Location	VP Number/Figure	Proposed Project Component	Proposed Project-Related Change and Visual Effect
Magnolia Avenue near Sherborn Street (Corona)	VP 19/Figure 4.1-9	Source Line Route Alternative 2	• Introduction of new steel poles, including a riser pole and overhead conductors; would be along an arterial road in an industrial/office park setting. • Visual change is noticeable; it would primarily be seen briefly by motorists traveling along this limited section of road in an industrial/commercial area.
River Road Park (Corona)	VP 26/Figure 4.1-10	Mira Loma-Jefferson 66 kV Subtransmission Line	• Slightly taller steel poles replace existing wood poles along an arterial road in a residential neighborhood. Existing poles are located along the road and on residential property. • Lighter-colored steel replacement poles would be less visible against the sky and would create a somewhat more unified streetscape; it would be a relatively minor visual change.
Hellman Avenue at Landerwood Drive (Chino)	VP 32/Figure 4.1-11	Mira Loma-Jefferson 66 kV Subtransmission Line	• Introduction of new TSPs and overhead conductors along an arterial road adjacent to a residential neighborhood. Setting includes existing TSPs and overhead conductors along the road and two lattice tower-supported transmission lines crossing the road. • Given the presence of numerous existing transmission structures, the Proposed Project would be an incremental visual change in the existing landscape character.
James C. Huber Park (Eastvale)	VP 35/Figure 4.1-12	Mira Loma-Jefferson 66 kV Subtransmission Line	• Conversion of a single-circuit line supported on steel poles to double circuit within an existing transmission corridor. • The Proposed Project represents a minor, almost unnoticeable visual change.

Note: See Figure 4.1-2: Photograph Viewpoint Locations Map (Source Line Route) and Figure 4.1-3: Photograph Viewpoint Locations Map (Subtransmission Line) for viewpoint locations.

As documented in Section 4.1.1.4 Visual Character and Representative Views of the Proposed Project Area, the Proposed Project—including the new substation, the Source Line Route, and the proposed Mira Loma-Jefferson 66 kV Subtransmission Line—is generally located within viewsheds where numerous existing utility structures and other vertical elements, such as streetlights and traffic signals, are established features in the landscape setting. A comparison between the existing views from the KOPs and the corresponding simulation images demonstrates that the Proposed Project would not substantially change the existing landscape character found within these viewsheds.

The Proposed Project would also include the installation of a new fiber-optic cable line that would be installed on the new steel poles along the Source Line Route. Because the introduction of this fiber-optic line would generally appear as part of the overall Source Line Route, it would not be particularly noticeable to the public, and therefore, would have a negligible effect on public views. In addition, minor modifications would occur at the existing Mira Loma Substation. These modifications would take place entirely within the existing substation fence line and would include elements that appear similar in scale and visual character to existing substation features. Therefore, the visual effects associated with these elements of the Proposed Project would be minor, incremental visual effects that would not substantially alter the visual setting.

The following subsections provide a detailed discussion and evaluation of the Proposed Project's potential visual effects on KOPs, as depicted in the visual simulations that are summarized in Table 4.1-2: Summary of Visual Effects at Key Observation Points.

Circle City Substation

The new substation would be built on a relatively flat, disturbed site in an industrial area of the City of Corona. Substation structures and equipment would occupy approximately 4 acres within the approximately 19.5-acre site. The facility would be enclosed on all sides by an 8-foot-tall, tan-colored block wall, and the enclosed substation surface would be covered with crushed rock. A new, paved access driveway would connect to Leeson Lane, and landscaping and irrigation would be established around the perimeter of the substation as needed. As documented in Section 4.1.1.4 Visual Character and Representative Views of the Proposed Project Area, the proposed substation site generally has limited public visibility.

Figure 4.1-5: Existing View and Visual Simulation from Magnolia Avenue near South Promenade Avenue represents a relatively close-range view looking across a commercial parking lot toward the proposed Circle City Substation site. The figure provides a motorist's view and approximates that of workers in the area. The view is framed by two single-story commercial buildings located off of Magnolia Avenue. Leeson Lane is visible just beyond the parking lot.

Figure 4.1-5: Existing View and Visual Simulation from Magnolia Avenue near South Promenade Avenue represents a relatively close-range view looking across a commercial parking lot toward the proposed Circle City Substation site. The figure provides a motorist's view and approximates that of workers in the area. The view is framed by two single-story commercial buildings located off of Magnolia Avenue. Leeson Lane appears just beyond the parking lot.

The substation site appears as part of the open, grassy field, set back from Leeson Lane, near the center of the photograph. A warehouse structure that lies partially on the site can be seen on the right side. Trees and red flowering shrubs frame the site on the left, partially screening other industrial buildings and more distant quarry structures. Graded quarry slopes and hillsides appear in the backdrop. Wood poles and overhead conductors are also visible in the foreground.

The simulation view portrays the new Circle City Substation facility, including the new access road, which connects to Leeson Lane. The substation structures, surrounded by a tan-colored wall, appear against a backdrop of hillside landform. The substation facility does not appear prominent in this unobstructed view; instead, it blends in with the surrounding landscape due to relatively weak visual contrast between the substation structures and landscape backdrop. Along the substation access road, the simulation shows new TSPs with overhead conductor connecting to Circle City Substation. As shown in the simulation, the new poles would be relatively similar in scale and appearance compared to the existing structures currently seen on adjacent properties. As seen from this location, the new poles may appear somewhat prominent; however, this effect would be less noticeable when seen within the overall context of the existing industrial, mixed-use visual setting. This comparison of the existing view and visual simulation demonstrates that the Proposed Project would not substantially degrade the existing character of this industrial landscape setting. Therefore, potential visual impacts would be less than significant.

Source Line Route

The Source Line Route would measure approximately 4.7 miles in length, and would extend southeast from Corona Substation to the new Circle City Substation, then exit the substation and continue along Magnolia Avenue to Rimpau Avenue, crossing through a mixture of urbanized land that ranges from industrial and commercial to residential and open yard storage uses. The Source Line Route would be installed underground where it crosses North Main Street and parallels East Grand Boulevard, and along Magnolia Street between Compton Avenue and Rimpau Avenue. The Source Line Route would introduce new poles and overhead conductor that would be seen primarily by motorists traveling along public roadways.

Figure 4.1-6: Existing View and Visual Simulation from Grand Boulevard portrays the Proposed Project-related visual change from Grand Boulevard at East 3rd Street in an industrial/commercial area located near a residential portion of the City of Corona. The photograph represents the view of motorists traveling along Grand Boulevard—a City of Corona scenic roadway—and the view from a limited number of nearby residences. This view includes auto repair businesses and an RV storage lot along the east side of the street. Mature street trees partially screen structures including traffic signals, lights, signage, and utility poles, as well as overhead conductors crossing Grand Boulevard.

The simulation portrays the Source Line Route where it transitions from an underground to an overhead configuration near the corner of East 3rd Street and Grand Boulevard. The simulation shows a new riser pole at this location. To the left, a steel pole replaces a smaller wood pole along East 3rd Street. An additional set of overhead conductors is also visible as the line travels to the east. The visual change at this location would be noticeable and would be seen briefly by motorists traveling along this section of roadway. In addition, the change could be noticeable from a limited number of nearby residences. However, from most locations along Grand

Boulevard, the Proposed Project would not be visible because the line would be underground along the roadway. Given the presence of existing utility and other vertical structures in this industrial area, the visual change described previously and portrayed in the before-and-after images in Figure 4.1-6: Existing View and Visual Simulation from Grand Boulevard would be an incremental effect that would not substantially alter the character or composition of the visual setting.

Figure 4.1-7: Existing View and Visual Simulation from Interstate 15 shows a view from this Eligible State Scenic Highway corridor as it passes through an industrial area in the City of Corona. At this location, the roadway is elevated above the adjacent development and local streets. On this eight-lane freeway, lighting and overhead signage dominate the motorist’s foreground view, and trees and buildings in the City of Corona are visible along both sides of the freeway. The Santa Ana Mountains, located approximately 5 miles south, provide a vivid backdrop.

The simulation shows new TSPs on either side of the freeway with overhead conductors crossing the roadway and an additional new steel pole visible near the right edge of the view. The visual change is noticeable from this roadway location; however, it would be seen briefly by motorists traveling along a limited section of highway. In addition, the Proposed Project, although visible, does not obstruct existing views toward the mountains in the backdrop. Due to the brief duration of affected views and given the presence of existing vertical elements, such as light and sign poles, the Proposed Project-related change would be incremental and would not substantially affect the landscape character seen along the roadway corridor.

Figure 4.1-8: Existing View and Visual Simulation from East 6th Street Near Magnolia Avenue portrays an existing view and visual simulation of the Proposed Project as seen from East 6th Street near Magnolia Avenue. The photograph represents a motorist’s brief view traveling westbound along East 6th Street—a major arterial that includes recently installed median landscaping comprised of ground cover and a mixture of street trees. In this area, the streetscape also includes landscaped industrial development that can be seen at the right edge of the view. Streetlights are also prominent vertical elements seen on the right side of the street. Light-colored, low-rise industrial buildings can be seen on the opposite side of the street, beyond vacant land along the roadside. Located approximately 4 miles away, the Santa Ana Mountains appear clearly in the backdrop.

The simulation portrays the introduction of new steel poles and overhead conductor along East 6th Street. As shown in the simulation, the upper portions of the new poles would be visible against the sky, whereas lower portions would be seen against mountains in the backdrop. Street trees in the foreground provide a measure of screening, and as they mature, these trees would provide additional screening. A comparison of the existing view and simulation image provided in Figure 4.1-8: Existing View and Visual Simulation from East 6th Street Near Magnolia Avenue indicates that the Proposed Project would represent a noticeable change to the streetscape visual setting. However, the new poles do not substantially affect views of the distant mountains seen in the backdrop. Although the new poles would be taller than the streetlights, their form and color would make them appear similar to the streetlights seen on the opposite side of East 6th Street. In addition, the new poles would be less noticeable with the increased screening that would occur when the street trees mature. In this respect, the degree of visual change associated with the Proposed Project would be evident; however, it would not substantially alter the existing character of the landscape setting at this location. At other locations along the Source Line Route, the Proposed Project would be seen within a visual context that includes numerous mature street trees, as well as utility structures, light standards, and overhead traffic signals. For example, Photograph 11 in Figure 4.1-4: Representative Photographs, a view from Grand Boulevard near East 3rd Street, shows utility poles, overhead conductors, light standards, and traffic signals—some of which are partially screened by mature street trees. Given the presence of existing utility structures, the visual change would be incremental and would not substantially affect the area's aesthetic character.

Figure 4.1-9: Existing View and Visual Simulation from Magnolia Avenue near Sherborn Street is representative of a westbound motorist's view along Magnolia Avenue near Sherborn Street, where low-rise, landscaped commercial development appears on the left side of the roadway.

Various signs seen along the street include a yellow railroad crossing marker and billboard in the foreground, as well as green I-15 freeway signs in the median. The Santa Ana Mountains form a vivid backdrop in the view. Vertical elements include overhead streetlight structures, and at the next intersection, overhead traffic signals. A mixture of landscaped office park uses, industrial buildings, and outdoor equipment storage yards, are also found nearby; however, no residences are located in the immediate vicinity. Along this portion of Magnolia Avenue, utilities are undergrounded; however, wood utility poles are present further east.

The simulation view shown in Figure 4.1-9: Existing View and Visual Simulation from Magnolia Avenue near Sherborn Street portrays the Source Line Route where it would transition from an underground to an overhead configuration. Seen along the roadside in the foreground, a new riser pole appears prominently with another steel support pole. Although not prominent, the new overhead conductors are also visible against the sky. The new structures do not substantially interfere with views of the distant Santa Ana Mountains; however, the Proposed Project represents a noticeable visual change that would be seen primarily by motorists traveling along this limited segment of Magnolia Avenue. Given the brief duration of motorists' views and the absence of sensitive visual receptors, the overall effect would be less than significant.

Mira Loma-Jefferson 66 kV Subtransmission Line

The approximately 10.9-mile proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be installed underground for approximately 0.6 mile. For approximately 10.3 miles, it would generally follow an existing SCE easement or street ROW that includes wood and steel power poles and steel-lattice transmission towers, as well as overhead conductors. In this area, the Proposed Project would generally involve replacing existing structures with new, slightly taller steel poles. As outlined in the following paragraphs, the visual change would be minor and incremental, and potential effects on public views would be less than significant.

The Proposed Project would also cross the Santa Ana River and pass near several public parks and open spaces. At the river crossing, the proposed Mira Loma-Jefferson 66 kV Subtransmission Line changes would primarily involve replacing two existing H-frame structures with two new structures that would be similar in scale and appearance. The location of existing and new structures would be comparable. Photograph 28 in Figure 4.1-4: Representative

Photographs shows the H-frame structures as seen from River Road at the river crossing. Because the Proposed Project-related visual change at this location would be minor and not particularly noticeable to the public, it would be less than significant.

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would follow River Road, a major arterial, for approximately 2.25 miles. Figure 4.1-10: Existing View and Visual Simulation from River Road Park represents motorist and pedestrian views looking northwest toward the Proposed Project along River Road, as well as a view from the park and an approximation of the view from nearby residences. Open park lawns, landscaping, and signage appear in the foreground at this location, and streetlights are seen along both sides of the roadway. In the background, the San Gabriel Mountain peaks are visible beyond the nearby tree canopies. Across River Road, reddish-brown-colored poles with multiple cross arms and overhead conductors can be seen along the street amid residential landscaping. These poles include transmission lines with distribution lines underbuilt below. A light-colored perimeter wall screens the bottom portions of the darker power poles, and median and street trees partially screen poles located farther from this viewpoint.

The simulation view provided in Figure 4.1-10: Existing View and Visual Simulation from River Road Park shows the proposed Mira Loma-Jefferson 66 kV Subtransmission Line with new steel poles that are light gray and somewhat taller than the existing poles. The lighter color and simpler form of the new poles would render them less noticeable against the sky, when compared with the existing reddish-brown colored poles. In addition, because the new poles more closely resemble the color of existing streetlights, the Proposed Project would result in a more unified streetscape. The Proposed Project change seen at this location would be relatively minor an incremental, and it would not substantially affect the quality or character of the landscape seen by motorists, residents, pedestrians, or people using River Road Park.

Figure 4.1-11: Existing View and Visual Simulation from Hellman Avenue at Landerwood Drive provides a before-and-after view from Hellman Avenue at Landerwood Drive that represents a northbound motorist’s view along this major arterial. Numerous utility structures are visible in this area. Residential development in the City of Eastvale includes two-story houses, a perimeter masonry wall, and recently installed landscaping seen along the east (right) side of the street. Also seen on the right side of this view are two lattice towers supporting a line that crosses Hellman Avenue and smaller steel poles that run parallel to the roadway. By contrast, the view also includes an open field along the opposite side of the street and, at the far left, residential development located approximately 0.3 mile away at the eastern border of the City of Chino. Steel poles, overhead conductors, and streetlights appear prominent in the foreground. Utility structures located along the left side of the street recede toward the horizon, and a largely unobstructed view of the distant San Gabriel Mountains forms a vivid landscape backdrop.

The simulation portrays the proposed Mira Loma-Jefferson 66 kV Subtransmission Line as it would parallel Hellman Avenue. The new poles would be similar in scale to the existing poles on the opposite side of the street. The Proposed Project would not substantially interfere with existing views of the distant San Gabriel Mountains. A comparison of the existing view and the visual simulation image indicates that the introduction of new poles and overhead conductors noticeably increases the visual presence of utility structures within this landscape setting. However, given the presence of numerous existing transmission structures and overhead lines, the Proposed Project represents an incremental visual change that would not substantially alter the landscape character seen in this area. As a result, operation of the Proposed Project would not substantially alter or degrade the existing visual character or the quality of the area; therefore, impacts would be less than significant.

Figure 4.1-12: Existing View and Visual Simulation from James C. Huber Park portrays the view from this park located on Rolling Meadows Street at the northern edge of the City of Eastvale's residential area. The park includes a skateboard park, sports fields, tennis courts, play equipment, and picnic areas. A portion of the skateboard park is visible in the foreground, with fenced tennis courts beyond. Lighting standards appear as vertical structures in the park. Lattice towers, steel poles, and overhead conductors in an approximately 500-foot wide transmission corridor appear beyond this, adjacent to the park. Deciduous and evergreen trees, as well as palm trees, are visible throughout the park and provide little screening of transmission structures. Open, agricultural lands, including grazing fields, lie beyond the transmission corridor. Backdropping the view, approximately 12 miles to the north, are the San Gabriel Mountains

The simulation portrays the proposed Mira Loma-Jefferson 66 kV Subtransmission Line as it travels along the northern edge of the City of Eastvale. In this area, the Proposed Project converts a single-circuit line supported on steel poles to a double-circuit line. In this view, a new replacement TSP—slightly taller than the existing steel pole that it replaces—can be seen on the right, and is partially screened by trees and other park elements. Two steel poles for the Proposed Project, now with six insulators instead of three, are visible just beyond the park, and one is toward the left side of the view and one is near the center. Additionally, several reconfigured Proposed Project poles can be seen receding into the distance, near the larger existing lattice towers on the right half of the view. A second set of overhead conductors has been introduced on these Proposed Project poles. Given the presence of numerous transmission structures, some of which are larger than the Proposed Project poles, the Proposed Project represents a minor, almost imperceptible visual change.

4.1.4.4 Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Construction – Less-than-Significant Impact

For the most part, construction of the Proposed Project would occur during daytime hours. However, on occasion, construction activities may be required at night, and would therefore require lighting. Staging yards may also be lit for staging and security. All such lighting would be installed and operated in conformance with applicable local lighting ordinances and regulations. If nighttime lighting would be necessary, it would generally be directed and focused away from off-site locations to the extent feasible. If temporary construction lighting is required, SCE would use shielded construction light fixtures and lighting would be directed away from nearby residences to the extent feasible, as specified in applicant-proposed measure (APM) AES-01. Because this impact is temporary in nature and the affected views would generally be brief in duration, these visual effects would be considered less than significant.

Operation – Less-than-Significant Impact

Lighting at the proposed Circle City Substation site would consist of low-intensity lights located in the switchracks around the transformer banks and in areas within the substation fence line where operation and maintenance activities may occur during evening hours for emergency or scheduled work. Maintenance lights would be controlled by a manual switch and would normally be in the "off" position. This lighting would be similar to nearby industrial facility lighting and operated only on an as-needed basis. Because substation lighting is designed to minimize potential effects outside the facility, and given that there are no sensitive receptors located in the immediate vicinity, these effects would not substantially affect nighttime views in the proposed Circle City Substation vicinity.

Neither the proposed source line segments, nor the proposed Mira Loma-Jefferson 66 kV Subtransmission Line would involve new lighting. In addition, no new lighting is proposed at the existing Mira Loma Substation. Therefore, the Proposed Project would not create a substantial source of new nighttime lighting.

With respect to potential glare effects, the new towers and conductors would weather to a dull, gray finish that would not cause noticeable glare. Given the previously described aspects of Proposed Project lighting design, the Proposed Project would not result in a substantial new source of light or glare that would adversely affect day or nighttime views in the area. As a result, impacts would be less than significant.

4.1.5 Applicant-Proposed Measures

The following APM would be implemented to reduce aesthetic impacts associated with the Proposed Project:

- **APM-AES-01: Construction Lighting.** If temporary construction lighting is required, SCE would use shielded construction light fixtures and lighting would be directed away from nearby residences.

4.1.6 Alternative Substation Site

The Alternative B Substation Site would be located adjacent and southeast of the proposed Circle City Substation site. The parcel is currently vacant and is bordered by All American Way on the west, mixed vacant land and an asphalt production facility to the south, and vacant land to the east. To the north is a Waste Management, Inc. facility, the terminus of Temescal Street, and a mobile home park. In comparison to the proposed Circle City Substation site, the alternative substation site would also be set back from major arterial streets. Therefore, construction of the substation at the alternative site would result in similar visibility and a similar impact on public views.

4.1.7 Alternative Source Line Routes

The portion of Source Line Route Alternative 2 between Corona Substation and the proposed Circle City Substation site would generally follow the proposed Source Line Route, except

Source Line Route Alternative 2 would continue south of East 3rd Street along Grand Boulevard and then continue to travel east on Quarry Street to the Temescal Wash flood control channel where it would meet up with the proposed Source Line Route. Alternative 2 would include approximately 0.9 mile of additional undergrounding compared to the proposed Source Line Route, which would be less visible and, therefore, would have less impact on public views.

The portion of Source Line Route Alternative 3 between Corona Substation and the proposed Circle City Substation site would follow the proposed Source Line Route. Similar to Source Line Route Alternative 2, the portion of Source Line Route Alternative 3 leaving the proposed Circle City Substation site would differ from the proposed Source Line Route by traveling southwest from the proposed Circle City Substation site, crossing Sherborn Street and I-15, and continuing south on Compton Avenue to Old Temescal Road. Source Line Route Alternative 3 would be approximately 0.6 mile longer than the proposed Source Line Route. As a result, Source Line Route Alternative 3 would result in a slightly greater visual impact that the Proposed Project due to the increased length of this alternative.

The portion of Source Line Route Alternative 4 between Corona Substation and the proposed Circle City Substation site would generally follow the proposed Source Line Route, except Source Line Route Alternative 2 would continue south of East 3rd Street along Grand Boulevard and then travel east on Quarry Street to the Temescal Wash flood control channel where it would meet up with the proposed Source Line Route. Alternative 4 would include approximately 1.5 miles of additional undergrounding compared to the proposed Source Line Route, which would be less visible and, therefore, would have less impact on public views.

4.1.8 Alternative Mira Loma-Jefferson 66 kV Subtransmission Line Routes

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2 would follow an identical route to that of the proposed Mira Loma-Jefferson 66 kV Subtransmission Line. However, Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2 would include undergrounding a short section of the line along Hellman Avenue, just north of Schleisman Road, to SCE’s 500-foot-wide easement in the City of Eastvale. Therefore, Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2 would result in a reduced visual impact in this area, and would be slightly beneficial to visual resources for the Proposed Project as a whole.

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3 would follow the proposed Mira Loma-Jefferson 66 kV Subtransmission Line north until it splits off from River Road at a location south of the Santa Ana River. This alternative would pass two public parks and would include an overhead river crossing that would follow an existing distribution line. In addition, the central portion of this alternative would pass a greater number of residences. Therefore, Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3 would result in a greater visual impact than the proposed Mira Loma-Jefferson 66 kV Subtransmission Line.

4.1.9 References

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ATTACHMENT 4.1-A: POLICIES CONSISTENCY ANALYSIS

ATTACHMENT 4.1-A: POLICIES CONSISTENCY ANALYSIS

City/ County/ Agency	Component	Document	Policy	Analysis
Riverside County	Mira Loma-Jefferson 66 kilovolt (kV) Subtransmission Line	Riverside County General Plan	LU 13.5: Require new or relocated electric or communication distribution lines, which would be visible from Designated and Eligible State and County Scenic Highways, to be placed underground.	State Route (SR-) 91 and Interstate (I-) 15 are considered Eligible State Scenic Highways, as described in Section 4.1.2 Regulatory Setting. The Proposed Project would cross SR-91 once and I-15 twice. The Proposed Project would be undergrounded at the SR-91 crossing because the proposed widening of SR-91 at this location would be too wide to cross overhead. It would also be installed underground at one of the I-15 crossings, as the crossing is too wide and because the new Magnolia Avenue bridge contains a utility bridge cell at this location. Undergrounding at the second I-15 crossing is not proposed because overhead lines are easier to maintain and/or repair, whereas underground subtransmission lines are encased in concrete, making it more difficult to locate and repair any problems.
		Eastvale Area Plan	EAP 1.13: Discourage utility lines within the river corridor. If approved, lines shall be placed underground where feasible and shall be located in a manner to harmonize with the natural environment and amenity of the river.	The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would cross the Santa Ana River corridor in an overhead configuration. However, the Proposed Project would follow the existing Mira Loma-Corona-Jefferson Subtransmission Line and would remove and replace the existing structures to support the new Mira Loma-Jefferson 66 kV Subtransmission Line in this area. As a result, the aesthetic impact would not noticeably differ from the existing setting. In addition, the lines would be constructed overhead for the reasons described in the analysis of Policy LU 13.5.

City/ County/ Agency	Component	Document	Policy	Analysis
City of Chino	Mira Loma-Jefferson 66 kV Subtransmission Line	City of Chino General Plan	Policy P8: New and existing site features, such as parks, utility easements, and drainage ways, should be improved and used as physical connections within and between neighborhoods. (p. CC- 17-18)	The Proposed Project would be constructed within an existing SCE utility easement and would not preclude connections between neighborhoods.
City of Corona	Circle City Substation Mira Loma-Jefferson 66 kV Subtransmission Line Source Line Route	City of Corona General Plan	6.1.14: Ensure that, to the extent possible, all pipelines and electrical transmission lines are placed underground.	The Proposed Project would include undergrounding lines in visually sensitive areas, including where the Proposed Project would pass city scenic routes. Undergrounding the entire route would be cost-prohibitive. In addition, the lines would be constructed overhead for the reasons previously described in the analysis of Policy LU 13.5.
			7.12.3: Continue to provide for the undergrounding of new and existing electrical distribution lines unless it is determined not to be economically or practically feasible as a result of significant environmental or other constraints.	The Proposed Project would include undergrounding lines in visually sensitive areas, including where the Proposed Project would pass city scenic routes. Undergrounding the entire route would be cost-prohibitive. In addition, the lines would be constructed overhead for the reasons previously described in the analysis of Policy LU 13.5.
			10.22.1: Create unobstructed view corridors or viewsheds of the San Bernardino, Santa Ana, and San Gabriel Mountains, the Chino and La Sierra Hills, and other significant natural features from public spaces such as parks, termination of streets and community trails, community centers, and school properties, where feasible, as part of the design of development projects. (Imp 2, 3, 4, 5, 9, 10, 17, 18, 20) (p. 218)	The Proposed Project would not substantially affect or interfere with views of the surrounding mountains and hills.

City/ County/ Agency	Component	Document	Policy	Analysis
City of Eastvale	Mira Loma-Jefferson 66 kV Subtransmission Line	City of Eastvale General Plan	Policy C-29: Locate new and relocated utilities underground when possible. All remaining utilities shall be located or screened in a manner that minimizes their visibility by the public.	The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be installed in an overhead configuration including the Santa Ana River corridor crossing. However, the Proposed Project would follow the existing Mira Loma-Corona-Jefferson Subtransmission Line and would remove and replace the existing structures to support the new Mira Loma-Jefferson 66 kV Subtransmission Line in this area. As a result, the aesthetic impact would not noticeably differ from the existing setting. In addition, the lines would be constructed overhead for the reasons described in the analysis of Policy LU 13.5.
City of Ontario	Mira Loma-Jefferson 66 kV Subtransmission Line	City of Ontario General Plan	CD1-5 View Corridors: We require all major north-south streets be designed and redeveloped to feature views of the San Gabriel Mountains, which are part of the City's visual identity and a key to geographic orientation. Such views should be free of visual clutter, including billboards and may be enhanced by framing with trees.	The Proposed Project would be sited within an existing utility corridor, and would not obstruct views of the San Gabriel Mountains.

4.2 Agriculture and Forestry Resources

This section describes the agriculture and forestry resources in the area of the Proposed Project. The potential impacts from construction, operation, and maintenance of the Proposed Project—as well as the alternative substation site, alternative source line routes, and the alternative Mira Loma-Jefferson 66 kilovolt (kV) Subtransmission Line routes—are evaluated. No forest land is located within the Proposed Project area, but the Proposed Project would cross lands under Williamson Act contracts, as well as land designated as Important Farmland (i.e., Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance). However, any potential impacts to these lands resulting from construction of the Proposed Project would be minimal and, as a result, the Proposed Project would have a less-than-significant impact on agriculture and forestry resources.

4.2.1 Environmental Setting

The Proposed Project would be located in Riverside and San Bernardino counties, and would cross the cities of Chino, Corona, Eastvale, Norco, and Ontario. A small section of the Mira Loma-Jefferson 66 kV Subtransmission Line would also cross an unincorporated area of Riverside County, just south of the Santa Ana River.

Agriculture has historically been, and continues to be, a strong factor in Riverside County's economy. The annual Riverside County Crop Report for 2013 notes that agricultural production accounted for approximately $1,327,804,000 in that year; nursery stock, milk, table grapes, bell peppers, and hay were the primary agricultural products produced in Riverside County in 2013. In addition to cultivated areas, approximately 110,841 acres of Riverside County are used as grazing lands.

Agriculture has historically been and is still an important part of San Bernardino County's economy, despite the continued conversion of agricultural land to non-agricultural uses. The annual San Bernardino County Crop Report noted that agricultural production accounted for approximately $527,087,000 in 2014. The primary agricultural products produced in San Bernardino County were milk; eggs; milk cows, cattle, and calves; and turf. In 2014, the top agricultural product in San Bernardino County was milk. In addition to cultivated areas, an estimated 733,153 acres of San Bernardino County are used as grazing lands.

The City of Chino was founded as an agricultural community, and has soils and climate suitable for growing crops and raising livestock. However, over the latter half of the 20th century, the city was developed for primarily urban uses. Between 1987 and 2002, agricultural acreage in San Bernardino County dropped from approximately 1.7 million acres to approximately 0.5 million acres, and the average size of farms decreased from approximately 868 acres to approximately 371 acres, as the entire county became more developed. Milk production currently dominates agricultural areas in San Bernardino County, but has been on the decline, and this trend is expected to continue, according to the City of Chino's General Plan.

Approximately 2 percent of the land in the City of Corona is designated as agricultural, according to the City of Corona's General Plan. However, according to the most recent available data, less than 1 percent of the lands within the City of Corona were being used for agricultural purposes as of 2002.

The City of Eastvale's agricultural history is due primarily to its proximity to the Chino Dairy Preserve.[1] Dairy operations in the Chino area expanded in the mid-20th century as dairies left the developing Los Angeles area, only to leave the Chino area in the 1990s. Today, only a handful of dairies remain in the City of Eastvale, as the area has been largely converted into homes, parks, and shopping centers. According to Riverside County's Eastvale Area Plan, approximately 1 percent of the land uses in the city is currently designated as agricultural.

The City of Norco was incorporated to preserve the lifestyle of its residents by focusing on small-plot agriculture, animal-keeping, and equestrian use, according to the city's website. However, with its abundance of relatively flat land, few safety hazards, proximity to the Los Angeles and Orange County employment regions, and the direct access to State Route (SR-) 91, Interstate (I-) 15, and I-10, it is likely that Norco will continue to experience urban growth. While commercial agriculture is limited in the City of Norco, the city encourages the continuance of a small-plot agricultural lifestyle, which is considered to be a defining part of the community, according to the city's general plan.

Agriculture has played a significant role in the City of Ontario for citrus fruits and olives, dairy farms and vineyards; however, many agricultural land uses have been replaced with industrial, commercial, and residential land uses. The majority of existing agricultural uses and Important Farmland are located in the New Model Colony Specific Plan area (NMC). Important Farmland in the NMC is now used for dairy, non-commercial poultry farms, alfalfa, barley, strawberry, and other row-crop farming. In 2006, approximately 7,330 acres (89 percent) of the NMC were used for agriculture, although several proposed developments have been approved and others are currently in the approval process within the NMC.

The California Environmental Quality Act (CEQA) provides that agricultural land is Prime Farmland, Farmland of Statewide Importance, or Unique Farmland, as defined by the United States (U.S.) Department of Agriculture land inventory and monitoring criteria and modified for California. According to the California Department of Conservation (DOC), to be classified as Prime Farmland or Farmland of Statewide Importance, the lands must have been used for irrigated agricultural production at some time during the 4 years prior to the Important Farmland Map date. Information regarding Important Farmland found within Riverside and San Bernardino counties is provided in Table 4.2-1: Summary of Farmland in Riverside County and Table 4.2-2: Summary of Farmland in San Bernardino County, which provide the acreage of the California DOC Division of Land Resource Protection (DLRP) Farmland Mapping and Monitoring Program (FMMP) land for the Proposed Project area.

4.2.1.1 Proposed Circle City Substation Site and Source Line Route

No agricultural land is located at or adjacent to the proposed Circle City Substation site, nor would any agricultural land be crossed by the proposed Source Line Route.

[1] The Chino Dairy Preserve includes the southeastern portion of the City of Chino. This area was once home to more than 400 dairies and 400,000 cattle and dairy cows.

Table 4.2-1: Summary of Farmland in Riverside County

Category	Approximate FMMP Land (acres)			
	Riverside County	City of Corona	City of Norco	City of Eastvale
Prime Farmland	104,808	238	0	260
Farmland of Statewide Importance	36,538	27	0	27
Unique Farmland	29,283	366	13	39
Farmland of Local Importance	159,848	782	116	1,379
Total	**330,477**	**1,412**	**128**	**1,706**

Sources: California DOC DLRP, 2012a; California DOC DLRP, 2012b

Table 4.2-2: Summary of Farmland in San Bernardino County

Category	Approximate FMMP Land (acres)		
	San Bernardino County	City of Chino	City of Ontario
Prime Farmland	6,265	2,257	2,106
Farmland of Statewide Importance	5,187	256	102
Unique Farmland	1,280	103	278
Farmland of Local Importance	48	226	107
Total	**12,780**	**2,843**	**2,594**

Source: California DOC DLRP, 2012c

4.2.1.2 Proposed Mira Loma-Jefferson 66 kV Subtransmission Line

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route would be located within an existing Southern California Edison (SCE) easement and rights-of-way (ROWs). However, portions of the underlying land that would be crossed by the Mira Loma-Jefferson 66 kV Subtransmission Line in the cities of Chino, Corona, Eastvale, Norco, and Ontario are currently zoned for agricultural use or include land on which agricultural use is permitted. Portions of the land that would be crossed by the Mira Loma-Jefferson 66 kV Subtransmission Line are also designated as Important Farmland by the FMMP. Based on a desktop-level review, the agricultural uses that would be crossed by the Proposed Project within designated Important Farmland include field crops, turf, fallow fields, nursery products, and livestock and poultry. The Proposed Project would also cross additional Important Farmland that has been developed into housing developments and a business park.

Table 4.2-3: Summary of Agricultural Zoning and Important Farmland Crossed lists the approximate distance of agricultural zoning and Important Farmland that would be crossed by the Proposed Project. The following agricultural zoning designations would be crossed by the Proposed Project:

- Land zoned as Agriculture/Open Space-Natural in the City of Chino
- Land zoned as Heavy Agriculture in the City of Eastvale
- Land zoned as Residential Agricultural in the City of Norco
- Land zoned as a Specific Plan (Agricultural Preserve) area in the City of Ontario

Table 4.2-3: Summary of Agricultural Zoning and Important Farmland Crossed

City	Approximate Agricultural Zoning Crossed (miles)	Approximate Prime Farmland Crossed (miles)	Approximate Unique Farmland Crossed (miles)	Approximate Farmland of Local Importance Crossed (miles)
Chino	0.1	0.8	0.0	0.0
Corona	<0.1	0.0	0.0	0.0
Eastvale	0.5	0.5	0.1	1.2
Norco	0.6	0.0	0.0	0.0
Ontario	1.0	0.8	0.0	0.0
Total	**2.2**	**2.0**	**0.1**	**1.2**

Sources: California DOC DLRP, 2014a; California DOC DLRP, 2014b

One small parcel in the City of Corona is zoned as residential, but also permits limited agricultural use. In addition, approximately 0.9 mile of land under a Williamson Act contract would be crossed by the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route in the City of Eastvale. Two areas designated as Grazing Land are located adjacent to, but would not be crossed by the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route in the City of Chino. Figure 4.2-1: Farmland Map (Subtransmission Line) depicts the FMMP-designated farmland in the Proposed Project area.

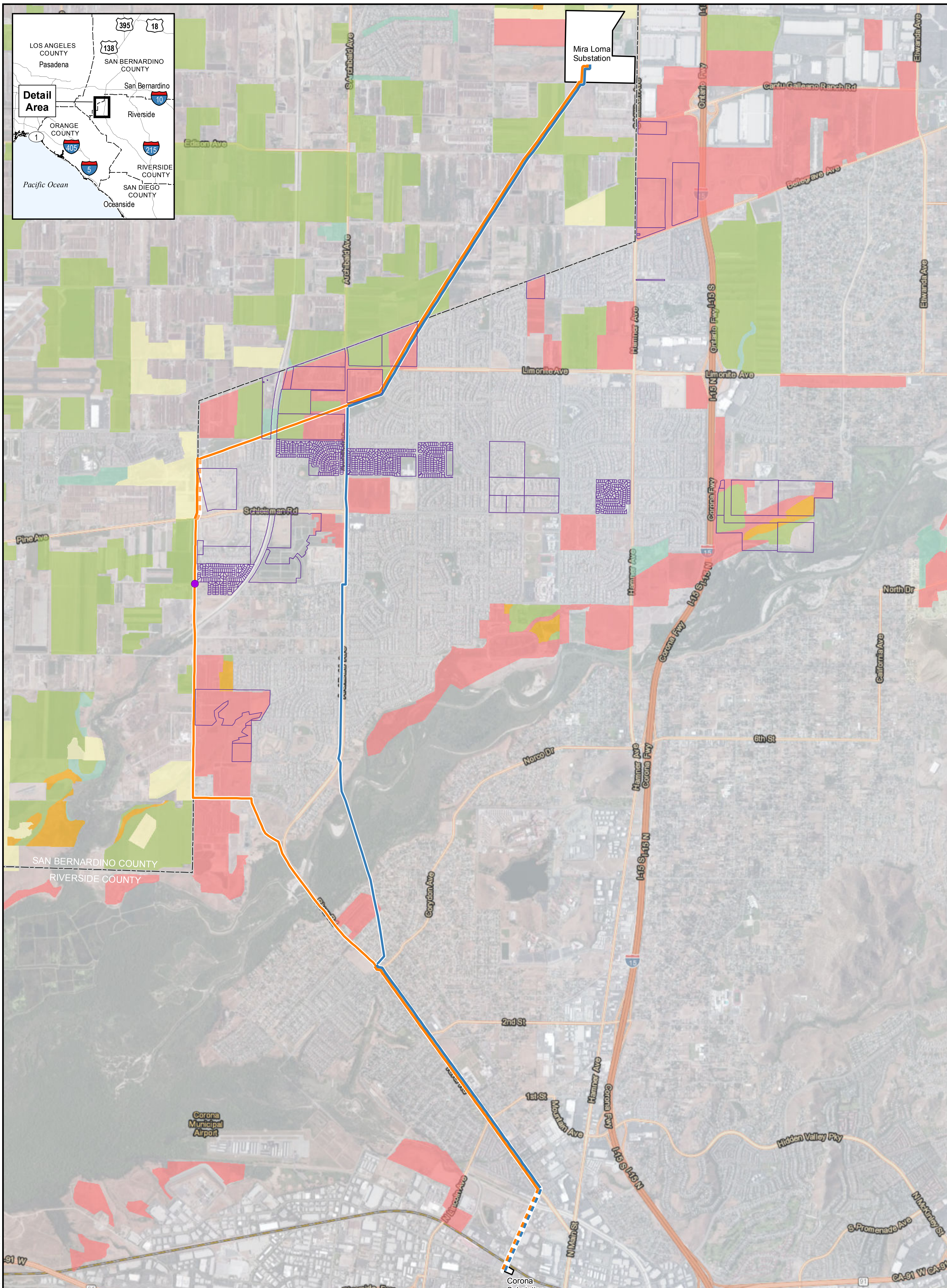

Figure 4.2-1: Farmland Map (Subtransmission Line)

Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project

Mira Loma-Jefferson 66 kV Subtransmission Line

- Subtransmission Line Route Alternative 1 - Overhead (Proposed)
- Subtransmission Line Route Alternative 1 - Underground (Proposed)
- Subtransmission Line Route Alternative 2 - Underground*
- Subtransmission Line Route Alternative 3 - Overhead
- Subtransmission Line Route Alternative 3 - Underground
- Subtransmission Line - Underground Crossing

Williamson Act Land

Important Farmland

- Farmland of Local Importance
- Farmland of Statewide Importance
- Grazing Land
- Prime Farmland
- Unique Farmland

Substation

County Boundary

*Note: Except for the underground portion indicated, Alternative Route 2 would utilize the same route as the Alternative Route 1/Proposed Route.

Source: California Department of Conservation, 2008 and 2012; Insignia 2015; SCE, 2015

1:42,000

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Staging Areas

SCE would use one or more of the seven potential staging yards identified in Table 3-3: Potential Staging Yard Locations in Chapter 3 – Project Description. The approximately 3-acre staging area within Mira Loma Substation, the approximately 5-acre staging area that would potentially be located in a vacant field west of Hellman Avenue in the City of Chino, and the approximately 0.5-acre staging area within Jefferson Substation would be located on land zoned for agricultural use. However, none of these areas are designated as Important Farmland by the FMMP.

Access Roads

The majority of the Proposed Project would be accessed along existing public roads and ROWs; these existing roads, as well as subtransmission and transmission line access roads, would be utilized to the maximum extent practicable. However, construction of the Proposed Project along the northern portion of the Mira Loma-Jefferson 66 kV Subtransmission Line through the cities of Eastvale and Ontario would require newly constructed temporary and permanent roads, as well as rehabilitated existing dirt roads to access work sites through approximately 1.3 miles of Prime Farmland, 0.06 mile of Unique Farmland, and 0.92 mile of Farmland of Local Importance. As described in Section 3.2.3.1 Access Roads in Chapter 3 – Project Description, typical construction activities associated with the rehabilitation of existing dirt access roads include vegetation clearing, blade-grading, over-excavation, and recompacting of soils to remove potholes, ruts, and other road surface irregularities.

4.2.1.1 Forest Land Classification

Forest land is defined by Section 12220(g) of the California Public Resources Code (PRC) as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." Timberland is "land, other than land owned by the federal government and land designated by the State Board of Forestry as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products." A timberland production zone (TPZ) is "an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, as defined in subdivision (h)." No forest land, timberland, or TPZs are currently located within or near the Proposed Project area.

4.2.2 Regulatory Setting

This section describes the relevant goals and policies relating to agricultural and forestry land uses for each jurisdiction that would be crossed by the Proposed Project.

4.2.2.1 Federal

Agriculture

A review of the U.S. Department of Agriculture (USDA) website, the Code of Federal Regulations, and the National Park Service website revealed no federal agricultural policies or guidelines applicable to the Proposed Project area.

Forestry

Forest Legacy Program Land Designations

The Forest Legacy Program (FLP) was created to protect environmentally important forest land threatened by conversion to non-forest uses, such as subdivision for residential or commercial development. To help maintain the integrity and traditional use of private forest lands, the FLP advocates for the creation of conservation easements on a voluntary basis. The federal government manages the program in cooperation with state and local agencies, private organizations, and individual landowners.

4.2.2.2 State

Agriculture

California Department of Conservation Division of Land Resource Protection Farmland Mapping and Monitoring Program

The California DOC DLRP FMMP generates maps depicting Important Farmlands, including: Prime Farmland, Farmland of Statewide Importance, Unique Farmland, and Farmland of Local Importance. These farmland classifications are categorized according to specific criteria, including soil quality and irrigation conditions. Approximately 94 percent of the FMMP study area is based on the USDA Natural Resource Conservation Service (NRCS) soil classification system, which evaluates both physical and chemical conditions of soils, including temperature, moisture regime, pH, flooding, groundwater depth, erodibility, permeability, and sodium content. FMMP maps are updated every 2 years using aerial imagery review, field reconnaissance, computer mapping analyses, and public input. The minimum land use mapping unit is 10 acres, and smaller units of land are generally incorporated into surrounding map classifications.

The extent of farmland designation coverage in California is relative to the availability of NRCS soil survey data. In areas for which data are not available, a series of Interim Farmland definitions have been established to allow land use monitoring to occur until soil data are available.

The California DOC has established eight land use classifications, which are summarized as follows:

- Prime Farmland: Prime Farmland has the optimum combination of physical and chemical conditions that are able to sustain long-term agricultural production. The soil quality, growing season, and moisture supply on Prime Farmlands provide the conditions required to produce sustained high yields. Prime Farmlands must be used for irrigated production 4 years prior to the mapping date.

- Farmland of Statewide Importance: Farmland of Statewide Importance is similar to Prime Farmland; however, this farmland has minor shortcomings, such as a higher slope or decreased ability to store soil moisture. Similar to Prime Farmland, Farmland of Statewide Importance must be used for irrigated production 4 years prior to the mapping date.

- Unique Farmland: Unique Farmland has lower-quality soils and is used for the production of California's leading agricultural products. Unique Farmland is typically irrigated, but may also include non-irrigated vineyards or orchards found in certain climatic zones. Unique Farmlands must be cropped 4 years prior to the mapping date.

- Farmland of Local Importance: Farmland of Local Importance is farmland that is vital to the local agricultural economy, as identified by each county's local advisory committee and board of supervisors.

- Grazing Land: Grazing Land is land on which existing vegetation is suitable for livestock grazing.

- Urban and Built-Up Land: Urban and Built-Up Land is defined as land that is occupied by buildings or other structures at a minimum density of one unit to 1.5 acres (or approximately six structures to 10 acres). This land is used for development purposes, including residential, commercial, industrial, construction, public administration, institutional, transportation yards, airports, cemeteries, golf courses, sewage treatment, sanitary landfills, and water control structures.

- Other Land: Other Land includes all land that is not in any other map category, such as waterbodies smaller than 40 acres; low-density rural developments; confined livestock, poultry, or aquaculture facilities; and brush, timber, wetland, and riparian areas that are not suitable for livestock grazing.

- Water: Water includes all perennial waterbodies that are a minimum of 40 acres.

Williamson Act Land Designations

The Williamson Act, also known as the California Land Conservation Act of 1965 (California Government Code [CGC] Section 51200 et seq.), preserves agricultural and open-space lands from conversion to urban land uses by establishing a contract between local governments (i.e., city and county governments) and private landowners to voluntarily restrict their landholdings to agricultural or open space use. In return, landowners receive property tax assessments based on farming or open space use, rather than assessments based on the full-market property value, which is typically 20 to 75 percent higher. Williamson Act contracts are valid for a minimum of 10 years and are automatically renewable after each 10-year term.

The Williamson Act also allows local governments to establish Agricultural Preserves, or parcels of land for which cities or counties are willing to enter into Williamson Act contracts. Agricultural Preserves generally include a minimum of 100 acres and are not in areas where public utility improvements and associated land acquisitions may be necessary (CGC § 51230). Although the Williamson Act does not specify compatible land uses for property located adjacent to contract lands or Agricultural Preserves, it does state that cities and counties must determine compatible land use types while recognizing that temporary or permanent population increases frequently impair or hamper agricultural operations (CGC § 51220.5). Section 51238 of the Williamson Act indicates that the erection, construction, alteration, or maintenance of gas, electric, water, or communication facilities are compatible with Williamson Act contracts—unless local organizations declare otherwise.

Forestry

California Public Resources Code

As previously described in Section 4.2.1.1 Forest Land Classification, the California PRC provides definitions of forest land and timberland, which are referenced in the CEQA Guidelines. PRC Section 12220(g) defines forest land as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." PRC Section 4526 defines timberland as "land, other than land owned by the federal government and land designated by the [State Board of Forestry and Fire Protection] as experimental forest land, which is available for, and capable of, growing a crop of trees of any commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the [State Board of Forestry and Fire Protection] on a district basis after consultation with the district committees and others."

California Government Code

As previously described in Section 4.2.1.1 Forest Land Classification, the CGC provides the definition of TPZ, which is referenced in the CEQA Guidelines. CGC Section 51104(g) defines a TPZ as "an area which has been zoned pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses, defined in subdivision (h). With respect to general plans of cities and counties, 'timberland preserve zone' means 'timberland production zone.'" Sections 51112 and 51113 describe the process for designating a TPZ, and subdivision (h) describes compatible uses with a TPZ.

4.2.2.3 Local

The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the Proposed Project. Pursuant to CPUC General Order No. 131-D, Section XIV.B, "Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC's jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters." Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the counties and cities' regulations are not applicable as the counties and cities do not have jurisdiction over the Proposed Project. Accordingly, the following discussion of local land use regulations is provided for informational purposes only.

The general plan documents for each jurisdiction that would be crossed by the Proposed Project were reviewed for relevance. No relevant local policies were identified in the City of Norco General Plan. The following subsections discuss the relevant local regulatory policies provided by Riverside County and the cities of Chino, Corona, Eastvale, and Ontario.

Riverside County General Plan

As a small portion of the Proposed Project is located in unincorporated Riverside County just south of the Santa Ana River, the county's General Plan was reviewed for goals and policies that are relevant to agricultural resources. The policies contained in the Riverside County General Plan address general countywide issues that may apply to numerous locations and land use designations. The Riverside County General Plan recognizes 19 geographic planning areas. The relevant policies from the Riverside County General Plan include the following:

- LU 16.2: Protect agricultural uses, including those with industrial characteristics (dairies, poultry, hog farms, etc.) by discouraging inappropriate land division in the immediate proximity and allowing only uses and intensities that are compatible with agricultural uses.

- LU 16.4: Encourage conservation of productive agricultural lands. Preserve prime agricultural lands for high-value crop production.

City of Chino General Plan

The Mira Loma-Jefferson 66 kV Subtransmission Line would travel adjacent to and within The Preserve Specific Plan area in the City of Chino. As described in Section 4.10 Land Use and Planning, The Preserve Specific Plan area consists of approximately 5,435 acres of former and existing farmland and dairy property located south of Kimball Avenue, north of SR-71, west of Hellman Avenue, and east of Euclid Avenue. Approximately half of the area will consist of residential, commercial, industrial, and airport-related development. The other half will be preserved as open space for natural, recreational, and agricultural uses.

The following policy, as provided in The Preserve Specific Plan and the City of Chino Zoning Code, is relevant to agricultural resources:

- The City of Chino shall allow continued agricultural operations within The Preserve concurrent with the planned urbanization of the area, to be achieved by the following means:

  - Areas within the Specific Plan shall be designated and zoned for long-term agricultural use only where feasible and where impacts on urban development and environmental resources are limited. Where the agricultural designation is included on the Specific Plan, the uses shall, where necessary, be protected by conditions placed on adjacent proposed uses.

City of Corona General Plan

The following policy, contained within the Environmental Resources Element of the City of Corona's General Plan, is relevant to agricultural resources:

- 10.12.1: Allow for and facilitate the continuance of agricultural activities in the City until such time as the land is needed to accommodate population and employment growth.

Although the Proposed Project would travel through four different specific plan areas in the City of Corona, there are no agricultural uses that occur within these areas.

City of Eastvale General Plan

The City of Eastvale became an incorporated city in October 2010. Prior to the city's General Plan being adopted on June 2012, the Riverside County General Plan was the governing document for the City of Eastvale. The city has adopted the Riverside County Right to Farm Ordinance to "balance the rights of farmers to produce food and other agricultural products with the rights of non-farmers who own, occupy, or use land within or adjacent to agricultural areas."

The following policies, as provided in the City of Eastvale General Plan, are relevant to agricultural resources:

- AQ-39: The loss of agricultural productivity on lands designated for urban uses within the city limits is anticipated as a consequence of the development of Eastvale.
- AQ-40: As long as agricultural land in the city exists, the City shall not require buffers between farmland and urban uses within the City, relying instead on the following actions to address the impacts of farming on urban uses:
  - Implement the City's "right-to-farm" ordinance.
  - Prospective buyers of property adjacent to agricultural land shall be notified through the title report that they could be subject to inconvenience or discomfort resulting from accepted farming activities per provisions of the City's right-to-farm ordinance.

City of Ontario General Plan and Specific Plan Areas

The Mira Loma-Jefferson 66 kV Subtransmission Line crosses the NMC in the City of Ontario, including the Rich-Haven and Subarea 29 specific plan areas along an existing SCE easement, as described in Section 4.10 Land Use and Planning. There are no policies that are relevant to agriculture in the Rich-Haven or Subarea 29 specific plans. The Mira Loma-Jefferson 66 kV Subtransmission Line would cross land zoned as Specific Plan (Agricultural Preserve), as provided by the City of Ontario's zoning designations. Portions of this area are located within the Grand Park and Rich-Haven specific plan areas that have been approved and the Subarea 29 Specific Plan area that is currently under construction.

The following policy contained within the Biological, Agricultural, and Mineral Resources Element of the City of Ontario's General Plan relates to agricultural resources:

- ER5-4: Transition of Farms. The City of Ontario protects both existing farms and sensitive uses around them as agricultural areas transition to urban uses.

4.2.3 Significance Criteria

The significance criteria for assessing the impacts to agriculture and forestry resources are derived from the CEQA Environmental Checklist. According to the CEQA Environmental Checklist, a project causes a potentially significant impact if it would:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use
- Conflict with existing zoning for agricultural use or a Williamson Act contract
- Conflict with existing zoning for, or cause rezoning of, forest land, timberland, or TPZ,
- Result in the permanent loss or conversion of forest land in the Proposed Project area to non-forest use
- Involve other changes in the existing environment which, due to their location or nature, could result in the permanent or long-term conversion of farmland to non-agricultural use, or of forest land in the Proposed Project area to non-forest use

4.2.4 Impact Analysis

4.2.4.1 Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use?

Construction – Less-than-Significant Impact

Land disturbance for the Proposed Project would include surface modifications for the proposed Circle City Substation, the proposed Source Line Route, fiber optic cable, the Mira Loma-Jefferson 66 kV Subtransmission Line, and proposed access roads. Except for approximately 28.7 acres of permanent impacts from pole installation and access roads, use of the temporary pole work areas, stringing sites, and temporary access roads would not disturb underlying soils to a degree that these areas would be converted from farmland to other uses.

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route would cross approximately 2.0 miles of land designated as Prime Farmland, approximately 0.1 mile of land designated as Unique Farmland, and approximately 1.2 miles of land designated as Farmland of Local Importance. No Farmland of Statewide Importance would be crossed by the Proposed Project. Proposed Project construction would primarily occur within existing easements and ROWs, and work sites would be accessed from public roads to the maximum extent practicable. However, the portion of the Mira Loma-Jefferson 66 kV Subtransmission Line located within SCE's existing easement, which measures approximately 500 feet wide and traverses through the cities of Eastvale and Ontario, would require the use of both existing and new temporary and permanent access roads.

Proposed Project activities—including existing pole removal, new pole installation, and access road construction—would result in approximately 20.1 acres of temporary disturbance and the permanent conversion of approximately 0.4 acre of Prime Farmland. Based on a desktop-level review, field crops would be permanently converted within designated Prime Farmland. The agricultural uses that would be temporarily disturbed within designated Prime Farmland include row crops, field crops, turf, and livestock.

Approximately 1.5 acres of temporary disturbance and the permanent conversion of approximately 0.01 acre of designated Unique Farmland would also result from the Proposed Project. Based on a desktop-level review, nursery use would be temporarily disturbed and permanently converted within designated Unique Farmland.

Approximately 14.5 acres of temporary disturbance and the permanent conversion of approximately 0.8 acre of designated Farmland of Local Importance would also result from the Proposed Project. Based on a desktop-level review, the agricultural uses that would be temporarily disturbed within designated Farmland of Local Importance include fallow fields and livestock. Livestock uses would be permanently converted within designated Farmland of Local Importance.

Table 4.2-4: Proposed Mira Loma-Jefferson 66 kV Subtransmission Line Estimated Farmland Disturbance provides the estimated amount of permanent and temporary farmland disturbance for the proposed Source Line Route, the proposed Mira Loma-Jefferson 66 kV Subtransmission Line, and the Proposed Project's access roads. The calculations used to estimate farmland disturbance are approximate and based on the geographic information system data prepared by SCE for the proposed Circle City Substation site, Source Line Route, fiber optic cable, Mira Loma-Jefferson 66 kV Subtransmission Line Route, and access roads.

Table 4.2-4: Proposed Mira Loma-Jefferson 66 kV Subtransmission Line Estimated Farmland Disturbance

Farmland Category	Approximate Temporarily Disturbed (acres)	Approximate Permanently Disturbed (acres)
Prime Farmland	20.1	0.4
Farmland of Statewide Importance	0.0	0.0
Unique Farmland	1.5	<0.1
Farmland of Local Importance	14.5	0.8
Total	**36.1**	**1.2**

Sources: California DOC DLRP, 2012a; California DOC DLRP, 2012b; California DOC DLRP, 2012c

The majority of the farmland that would be converted to non-agricultural use as a result of the Proposed Project has already been designated for residential, commercial, and industrial development by the cities of Chino, Eastvale, and Ontario. An approximately 0.8-mile portion of the line would cross Prime Farmland in the City of Chino. In the City of Eastvale, an approximately 1.8-mile portion of the Mira Loma-Jefferson 66 kV Subtransmission Line would cross Prime Farmland, Unique Farmland, and Farmland of Local Importance. In the City of Ontario, the Mira Loma-Jefferson 66 kV Subtransmission Line would cross approximately 1.0 mile of land zoned as Specific Plan (Agricultural Preserve), and portions of this are located within the Grand Park and Rich-Haven specific plan areas that have been approved and the Subarea 29 Specific Plan area that is currently under construction. The Mira Loma-Jefferson 66 kV Subtransmission Line would also cross approximately 0.8 mile of Prime Farmland within the City of Ontario, portions of which are located within the Rich-Haven Specific Plan area and the Subarea 29 Specific Plan area.

The proposed Mira Loma-Jefferson 66 kV Subtransmission Line would be installed in a nearly identical location to the existing subtransmission line within SCE's existing easement. In addition, two existing 220 kV transmission lines are located within the approximately 500-foot-wide easement, where the majority of impacts to farmland would occur. Further, the proposed Circle City Substation, the proposed Source Line Route, and collocated fiber optic cables would not be located on FMMP-designated land. Any potential impacts to agriculture as a result of constructing the Proposed Project would be less than significant because the portion of the Proposed Project that would convert Prime Farmland and Unique Farmland would be constructed within an existing utility corridor and would replace existing structures. In addition, the majority of these areas have already been designated for residential, commercial, and industrial development; the total amount of permanent impacts to agricultural lands would not exceed more than 1 percent; and the majority of the construction impacts would be temporary.

Operation and Maintenance – No Impact

Following construction of the Proposed Project, operation and maintenance activities associated with the Mira Loma-Jefferson 66 kV Subtransmission Line would continue in essentially the same manner as they do for the existing line. Therefore, there would be no substantial change in the operation and maintenance activities for the Mira Loma-Jefferson 66 kV Subtransmission Line, and no new impacts would result from the Proposed Project.

4.2.4.2 Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?

Construction – No Impact

The Proposed Project would cross a total of approximately 3.3 miles of land designated as Important Farmland and approximately 2.2 miles of land zoned for agricultural use, including five parcels that are currently under Williamson Act contracts. In addition, three of the potential staging areas—measuring approximately 0.5 acre, 3 acres, and 5 acres—would be located on land zoned for agricultural use. However, although located within an agriculturally zoned site, the approximately 3-acre staging area would be located entirely within the existing Mira Loma Substation fence line and the approximately 0.5-acre staging area would be located entirely within the existing Jefferson Substation. The 5-acre staging area, located west of Hellman Avenue in the City of Chino currently has a small dairy area. Accordingly, approximately 68.2 acres of temporary disturbance and approximately 2.2 acres of permanent impacts to lands zoned for agricultural use would result from construction of the Proposed Project. Potential impacts resulting from the construction of the Proposed Project along the Mira Loma-Jefferson 66 kV Subtransmission Line would temporarily disturb approximately 11.9 acres and would permanently impact approximately 0.6 acre currently under Williamson Act contract. However, approximately 0.01 acre of land would be available to be restored for agricultural use as a result of existing pole removal, and no Williamson Act contracts would need to be cancelled in order to construct the Proposed Project.

The Proposed Project is compatible with agricultural uses according to CGC Section 51238. The placement of subtransmission poles and the construction of new access roads on land currently under agricultural production would not affect the status of the agricultural land zoning. Further, public utility uses are deemed to be compatible with zoning for, and currently occur within, these agricultural lands, according to the jurisdictions that would be crossed by the Proposed Project. As a result, there would be no impact from the Proposed Project on existing zoning or Williamson Act contracts.

Operation and Maintenance – No Impact

Periodic maintenance and inspection activities would occur in essentially the same manner as they do for the existing Mira Loma-Jefferson 66 kV Subtransmission Line, and would have a negligible effect on the surrounding land uses. Because existing agricultural land uses would resume during operation of the Proposed Project, there would be no impact on existing zoning for agricultural use or a Williamson Act contract.

4.2.4.3 Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))? – No Impact

The Proposed Project area contains no lands zoned as forest land, timberland, or TPZ. Therefore, no impact would occur.

4.2.4.4 Would the project result in the loss of forest land or conversion of forest land to non-forest use? – No Impact

No forest land is located within or adjacent to the Proposed Project area. Therefore, construction and operation of the Proposed Project would not result in the loss or conversion of forest land to non-forest use, and no impact would occur.

4.2.4.5 Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use? – No Impact

Construction of the proposed Circle City Substation, the proposed Source Line Route, and the collocated fiber optic cable would not result in any impacts to agricultural lands. In addition, any potential impacts to agriculture would result solely from construction of the proposed Mira Loma-Jefferson 66 kV Subtransmission Line, which would be located along the same alignment as the existing subtransmission line to be replaced as part of the Proposed Project. Because the Mira Loma-Jefferson 66 kV Subtransmission Line would be constructed within an existing SCE easement and ROWs, the Proposed Project would not convert or otherwise induce the conversion of agricultural lands within the Proposed Project area to non-agricultural use. Further, the Proposed Project would not induce growth, but is instead designed to respond to existing growth and demand trends within SCE's service area. Access roads and other appurtenant facilities constructed and operated as part of the Proposed Project would be similar to those currently in place for the existing subtransmission line and would not make additional agricultural areas available for non-agricultural use, nor would they induce other changes in the existing environment. Therefore, the Proposed Project would not involve other changes in the existing environment, and no impact would occur.

4.2.5 Applicant-Proposed Measures

Because no impacts to agriculture or forestry would occur as a result of the Proposed Project, no avoidance or minimization measures are proposed.

4.2.6 Alternative Substation Site

Similar to the proposed Circle City Substation site (i.e., Substation Site Alternative A), Substation Site Alternative B is not being used for agricultural activities, is not designated or zoned for agricultural use, and contains no lands under Williamson Act contract. As a result, any potential impacts to agriculture and forestry resources would be the same as those for the proposed Circle City Substation site.

4.2.7 Alternative Source Line Routes

Like the proposed Source Line Route, the alternative source line routes would not include any lands that are being used for agricultural activities or lands designated or zoned for agricultural use. Construction and operation of the alternative source line routes would also not affect any Williamson Act lands. As a result, any potential impacts to agriculture and forestry resources would be the same as those for the proposed Source Line Route.

4.2.8 Alternative Mira Loma-Jefferson 66 kV Subtransmission Line Routes

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 3 would be located within existing street ROW along Archibald Avenue in the City of Eastvale, which is in a more highly populated area than the corresponding portion of the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route, and would not cross into the City of Chino. Thus, Alternative 3 would cross slightly less agricultural land than the proposed route. However, the alternative route would all cross through agricultural land in the City of Ontario. Alternative 3 would impact only slightly less agricultural land than the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route.

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternative 2 would follow the same alignment as the proposed route and would therefore cross the same zoning designations. The portion of Alternative 2 that would be installed underground along Hellman Avenue would not be located within an area zoned for agricultural use. Alternative 2 would result in exactly the same impacts to agriculture and forestry resources as the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route.

As a result, any potential impacts from either Alternative 2 or Alternative 3 would be similar to those associated with the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route.

4.2.9 References

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4.3 Air Quality

This section describes the air quality in the area of the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project), as well as the potential impacts and alternatives. Criteria air pollutant emissions due to construction equipment and motor vehicle use during the construction phase of the Proposed Project would have potentially significant impacts. Emissions related to the operation of the Proposed Project would be less than significant.

4.3.1 Environmental Setting

The Proposed Project is located within the South Coast Air Basin (SoCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). The SoCAB includes areas of Orange County, Los Angeles County, San Bernardino County, and Riverside County. The air above the SoCAB often exhibits weak vertical and horizontal dispersion due to persistent temperature inversions (i.e., a warm air mass moves above a cooler air mass, limiting mixing of the two masses), and the air movement is restricted by the presence of nearby mountain ranges.

4.3.1.1 Criteria Air Pollutants

Ozone (O_3), particulate matter (PM) less than 10 microns in diameter (PM_{10}), PM less than 2.5 microns in diameter ($PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead are all criteria air pollutants that are regulated in California. In addition, non-methane ethane volatile organic compounds (VOCs)—also referred to as reactive organic compounds (ROGs)—are also regulated as precursors to the formation of O_3. These criteria pollutants and their effects on humans are discussed in the following subsections.

Ozone

O_3 is a colorless gas that is not directly emitted as a pollutant, but is formed when hydrocarbons and nitrogen oxides (NO_x) react in the presence of sunlight. Low wind speeds or stagnant air mixed with warm temperatures typically provide optimum conditions for the formation of O_3. Because O_3 formation does not occur quickly, O_3 concentrations often peak downwind of the emission source. As a result, O_3 is of regional concern as it impacts a larger area. When inhaled, O_3 irritates and damages the respiratory system.

Particulate Matter

PM, which is defined as particles suspended in a gas, is often a mixture of substances, including metals, nitrates, organic compounds, diesel exhaust, and soil. PM can be traced back to both man-made and natural sources. The most common sources of natural PM are dust and fires, while the most common man-made source is the combustion of fossil fuels.

PM causes irritation to the human respiratory system when inhaled. The extent of the health risks due to PM exposure can be determined by the size of the particles. The smaller the particles, the deeper they can be deposited in the lungs. PM is often grouped into two categories—PM_{10} and $PM_{2.5}$.

Carbon Monoxide

CO is a colorless, odorless, and tasteless gas that is directly emitted as a by-product of combustion. CO concentrations tend to be localized to the source, and the highest concentrations are associated with cold, stagnant weather conditions. CO is readily absorbed through the lungs into the blood, where it reduces the ability of the blood to carry oxygen.

Nitrogen Oxides

NO_x is a generic name for the group of highly reactive gases that contain nitrogen and oxygen in varying amounts. Many types of NO_x are colorless and odorless. However, when combined with particles in the air, one common pollutant—NO_2—can often be seen as a reddish-brown layer over many urban areas.

NO_x form when fuel is burned at high temperatures. Typical man-made sources of NO_x include motor vehicles, fossil-fueled electricity generation utilities, and other industrial, commercial, and residential sources that burn fossil fuels. NO_x can harm humans by affecting the respiratory system. Small particles can penetrate the sensitive parts of the lungs, causing or worsening respiratory disease and aggravating existing heart conditions.

As previously discussed, O_3 is formed when NO_x and VOCs react with sunlight.

Sulfur Oxides

Sulfur oxides (SO_x) form when sulfur-containing materials are processed or burned. SO_x sources include industrial facilities (e.g., petroleum refineries, cement manufacturing facilities, and metal processing facilities), locomotives, large ships, and some non-road diesel equipment.

A wide variety of adverse health and environmental impacts are associated with SO_x because of the way it reacts with other substances in the air. Children, elderly people, and people with asthma or a heart or lung disease are particularly sensitive to SO_x emissions. When inhaled, these particles gather in the lungs and contribute to increased respiratory symptoms and disease, difficulty breathing, and premature death.

Volatile Organic Compounds

VOCs (or ROGs) are a group of chemicals that react with NO_x and hydrocarbons in the presence of heat and sunlight to form O_3. Examples of VOCs include gasoline fumes and oil-based paints. This group of chemicals does not include methane or other compounds determined by the United States (U.S.) Environmental Protection Agency (EPA) to have negligible photochemical reactivity.

4.3.1.2 Sensitive Receptors

Some exposed population groups—including children, and people who are elderly or ill—can be especially vulnerable to airborne chemicals and irritants, and are termed “sensitive receptors.” In addition, due to sustained exposure durations, all persons located within residential areas are considered sensitive receptors. Sensitive receptors in the vicinity of the Proposed Project include the following:

- Occupied residential dwellings located within approximately 20 feet of the source line routes and the Mira Loma-Jefferson 66 kilovolt (kV) Subtransmission Line
- Occupied residential dwellings located at Corona La Linda Mobile Home Park, east of South Temescal Street, approximately 720 feet from the proposed Circle City Substation
- Auburndale Intermediate School, located adjacent to the Mira Loma-Jefferson 66 kV Subtransmission Line along River Road; Victress Bower Elementary and George Washington Elementary School, located within 0.25 mile of the Mira Loma-Jefferson 66 kV Subtransmission Line; and Colony High School, located approximately 0.2 mile north of the existing Mira Loma Substation

Section 4.12 Noise and Section 4.14 Public Services provide a more detailed description of the locations of residential areas and other sensitive receptors in the vicinity of the Proposed Project.

4.3.1.3 Ambient Air Quality

Ambient air quality data was obtained from the two monitoring sites nearest to the Proposed Project area that are currently in operation.[1] The most recently available data on the number of exceedances of applicable air quality standards for O_3, PM_{10}, and $PM_{2.5}$ at these locations are summarized in Table 4.3-1: Frequency of Air Quality Standard Exceedances. As reflected in Table 4.3-1: Frequency of Air Quality Standard Exceedances, records at the Mira Loma Van Buren and Fontana-Arrow Highway monitoring sites indicated multiple violations of the National Ambient Air Quality Standards (NAAQS) or California Ambient Air Quality Standards (CAAQS) for O_3, PM_{10}, and $PM_{2.5}$ between 2009 and 2013.

4.3.1.4 Air Quality Designations

As described in Section 4.3.2 Regulatory Setting, three air quality designations can be assigned to an area for a particular pollutant:

- Nonattainment: This designation applies when air quality standards have not been consistently achieved.
- Attainment: This designation applies when air quality standards have been achieved.
- Unclassified: This designation applies when insufficient monitoring data exist to determine either a nonattainment or attainment designation.

The current NAAQS and CAAQS attainment statuses for the Proposed Project area are provided in Table 4.3-2: Attainment Status for the Proposed Project Area. The Proposed Project area is currently designated as a nonattainment area under the CAAQS for O_3 and PM_{10}.

[1] The Mira Loma Van Buren monitoring station is located approximately 4.3 miles east of the Proposed Project, and the Fontana-Arrow Highway monitoring station is located approximately 7.6 miles northeast of the Proposed Project.

Table 4.3-1: Frequency of Air Quality Standard Exceedances

Monitoring Site	Year	Days in Exceedance of Standard			
		State 1-Hour O_3	State 24-Hour PM_{10}	National 24-Hour PM_{10}	National 24-Hour $PM_{2.5}$
Mira Loma Van Buren	2013	11	73.0	0	9.2
	2012	31	98.2	0	7.0
	2011	32	145.9	0	8.2
	2010	22	137.1	0	8.7
	2009	13	204.6	0	--
Fontana-Arrow Highway	2013	34	90.2	0	3.0
	2012	60	29.7	0	10.6
	2011	39	24.4	0	7.1
	2010	28	--	0	6.6
	2009	45	66.9	0	6.2

Source: California Air Resources Board (CARB), 2015
Notes: “--” = Insufficient or unavailable data. Days over PM_{10} CAAQS are based on monitoring every sixth day. The national 1-hour O_3 standard was revoked in 2005 and is no longer in effect.

Table 4.3-2: Attainment Status for the Proposed Project Area

Pollutant	State Standards	National Standards
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Attainment
$PM_{2.5}$	Nonattainment	Nonattainment
CO	Attainment	Unclassified/Attainment[1]
NO_2	Attainment	Unclassified/Attainment[1]
SO_2	Attainment	Attainment

Sources: CARB, 2014; SCAQMD, 2014d
Note: The U.S. EPA often only declares areas Nonattainment areas when air quality standards have not been consistently achieved; everywhere else is listed as Unclassifiable/Attainment or Unclassifiable.

4.3.2 Regulatory Setting

4.3.2.1 Federal

The 1970 Federal Clean Air Act (CAA) established ambient air quality standards (AAQS) for six major pollutants—O_3, particle pollution (PM_{10}, $PM_{2.5}$), CO, NO_2, SO_2, and lead. These six air pollutants are known to have adverse impacts on human health and the environment. To protect human health and the environment, the U.S. EPA set primary and secondary maximum ambient thresholds for criteria pollutants. The primary thresholds were set to protect human health—particularly for children and the elderly, as well as for individuals who suffer from chronic lung conditions (e.g., asthma and emphysema). The secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings. The NAAQS is comprised of the combined primary and secondary standards set by the EPA. The 1977 CAA Amendments required each state to develop and maintain a State Implementation Plan (SIP) for each criteria pollutant that exceeds the NAAQS for that pollutant. The SIP serves as a tool to reduce pollutants that are known to cause impacts if they exceed ambient thresholds and to achieve compliance with the NAAQS. In 1990, the CAA was amended to strengthen regulation of both stationary and mobile emission sources for the criteria pollutants.

In July 1997, the U.S. EPA developed new health-based NAAQS for O_3 and PM_{10}. However, these standards were not fully implemented until 2001, after the resolution of several lawsuits. The new federal O_3 standard of 0.080 parts per million (ppm), established in 1997, was based on a longer averaging period (8 hours versus 1 hour), recognizing that prolonged exposure to O_3 is more damaging. In March 2008, the EPA further lowered the 8-hour O_3 standard from 0.080 ppm to 0.075 ppm. The new federal PM standard is based on finer particles (2.5 microns and smaller versus 10 microns and smaller), recognizing that finer particles may have a higher residence time in the lungs and contribute to greater respiratory illness. In February 2007, the NAAQS for NO_2 was amended to lower the existing 1-hour standard of 0.25 ppm to 0.18 ppm, which is not to be exceeded; and established a new annual standard of 0.030 ppm, which is also not to be exceeded. Table 4.3-3: State and Federal Ambient Air Quality Standards contains a list of the NAAQS and CAAQS.

4.3.2.2 State

The California Clean Air Act (CCAA) requires air districts to develop and implement strategies to attain CAAQS. For some pollutants, the California standards are more stringent than the national standards. Regional air quality management districts are mandated to prepare an air quality plan specifying how federal and state standards would be met. The CAAQS are listed in Table 4.3-3: State and Federal Ambient Air Quality Standards.

The CARB enforces the CAAQS and works with the state's Office of Environmental Health Hazard Assessment in identifying toxic air contaminants (TACs) and enforcing rules related to TACs, including the Air Toxic Hot Spots Information and Assessment Act of 1987. Enacted to identify TAC hot spots where emissions from specific sources may expose individuals to an elevated risk of adverse health effects, this act requires that businesses or other establishments identified as significant sources of toxic emissions provide the affected population with information about health risks posed by the emissions.

Table 4.3-3: State and Federal Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard[1, 3]	Federal Standard[2]	
			Primary[3, 5]	Secondary[3, 6]
O_3	1-hour	0.09 ppm (180 µg/m^3)	NA	NA
	8-hour	0.070 ppm (137 µg/m^3)	0.075 ppm (147 µg/m^3)	0.075 ppm (147 µg/m^3)
PM_{10}	24-hour	50 µg/m^3	150 µg/m^3	150 µg/m^3
	Annual arithmetic mean	20 µg/m^3	50 µg/m^3	35 µg/m^3
$PM_{2.5}$	24-hour	NA	35 µg/m^3	35 µg/m^3
	Annual arithmetic mean	12 µg/m^3	15 µg/m^3	15 µg/m^3
CO	1-hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	NA
	8-hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	NA
	8-hour (Lake Tahoe)	6 ppm (7 mg/m^3)	NA	NA
NO_2	1-hour	0.18 ppm (339 µg/m^3)	NA	NA
	Annual arithmetic mean	0.030 ppm (57 µg/m^3)	0.053 ppb (100 µg/m^3)[8]	0.053 ppm (100 µg/m^3)
SO_2	1-hour	0.25 ppm (655 µg/m^3)	NA	NA
	3-hour	NA	NA	0.5 ppm (1,300 µg/m^3)[9]
	24-hour	0.04 ppm (105 µg/m^3)	0.14ppm (365 µg/m$^{3)}$	NA
Lead[10]	30-day	1.5 µg/m^3	NA	NA
	Rolling 3-month[11]	NA	0.15 µg/m^3	0.15 µg/m^3
	Quarterly	NA	1.5 µg/m^3	1.5 µg/m^3

Sources: CARB, 2013; U.S. EPA, 2014

Key: mg/m^3 = milligrams per cubic meter, µg/m^3 = micrograms per cubic meter, ppb = parts per billion, NA = not applicable

Notes:

1. The CAAQS for O_3, PM_{10}, $PM_{2.5}$, CO (except Lake Tahoe), NO_2, SO_2 (1- and 24-hour), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. The CAAQS are listed in the Table of Standards in Title 17, Section 70200 of the California Code of Regulations.
2. The NAAQS (other than O_3, PM_{10}, $PM_{2.5}$, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m^3 is equal to or less than 1. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard.
3. Concentrations are expressed first in the units in which they were promulgated. Equivalent units given in parentheses are based on a reference temperature of 25° Celsius (°C) and a reference pressure of 760 torr (1 torr is the pressure approximately exerted by 1 millimeter of mercury).

Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent procedure that can be shown to the satisfaction of the CARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality deemed necessary, with an adequate margin of safety, to protect the public health.
6. National Secondary Standards: The levels of air quality deemed necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the EPA. An "equivalent method" of measurement may be used, but must have a "consistent relationship to the reference method" and must be approved by the EPA.
8. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010). Note that the EPA standards are in units of ppb, and California standards are in units of ppm. To directly compare the NAAQS to the CAAQS, the units can be converted from ppb to ppm. In this case, the NAAQS of 53 ppb and 100 ppb are identical to 0.053 ppm and 0.100 ppm, respectively.
9. On June 9, 2010, the EPA established a new 1-hour SO_2 standard, effective August 23, 2010, which is based on the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations. The EPA also proposed a new automated Federal Reference Method using ultraviolet technology, but will retain the older pararosaniline methods until the new Federal Reference Method has adequately permeated state monitoring networks. The EPA also revoked both the existing 24-hour SO_2 standard of 0.14 ppm and the annual primary SO_2 standard of 0.030 ppm, effective August 23, 2010. The secondary SO_2 standard was not revised at that time; however, the secondary standard is undergoing a separate review by the EPA. Note that the new national standard is in units of ppb, and CAAQS are in units of ppm. To directly compare the new primary national standard to the California standard, the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
10. The CARB has identified lead and vinyl chloride as TACs with no threshold level of exposure for adverse health effects established. These actions allow for implementation of control measures at levels below the ambient concentrations specified for these pollutants.
11. National lead standard, rolling 3-month average; final rule signed October 15, 2008.

CARB also regulates mobile emission sources in California (e.g., construction equipment, trucks, and automobiles) and oversees the air districts. Relevant programs related to the oversight of mobile source emissions include the Off-Road and On-Road Mobile Sources Emission Reduction Programs, the Portable Equipment Registration Program (PERP), and the Airborne Toxic Control Measure for Diesel Particulate Matter (DPM) from Portable Engines. The Mobile Sources Emission Reduction programs are aimed at reductions of PM_{10}, CO, NO_x, and VOCs. CARB has also adopted specific control measures for the reduction of DPM from off-road, in-use diesel vehicles (rated 25 horsepower and higher), such as backhoes, bulldozers, and earthmovers used in construction projects. Additional DPM control measures are also in place for heavy-duty, on-road diesel trucks operated by public utilities and municipalities. The PERP and Airborne Toxic Control Measure for DPM from Portable Engines provide for statewide registration and control of DPM from portable engines rated 50 horsepower and higher.

4.3.2.3 Local

The California Public Utilities Commission (CPUC) has sole and exclusive state jurisdiction over the siting and design of the Proposed Project. Pursuant to CPUC General Order No. 131-D, Section XIV.B, “Local jurisdictions acting pursuant to local authority are preempted from regulating electric power line projects, distribution lines, substations, or electric facilities constructed by public utilities subject to the CPUC’s jurisdiction. However, in locating such projects, the public utilities shall consult with local agencies regarding land use matters.” Consequently, public utilities are directed to consider local regulations and consult with local agencies, but the counties and cities’ regulations are not applicable as the counties and cities do not have jurisdiction over the Proposed Project. Accordingly, the following discussion of local land use regulations is provided for informational purposes only.

City of Chino

The Air Quality Element of the City of Chino General Plan includes goals and policies for improving air quality within the region. The city has the following objectives for addressing air quality improvement:

- Improve air quality through land use and transportation planning decisions.
- Support local and regional air quality improvement efforts.
- Reduce air pollution during construction and operations of a project.
- Promote healthy indoor air quality.

City of Corona

The Environmental Resources Element of the City of Corona General Plan contains policies related to improving air quality at the local level. The city has the following goals for addressing air quality:

- Improve air quality conditions within the Corona Planning Area by controlling point sources, reducing vehicle trips, and striving to achieve standards as enforced by the SCAQMD.

- Reduce vehicle trip generation within the City of Corona and its planning area through transit, shuttle, carpool, and cycling facilities.

- Reduce criteria air pollutant emissions through more efficient land use planning and construction practices.

- Reduce air quality degradation through energy conservation.

City of Eastvale

The Air Quality and Conservation Element of the City of Eastvale General Plan contains policies for improving air quality and conserving energy. Specific policies include the following:

- Obtain air quality that meets or exceeds all federal and state standards.
- Provide safe and reliable energy, including energy from renewable sources, to meet the city's needs and enable continued economic growth.

City of Ontario

The Environmental Resources Element of the City of Ontario General Plan includes policies for improving air quality and reducing pollution sources within the city. Specific policies include the following:

- Reduce local pollutant emissions through compact, mixed use, and development that improves the transit and regional jobs-housing balance.
- Prohibit the future siting of sensitive land uses, within the distances defined by CARB for specific source categories, without sufficient mitigation.
- Promote mass transit and non-motorized mobility options.
- Support efforts to reduce PM to meet federal and state clean air standards.
- Collaborate with other agencies within the SoCAB to improve regional air quality at the emission source.

South Coast Air Quality Management District

The air districts are primarily responsible for regulating stationary emission sources at industrial and commercial facilities within their respective geographic areas, and for preparing the air quality plans required under the CAA and CCAA. The Proposed Project area is located within the SoCAB, and the SCAQMD has jurisdictional control over the entire basin. The SCAQMD stipulates rules and regulations with which all projects must comply. In addition, the SCAQMD provides methodologies for analyzing a project's impacts under the California Environmental Quality Act (CEQA). The following plans, rules, and regulations apply to all sources within the SCAQMD's jurisdiction.

2012 Air Quality Management Plan

The SCAQMD is required to prepare an Air Quality Management Plan (AQMP) that outlines policies and practices intended to achieve attainment levels for criteria pollutants and avoid future levels that exceed applicable standards. The AQMP is updated periodically to meet the federal requirements and/or to incorporate the latest technical planning information. Each iteration of the plan is an update of the previous plan.

The SCAQMD has developed the 2012 AQMP, which is a regional and multi-agency effort to develop control methods, demonstrate attainment progress, and establish maintenance strategies. The 2012 AQMP builds on the 2007 AQMP by incorporating the latest scientific and technical information and planning assumptions, including the 2012 Regional Transportation Plan/Sustainable Communities Strategy, updated emission inventory methodologies for various source categories, and the latest growth forecasts by the Southern California Association of Governments (SCAG).

South Coast Air Quality Management District Rules and Regulations

Rule 403 – Fugitive Dust of the SCAQMD Rules and Regulations prohibits construction activities from generating visible dust over 20 percent opacity or beyond the property line. To minimize fugitive dust emissions, the rule requires construction activities to use the best available control measures, which may include the following:

- Stabilizing disturbed areas with water, chemical stabilizer, or by covering the areas with a tarp or other suitable cover
- Covering materials transported off site or stabilizing the transported materials while maintaining at least 6 inches of freeboard space from the top of the container
- Limiting traffic speeds on unpaved roads to 15 miles per hour

These actions are required for all projects within the SoCAB that are capable of generating fugitive dust.

4.3.3 Significance Criteria

The significance criteria for assessing the impacts to air quality are derived from the CEQA Environmental Checklist. According to the CEQA Environmental Checklist, a project causes a potentially significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state AAQS (including releasing emissions which exceed quantitative thresholds for O_3 precursors)
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting a substantial number of people

The SCAQMD adopted the CEQA Air Quality Handbook in 1993, and the handbook’s purpose is to provide a framework for preparing air quality evaluations for environmental documents.

The handbook recommends specific criteria and threshold levels for determining whether a proposed project may have a significant adverse air quality impact.

CEQA significance thresholds that have been adopted by the SCAQMD are listed in Table 4.3-4: SCAQMD Thresholds of Significance for Criteria Air Pollutants. Although ambient air quality standards have not been established for NO_x or VOCs, they have air quality significance thresholds because they react in the atmosphere to form O_3.

Table 4.3-4: SCAQMD Thresholds of Significance for Criteria Air Pollutants

Pollutant	Construction (pounds per day)	Operation (pounds per day)
PM_{10}	150	150
$PM_{2.5}$	55	55
CO	550	550
NO_x	100	55
SO_x	150	150
VOCs	75	55

Source: SCAQMD, 2014i

4.3.4 Impact Analysis

4.3.4.1 Would the project conflict with or obstruct implementation of the applicable air quality plan? – No Impact

The AQMP provides a roadmap for meeting the current AAQS. The control measures included in the AQMP are developed by projecting the current emissions inventory to future years; evaluating the impacts of projected emissions on ambient air quality through air quality modeling; determining the required reduction in these emissions needed to attain the standards; and devising control measures that will achieve those emission reductions. The 2012 AQMP demonstrates that the applicable AAQS can be achieved within the timeframes required under federal law.

Growth projections from local general plans adopted by cities in the district and vehicle miles-traveled projections developed by the SCAG are some of the inputs used to develop the AQMP. Generally, a project may be inconsistent with the applicable AQMP or attainment plan if it could cause population and/or employment growth or growth in vehicle-miles traveled in excess of the growth forecasts included in the attainment plan. Construction and operation of the Proposed Project would not result in a population increase; therefore, the Proposed Project would not conflict with the growth projections in the AQMP. Chapter 6 – Other CEQA Considerations contains a discussion of the potential for growth-inducing impacts. Construction and operation of the Proposed Project would not conflict with the implementation of the 2012 AQMP and, therefore, there would be no impact.

4.3.4.2 Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Construction – Significant and Unavoidable Impact

As described in Attachment 4.3-A: Air Quality Calculations, peak daily emissions during construction were estimated for comparison with the SCAQMD's significance thresholds to evaluate whether construction could cause or contribute to regional violations of air quality standards. The projected emissions were developed by applying pollutant emission factors from the SCAQMD to construction equipment and Proposed Project parameters provided in Chapter 3 – Project Description. In order to evaluate a worst-case scenario, activities that are likely to occur simultaneously during the construction of each Proposed Project component were grouped together and emissions were totaled. The resulting maximum emissions for each component are summarized in Table 4.3-5: Peak Daily Uncontrolled Construction Emissions. Because each Proposed Project component may potentially be constructed at the same time, these maximum group emissions were then totaled to obtain an estimate of the peak daily emissions.

Table 4.3-5: Peak Daily Uncontrolled Construction Emissions

Proposed Project Component	Peak Simulated Construction Emissions (pounds/day)					
	PM_{10}	$PM_{2.5}$	CO	NO_x	SO_x	VOCs
Circle City Substation	64.11	9.13	96.31	139.54	0.24	13.11
Mira Loma Substation	7.14	0.95	9.51	21.95	0.03	1.81
Proposed Source Line Route 1 and Source Line Route Alternative 2	131.81	12.20	114.60	229.38	0.33	19.68
Mira Loma-Jefferson 66 kV Subtransmission Line	624.19	28.74	153.17	290.55	0.43	26.72
Telecommunication Facilities	17.40	1.18	9.61	22.23	0.03	1.79
Total	**844.65**	**52.20**	**383.21**	**703.65**	**1.06**	**63.12**
Threshold	150	55	550	100	150	75
Threshold Exceeded?	**Yes**	**No**	**No**	**Yes**	**No**	**No**

The simulated peak emissions of PM_{10}, and NO_x during construction activities would exceed corresponding SCAQMD daily significance thresholds, and emissions of these pollutants during construction may contribute to regional air quality violations. The majority of CO, NO_x, and VOCs would be emitted from on-site construction equipment used during installation of the Proposed Project. The majority of PM_{10} and $PM_{2.5}$ emissions would result from earth-moving activities and vehicle travel on unpaved and paved roads.

To reduce temporary fugitive dust emissions, Southern California Edison (SCE) would implement Applicant-Proposed Measure (APM-) AIR-01, which would require that all unpaved construction areas, including unpaved access roads, must be stabilized using water or an approved tackifier. In addition, vehicle speeds on unpaved access roads would be limited to 15 miles per hour (mph). SCE would also comply with SCAQMD's Rule 403 – Fugitive Dust, which is designed to reduce the amount of PM emitted into the atmosphere as a result of man-made fugitive dust sources. Best available control measures, as required by Rule 403, would be implemented during construction of the Proposed Project. In addition, emissions from construction equipment and vehicle use would be reduced by complying with the CARB Off-Road Idling Policy, which restricts most occurrences of off-road equipment engine idling to fewer than 5 minutes. SCE would also implement APM-AIR-02, which would require the use of off-road equipment that complies with U.S. EPA Tier 3 non-road engine standards to the extent feasible. Table 4.3-6: Peak Daily Controlled Construction Emissions summarizes the anticipated construction emissions with the implementation of these control measures. With these control measures, the SCAQMD thresholds of significance for PM_{10} and NO_x would continue to be exceeded, and the Proposed Project would have a potentially significant impact on air quality.

Table 4.3-6: Peak Daily Controlled Construction Emissions

Proposed Project Component	Peak Simulated Construction Emissions (pounds/day)					
	PM_{10}	$PM_{2.5}$	CO	NO_x	SO_x	VOCs
Circle City Substation	22.98	7.19	115.34	98.56	0.24	8.63
Mira Loma Substation	2.57	0.71	14.37	10.03	0.03	0.92
Proposed Source Line Route 1 and Source Line Route Alternative 2	43.61	9.92	155.98	127.48	0.33	10.97
Mira Loma-Jefferson 66 kV Subtransmission Line	182.10	25.49	203.10	160.83	0.43	15.27
Telecommunication Facilities	5.60	1.14	15.75	13.28	0.03	1.31
Total	**256.86**	**44.46**	**504.54**	**410.18**	**1.06**	**37.10**
Threshold	150	55	550	100	150	75
Threshold Exceeded?	**Yes**	**No**	**No**	**Yes**	**No**	**No**

Operation – Less-than-Significant Impact

Peak daily emissions during Proposed Project operation were estimated. Table 4.3-7: Peak Daily Operation Emissions compares these simulated emissions against the SCAQMD's significance thresholds for operation. A detailed discussion of the calculation methodology for operation emissions is provided in Attachment 4.3-A: Air Quality Calculations. Operation emissions result from vehicles driven by employees during routine maintenance inspections. The operation emissions were calculated as a worst-case scenario and, therefore, all Proposed Project components were assumed to be inspected simultaneously on the same potential peak day. As shown in Table 4.3-7: Peak Daily Operation Emissions, operation of the Proposed Project would not exceed any of the applicable SCAQMD thresholds. As a result, these emissions would not contribute to an existing or projected air quality violation, and impacts would be less than significant.

Table 4.3-7: Peak Daily Operation Emissions

Proposed Project Component	Peak Simulated Operation Emissions (pounds/day)					
	PM_{10}	**$PM_{2.5}$**	**CO**	**NO_x**	**SO_x**	**VOCs**
Circle City Substation	2.67	0.82	16.78	1.60	0.03	1.88
Proposed Source Line Route and Source Line Route Alternative 2/ Telecommunication Facilities	0.02	0.01	0.11	0.01	< 0.01	0.01
Mira Loma-Jefferson 66 kV Subtransmission Line	14.75	1.48	0.27	0.03	< 0.01	0.03
Total	**17.44**	**2.31**	**16.78**	**1.64**	**0.03**	**1.92**
Threshold	150	55	550	55	150	75
Threshold Exceeded?	**No**	**No**	**No**	**No**	**No**	**No**

4.3.4.3 Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Construction – Potentially Significant Impact

The SoCAB is classified as nonattainment for O_3, PM_{10} and $PM_{2.5}$. As shown in Table 4.3-6: Peak Daily Controlled Construction Emissions, peak daily controlled emissions of NO_x—an O_3 precursor—would exceed the SCAQMD's significance thresholds. Therefore, construction of the Proposed Project could result in a cumulatively considerable net increase of O_3 precursors. As a result, impacts would be potentially significant.

Operation – Less-than-Significant Impact

As summarized in Table 4.3-7: Peak Daily Operation Emissions, peak daily emissions from vehicle maintenance trips would not exceed the applicable SCAQMD's significance thresholds. SCE currently operates and inspects existing subtransmission facilities in the vicinity of the Proposed Project and these activities would not change as a result of the construction of the Proposed Project. As a result, operation of the Proposed Project would not result in a cumulatively considerable increase of nonattainment criteria pollutants; therefore, impacts would be less than significant.

4.3.4.4 Would the project expose sensitive receptors to substantial pollutant concentrations?

Construction – Potentially Significant Impact

The SCAQMD's Localized Significance Threshold Methodology was used to evaluate the potential impacts to sensitive receptors during construction of the Proposed Project. As detailed in Attachment 4.3-A: Air Quality Calculations, this analysis consists of comparing maximum daily on-site PM_{10}, $PM_{2.5}$, CO, and NO_x emissions at individual locations with maximum allowable emissions in the look-up tables provided in the SCAQMD methodology. The methodology takes into consideration the location of the site within the SoCAB, the disturbed area at each site, and the distance from the site to the nearest sensitive receptor. Table 4.3-8: Peak On-Site Uncontrolled Construction Emissions compares the maximum uncontrolled daily on-site emissions for the construction of each Proposed Project component with the maximum allowable emissions from the SCAQMD's look-up tables.

Table 4.3-8: Peak On-Site Uncontrolled Construction Emissions

Proposed Project Component	Peak On-Site Emissions (pounds/day)			
	PM_{10}	$PM_{2.5}$	CO	NO_X
Circle City Substation	19.9	5.9	66.7	130.7
Threshold	14	5	3,964	378
Exceeded?	**Yes**	**Yes**	**No**	**No**
Mira Loma Substation	2.3	0.8	5.8	21.4
Threshold	55	28	22,490	778
Exceeded?	**No**	**No**	**No**	**No**
Proposed Source Line Route	10.9	2.5	22.2	65.2
Threshold	1	1	674	118
Exceeded?	**Yes**	**Yes**	**No**	**No**
Mira Loma-Jefferson 66 kV Subtransmission Line	11.0	2.8	22.3	65.2
Threshold	1	1	647	118
Exceeded?	**Yes**	**Yes**	**No**	**No**
Telecommunication Facilities	2.8	0.6	3.9	17.9
Threshold	1	1	647	118
Exceeded?	**Yes**	**No**	**No**	**No**

As shown in Table 4.3-8: Peak On-Site Uncontrolled Construction Emissions, maximum daily on-site construction emissions would not exceed the maximum allowable emissions for CO and NO_X. Because the NAAQS and CAAQS provide the levels—with a margin of safety—that are considered safe for public health, construction of the Proposed Project would not expose sensitive receptors to substantial concentrations of these pollutants. However, Table 4.3-8: Peak On-Site Uncontrolled Construction Emissions indicates that the localized emissions of PM_{10} and $PM_{2.5}$ would exceed the applicable thresholds during construction of the proposed Circle City Substation, modifications to the existing Mira Loma Substation, and construction of the proposed Source Line Route. As a result, sensitive receptors in these locations may be exposed to potentially significant concentrations of PM.

This analysis was repeated with the implementation of APM-AIR-01 and APM-AIR-02, which would control fugitive dust emissions through the application of water or other chemical tackifiers to unpaved areas and require the use of equipment that complies with the U.S. EPA Tier 3 non-road engine standards. As shown in Table 4.3-9: Peak On-Site Controlled Construction Emissions, the Proposed Project would continue to exceed applicable thresholds for PM_{10} and $PM_{2.5}$ with these control measures implemented. As a result, sensitive receptors in these locations may be exposed to potentially significant concentrations of PM with the implementation of APM-AIR-01 and APM AIR-02, and impacts would be potentially significant.

Table 4.3-9: Peak On-Site Controlled Construction Emissions

Proposed Project Component	Peak On-Site Emissions (pounds/day)			
	PM_{10}	**$PM_{2.5}$**	**CO**	**NO_X**
Circle City Substation	18.2	4.6	85.8	73.7
Threshold	14	5	3,964	378
Exceeded?	**Yes**	**No**	**No**	**No**
Mira Loma Substation	2.0	0.5	10.6	9.5
Threshold	55	28	22,490	778
Exceeded?	**No**	**No**	**No**	**No**
Proposed Source Line Route	8.6	2.0	37.7	33.8
Threshold	1	1	674	118
Exceeded?	**Yes**	**Yes**	**No**	**No**
Mira Loma-Jefferson 66 kV Subtransmission Line	9.0	2.1	37.7	33.9
Threshold	1	1	647	118
Exceeded?	**Yes**	**Yes**	**No**	**No**
Telecommunication Facilities	2.8	0.6	10.0	9.0
Threshold	1	1	647	118
Exceeded?	**Yes**	**No**	**No**	**No**

Operation – Less-than-Significant Impact

As shown in Table 4.3-7: Peak Daily Operation Emissions, emissions that are generated during operation of the Proposed Project would be extremely small when compared to the SCAQMD significance thresholds. In addition, SCE currently operates existing facilities adjacent to the Proposed Project, and these operational activities would not change following construction. The emissions presented would also be distributed along the proposed Source Line Route and the Mira Loma-Jefferson 66 kV Subtransmission Line Route. As a result, operation of the Proposed Project would not cause or contribute to a localized exceedance of an air quality standard.

Therefore, sensitive receptors would not be exposed to substantial pollutant concentrations, and impacts would be less than significant.

4.3.4.5 Would the project create objectionable odors affecting a substantial number of people? – Less-than-Significant Impact

Typical odor nuisances include hydrogen sulfide, ammonia, chlorine, and other sulfide-related emissions. No significant sources of these pollutants would exist during construction. An additional potential source of Proposed Project-related odor is diesel engine emissions. As previously described, there are residences located adjacent to the Proposed Project alignment. However, because there would be few sources of odor and construction would be short-term along the proposed Source Line Route and Mira Loma-Jefferson 66 kV Subtransmission Line (lasting a few days at each receptor), impacts due to odor would be less than significant. The nearest receptors at the proposed Circle City Substation site would be located more than 250 feet from construction activities; therefore, there would be no impact due to odor.

As previously described, SCE currently operates existing facilities adjacent to the Proposed Project, and these activities would not change following construction. Operation of the proposed Circle City Substation would involve the use of passenger vehicles visiting the site weekly, which already occurs in the area for SCE's existing lines. As a result, impacts due to odor would be less than significant.

4.3.5 Applicant-Proposed Measures

SCE would adhere to the requirements of SCAQMD's Rule 403 and CARB's Off-Road Idling Policy during construction of the Proposed Project. The following APMs would also be implemented to reduce temporary criteria air pollutant emissions during construction:

- **APM-AIR-01: Fugitive Dust.** During construction, surfaces disturbed by construction activities would be covered or treated with a dust suppressant until completion of activities at each site of disturbance. On-site unpaved roads and off-site unpaved access roads utilized during construction within the Proposed Project area would be effectively stabilized (e.g., using water or chemical stabilizer/suppressant) to control dust emissions. On-road vehicle speeds on unpaved roadways would be restricted to 15 mph.

- **APM-AIR-02: Tier 3 Engines.** Off-road diesel construction equipment with a rating between 100 and 750 horsepower would be required to use engines compliant with U.S. EPA Tier 3 non-road engine standards. In the event that a Tier 3 engine is not available, the equipment would be equipped with a Tier 2 engine and documentation would be provided from a local rental company stating that the rental company does not currently have the required diesel-fueled off-road construction equipment, or that the vehicle is specialized and is not available to rent. Similarly, if a Tier 2 engine is not available, that equipment would be equipped with a Tier 1 engine and documentation of the unavailability would be provided.

4.3.6 Alternative Substation Site

Substation Site Alternative B would also be located within an area under the jurisdiction of the SCAQMD, and its construction and operation would be similar in scope to that of the proposed Circle City Substation site (i.e., Substation Site Alternative A). Construction and operation of Substation Site Alternative B would have similar impacts to the proposed Circle City Substation site. Substation Site Alternative B would be located approximately 115 feet closer to the nearby sensitive receptors than the proposed Circle City Substation site. Construction impacts would be potentially significant, and operational impacts would be less than significant.

4.3.7 Alternative Source Line Routes

The alternative source line routes would also be located within an area under the jurisdiction of the SCAQMD. While the construction activities would be similar in scope to that of the proposed Source Line Route, the Source Line Routes Alternatives 2 and 4 would involve installing a greater portion of the lines underground. This additional underground work would require increased ground disturbance and construction equipment use. As a result, construction of these alternatives would generate increased criteria air pollutant emissions and the resulting construction impacts would also be potentially significant and greater than the Proposed Project. Construction of Source Line Route Alternative 3 would be similar in scope to that of the proposed Source Line Route. Emissions related to the operation of these alternatives would be similar to that of the proposed Source Line Route, and operational impacts would be less than significant.

4.3.8 Alternative Mira Loma-Jefferson 66 kV Subtransmission Line Routes

Mira Loma-Jefferson 66 kV Subtransmission Line Route Alternatives 2 and 3 would also be located within an area under the jurisdiction of the SCAQMD. Construction of Alternative 3 would be similar in scope to the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route. As a result, construction impacts associated with Alternative 3 would be potentially significant. Construction of Alternative 2 would involve installing a greater portion of the line underground. This additional underground work would require increased ground disturbance and construction equipment use. As a result, construction of Alternative 2 would generate increased criteria air pollutant emissions, and the resulting construction impacts would also be potentially significant. Emissions related to the operation of Alternative 2 and Alternative 3 would be similar to the proposed Mira Loma-Jefferson 66 kV Subtransmission Line Route and operational impacts would be less than significant.

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ATTACHMENT 4.3-A: AIR QUALITY CALCULATIONS

ATTACHMENT 4.3-A: AIR QUALITY CALCULATIONS

1.0 Introduction

The following analyses were performed to evaluate the potential for impacts to air quality and greenhouse gas (GHG) from the construction and operation of the Circle City Substation and Mira Loma-Jefferson Subtransmission Line Project (Proposed Project):

- Total peak daily emissions for the construction and operation phases for the following criteria air pollutants were calculated and compared to the South Coast Air Quality Management District's (SCAQMD's) significance thresholds for regional air quality impacts:
  - Volatile organic compounds (VOC)
  - Carbon monoxide (CO)
  - Nitrogen oxides (NO_x)
  - Sulfur oxides (SO_x)
  - Particulate matter (PM) less than 10 microns in diameter (PM_{10})
  - PM less than 2.5 microns in diameter ($PM_{2.5}$)
- On-site peak daily emissions for the construction phase for the following criteria air pollutants were calculated and compared to the SCAQMD's localized significance thresholds (LSTs) for impacts to sensitive receptors:
  - CO
  - NO_x
  - PM_{10}
  - $PM_{2.5}$
- Total emissions for the construction and operation phases for the following GHGs were calculated and compared to applicable thresholds of significance from the SCAQMD and California Air Resources Board (CARB) to evaluate the potential for cumulative impacts:
  - Carbon dioxide (CO_2)
  - Methane (CH_4)
  - Sulfur hexafluoride (SF_6)

The emission sources considered and the calculation methodology for each of these sources is described in the sections that follow.

1.1 Emission Sources

Construction emissions were divided into two categories—on-site and off-site—for preparation of the analyses described in Section 1.0 Introduction. On-site construction emissions consist of tailpipe emissions from construction equipment and vehicles used at active construction areas, fugitive dust emissions from earthwork activities, and entrained PM emissions from vehicle and equipment travel on paved and unpaved roads. Off-site emissions consist of tailpipe emissions and entrained PM emissions from roadways during travel to and from active construction areas.

For the operation phase, all emissions were combined to present a worst-case scenario. In addition to the aforementioned sources, fugitive SF_6 emissions from the circuit breakers installed at the proposed Circle City Substation were also calculated.

1.1.1 Off-Road Equipment Exhaust Emissions

Exhaust emissions from off-road equipment use were calculated using the following equation:

$$E_{i,j} = EF_{i,j} \times H_j \times N_j$$

Where:

$E_{i,j}$ = Emissions of pollutant *i* from equipment type *j* (pounds/day)

$EF_{i,j}$ = Emission factor for pollutant *i* from equipment type *j* (pounds/operating hour)

H_j = Daily operating time for equipment type *j* (hours/day)

N_j = Number of pieces of equipment of type *j*

The emission factors used for this calculation were obtained from the California Emissions Estimator Model (CalEEMod) version 2013.2.2. A CalEEMod simulation was prepared by generating a single construction phase for each type of equipment, by horsepower rating, that would be used for the Proposed Project. During each phase, the matching piece of equipment was run for 100 hours each day. The resulting outputs were then divided by 100 to obtain the final emission factors.[1] These emission factors are provided in Table 1: Off-Road Equipment Uncontrolled Emission Factors. This simulation also included mitigation requiring all pieces of equipment to utilize engines that comply with U.S. EPA Tier 3 specifications. The resulting Tier 3 emission factors are provided in Table 2: Off-Road Equipment Controlled Emission Factors.

1.1.2 On-Road Vehicle Exhaust Emissions

Exhaust emissions from on-road vehicle use were calculated using the following equation:

$$E_{i,j} = EF_{i,j} \times VMT_j \times N_j$$

Where:

$E_{i,j}$ = Emissions of pollutant *i* from motor vehicle type *j* (pounds/day)

$EF_{i,j}$ = Emission factor for pollutant *i* from motor vehicle type *j* (pounds/mile)

[1] A total of 10 pieces of equipment were assumed to operate for 10 hours per day.

VMT_j = Daily vehicle-miles-traveled (VMT) for motor vehicle type j (miles/day)

N_j = Number of motor vehicles of type j

The emission factors used for this calculation were obtained from the SCAQMD and were derived from the CARB's EMFAC 2007 BURDEN model. The emission factors were derived by dividing the total daily district-wide emissions by total daily VMT to obtain emission factors in pounds per mile traveled. Emission factors were derived for gasoline-fueled passenger/light-duty vehicles and diesel-fueled medium-/heavy-duty vehicles by taking the weighted average of vehicle types and simplifying them into two categories—passenger/light-duty and medium-/heavy-duty vehicles (e.g., delivery trucks). Emission factors were also derived for heavy heavy-duty diesel-fueled trucks, which have a vehicle weight ranging between 33,001 and 60,000 pounds.

The CARB's EMFAC 2007 BURDEN model provides factors for VOCs, CO, NO_x, SO_x, PM, CO_2, and CH_4. All PM emissions were considered to be PM_{10}, and 92 percent of PM emissions were considered to be $PM_{2.5}$. These emission factors are provided in Table 3: On-Road Vehicle Emission Factors.

1.1.3 Earthwork PM Emissions

Soil disturbance during excavation and grading activities generates fugitive PM emissions from soil dropping during transfers and bulldozing, scraping, and grading. The following equation was used to calculate daily emissions from soil dropping during construction:

$$E_i = EF_i \times V_s$$

Where:

E_i = Emissions of pollutant i (PM_{10} or $PM_{2.5}$) from soil dropping (pounds/day)

EF_i = Emission factor for pollutant i from soil dropping (pounds/cubic yard)

V_s = Volume of soil dropped (cubic yards/day)

The following equation was used to calculate the emission factor for PM emissions during soil dropping:

$$EF_i = f_i \times 0.011 \times \frac{\left(\frac{WS}{5}\right)^{1/3}}{\left(\frac{M}{2}\right)^{1.4}} \times N_s \times D_s$$

Where:

EF_i = Emission factor for fugitive PM emissions from soil dropping

f_i = Mass fraction of pollutant i (PM_{10} or $PM_{2.5}$) in PM emissions from soil dropping

WS = Mean wind speed (miles/hour)

M = Soil moisture content (percent by weight)

N_s = Number of times each cubic yard is dropped (number/day)

D_s = Soil density (tons/cubic yard)

The following equation was used to calculate daily emissions from bulldozing, scraping, and grading:

$$E_i = EF_i \times H_G$$

Where:

E_i = Emissions of pollutant *i* (PM_{10} or $PM_{2.5}$) from bulldozing, scraping, and grading (pounds/day)

EF_i = Emission factor for pollutant *i* from bulldozing, scraping, and grading (pounds/hour)

H_G = Daily bulldozing, scraping, and grading (hours/day)

The following equation was used to calculate the emission factor for PM emissions during bulldozing, scraping, and grading:

$$EF_i = f_i \times 0.75 \times \frac{s^{1.5}}{M^{1.4}} \times \left(1 - \frac{CE}{100}\right)$$

Where:

EF_i = Emission factor for fugitive PM emissions from bulldozing, scraping, and grading

f_i = Mass fraction of pollutant *i* (PM_{10} or $PM_{2.5}$) in PM emissions from bulldozing, scraping, and grading

s = Material silt content (weight percent)

M = Soil moisture content (percent by weight)

CE = Control efficiency

A control efficiency of 55 percent was used for both earthwork calculations to account for the planned dust control measures.

1.1.4 Entrained PM Emissions

Motor vehicles entrain PM from the surfaces on which they travel. The following equation was used to calculate daily PM emissions from each type of motor vehicle used during the construction and operation phases of the Proposed Project:

$$E_{i,j,k} = EF_{i,j,k} \times VMT_{j,k} \times N_j$$

Where:

$E_{i,j,k}$ = Emissions of pollutant *i* (PM_{10} or $PM_{2.5}$) from motor vehicle type *j* traveling on surface type *k* (paved or unpaved) (pounds/day)

$EF_{i,j,k}$ = Emission factor for pollutant *i* from motor vehicle type *j* on surface type *k* (pounds/mile)

$VMT_{j,k}$ = Daily VMT for motor vehicle type *j* on surface type *k* (miles/day)

N_j = Number of motor vehicles of type *j*

Uncontrolled and controlled emission factors were obtained from CalEEMod. A simulation was developed by specifying a total of six construction phases—paved and unpaved options for passenger, vendor, and delivery activities. One vehicle, traveling 100 miles each day, was run for each corresponding construction phase, generating the required emission factors. These factors are presented in Table 4: Entrained Road Dust Emission Factors.

1.1.5 Fugitive SF_6 Emissions

The new circuit breakers that would be installed at the proposed Circle City Substation would be insulated with SF_6. The following equation was used to calculate the annual emissions due to the leaking of SF_6 gas during operation:

$$E = \frac{L}{100} \times M_{SF_6}$$

Where:

E = SF_6 emission from leakage (pounds of SF_6/year)

L = SF_6 leak rate (percent/year)

1.2 Peak Daily Emissions Calculations

Peak daily emissions during construction and operation of the Proposed Project were calculated for comparison with the SCAQMD's significance thresholds. The calculations for construction and operation peak daily emissions are discussed in the subsections that follow.

1.2.1 Peak Daily Construction Emissions

The following emission sources were calculated during the construction phase for each Proposed Project component:

- Daily emissions for each piece off-road construction equipment
- Daily emissions for on-road vehicle travel
- Fugitive PM emissions for earthwork
- Entrained PM emissions for vehicle travel

Construction activities within each Proposed Project component with the potential to occur simultaneously were collected into groups and the emissions from each activity in each group were summed together. To develop a worst-case scenario, the maximum group emissions from each Proposed Project component was then summed to develop the peak daily emissions. The activities and their respective groups are provided in the table that follows. The results of these calculations are provided in Table 5: Uncontrolled Off-Road Equipment Emissions and Table 6: Controlled Off-Road Equipment Emissions, Table 7: On-Road Vehicle Emissions, Table 8: Earthwork Emissions, and Table 9: Entrained Vehicle Travel Emissions.

1.2.2 Peak Daily Operation Emissions

The following emission sources were calculated during the operation phase for each Proposed Project component:

- Daily emissions for on-road vehicle travel
- Entrained PM emissions for vehicle travel

To develop a worst-case scenario, the emissions from these sources at all Proposed Project components were then summed to develop the peak daily emissions. Both on- and off-site emissions were included in this calculation. The calculations are provided in Table 10: Operational Emissions.

1.3 On-Site Peak Daily Emissions

The SCAQMD has developed look-up tables that can be used to evaluate the potential for construction emissions to cause localized exceedances of the ambient air quality significance thresholds. This localized significance threshold (LST) analysis consists of comparing maximum daily on-site CO, NO_x, PM_{10}, and $PM_{2.5}$ emissions at individual locations with maximum allowable emissions obtained from the look-up tables. The maximum allowable emissions in the tables depend on the location within the South Coast Air Basin, the size (disturbed area) of the construction activities, and the distance from the construction site boundary to the nearest receptor. Receptors for the analysis include residences for PM_{10} and $PM_{2.5}$ and either residences or commercial locations for CO and NO_x.

Construction Activity	Activity Group[2]						
	1	2	3	4	5	6	7
Circle City Substation							
Survey	✓						
Grading	✓						
Soil Import / Export	✓						
Fencing		✓					
Temporary Power-Pole Installation		✓					
Civil		✓					
MEER		✓					
Electrical		✓	✓	✓	✓		
Wiring			✓	✓			
Transformers			✓				
Maintenance Crew Equipment Check				✓			
Testing				✓	✓		
Asphalting					✓		
Vault Installation		✓					
Trench/Duct Installation		✓					
Mira Loma Substation							
Civil	✓						
Electrical		✓					
Maintenance Commission		✓					
Test		✓					
Source Lines 1 and 2							
Survey	✓						
Marshaling Yard		✓	✓	✓	✓		
ROW Clearing		✓					
Road Work		✓					
Guard Structure Installation					✓		
Wood/H-Frame/LWS Pole Removal					✓		
Install TSP Foundation		✓	✓				
TSP Haul			✓	✓			
TSP Assembly			✓	✓			

[2] Activities with the same group number but associated with different Proposed Project components may or may not occur simultaneously.

Construction Activity	Activity Group[2]						
	1	2	3	4	5	6	7
TSP Erection			✓	✓			
Install Wood/LWS Pole				✓			
Install Conductor				✓	✓		
Guard Structure Removal					✓		
Restoration						✓	
Vault Installation				✓			
Duct Bank Installation				✓			
Location 1				✓			
Location 2				✓			
Mira Loma-Jefferson Subtransmission Line							
Survey	✓						
Marshaling Yard		✓	✓	✓	✓		
ROW Clearing		✓					
Road Work		✓					
Guard Structure Installation					✓		
Remove Exiting Conductor & Ground Wire					✓		
Wood/H-Frame/LWS Pole Removal					✓		
H-Frame Hybrid Pole Structure Removal					✓		
TSP Removal					✓		
TSP Foundation Removal					✓		
Install TSP Foundations		✓	✓				
TSP Haul			✓	✓			
TSP Assembly			✓	✓			
TSP Erection			✓	✓			
Wood/LWS Pole Haul				✓			
Wood/LWS Pole Assembly				✓			
Hybrid Pole Haul				✓			
Install H-frame Hybrid Pole Structure				✓			
Transfer & Install Conductor				✓	✓		
Guard Structure Removal					✓		
Restoration							✓
Vault Installation				✓			
Duct Bank Installation				✓			

Construction Activity	Activity Group[2]						
	1	2	3	4	5	6	7
Install Underground Cable						✓	
Location 1				✓			
Location 2				✓			
Location 3				✓			
Location 4				✓			
Location 5				✓			
Telecommunications Facilities							
Fiber Optic Cable Installation		✓					
Fiber Optic Cable Splicing		✓					
Underground Conduit	✓						

Daily on-site emissions during each Proposed Project component were calculated using the procedures described in Section 1.1 Emission Sources for use in the LST analysis for impacts during construction of the Proposed Project. All construction equipment usage and fugitive PM emissions from earthwork were assumed to occur on-site. On-site motor vehicle travel estimates used to calculate on-site vehicle exhaust and entrained particulate matter emissions are listed in and Table 7: On-Road Vehicle Emissions and Table 9: Entrained Vehicle Travel Emissions.

The SCAQMD look-up tables for the LST analysis list maximum daily allowable on-site emissions that will not cause LSTs to be exceeded for 1-, 2-, and 5-acre construction sites and for receptor distances from the boundary of 25, 50, 100, 200, and 500 meters. The values for a 5-acre site were used for the analyses for the Circle City and Mira Loma substation sites, and the values for a 1-acre site were used for construction of the other Proposed Project components. Because the work areas associated with construction of the source lines, subtransmission line, and telecommunications facilities are smaller in size, the maximum emissions from each construction activity were compared against the SCAQMD LSTs. The peak daily controlled and uncontrolled cumulative emissions were used for comparison at the substations. The results of this analysis are presented in Table 11: Uncontrolled LST Emissions and Thresholds and Table 12: Controlled LST Emissions and Thresholds, respectively.

Emissions during operation of the Proposed Project would be solely from motor vehicle travel to visit the Circle City Substation site and to inspect the source lines and subtransmission line. Since these emissions would not occur at a single location each day, they would not cause the LSTs to be exceeded.

1.4 Total GHG Emissions

GHG emissions during the construction and operation phases of the Proposed Project were calculated using the procedures described in Section 1.1.1 Off-Road Equipment Exhaust Emissions, Section 1.1.2 On-Road Vehicle Exhaust Emissions, and Section 1.1.5 Fugitive SF_6 Emissions. To prepare the CO_2 equivalent emissions, CH_4 and SF_6 emissions were multiplied by their respective global warming potentials and summed with the CO_2 emissions. For comparison with the operational significance thresholds, emissions from the construction phase were amortized over 30 years and then added to the annual operational emissions. The results of this analysis are presented in Table 13: Total GHG Emissions.

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Table 1: Off-Road Equipment Uncontrolled Emission Factors

Equipment Type	Engine Output (horsepower)	Equipment Category	Emission Factor (pounds per mile)							
			VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
165-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
15-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
17-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
20-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
3 Drum Sock Line Puller	300	Other Construction Equipment	0.0805	0.5892	1.0492	0.0014	0.0384	0.0353	139.2049	0.0427
30-ton Rough Terrain Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
40-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
50-ton Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
Asphalt Curb Machine	35	Paving Equipment	0.0257	0.1335	0.1313	0.0001	0.0100	0.0092	15.2405	0.0047
Asphalt Paver	152	Pavers	0.0547	0.4311	0.6127	0.0007	0.0301	0.0277	70.2262	0.0215
Backhoe/Front Loader	200	Tractors/Loaders/Backhoes	0.0475	0.2127	0.6592	0.0008	0.0215	0.0198	81.0563	0.0248
Bobcat	75	Skid Steer Loaders	0.0156	0.2030	0.2010	0.0003	0.0108	0.0099	30.4867	0.0093
Boom/Crane Truck	235	Cranes	0.0842	0.3583	0.9999	0.0007	0.0446	0.0410	75.0282	0.0230
Bucket Truck	350	Aerial Lifts	0.0588	0.2385	1.1141	0.0012	0.0250	0.0230	119.1893	0.0365
Bull Wheel Puller	300	Other Construction Equipment	0.0805	0.5892	1.0492	0.0014	0.0384	0.0353	139.2049	0.0427
Cable-pulling Truck with Single-axle Cable Dolly	9	Other Construction Equipment	0.0104	0.0471	0.0452	0.0000	0.0040	0.0037	4.6501	0.0014
Compressor Trailer	120	Air Compressors	0.0852	0.4790	0.5603	0.0008	0.0444	0.0444	72.1662	0.0076
Crane	300	Cranes	0.0787	0.6804	1.0035	0.0009	0.0407	0.0375	95.6017	0.0293
Drill Rig	500	Bore/Drill Rigs	0.0392	0.2490	0.5698	0.0011	0.0164	0.0151	111.6622	0.0342
Drum Type Compactor	250	Rollers	0.0574	0.2950	0.8212	0.0010	0.0271	0.0249	104.6572	0.0321
Earth Movers	350	Crawler Tractors	0.1277	0.8742	1.6687	0.0016	0.0646	0.0594	166.7015	0.0511
Excavator	152	Excavators	0.0419	0.3960	0.4649	0.0006	0.0229	0.0210	62.6460	0.0192
Forklift	100	Forklifts	0.0296	0.1754	0.2565	0.0002	0.0212	0.0195	21.9459	0.0067
Medium Duty Splicing Lab Truck	15	Generator Sets	0.0171	0.0881	0.1186	0.0002	0.0061	0.0061	13.9070	0.0015
Motor Grader	350	Graders	0.1057	0.5402	1.1253	0.0015	0.0441	0.0405	157.7386	0.0483
Paving Roller	46	Rollers	0.0462	0.1984	0.1965	0.0002	0.0168	0.0154	21.3887	0.0066
Puller	300	Other Construction Equipment	0.0805	0.5892	1.0492	0.0014	0.0384	0.0353	139.2049	0.0427
Reach Manlift	50	Aerial Lifts	0.0071	0.1083	0.1186	0.0002	0.0027	0.0025	18.0395	0.0058
Road Grader	350	Graders	0.1057	0.5402	1.1253	0.0015	0.0441	0.0405	157.7386	0.0483
Rough Terrain Crane	350	Cranes	0.0918	0.7938	1.1707	0.0011	0.0475	0.0437	111.5353	0.0342
Rough Terrain Forklift	200	Forklifts	0.0437	0.1845	0.5072	0.0004	0.0222	0.0204	44.0591	0.0135

Equipment Type	Engine Output (horsepower)	Equipment Category	Emission Factor (pounds per mile)							
			VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Scissor Lift	50	Aerial Lifts	0.0071	0.1083	0.1186	0.0002	0.0027	0.0025	18.0395	0.0058
Skip Loader	100	Tractors/Loaders/Backhoes	0.0408	0.3085	0.3923	0.0004	0.0295	0.0271	20.0027	0.0126
Sock Line Puller	300	Other Construction Equipment	0.0805	0.5892	1.0492	0.0014	0.0384	0.0353	139.2049	0.0427
Splicing Van	15	Other Construction Equipment	0.0173	0.0785	0.0753	0.0001	0.0066	0.0061	7.7501	0.0024
Static Truck/Tensioner	350	Other Construction Equipment	0.0939	0.6874	1.2241	0.0016	0.0448	0.0412	162.4058	0.0498
Track Type Dozer	350	Crawler Tractors	0.1277	0.8742	1.6687	0.0016	0.0646	0.0594	166.7015	0.0511
Tracker	120	Tractors/Loaders/Backhoes	0.0490	0.3702	0.4707	0.0005	0.0354	0.0326	49.2162	0.0151
Tractor	45	Tractors/Loaders/Backhoes	0.0438	0.2088	0.1876	0.0002	0.0159	0.0146	20.0027	0.0061
Truck Pulling Reel Dolly	9	Other Construction Equipment	0.0104	0.0471	0.0452	0.0000	0.0040	0.0037	4.6501	0.0014
Work Truck with Attached Auger	500	Bore/Drill Rigs	0.0392	0.2490	0.5698	0.0011	0.0164	0.0151	111.6622	0.0342

Table 2: Off-Road Equipment Controlled Emission Factors

Equipment Type	Engine Output (horsepower)	Equipment Category	Emission Factor (pounds per mile)							
			VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
165-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
15-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
17-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
20-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
3 Drum Sock Line Puller	300	Other Construction Equipment	0.0333	0.7222	0.6445	0.0014	0.0244	0.0244	139.2049	0.0427
30-ton Rough Terrain Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
40-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
50-ton Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
Asphalt Curb Machine	35	Paving Equipment	0.0081	0.1139	0.1286	0.0001	0.0078	0.0078	15.2405	0.0047
Asphalt Paver	152	Pavers	0.0169	0.5208	0.3265	0.0007	0.0158	0.0158	70.2262	0.0215
Backhoe/Front Loader	200	Tractors/Loaders/Backhoes	0.0196	0.4242	0.3785	0.0008	0.0144	0.0144	81.0563	0.0248
Bobcat	75	Skid Steer Loaders	0.0073	0.2264	0.1676	0.0003	0.0117	0.0117	30.4867	0.0093
Boom/Crane Truck	235	Cranes	0.0180	0.3906	0.3486	0.0007	0.0132	0.0132	75.0282	0.0230
Bucket Truck	350	Aerial Lifts	0.0287	0.6219	0.5549	0.0012	0.0211	0.0211	119.1893	0.0365
Bull Wheel Puller	300	Other Construction Equipment	0.0333	0.7222	0.6445	0.0014	0.0244	0.0244	139.2049	0.0427
Cable-pulling Truck with Single-axle Cable Dolly	9	Other Construction Equipment	0.0104	0.0471	0.0452	0.0000	0.0040	0.0037	4.6501	0.0014
Compressor Trailer	120	Air compressors	0.0152	0.4698	0.2946	0.0008	0.0142	0.0142	72.1662	0.0076
Crane	300	Cranes	0.0230	0.4987	0.4450	0.0009	0.0169	0.0169	95.6017	0.0293
Drill Rig	500	Bore/Drill Rigs	0.0271	0.5875	0.5243	0.0011	0.0199	0.0199	111.6623	0.0342
Drum Type Compactor	250	Rollers	0.0251	0.5445	0.4859	0.0010	0.0184	0.0184	104.6572	0.0321
Earth Movers	350	Crawler Tractors	0.0398	0.8627	0.7698	0.0016	0.0292	0.0292	166.7015	0.0511
Excavator	152	Excavators	0.0151	0.4650	0.2915	0.0006	0.0141	0.0141	62.6460	0.0192
Forklift	100	Forklifts	0.0053	0.1631	0.1208	0.0002	0.0085	0.0085	21.9459	0.0067
Medium Duty Splicing Lab Truck	15	Generator Sets	0.0171	0.0881	0.1186	0.0002	0.0061	0.0061	13.9070	0.0015
Motor Grader	350	Graders	0.0380	0.8225	0.7340	0.0015	0.0278	0.0278	157.7386	0.0483
Paving Roller	46	Rollers	0.0112	0.1580	0.1784	0.0002	0.0108	0.0108	21.3887	0.0066
Puller	300	Other Construction Equipment	0.0333	0.7222	0.6445	0.0014	0.0244	0.0244	139.2049	0.0427
Reach Manlift	50	Aerial Lifts	0.0041	0.1264	0.0936	0.0002	0.0066	0.0066	18.9395	0.0058
Road Grader	350	Graders	0.0380	0.8225	0.7340	0.0015	0.0278	0.0278	157.7386	0.0483
Rough Terrain Crane	350	Cranes	0.0269	0.5818	0.5191	0.0011	0.0197	0.0197	111.5353	0.0342

Equipment Type	Engine Output (horsepower)	Equipment Category	Emission Factor (pounds per mile)							
			VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Rough Terrain Forklift	200	Forklifts	0.0106	0.2293	0.2046	0.0004	0.0078	0.0078	44.0591	0.0135
Scissor Lift	50	Aerial Lifts	0.0041	0.1264	0.0936	0.0002	0.0066	0.0066	18.9395	0.0058
Skip Loader	100	Tractors/Loaders/Backhoes	0.0098	0.3018	0.2235	0.0004	0.0157	0.0157	20.0027	0.0126
Sock Line Puller	300	Other Construction Equipment	0.0333	0.7222	0.6445	0.0014	0.0244	0.0244	139.2049	0.0427
Splicing Van	15	Other Construction Equipment	0.0173	0.0785	0.0753	0.0001	0.0066	0.0061	7.7501	0.0024
Static Truck/Tensioner	350	Other Construction Equipment	0.0389	0.8426	0.7519	0.0016	0.0285	0.0285	162.4058	0.0498
Track Type Dozer	350	Crawler Tractors	0.0398	0.8627	0.7698	0.0016	0.0292	0.0292	166.7015	0.0511
Tracker	120	Tractors/Loaders/Backhoes	0.0117	0.3622	0.2211	0.0005	0.0110	0.0110	49.2162	0.0151
Tractor	45	Tractors/Loaders/Backhoes	0.0106	0.1505	0.1700	0.0002	0.0103	0.0103	20.0027	0.0061
Truck Pulling Reel Dolly	9	Other Construction Equipment	0.0104	0.0471	0.0452	0.0000	0.0040	0.0037	4.6501	0.0014
Work Truck with Attached Auger	500	Bore/Drill Rigs	0.0271	0.5875	0.5243	0.0011	0.0199	0.0199	111.6623	0.0342

Table 3: On-Road Vehicle Emission Factors

Equipment Type	On Road Type	Emission Factor (pounds per mile)							
		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
1-ton Crew Cab, 4x4	delivery	0.0015	0.0100	0.0107	0.0000	0.0004	0.0003	2.8401	0.0001
15-ton Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
17-ton Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
20-ton Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
3 Drum Sock Line Puller	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
¾-ton Truck, 4x4	delivery	0.0015	0.0100	0.0107	0.0000	0.0004	0.0003	2.8401	0.0001
30-ton Rough Terrain Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
40-ton Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
50-ton Crane	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Auger Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Boom/Crane Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Bucket Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Bull Wheel Puller	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Cable Chopping Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Cable-pulling Truck with Single-axle Cable Dolly	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Carry-all Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Commander Truck	delivery	0.0015	0.0100	0.0107	0.0000	0.0004	0.0003	2.8401	0.0001
Concrete Mixer Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Concrete Pump Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Drill Rig	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Dump Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001

Equipment Type	On Road Type	Emission Factor (pounds per mile)							
		VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Extendable Flat Bed Pole Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Flat Bed Pole Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Flat Bed Truck/Trailer	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Lowboy Truck/Trailer	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Maintenance Truck	passenger	0.0006	0.0054	0.0005	0.0000	0.0001	0.0001	1.1063	0.0001
Medium Duty Splicing Lab Truck	delivery	0.0015	0.0100	0.0107	0.0000	0.0004	0.0003	2.8401	0.0001
Pipe Truck/Trailer	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Puller	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Single-axle Trailer	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Sock Line Puller	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Splicing Van	delivery	0.0015	0.0100	0.0107	0.0000	0.0004	0.0003	2.8401	0.0001
Stake Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Survey Truck	passenger	0.0006	0.0054	0.0005	0.0000	0.0001	0.0001	1.1063	0.0001
Test Truck	passenger	0.0006	0.0054	0.0005	0.0000	0.0001	0.0001	1.1063	0.0001
Tool Trailer	passenger	0.0006	0.0054	0.0005	0.0000	0.0001	0.0001	1.1063	0.0001
Truck pulling Reel Dolly	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Truck, Semi	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Water Truck	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Wire Truck/Trailer	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Work Truck with Attached Auger	hhdt	0.0015	0.0065	0.0169	0.0000	0.0008	0.0007	4.2082	0.0001
Worker Commute	passenger	0.0006	0.0054	0.0005	0.0000	0.0001	0.0001	1.1063	0.0001

Emission factors downloaded from the SCAQMD (http://www.aqmd.gov/ceqa/handbook/onroad/onroad.html)

Table 4: Entrained Road Dust Emission Factors

Vehicle Category	Emission Factor (pounds per mile)							
	Paved Roads				Unpaved Roads			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Passenger	0.0008	0.0002	0.0008	0.0002	1.4719	0.1469	0.4056	0.0404
Delivery	0.0009	0.0003	0.0009	0.0003	1.4720	0.1470	0.4058	0.0405
hhdt	0.0009	0.0002	0.0009	0.0002	1.4720	0.1469	0.4057	0.0405

Table 5: Uncontrolled Off-Road Equipment Emissions

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Circle City Substation											
Grading	Earth Movers	2	8	2.043	13.988	26.699	0.026	1.033	0.951	2,667.224	0.817
Grading	Tracker	1	8	0.392	2.961	3.766	0.004	0.283	0.261	393.730	0.121
Fencing	Bobcat	1	8	0.125	1.624	1.608	0.002	0.086	0.080	243.894	0.075
Temporary Power-Pole Installation	Work Truck with attached Auger	1	8	0.314	1.992	4.558	0.009	0.131	0.121	893.298	0.274
Civil	Drill Rig	2	8	0.627	3.985	9.117	0.017	0.262	0.241	1,786.595	0.547
Civil	Bobcat	3	8	0.375	4.873	4.825	0.007	0.259	0.239	731.681	0.224
Civil	Backhoe/Front Loader	2	8	0.760	3.403	10.547	0.013	0.344	0.317	1,296.901	0.397
Civil	Excavator	1	8	0.335	3.168	3.719	0.005	0.183	0.168	501.168	0.154
Civil	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Civil	Forklift	2	6	0.356	2.105	3.078	0.003	0.254	0.234	263.351	0.081
Civil	Crane	2	4	0.629	5.443	8.028	0.007	0.326	0.300	764.814	0.234
Electrical	Forklift	2	8	0.474	2.807	4.104	0.003	0.339	0.312	351.134	0.108
Electrical	Scissor Lift	2	8	0.114	1.733	1.897	0.003	0.043	0.040	288.632	0.093
Electrical	Crane	2	8	1.259	10.887	16.056	0.015	0.652	0.600	1,529.627	0.469
Electrical	Crane	1	6	0.472	4.082	6.021	0.006	0.244	0.225	573.610	0.176
Electrical	Crane	1	6	0.472	4.082	6.021	0.006	0.244	0.225	573.610	0.176
Electrical	Bucket Truck	3	8	1.411	5.725	26.739	0.028	0.600	0.552	2,860.543	0.876
Wiring	Bucket Truck	2	4	0.470	1.908	8.913	0.009	0.200	0.184	953.514	0.292
Transformers	Crane	1	4	0.315	2.722	4.014	0.004	0.163	0.150	382.407	0.117
Transformers	Forklift	1	6	0.178	1.053	1.539	0.001	0.127	0.117	131.675	0.040
Transformers	Crane	2	4	0.629	5.443	8.028	0.007	0.326	0.300	764.814	0.234
Transformers	Bucket Truck	2	6	0.705	2.862	13.370	0.014	0.300	0.276	1,430.272	0.438
Asphalting	Paving Roller	1	8	0.369	1.587	1.572	0.002	0.134	0.124	171.110	0.052
Asphalting	Asphalt Paver	1	8	0.438	3.449	4.901	0.005	0.241	0.222	561.809	0.172
Asphalting	Asphalt Curb Machine	1	8	0.206	1.068	1.051	0.001	0.080	0.073	121.924	0.037
Asphalting	Tractor	1	8	0.351	1.671	1.500	0.002	0.127	0.117	160.021	0.049
Vault Installation	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Vault Installation	40 Ton Crane	1	8	0.629	5.443	8.028	0.007	0.326	0.300	764.814	0.234
Trench/Duct Installation	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Mira Loma Substation											
Civil	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Civil	Bobcat	1	8	0.125	1.624	1.608	0.002	0.086	0.080	243.894	0.075
Civil	Drill Rig	1	4	0.157	0.996	2.279	0.004	0.066	0.060	446.649	0.137
Electrical	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
Electrical	Bucket Truck	2	6	0.705	2.862	13.370	0.014	0.300	0.276	1,430.272	0.438
Location 1 - Construction Line	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 1 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 1 - Stringing Crew	Truck pulling reel dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 2 - Construction Line	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 2- Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 2- Stringing Crew	Truck pulling reel dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 3 - Construction Line	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 3 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 3 - Stringing Crew	Truck pulling reel dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 4 - Construction Line	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 4 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 4 - Stringing Crew	Truck pulling reel dolly	1	8	0.083	0.377	0.361	0.000	0.032	0.029	37.201	0.011
Location 5 -Vault Installation	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Location 5 -Vault Installation	40 Ton Crane	1	8	0.629	5.443	8.028	0.007	0.326	0.300	764.814	0.234
Location 5 -Trench/Duct Installation	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Mira Loma-Jefferson 66kV Subtransmission Line											
Marshaling Yard	Boom/Crane Truck	1	2	0.168	0.717	2.000	0.001	0.089	0.082	150.056	0.046
Marshaling Yard	Rough Terrain Forklift	1	6	0.262	1.107	3.043	0.003	0.133	0.123	264.354	0.081
ROW Clearing	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
ROW Clearing	Track Type Dozer	1	6	0.766	5.245	10.012	0.010	0.387	0.356	1,000.209	0.306
ROW Clearing	Motor Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
Road Work	Backhoe/Front Loader	1	4	0.190	0.851	2.637	0.003	0.086	0.079	324.225	0.099
Road Work	Track Type Dozer	1	4	0.511	3.497	6.675	0.007	0.258	0.238	666.806	0.204
Road Work	Motor Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
Road Work	Drum Type Compactor	1	6	0.345	1.770	4.927	0.006	0.163	0.150	627.943	0.192
Road Work	Excavator	1	4	0.168	1.584	1.860	0.002	0.091	0.084	250.584	0.077

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Guard Structure Installation	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Guard Structure Installation	Bucket Truck	1	4	0.235	0.954	4.457	0.005	0.100	0.092	476.757	0.146
Guard Structure Installation	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Remove Exiting Conductor & GW	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Remove Exiting Conductor & GW	Boom/Crane Truck	2	8	1.348	5.732	15.999	0.012	0.713	0.656	1,200.451	0.368
Remove Exiting Conductor & GW	Bull Wheel Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Remove Exiting Conductor & GW	Sock Line Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Remove Exiting Conductor & GW	Static Truck/ Tensioner	1	6	0.564	4.125	7.344	0.010	0.269	0.247	974.435	0.299
Wood/H-Frame/LWS Pole Removal	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	6	0.353	1.431	6.685	0.007	0.150	0.138	715.136	0.219
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
H-Frame Hybrid Pole Structure Removal	Compressor Trailer	1	8	0.682	3.832	4.482	0.006	0.356	0.356	577.329	0.061
H-Frame Hybrid Pole Structure Removal	Rough Terrain Crane (M)	1	6	0.551	4.763	7.024	0.007	0.285	0.262	669.212	0.205
H-Frame Hybrid Pole Structure Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
TSP Removal	Compressor Trailer	1	8	0.682	3.832	4.482	0.006	0.356	0.356	577.329	0.061
TSP Removal	Rough Terrain Crane (M)	1	6	0.551	4.763	7.024	0.007	0.285	0.262	669.212	0.205
TSP Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
TSP Foundation Removal	Compressor Trailer	1	8	0.682	3.832	4.482	0.006	0.356	0.356	577.329	0.061
TSP Foundation Removal	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
TSP Foundation Removal	Excavator	1	4	0.168	1.584	1.860	0.002	0.091	0.084	250.584	0.077
Install TSP Foundations	Boom/Crane Truck	1	4	0.337	1.433	4.000	0.003	0.178	0.164	300.113	0.092
Install TSP Foundations	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
TSP Haul	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
TSP Assembly	Compressor Trailer	1	6	0.511	2.874	3.362	0.005	0.267	0.267	432.997	0.046
TSP Assembly	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
TSP Erection	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
TSP Erection	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
Wood/LWS Pole Haul	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Wood/LWS Pole Assembly	Compressor Trailer	1	6	0.511	2.874	3.362	0.005	0.267	0.267	432.997	0.046
Wood/LWS Pole Assembly	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
Hybrid Pole Haul	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Install H-frame Hybrid Pole Structure	Bucket Truck	1	6	0.353	1.431	6.685	0.007	0.150	0.138	715.136	0.219

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Install H-frame Hybrid Pole Structure	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Install H-frame Hybrid Pole Structure	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Transfer & Install Conductor	Bucket Truck	4	8	1.881	7.633	35.652	0.037	0.800	0.736	3,814.058	1.169
Transfer & Install Conductor	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
Transfer & Install Conductor	Sock Line Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Transfer & Install Conductor	Bull Wheel Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Transfer & Install Conductor	Static Truck/ Tensioner	1	6	0.564	4.125	7.344	0.010	0.269	0.247	974.435	0.299
Transfer & Install Conductor	Backhoe/Front Loader	1	2	0.095	0.425	1.318	0.002	0.043	0.040	162.113	0.050
Guard Structure Removal	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Guard Structure Removal	Bucket Truck	1	4	0.235	0.954	4.457	0.005	0.100	0.092	476.757	0.146
Guard Structure Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Restoration	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Restoration	Motor Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
Restoration	Drum Type Compactor	1	4	0.230	1.180	3.285	0.004	0.108	0.100	418.629	0.128
Vault Installation	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Vault Installation	Excavator	1	6	0.252	2.376	2.789	0.004	0.137	0.126	375.876	0.115
Vault Installation	Crane	1	6	0.472	4.082	6.021	0.006	0.244	0.225	573.610	0.176
Duct Bank Installation	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Duct Bank Installation	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
Install Underground Cable	Bucket Truck	1	6	0.353	1.431	6.685	0.007	0.150	0.138	715.136	0.219
Install Underground Cable	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Install Underground Cable	Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Install Underground Cable	Static Truck/ Tensioner	1	6	0.564	4.125	7.344	0.010	0.269	0.247	974.435	0.299
Source Line Routes 1 and 2											
Marshaling Yard	Boom/Crane Truck	1	2	0.168	0.717	2.000	0.001	0.089	0.082	150.056	0.046
Marshaling Yard	Rough Terrain Forklift	1	6	0.262	1.107	3.043	0.003	0.133	0.123	264.354	0.081
ROW Clearing	Road Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
ROW Clearing	Backhoe/Front Loader	1	4	0.190	0.851	2.637	0.003	0.086	0.079	324.225	0.099
ROW Clearing	Track Type Dozer	1	6	0.766	5.245	10.012	0.010	0.387	0.356	1,000.209	0.306
Road Work	Road Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
Road Work	Backhoe/Front Loader	1	4	0.190	0.851	2.637	0.003	0.086	0.079	324.225	0.099
Road Work	Drum Type Compactor	1	4	0.230	1.180	3.285	0.004	0.108	0.100	418.629	0.128

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Road Work	Track Type Dozer	1	4	0.511	3.497	6.675	0.007	0.258	0.238	666.806	0.204
Road Work	Excavator	1	4	0.168	1.584	1.860	0.002	0.091	0.084	250.584	0.077
Guard Structure Installation	Bucket Truck	1	4	0.235	0.954	4.457	0.005	0.100	0.092	476.757	0.146
Guard Structure Installation	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Guard Structure Installation	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Wood/H-Frame/LWS Pole Removal	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	6	0.353	1.431	6.685	0.007	0.150	0.138	715.136	0.219
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Install TSP Foundation	Boom/Crane Truck	1	4	0.337	1.433	4.000	0.003	0.178	0.164	300.113	0.092
Install TSP Foundation	Backhoe/Front Loader	1	4	0.190	0.851	2.637	0.003	0.086	0.079	324.225	0.099
TSP Haul	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
TSP Assembly	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
TSP Assembly	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
TSP Erection	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
TSP Erection	30 Ton Rough Terrain Crane	1	6	0.472	4.082	6.021	0.006	0.244	0.225	573.610	0.176
Install Wood/LWS Pole	Bucket Truck	1	6	0.353	1.431	6.685	0.007	0.150	0.138	715.136	0.219
Install Wood/LWS Pole	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Install Wood/LWS Pole	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Install Conductor	Bucket Truck	4	8	1.881	7.633	35.652	0.037	0.800	0.736	3,814.058	1.169
Install Conductor	Boom/Crane Truck	1	8	0.674	2.866	7.999	0.006	0.357	0.328	600.225	0.184
Install Conductor	3 Drum Sock Line Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Install Conductor	Bull Wheel Puller	1	6	0.483	3.535	6.295	0.008	0.230	0.212	835.229	0.256
Install Conductor	Static Truck/ Tensioner	1	6	0.564	4.125	7.344	0.010	0.269	0.247	974.435	0.299
Install Conductor	Backhoe/Front Loader	1	2	0.095	0.425	1.318	0.002	0.043	0.040	162.113	0.050
Guard Structure Removal	Bucket Truck	1	4	0.235	0.954	4.457	0.005	0.100	0.092	476.757	0.146
Guard Structure Removal	Boom/Crane Truck	1	6	0.505	2.150	6.000	0.004	0.267	0.246	450.169	0.138
Guard Structure Removal	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Restoration	Road Grader	1	6	0.634	3.241	6.752	0.009	0.264	0.243	946.432	0.290
Restoration	Backhoe/Front Loader	1	2	0.095	0.425	1.318	0.002	0.043	0.040	162.113	0.050
Restoration	Drum Type Compactor	1	4	0.230	1.180	3.285	0.004	0.108	0.100	418.629	0.128
Vault Installation	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
Vault Installation	Excavator	1	6	0.252	2.376	2.789	0.004	0.137	0.126	375.876	0.115

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Vault Installation	165 Ton Crane	1	6	0.472	4.082	6.021	0.006	0.244	0.225	573.610	0.176
Duct Bank Installation	Backhoe/Front Loader	1	6	0.285	1.276	3.955	0.005	0.129	0.119	486.338	0.149
Duct Bank Installation	Compressor Trailer	1	4	0.341	1.916	2.241	0.003	0.178	0.178	288.665	0.030
Location 1	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 2	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 1	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Location 1	Splicing Van	1	8	0.138	0.628	0.602	0.001	0.053	0.049	62.001	0.019
Location 1	Cable-pulling Truck with single axle cable dolly	2	8	0.166	0.754	0.723	0.001	0.064	0.059	74.401	0.023
Location 1	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Location 2	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199
Location 2	40 Ton Crane	1	8	0.629	5.443	8.028	0.007	0.326	0.300	764.814	0.234
Telecommunication Facilities											
Fiber Optic Cable Installation	Bucket Truck	2	8	0.940	3.817	17.826	0.019	0.400	0.368	1,907.029	0.584
Fiber Optic Cable Splicing	Medium Duty Splicing Lab Truck	2	8	0.274	1.409	1.898	0.003	0.098	0.098	222.512	0.025
Underground Conduit	Backhoe/Front Loader	1	8	0.380	1.701	5.274	0.006	0.172	0.158	648.450	0.199

Table 6: Controlled Off-Road Equipment Emissions

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Circle City Substation											
Grading	Earth Movers	2	8	0.6371	13.8027	12.3163	0.0261	0.4672	0.4672	2,667.2236	0.8172
Grading	Tracker	1	8	0.0940	2.8974	1.7688	0.0038	0.0877	0.0877	393.7298	0.1206
Fencing	Bobcat	1	8	0.0587	1.8109	1.3410	0.0024	0.0940	0.0940	243.8936	0.0747
Temporary Power-Pole Installation	Work Truck with attached Auger	1	8	0.2169	4.7003	4.1941	0.0087	0.1591	0.1591	893.2982	0.2737
Civil	Drill Rig	2	8	0.4339	9.4005	8.3881	0.0175	0.3182	0.3182	1,786.5964	0.5474
Civil	Bobcat	3	8	0.1762	5.4326	4.0231	0.0072	0.2819	0.2819	731.6808	0.2242
Civil	Backhoe/Front Loader	2	8	0.3132	6.7867	6.0558	0.0127	0.2297	0.2297	1,296.9009	0.3974
Civil	Excavator	1	8	0.1206	3.7196	2.3323	0.0049	0.1126	0.1126	501.1683	0.1536
Civil	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Civil	Forklift	2	6	0.0635	1.9577	1.4498	0.0026	0.1016	0.1016	263.3507	0.0807
Civil	Crane	2	4	0.1841	3.9895	3.5598	0.0075	0.1350	0.1350	764.8135	0.2343
Electrical	Forklift	2	8	0.0847	2.6103	1.9330	0.0034	0.1355	0.1355	351.1343	0.1076
Electrical	Scissor Lift	2	8	0.0656	2.0230	1.4981	0.0030	0.1050	0.1050	303.0315	0.0928
Electrical	Crane	2	8	0.3683	7.9790	7.1197	0.0150	0.2701	0.2701	1,529.6270	0.4687
Electrical	Crane	1	6	0.1381	2.9921	2.6699	0.0056	0.1013	0.1013	573.6101	0.1758
Electrical	Crane	1	6	0.1381	2.9921	2.6699	0.0056	0.1013	0.1013	573.6101	0.1758
Electrical	Bucket Truck	3	8	0.6889	14.9262	13.3188	0.0280	0.5052	0.5052	2,860.5432	0.8765
Wiring	Bucket Truck	2	4	0.2296	4.9754	4.4396	0.0093	0.1684	0.1684	953.5144	0.2922
Transformers	Crane	1	4	0.0921	1.9947	1.7799	0.0037	0.0675	0.0675	382.4068	0.1172
Transformers	Forklift	1	6	0.0317	0.9789	0.7249	0.0013	0.0508	0.0508	131.6754	0.0403
Transformers	Crane	2	4	0.1841	3.9895	3.5598	0.0075	0.1350	0.1350	764.8135	0.2343
Transformers	Bucket Truck	2	6	0.3444	7.4631	6.6594	0.0140	0.2526	0.2526	1,430.2716	0.4382
Asphalting	Paving Roller	1	8	0.0894	1.2640	1.4274	0.0017	0.0863	0.0863	171.1096	0.0524
Asphalting	Asphalt Paver	1	8	0.1351	4.1660	2.6122	0.0055	0.1261	0.1261	561.8093	0.1721
Asphalting	Asphalt Curb Machine	1	8	0.0644	0.9111	1.0289	0.0012	0.0622	0.0622	121.9239	0.0374
Asphalting	Tractor	1	8	0.0852	1.2040	1.3596	0.0016	0.0822	0.0822	160.0214	0.0490
Vault Installation	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Vault Installation	40 Ton Crane	1	8	0.1841	3.9895	3.5598	0.0075	0.1350	0.1350	764.8135	0.2343
Trench/Duct Installation	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Mira Loma Substation											
Civil	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Civil	Bobcat	1	8	0.0587	1.8109	1.3410	0.0024	0.0940	0.0940	243.8936	0.0747
Civil	Drill Rig	1	4	0.1085	2.3501	2.0970	0.0044	0.0795	0.0795	446.6491	0.1369
Electrical	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
Electrical	Bucket Truck	2	6	0.3444	7.4631	6.6594	0.0140	0.2526	0.2526	1,430.2716	0.4382
Location 1 - Construction Line	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 1 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 1 - Stringing Crew	Truck pulling reel dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 2 - Construction Line	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 2- Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 2- Stringing Crew	Truck pulling reel dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 3 - Construction Line	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 3 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 3 - Stringing Crew	Truck pulling reel dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 4 - Construction Line	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 4 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 4 - Stringing Crew	Truck pulling reel dolly	1	8	0.0829	0.3770	0.3614	0.0004	0.0318	0.0293	37.2007	0.0114
Location 5 -Vault Installation	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Location 5 -Vault Installation	40 Ton Crane	1	8	0.1841	3.9895	3.5598	0.0075	0.1350	0.1350	764.8135	0.2343
Location 5 -Trench/Duct Installation	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Mira Loma-Jefferson 66kV Subtransmission Line											
Marshaling Yard	Boom/Crane Truck	1	2	0.0361	0.7813	0.6971	0.0015	0.0264	0.0264	150.0563	0.0460
Marshaling Yard	Rough Terrain Forklift	1	6	0.0635	1.3757	1.2275	0.0026	0.0466	0.0466	264.3544	0.0810
ROW Clearing	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
ROW Clearing	Track Type Dozer	1	6	0.2389	5.1760	4.6186	0.0098	0.1752	0.1752	1,000.2089	0.3065
ROW Clearing	Motor Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
Road Work	Backhoe/Front Loader	1	4	0.0783	1.6967	1.5140	0.0032	0.0574	0.0574	324.2252	0.0993
Road Work	Track Type Dozer	1	4	0.1593	3.4507	3.0791	0.0065	0.1168	0.1168	666.8059	0.2043
Road Work	Motor Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
Road Work	Drum Type Compactor	1	6	0.1508	3.2673	2.9154	0.0061	0.1106	0.1106	627.9431	0.1924
Road Work	Excavator	1	4	0.0603	1.8598	1.1662	0.0025	0.0563	0.0563	250.5842	0.0768

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Guard Structure Installation	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Guard Structure Installation	Bucket Truck	1	4	0.1148	2.4877	2.2198	0.0047	0.0842	0.0842	476.7572	0.1461
Guard Structure Installation	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Remove Exiting Conductor & GW	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Remove Exiting Conductor & GW	Boom/Crane Truck	2	8	0.2885	6.2502	5.5771	0.0117	0.2116	0.2116	1,200.4507	0.3678
Remove Exiting Conductor & GW	Bull Wheel Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Remove Exiting Conductor & GW	Sock Line Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Remove Exiting Conductor & GW	Static Truck/ Tensioner	1	6	0.2333	5.0556	4.5112	0.0095	0.1711	0.1711	974.4348	0.2986
Wood/H-Frame/LWS Pole Removal	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	6	0.1722	3.7315	3.3297	0.0070	0.1263	0.1263	715.1358	0.2191
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
H-Frame Hybrid Pole Structure Removal	Compressor Trailer	1	8	0.1219	3.7588	2.3569	0.0061	0.1138	0.1138	577.3293	0.0610
H-Frame Hybrid Pole Structure Removal	Rough Terrain Crane (M)	1	6	0.1611	3.4908	3.1149	0.0065	0.1182	0.1182	669.2118	0.2050
H-Frame Hybrid Pole Structure Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
TSP Removal	Compressor Trailer	1	8	0.1219	3.7588	2.3569	0.0061	0.1138	0.1138	577.3293	0.0610
TSP Removal	Rough Terrain Crane (M)	1	6	0.1611	3.4908	3.1149	0.0065	0.1182	0.1182	669.2118	0.2050
TSP Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
TSP Foundation Removal	Compressor Trailer	1	8	0.1219	3.7588	2.3569	0.0061	0.1138	0.1138	577.3293	0.0610
TSP Foundation Removal	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
TSP Foundation Removal	Excavator	1	4	0.0603	1.8598	1.1662	0.0025	0.0563	0.0563	250.5842	0.0768
Install TSP Foundations	Boom/Crane Truck	1	4	0.0721	1.5625	1.3943	0.0029	0.0529	0.0529	300.1127	0.0920
Install TSP Foundations	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
TSP Haul	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
TSP Assembly	Compressor Trailer	1	6	0.0914	2.8191	1.7676	0.0046	0.0853	0.0853	432.9970	0.0457
TSP Assembly	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
TSP Erection	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
TSP Erection	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
Wood/LWS Pole Haul	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Wood/LWS Pole Assembly	Compressor Trailer	1	6	0.0914	2.8191	1.7676	0.0046	0.0853	0.0853	432.9970	0.0457
Wood/LWS Pole Assembly	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
Hybrid Pole Haul	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Install H-frame Hybrid Pole Structure	Bucket Truck	1	6	0.1722	3.7315	3.3297	0.0070	0.1263	0.1263	715.1358	0.2191

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Install H-frame Hybrid Pole Structure	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Install H-frame Hybrid Pole Structure	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Transfer & Install Conductor	Bucket Truck	4	8	0.9185	19.9016	17.7583	0.0373	0.6736	0.6736	3,814.0576	1.1686
Transfer & Install Conductor	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
Transfer & Install Conductor	Sock Line Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Transfer & Install Conductor	Bull Wheel Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Transfer & Install Conductor	Static Truck/ Tensioner	1	6	0.2333	5.0556	4.5112	0.0095	0.1711	0.1711	974.4348	0.2986
Transfer & Install Conductor	Backhoe/Front Loader	1	2	0.0392	0.8483	0.7570	0.0016	0.0287	0.0287	162.1126	0.0497
Guard Structure Removal	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Guard Structure Removal	Bucket Truck	1	4	0.1148	2.4877	2.2198	0.0047	0.0842	0.0842	476.7572	0.1461
Guard Structure Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Restoration	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Restoration	Motor Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
Restoration	Drum Type Compactor	1	4	0.1005	2.1782	1.9436	0.0041	0.0737	0.0737	418.6287	0.1283
Vault Installation	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Vault Installation	Excavator	1	6	0.0905	2.7897	1.7492	0.0037	0.0844	0.0844	375.8762	0.1152
Vault Installation	Crane	1	6	0.1381	2.9921	2.6699	0.0056	0.1013	0.1013	573.6101	0.1758
Duct Bank Installation	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Duct Bank Installation	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
Install Underground Cable	Bucket Truck	1	6	0.1722	3.7315	3.3297	0.0070	0.1263	0.1263	715.1358	0.2191
Install Underground Cable	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Install Underground Cable	Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Install Underground Cable	Static Truck/ Tensioner	1	6	0.2333	5.0556	4.5112	0.0095	0.1711	0.1711	974.4348	0.2986
Source Line Routes 1 and 2											
Marshaling Yard	Boom/Crane Truck	1	2	0.0361	0.7813	0.6971	0.0015	0.0264	0.0264	150.0563	0.0460
Marshaling Yard	Rough Terrain Forklift	1	6	0.0635	1.3757	1.2275	0.0026	0.0466	0.0466	264.3544	0.0810
ROW Clearing	Road Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
ROW Clearing	Backhoe/Front Loader	1	4	0.0783	1.6967	1.5140	0.0032	0.0574	0.0574	324.2252	0.0993
ROW Clearing	Track Type Dozer	1	6	0.2389	5.1760	4.6186	0.0098	0.1752	0.1752	1,000.2089	0.3065
Road Work	Road Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
Road Work	Backhoe/Front Loader	1	4	0.0783	1.6967	1.5140	0.0032	0.0574	0.0574	324.2252	0.0993
Road Work	Drum Type Compactor	1	4	0.1005	2.1782	1.9436	0.0041	0.0737	0.0737	418.6287	0.1283

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Road Work	Track Type Dozer	1	4	0.1593	3.4507	3.0791	0.0065	0.1168	0.1168	666.8059	0.2043
Road Work	Excavator	1	4	0.0603	1.8598	1.1662	0.0025	0.0563	0.0563	250.5842	0.0768
Guard Structure Installation	Bucket Truck	1	4	0.1148	2.4877	2.2198	0.0047	0.0842	0.0842	476.7572	0.1461
Guard Structure Installation	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Guard Structure Installation	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Wood/H-Frame/LWS Pole Removal	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	6	0.1722	3.7315	3.3297	0.0070	0.1263	0.1263	715.1358	0.2191
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Install TSP Foundation	Boom/Crane Truck	1	4	0.0721	1.5625	1.3943	0.0029	0.0529	0.0529	300.1127	0.0920
Install TSP Foundation	Backhoe/Front Loader	1	4	0.0783	1.6967	1.5140	0.0032	0.0574	0.0574	324.2252	0.0993
TSP Haul	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
TSP Assembly	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
TSP Assembly	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
TSP Erection	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
TSP Erection	30 Ton Rough Terrain Crane	1	6	0.1381	2.9921	2.6699	0.0056	0.1013	0.1013	573.6101	0.1758
Install Wood/LWS Pole	Bucket Truck	1	6	0.1722	3.7315	3.3297	0.0070	0.1263	0.1263	715.1358	0.2191
Install Wood/LWS Pole	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Install Wood/LWS Pole	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Install Conductor	Bucket Truck	4	8	0.9185	19.9016	17.7583	0.0373	0.6736	0.6736	3,814.0576	1.1686
Install Conductor	Boom/Crane Truck	1	8	0.1442	3.1251	2.7886	0.0059	0.1058	0.1058	600.2254	0.1839
Install Conductor	3 Drum Sock Line Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Install Conductor	Bull Wheel Puller	1	6	0.2000	4.3334	3.8667	0.0082	0.1467	0.1467	835.2294	0.2559
Install Conductor	Static Truck/ Tensioner	1	6	0.2333	5.0556	4.5112	0.0095	0.1711	0.1711	974.4348	0.2986
Install Conductor	Backhoe/Front Loader	1	2	0.0392	0.8483	0.7570	0.0016	0.0287	0.0287	162.1126	0.0497
Guard Structure Removal	Bucket Truck	1	4	0.1148	2.4877	2.2198	0.0047	0.0842	0.0842	476.7572	0.1461
Guard Structure Removal	Boom/Crane Truck	1	6	0.1082	2.3438	2.0914	0.0044	0.0793	0.0793	450.1690	0.1379
Guard Structure Removal	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Restoration	Road Grader	1	6	0.2278	4.9353	4.4038	0.0093	0.1670	0.1670	946.4319	0.2900
Restoration	Backhoe/Front Loader	1	2	0.0392	0.8483	0.7570	0.0016	0.0287	0.0287	162.1126	0.0497
Restoration	Drum Type Compactor	1	4	0.1005	2.1782	1.9436	0.0041	0.0737	0.0737	418.6287	0.1283
Vault Installation	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
Vault Installation	Excavator	1	6	0.0905	2.7897	1.7492	0.0037	0.0844	0.0844	375.8762	0.1152

Activity	Equipment Type	Equipment Quantity	Duration of Use	Off-Road Emissions (pounds per day)							
				VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Vault Installation	165 Ton Crane	1	6	0.1381	2.9921	2.6699	0.0056	0.1013	0.1013	573.6101	0.1758
Duct Bank Installation	Backhoe/Front Loader	1	6	0.1175	2.5450	2.2709	0.0048	0.0861	0.0861	486.3378	0.1490
Duct Bank Installation	Compressor Trailer	1	4	0.0610	1.8794	1.1784	0.0030	0.0569	0.0569	288.6647	0.0305
Location 1	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 2	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 1	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Location 1	Splicing Van	1	8	0.1382	0.6283	0.6023	0.0006	0.0530	0.0488	62.0011	0.0190
Location 1	Cable-pulling Truck with single axle cable dolly	2	8	0.1659	0.7540	0.7228	0.0007	0.0636	0.0586	74.4013	0.0228
Location 1	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Location 2	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987
Location 2	40 Ton Crane	1	8	0.1841	3.9895	3.5598	0.0075	0.1350	0.1350	764.8135	0.2343
Telecommunication Facilities											
Fiber Optic Cable Installation	Bucket Truck	2	8	0.4593	9.9508	8.8792	0.0187	0.3368	0.3368	1,907.0288	0.5843
Fiber Optic Cable Splicing	Medium Duty Splicing Lab Truck	2	8	0.2737	1.4092	1.8978	0.0031	0.0979	0.0979	222.5124	0.0247
Underground Conduit	Backhoe/Front Loader	1	8	0.1566	3.3934	3.0279	0.0063	0.1149	0.1149	648.4504	0.1987

Table 7: On-Road Vehicle Emissions

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Circle City Substation													
Survey	Survey Truck	1	1	1	20	0.013	0.113	0.011	0.000	0.002	0.001	23.232	0.001
Survey	Worker Commute	2	1	0	60	0.072	0.645	0.062	0.001	0.011	0.007	132.753	0.006
Grading	Water Truck	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Grading	Dump Truck	2	29	0	20	1.684	7.546	19.608	0.047	0.985	0.809	4,881.513	0.078
Grading	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Soil Import / Export	Dump Truck	10	19	0	20	5.518	24.720	64.235	0.153	3.226	2.649	15,991.165	0.255
Soil Import / Export	Worker Commute	10	1	0	60	0.361	3.227	0.308	0.006	0.057	0.037	663.765	0.032
Fencing	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Fencing	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Fencing	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Temporary Power-Pole Installation	Work Truck with attached Auger	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000
Temporary Power-Pole Installation	Worker Commute	2	1	0	60	0.072	0.645	0.062	0.001	0.011	0.007	132.753	0.006
Civil	Drill Rig	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Civil	Tool Trailer	2	1	1	0	0.001	0.011	0.001	0.000	0.000	0.000	2.213	0.000
Civil	3/4 Ton Truck, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Civil	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Civil	Water Truck	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Civil	Worker Commute	30	1	0	60	1.082	9.682	0.923	0.019	0.170	0.111	1,991.295	0.095
Civil	Dump Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Civil	Crane	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Civil	Concrete Mixer Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
MEER	Carry all Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
MEER	Stake Truck	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000
MEER	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Electrical	Tool Trailer	1	1	1	0	0.001	0.005	0.001	0.000	0.000	0.000	1.106	0.000
Electrical	Commander Truck	1	1	1	0	0.002	0.010	0.011	0.000	0.000	0.000	2.840	0.000
Electrical	3/4 Ton Truck, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Electrical	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Electrical	Worker Commute	25	1	0	60	0.902	8.068	0.769	0.016	0.142	0.093	1,659.412	0.080
Electrical	Crane	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Electrical	Crane	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000
Electrical	Crane	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Electrical	Flat Bed Truck/Trailer	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Wiring	Bucket Truck	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Wiring	Tool Trailer	2	1	1	0	0.001	0.011	0.001	0.000	0.000	0.000	2.213	0.000
Wiring	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Transformers	Crane	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000
Transformers	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Transformers	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Transformers	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Transformers	Crane	2	1	1	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Maintenance Crew Equipment Check	Maintenance Truck	2	1	1	0	0.001	0.011	0.001	0.000	0.000	0.000	2.213	0.000
Maintenance Crew Equipment Check	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Testing	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Testing	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Asphalting	Dump Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Asphalting	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Asphalting	Worker Commute	8	1	0	60	0.289	2.582	0.246	0.005	0.045	0.030	531.012	0.025
Vault Installation	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Vault Installation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Vault Installation	Water Truck	1	1	2	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Vault Installation	Concrete Mixer Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Vault Installation	40 Ton Crane	1	1	2	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Vault Installation	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Vault Installation	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Trench/Duct Installation	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Trench/Duct Installation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Trench/Duct Installation	Water Truck	1	1	2	0	0.003	0.013	0.034	0.000	0.002	0.001	8.416	0.000
Trench/Duct Installation	Concrete Mixer Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Trench/Duct Installation	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Mira Loma Substation													
Civil	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Civil	3/4 Ton Truck, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Civil	Worker Commute	8	1	0	60	0.289	2.582	0.246	0.005	0.045	0.030	531.012	0.025
Civil	Drill Rig	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Electrical	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Electrical	Boom/Crane Truck	1	1	1	0	0.001	0.007	0.017	0.000	0.001	0.001	4.208	0.000
Electrical	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Maintenance Commission	Maintenance Truck	1	1	1	0	0.001	0.005	0.001	0.000	0.000	0.000	1.106	0.000
Maintenance Commission	Worker Commute	2	1	0	60	0.072	0.645	0.062	0.001	0.011	0.007	132.753	0.006
Test	Test Truck	1	1	1	0	0.001	0.005	0.001	0.000	0.000	0.000	1.106	0.000
Test	Worker Commute	2	1	0	60	0.072	0.645	0.062	0.001	0.011	0.007	132.753	0.006
Location 1 - Construction Line	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 1 - Construction Line	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 1 - Construction Line	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 1 - Construction Line	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016
Location 1 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 1 - Stringing Crew	Truck pulling reel dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 1 - Stringing Crew	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 1 - Stringing Crew	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Location 2 - Construction Line	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 2 - Construction Line	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 2 - Construction Line	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 2 - Construction Line	Worker Commute	9	1	0	60	0.325	2.905	0.277	0.006	0.051	0.033	597.388	0.029
Location 2- Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 2- Stringing Crew	Truck pulling reel dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 2- Stringing Crew	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 2- Stringing Crew	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Location 3 - Construction Line	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 3 - Construction Line	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 3 - Construction Line	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 3 - Construction Line	Worker Commute	9	1	0	60	0.325	2.905	0.277	0.006	0.051	0.033	597.388	0.029
Location 3 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 3 - Stringing Crew	Truck pulling reel dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 3 - Stringing Crew	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 3 - Stringing Crew	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Location 4 - Construction Line	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Location 4 - Construction Line	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 4 - Construction Line	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 4 - Construction Line	Worker Commute	9	1	0	60	0.325	2.905	0.277	0.006	0.051	0.033	597.388	0.029
Location 4 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 4 - Stringing Crew	Truck pulling reel dolly	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 4 - Stringing Crew	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 4 - Stringing Crew	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Location 5 -Vault Installation	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 5 -Vault Installation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 5 -Vault Installation	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Location 5 -Vault Installation	Concrete Mixer Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Location 5 -Vault Installation	40 Ton Crane	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 5 -Vault Installation	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 5 -Vault Installation	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Location 5 -Trench/Duct Installation	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 5 -Trench/Duct Installation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 5 -Trench/Duct Installation	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Location 5 -Trench/Duct Installation	Concrete Mixer Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Location 5 -Trench/Duct Installation	Worker Commute	4	1	1	60	0.147	1.312	0.125	0.003	0.023	0.015	269.931	0.013
Mira Loma-Jefferson 66kV Subtransmission Line													
Survey	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Survey	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
Marshaling Yard	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Marshaling Yard	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Marshaling Yard	Truck, Semi	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Marshaling Yard	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Marshaling Yard	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
ROW Clearing	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
ROW Clearing	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
ROW Clearing	Lowboy Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
ROW Clearing	Worker Commute	5	1	0	62	0.186	1.667	0.159	0.003	0.029	0.019	342.945	0.016
Road Work	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Road Work	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Road Work	Lowboy Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Road Work	Worker Commute	5	1	0	62	0.186	1.667	0.159	0.003	0.029	0.019	342.945	0.016
Guard Structure Installation	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Guard Structure Installation	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Guard Structure Installation	Bucket Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Guard Structure Installation	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Guard Structure Installation	Auger Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Guard Structure Installation	Extendable Flat Bed Pole Truck	1	1	1	22	0.033	0.150	0.389	0.001	0.020	0.016	96.789	0.002
Guard Structure Installation	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
Remove Exiting Conductor & GW	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Remove Exiting Conductor & GW	Bucket Truck	2	1	2	22	0.070	0.312	0.811	0.002	0.041	0.033	201.994	0.003
Remove Exiting Conductor & GW	Boom/Crane Truck	2	1	2	22	0.070	0.312	0.811	0.002	0.041	0.033	201.994	0.003
Remove Exiting Conductor & GW	Bull Wheel Puller	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Remove Exiting Conductor & GW	Sock Line Puller	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Remove Exiting Conductor & GW	Lowboy Truck/Trailer	2	1	0	22	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Remove Exiting Conductor & GW	Worker Commute	14	1	0	62	0.522	4.669	0.445	0.009	0.082	0.054	960.247	0.046
Wood/H-Frame/LWS Pole Removal	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Wood/H-Frame/LWS Pole Removal	Flat Bed Pole Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Wood/H-Frame/LWS Pole Removal	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
H-Frame Hybrid Pole Structure Removal	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
H-Frame Hybrid Pole Structure Removal	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
H-Frame Hybrid Pole Structure Removal	Flat Bed Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
H-Frame Hybrid Pole Structure Removal	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
TSP Removal	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
TSP Removal	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
TSP Removal	Flat Bed Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
TSP Removal	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026
TSP Foundation Removal	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
TSP Foundation Removal	Dump Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
TSP Foundation Removal	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
Install TSP Foundations	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Install TSP Foundations	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install TSP Foundations	Auger Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install TSP Foundations	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install TSP Foundations	Dump Truck	1	6	0	22	0.192	0.859	2.231	0.005	0.112	0.092	555.483	0.009
Install TSP Foundations	Concrete Mixer Truck	3	1	0	22	0.096	0.429	1.116	0.003	0.056	0.046	277.741	0.004
Install TSP Foundations	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
TSP Haul	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
TSP Haul	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
TSP Haul	Flat Bed Pole Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
TSP Haul	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
TSP Assembly	3/4 Ton Truck, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
TSP Assembly	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
TSP Assembly	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
TSP Assembly	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026
TSP Erection	3/4 Ton Truck, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
TSP Erection	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
TSP Erection	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
TSP Erection	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026
Wood/LWS Pole Haul	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Wood/LWS Pole Haul	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Wood/LWS Pole Haul	Flat Bed Pole Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Wood/LWS Pole Haul	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
Wood/LWS Pole Assembly	3/4 Ton Truck, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Wood/LWS Pole Assembly	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Wood/LWS Pole Assembly	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Wood/LWS Pole Assembly	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Hybrid Pole Haul	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Hybrid Pole Haul	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Hybrid Pole Haul	Flat Bed Pole Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Hybrid Pole Haul	Worker Commute	4	1	0	62	0.149	1.334	0.127	0.003	0.023	0.015	274.356	0.013
Install H-frame Hybrid Pole Structure	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Install H-frame Hybrid Pole Structure	Bucket Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install H-frame Hybrid Pole Structure	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install H-frame Hybrid Pole Structure	Auger Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install H-frame Hybrid Pole Structure	Extendable Flat Bed Pole Truck	1	1	1	22	0.033	0.150	0.389	0.001	0.020	0.016	96.789	0.002
Install H-frame Hybrid Pole Structure	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
Transfer & Install Conductor	1 Ton Crew Cab, 4x4	3	1	1	22	0.104	0.689	0.738	0.002	0.030	0.024	195.963	0.005
Transfer & Install Conductor	Bucket Truck	4	1	2	22	0.139	0.625	1.623	0.004	0.081	0.067	403.987	0.006
Transfer & Install Conductor	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Transfer & Install Conductor	Dump Truck	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Transfer & Install Conductor	Wire Truck/Trailer	2	1	1	22	0.067	0.299	0.778	0.002	0.039	0.032	193.577	0.003
Transfer & Install Conductor	Sock Line Puller	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Transfer & Install Conductor	Bull Wheel Puller	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Transfer & Install Conductor	Lowboy Truck/Trailer	2	1	0	22	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Transfer & Install Conductor	Worker Commute	20	1	0	62	0.745	6.670	0.636	0.013	0.117	0.077	1,371.781	0.066
Guard Structure Removal	3/4 Ton Truck, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Guard Structure Removal	1 Ton Crew Cab, 4x4	1	1	1	22	0.035	0.230	0.246	0.001	0.010	0.008	65.321	0.002
Guard Structure Removal	Bucket Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Guard Structure Removal	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Guard Structure Removal	Extendable Flat Bed Pole Truck	1	1	1	22	0.033	0.150	0.389	0.001	0.020	0.016	96.789	0.002
Guard Structure Removal	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
Restoration	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Restoration	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Restoration	Lowboy Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Restoration	Worker Commute	7	1	0	62	0.261	2.334	0.223	0.005	0.041	0.027	480.123	0.023
Vault Installation	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Vault Installation	Dump Truck	2	1	0	22	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Vault Installation	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Vault Installation	Crane	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Vault Installation	Concrete Mixer Truck	3	1	0	22	0.096	0.429	1.116	0.003	0.056	0.046	277.741	0.004
Vault Installation	Lowboy Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Vault Installation	Flat Bed Truck/Trailer	3	1	0	22	0.096	0.429	1.116	0.003	0.056	0.046	277.741	0.004
Vault Installation	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
Duct Bank Installation	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Duct Bank Installation	Dump Truck	2	1	0	22	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Duct Bank Installation	Pipe Truck/Trailer	1	1	1	22	0.033	0.150	0.389	0.001	0.020	0.016	96.789	0.002
Duct Bank Installation	Water Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Duct Bank Installation	Concrete Mixer Truck	3	1	0	22	0.096	0.429	1.116	0.003	0.056	0.046	277.741	0.004
Duct Bank Installation	Lowboy Truck/Trailer	1	1	0	22	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Duct Bank Installation	Worker Commute	6	1	0	62	0.224	2.001	0.191	0.004	0.035	0.023	411.534	0.020
Install Underground Cable	1 Ton Crew Cab, 4x4	2	1	1	22	0.069	0.459	0.492	0.001	0.020	0.016	130.642	0.003
Install Underground Cable	Bucket Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install Underground Cable	Boom/Crane Truck	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install Underground Cable	Wire Truck/Trailer	2	1	1	22	0.067	0.299	0.778	0.002	0.039	0.032	193.577	0.003
Install Underground Cable	Puller	1	1	2	22	0.035	0.156	0.406	0.001	0.020	0.017	100.997	0.002
Install Underground Cable	Worker Commute	8	1	0	62	0.298	2.668	0.254	0.005	0.047	0.031	548.712	0.026
Source Line Routes 1 and 2													
Survey	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Survey	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
Marshaling Yard	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Marshaling Yard	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Marshaling Yard	Truck, Semi	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Marshaling Yard	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
ROW Clearing	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
ROW Clearing	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
ROW Clearing	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
ROW Clearing	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016
Road Work	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Road Work	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Road Work	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Road Work	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016
Guard Structure Installation	3/4 Ton Truck, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Guard Structure Installation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Guard Structure Installation	Bucket Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Guard Structure Installation	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Guard Structure Installation	Auger Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Guard Structure Installation	Extendable Flat Bed Pole Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Guard Structure Installation	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Wood/H-Frame/LWS Pole Removal	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Wood/H-Frame/LWS Pole Removal	Flat Bed Pole Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Wood/H-Frame/LWS Pole Removal	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Install TSP Foundation	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Install TSP Foundation	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install TSP Foundation	Auger Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install TSP Foundation	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install TSP Foundation	Dump Truck	1	5	0	20	0.145	0.651	1.690	0.004	0.085	0.070	420.820	0.007
Install TSP Foundation	Concrete Mixer Truck	3	1	0	20	0.087	0.390	1.014	0.002	0.051	0.042	252.492	0.004
Install TSP Foundation	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
TSP Haul	3/4 Ton Truck, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
TSP Haul	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
TSP Haul	Flat Bed Pole Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
TSP Haul	Worker Commute	4	1	0	60	0.144	1.291	0.123	0.003	0.023	0.015	265.506	0.013
TSP Assembly	3/4 Ton Truck, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
TSP Assembly	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
TSP Assembly	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
TSP Assembly	Worker Commute	8	1	0	60	0.289	2.582	0.246	0.005	0.045	0.030	531.012	0.025
TSP Erection	3/4 Ton Truck, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
TSP Erection	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
TSP Erection	30 Ton Rough Terrain Crane	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
TSP Erection	Worker Commute	8	1	0	60	0.289	2.582	0.246	0.005	0.045	0.030	531.012	0.025
Install Wood/LWS Pole	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Install Wood/LWS Pole	Bucket Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install Wood/LWS Pole	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install Wood/LWS Pole	Auger Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install Wood/LWS Pole	Extendable Flat Bed Pole Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Install Wood/LWS Pole	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Install Conductor	1 Ton Crew Cab, 4x4	3	1	1	20	0.095	0.629	0.674	0.002	0.027	0.022	178.923	0.004
Install Conductor	Bucket Truck	4	1	2	20	0.128	0.572	1.488	0.004	0.075	0.061	370.322	0.006
Install Conductor	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install Conductor	Wire Truck/Trailer	2	1	1	20	0.061	0.273	0.710	0.002	0.036	0.029	176.744	0.003
Install Conductor	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Install Conductor	3 Drum Sock Line Puller	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Install Conductor	Bull Wheel Puller	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Install Conductor	Lowboy Truck/Trailer	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Install Conductor	Worker Commute	20	1	0	60	0.721	6.455	0.616	0.013	0.113	0.074	1,327.530	0.064
Guard Structure Removal	3/4 Ton Truck, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Guard Structure Removal	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Guard Structure Removal	Bucket Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Guard Structure Removal	Boom/Crane Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Guard Structure Removal	Extendable Flat Bed Pole Truck	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Guard Structure Removal	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Restoration	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Restoration	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Restoration	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Restoration	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Vault Installation	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Vault Installation	Dump Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Vault Installation	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Vault Installation	Concrete Mixer Truck	3	1	0	20	0.087	0.390	1.014	0.002	0.051	0.042	252.492	0.004
Vault Installation	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Vault Installation	Flat Bed Truck/Trailer	3	1	0	20	0.087	0.390	1.014	0.002	0.051	0.042	252.492	0.004
Vault Installation	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Duct Bank Installation	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Duct Bank Installation	Dump Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Duct Bank Installation	Pipe Truck/Trailer	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Duct Bank Installation	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Duct Bank Installation	Concrete Mixer Truck	3	1	0	20	0.087	0.390	1.014	0.002	0.051	0.042	252.492	0.004
Duct Bank Installation	Lowboy Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Duct Bank Installation	Worker Commute	6	1	0	60	0.216	1.936	0.185	0.004	0.034	0.022	398.259	0.019
Location 1	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 1	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 1	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Location 1	3/4 Ton Truck, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 1	Worker Commute	9	1	0	60	0.325	2.905	0.277	0.006	0.051	0.033	597.388	0.029
Location 2	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 2	Single axle Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 2	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 2	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016
Location 1	Bucket Truck	2	1	2	0	0.006	0.026	0.068	0.000	0.003	0.003	16.833	0.000
Location 1	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Location 1	Splicing Van	1	1	1	0	0.002	0.010	0.011	0.000	0.000	0.000	2.840	0.000
Location 1	Cable-pulling Truck with single axle cable dolly	2	1	2	20	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Location 1	Cable Chopping Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Location 1	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 1	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016
Location 2	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 2	1 Ton Crew Cab, 4x4	1	1	0	20	0.030	0.200	0.214	0.001	0.009	0.007	56.801	0.001
Location 2	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Location 2	Concrete Mixer Truck	2	1	0	20	0.058	0.260	0.676	0.002	0.034	0.028	168.328	0.003
Location 2	40 Ton Crane	1	1	1	20	0.030	0.137	0.355	0.001	0.018	0.015	88.372	0.001
Location 2	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Location 2	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022
Telecommunication Facilities													
Fiber Optic Cable Installation	1 Ton Crew Cab, 4x4	2	1	1	20	0.063	0.419	0.449	0.001	0.018	0.015	119.282	0.003
Fiber Optic Cable Installation	Bucket Truck	2	1	2	20	0.064	0.286	0.744	0.002	0.037	0.031	185.161	0.003
Fiber Optic Cable Installation	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Fiber Optic Cable Installation	Worker Commute	7	1	0	60	0.252	2.259	0.215	0.005	0.040	0.026	464.635	0.022

Activity	Equipment Type	Equipment Quantity	Trips Required	Daily VMT (miles)		On-Road Exhaust Emissions (pounds per day)							
				On-Site	Off-Site	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Fiber Optic Cable Splicing	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Fiber Optic Cable Splicing	Medium Duty Splicing Lab Truck	2	1	2	20	0.066	0.439	0.471	0.001	0.019	0.015	124.962	0.003
Fiber Optic Cable Splicing	Worker Commute	2	1	0	60	0.072	0.645	0.062	0.001	0.011	0.007	132.753	0.006
Underground Conduit	Dump Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Underground Conduit	Flat Bed Truck/Trailer	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Underground Conduit	1 Ton Crew Cab, 4x4	1	1	1	20	0.032	0.210	0.225	0.001	0.009	0.007	59.641	0.001
Underground Conduit	Water Truck	1	1	2	20	0.032	0.143	0.372	0.001	0.019	0.015	92.580	0.001
Underground Conduit	Concrete Mixer Truck	1	1	0	20	0.029	0.130	0.338	0.001	0.017	0.014	84.164	0.001
Underground Conduit	Worker Commute	5	1	0	60	0.180	1.614	0.154	0.003	0.028	0.019	331.882	0.016

Table 8: Earthwork Emissions

Activity	Soil Handling (cy per day)	Grading (hours per day)	Uncontrolled Emissions (pounds per day)		Controlled Emissions (pounds per day)	
			PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Circle City Substation						
Grading	--	8	11.848	2.464	6.516	1.355
Grading	572.25	--	0.927	0.192	0.510	0.106
Soil Import / Export	572.25	--	0.927	0.192	0.510	0.106
Civil	4.17	--	0.007	0.001	0.004	0.001
Mira Loma-Jefferson 66kV Subtransmission Line						
ROW Clearing	--	6	8.886	1.848	4.887	1.016
Road Work	--	6	8.886	1.848	4.887	1.016
Guard Structure Installation	4.30	--	0.007	0.001	0.004	0.001
Install TSP Foundations	55.85	--	0.090	0.019	0.050	0.010
Source Line Routes 1 and 2						
Guard Structure Installation	3.99	--	0.006	0.001	0.004	0.001
Install TSP Foundation	55.85	--	0.090	0.019	0.050	0.010
Install Wood/LWS Pole	2.88	--	0.005	0.001	0.003	0.001
Guard Structure Removal	3.49	--	0.006	0.001	0.003	0.001
Restoration	--	6	8.886	1.848	4.887	1.016
Vault Installation	53.03	--	0.086	0.018	0.047	0.010

Activity	Soil Handling (cy per day)	Grading (hours per day)	Uncontrolled Emissions (pounds per day)		Controlled Emissions (pounds per day)	
			PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Duct Bank Installation	172.25	--	0.279	0.058	0.153	0.032

Soil Handling Constants: fi= 0.0011, WS = 12 miles per hour, M = 10.6, Ns = 4, Ds = 1.215
Grading Constants: fi= 0.85, s = 26.7, M = 100 percent, CE = 90 percent

Table 9: Entrained Vehicle Travel Emissions

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Circle City Substation										
Survey	Survey Truck	1	passenger	1	20	0	1.487	0.044	0.421	0.044
Survey	Worker Commute	2	passenger	0	60	0	0.091	0.024	0.091	0.024
Grading	Water Truck	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Grading	Dump Truck	2	hhdt	0	20	0	1.010	0.277	1.010	0.277
Grading	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Soil Import / Export	Dump Truck	10	hhdt	0	20	0	3.310	0.908	3.310	0.908
Soil Import / Export	Worker Commute	10	passenger	0	60	0	0.456	0.121	0.456	0.121
Fencing	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Fencing	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Fencing	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Temporary Power-Pole Installation	Work Truck with attached Auger	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Temporary Power-Pole Installation	Worker Commute	2	passenger	0	60	0	0.091	0.024	0.091	0.024
Civil	Drill Rig	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Civil	Tool Trailer	2	passenger	1	0	0	2.944	0.081	0.811	0.081
Civil	3/4 Ton Truck, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Civil	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Civil	Water Truck	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Civil	Worker Commute	30	passenger	0	60	0	1.368	0.362	1.368	0.362
Civil	Dump Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Civil	Crane	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Civil	Concrete Mixer Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
MEER	Carry all Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
MEER	Stake Truck	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
MEER	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Electrical	Tool Trailer	1	passenger	1	0	0	1.472	0.040	0.406	0.040
Electrical	Commander Truck	1	delivery	1	0	0	1.472	0.041	0.406	0.041
Electrical	3/4 Ton Truck, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Electrical	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Electrical	Worker Commute	25	passenger	0	60	0	1.140	0.302	1.140	0.302
Electrical	Crane	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Electrical	Crane	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Electrical	Crane	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Electrical	Flat Bed Truck/Trailer	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Wiring	Bucket Truck	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Wiring	Tool Trailer	2	passenger	1	0	0	2.944	0.081	0.811	0.081
Wiring	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Transformers	Crane	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Transformers	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Transformers	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Transformers	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Transformers	Crane	2	hhdt	1	0	0	2.944	0.081	0.811	0.081
Maintenance Crew Equipment Check	Maintenance Truck	2	passenger	1	0	0	2.944	0.081	0.811	0.081
Maintenance Crew Equipment Check	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Testing	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Testing	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Asphalting	Dump Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Asphalting	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Asphalting	Worker Commute	8	passenger	0	60	0	0.365	0.096	0.365	0.096
Vault Installation	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Vault Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Vault Installation	Water Truck	1	hhdt	2	0	0	2.944	0.081	0.811	0.081
Vault Installation	Concrete Mixer Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Vault Installation	40 Ton Crane	1	hhdt	2	0	0	2.944	0.081	0.811	0.081
Vault Installation	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Vault Installation	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Trench/Duct Installation	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Trench/Duct Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Trench/Duct Installation	Water Truck	1	hhdt	2	0	0	2.944	0.081	0.811	0.081

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Trench/Duct Installation	Concrete Mixer Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Trench/Duct Installation	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Mira Loma Substation										
Civil	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Civil	3/4 Ton Truck, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Civil	Worker Commute	8	passenger	0	60	0	0.365	0.096	0.365	0.096
Civil	Drill Rig	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Electrical	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Electrical	Boom/Crane Truck	1	hhdt	1	0	0	1.472	0.040	0.406	0.040
Electrical	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Maintenance Commission	Maintenance Truck	1	passenger	1	0	0	1.472	0.040	0.406	0.040
Maintenance Commission	Worker Commute	2	passenger	0	60	0	0.091	0.024	0.091	0.024
Test	Test Truck	1	passenger	1	0	0	1.472	0.040	0.406	0.040
Test	Worker Commute	2	passenger	0	60	0	0.091	0.024	0.091	0.024
Location 1 - Construction Line	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 1 - Construction Line	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 1 - Construction Line	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 1 - Construction Line	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060
Location 1 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 1 - Stringing Crew	Truck pulling reel dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 1 - Stringing Crew	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 1 - Stringing Crew	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Location 2 - Construction Line	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 2 - Construction Line	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 2 - Construction Line	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 2 - Construction Line	Worker Commute	9	passenger	0	60	0	0.410	0.109	0.410	0.109
Location 2- Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 2- Stringing Crew	Truck pulling reel dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 2- Stringing Crew	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 2- Stringing Crew	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Location 3 - Construction Line	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 3 - Construction Line	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 3 - Construction Line	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 3 - Construction Line	Worker Commute	9	passenger	0	60	0	0.410	0.109	0.410	0.109
Location 3 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 3 - Stringing Crew	Truck pulling reel dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 3 - Stringing Crew	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 3 - Stringing Crew	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Location 4 - Construction Line	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 4 - Construction Line	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 4 - Construction Line	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 4 - Construction Line	Worker Commute	9	passenger	0	60	0	0.410	0.109	0.410	0.109
Location 4 - Stringing Crew	Cable-pulling Truck with single axle cable dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 4 - Stringing Crew	Truck pulling reel dolly	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 4 - Stringing Crew	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 4 - Stringing Crew	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Location 5 -Vault Installation	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 5 -Vault Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 5 -Vault Installation	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Location 5 -Vault Installation	Concrete Mixer Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Location 5 -Vault Installation	40 Ton Crane	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 5 -Vault Installation	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 5 -Vault Installation	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Location 5 -Trench/Duct Installation	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 5 -Trench/Duct Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 5 -Trench/Duct Installation	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Location 5 -Trench/Duct Installation	Concrete Mixer Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Location 5 -Trench/Duct Installation	Worker Commute	4	passenger	1	60	0	6.070	0.210	1.805	0.210
Mira Loma-Jefferson 66kV Subtransmission Line										
Survey	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Survey	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
Marshaling Yard	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Marshaling Yard	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Marshaling Yard	Truck, Semi	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Marshaling Yard	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Marshaling Yard	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
ROW Clearing	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
ROW Clearing	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
ROW Clearing	Lowboy Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
ROW Clearing	Worker Commute	5	passenger	0	60	2	14.947	0.465	4.284	0.465
Road Work	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Road Work	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Road Work	Lowboy Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Road Work	Worker Commute	5	passenger	0	60	2	14.947	0.465	4.284	0.465
Guard Structure Installation	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Guard Structure Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Guard Structure Installation	Bucket Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Guard Structure Installation	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Guard Structure Installation	Auger Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Guard Structure Installation	Extendable Flat Bed Pole Truck	1	hhdt	1	20	2	4.433	0.126	1.235	0.126
Guard Structure Installation	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
Remove Exiting Conductor & GW	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Remove Exiting Conductor & GW	Bucket Truck	2	hhdt	2	20	2	11.811	0.333	3.281	0.333
Remove Exiting Conductor & GW	Boom/Crane Truck	2	hhdt	2	20	2	11.811	0.333	3.281	0.333
Remove Exiting Conductor & GW	Bull Wheel Puller	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Remove Exiting Conductor & GW	Sock Line Puller	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Remove Exiting Conductor & GW	Lowboy Truck/Trailer	2	hhdt	0	20	2	5.923	0.171	1.658	0.171
Remove Exiting Conductor & GW	Worker Commute	14	passenger	0	60	2	41.851	1.301	11.996	1.301
Wood/H-Frame/LWS Pole Removal	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Wood/H-Frame/LWS Pole Removal	Flat Bed Pole Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Wood/H-Frame/LWS Pole Removal	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
H-Frame Hybrid Pole Structure Removal	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
H-Frame Hybrid Pole Structure Removal	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
H-Frame Hybrid Pole Structure Removal	Flat Bed Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
H-Frame Hybrid Pole Structure Removal	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
TSP Removal	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
TSP Removal	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
TSP Removal	Flat Bed Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
TSP Removal	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
TSP Foundation Removal	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
TSP Foundation Removal	Dump Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
TSP Foundation Removal	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
Install TSP Foundations	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Install TSP Foundations	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install TSP Foundations	Auger Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install TSP Foundations	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install TSP Foundations	Dump Truck	1	hhdt	0	20	2	17.769	0.514	4.973	0.514
Install TSP Foundations	Concrete Mixer Truck	3	hhdt	0	20	2	8.884	0.257	2.487	0.257
Install TSP Foundations	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
TSP Haul	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
TSP Haul	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
TSP Haul	Flat Bed Pole Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
TSP Haul	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
TSP Assembly	3/4 Ton Truck, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
TSP Assembly	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
TSP Assembly	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
TSP Assembly	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
TSP Erection	3/4 Ton Truck, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
TSP Erection	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
TSP Erection	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
TSP Erection	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
Wood/LWS Pole Haul	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Wood/LWS Pole Haul	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Wood/LWS Pole Haul	Flat Bed Pole Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Wood/LWS Pole Haul	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
Wood/LWS Pole Assembly	3/4 Ton Truck, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Wood/LWS Pole Assembly	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Wood/LWS Pole Assembly	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Wood/LWS Pole Assembly	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
Hybrid Pole Haul	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Hybrid Pole Haul	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Hybrid Pole Haul	Flat Bed Pole Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Hybrid Pole Haul	Worker Commute	4	passenger	0	60	2	11.957	0.372	3.427	0.372
Install H-frame Hybrid Pole Structure	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Install H-frame Hybrid Pole Structure	Bucket Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install H-frame Hybrid Pole Structure	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install H-frame Hybrid Pole Structure	Auger Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install H-frame Hybrid Pole Structure	Extendable Flat Bed Pole Truck	1	hhdt	1	20	2	4.433	0.126	1.235	0.126
Install H-frame Hybrid Pole Structure	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
Transfer & Install Conductor	1 Ton Crew Cab, 4x4	3	delivery	1	20	2	13.303	0.380	3.706	0.380
Transfer & Install Conductor	Bucket Truck	4	hhdt	2	20	2	23.622	0.667	6.561	0.667
Transfer & Install Conductor	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Transfer & Install Conductor	Dump Truck	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Transfer & Install Conductor	Wire Truck/Trailer	2	hhdt	1	20	2	8.867	0.252	2.469	0.252
Transfer & Install Conductor	Sock Line Puller	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Transfer & Install Conductor	Bull Wheel Puller	1	hhdt	2	20	2	5.905	0.167	1.640	0.167

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Transfer & Install Conductor	Lowboy Truck/Trailer	2	hhdt	0	20	2	5.923	0.171	1.658	0.171
Transfer & Install Conductor	Worker Commute	20	passenger	0	60	2	59.787	1.859	17.137	1.859
Guard Structure Removal	3/4 Ton Truck, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Guard Structure Removal	1 Ton Crew Cab, 4x4	1	delivery	1	20	2	4.434	0.127	1.235	0.127
Guard Structure Removal	Bucket Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Guard Structure Removal	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Guard Structure Removal	Extendable Flat Bed Pole Truck	1	hhdt	1	20	2	4.433	0.126	1.235	0.126
Guard Structure Removal	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
Restoration	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Restoration	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Restoration	Lowboy Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Restoration	Worker Commute	7	passenger	0	60	2	20.926	0.651	5.998	0.651
Vault Installation	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Vault Installation	Dump Truck	2	hhdt	0	20	2	5.923	0.171	1.658	0.171
Vault Installation	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Vault Installation	Crane	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Vault Installation	Concrete Mixer Truck	3	hhdt	0	20	2	8.884	0.257	2.487	0.257
Vault Installation	Lowboy Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Vault Installation	Flat Bed Truck/Trailer	3	hhdt	0	20	2	8.884	0.257	2.487	0.257
Vault Installation	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
Duct Bank Installation	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Duct Bank Installation	Dump Truck	2	hhdt	0	20	2	5.923	0.171	1.658	0.171
Duct Bank Installation	Pipe Truck/Trailer	1	hhdt	1	20	2	4.433	0.126	1.235	0.126
Duct Bank Installation	Water Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Duct Bank Installation	Concrete Mixer Truck	3	hhdt	0	20	2	8.884	0.257	2.487	0.257
Duct Bank Installation	Lowboy Truck/Trailer	1	hhdt	0	20	2	2.961	0.086	0.829	0.086
Duct Bank Installation	Worker Commute	6	passenger	0	60	2	17.936	0.558	5.141	0.558
Install Underground Cable	1 Ton Crew Cab, 4x4	2	delivery	1	20	2	8.869	0.253	2.471	0.253
Install Underground Cable	Bucket Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install Underground Cable	Boom/Crane Truck	1	hhdt	2	20	2	5.905	0.167	1.640	0.167

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Install Underground Cable	Wire Truck/Trailer	2	hhdt	1	20	2	8.867	0.252	2.469	0.252
Install Underground Cable	Puller	1	hhdt	2	20	2	5.905	0.167	1.640	0.167
Install Underground Cable	Worker Commute	8	passenger	0	60	2	23.915	0.744	6.855	0.744
Source Line Routes 1 and 2										
Survey	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Survey	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
Marshaling Yard	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Marshaling Yard	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Marshaling Yard	Truck, Semi	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Marshaling Yard	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
ROW Clearing	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
ROW Clearing	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
ROW Clearing	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
ROW Clearing	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060
Road Work	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Road Work	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Road Work	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Road Work	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060
Guard Structure Installation	3/4 Ton Truck, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Guard Structure Installation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Guard Structure Installation	Bucket Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Guard Structure Installation	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Guard Structure Installation	Auger Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Guard Structure Installation	Extendable Flat Bed Pole Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Guard Structure Installation	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Wood/H-Frame/LWS Pole Removal	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Wood/H-Frame/LWS Pole Removal	Bucket Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Wood/H-Frame/LWS Pole Removal	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Wood/H-Frame/LWS Pole Removal	Flat Bed Pole Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Wood/H-Frame/LWS Pole Removal	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Install TSP Foundation	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Install TSP Foundation	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install TSP Foundation	Auger Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install TSP Foundation	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install TSP Foundation	Dump Truck	1	hhdt	0	20	0	0.087	0.024	0.087	0.024
Install TSP Foundation	Concrete Mixer Truck	3	hhdt	0	20	0	0.052	0.014	0.052	0.014
Install TSP Foundation	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
TSP Haul	3/4 Ton Truck, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
TSP Haul	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
TSP Haul	Flat Bed Pole Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
TSP Haul	Worker Commute	4	passenger	0	60	0	0.182	0.048	0.182	0.048
TSP Assembly	3/4 Ton Truck, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
TSP Assembly	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
TSP Assembly	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
TSP Assembly	Worker Commute	8	passenger	0	60	0	0.365	0.096	0.365	0.096
TSP Erection	3/4 Ton Truck, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
TSP Erection	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
TSP Erection	30 Ton Rough Terrain Crane	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
TSP Erection	Worker Commute	8	passenger	0	60	0	0.365	0.096	0.365	0.096
Install Wood/LWS Pole	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Install Wood/LWS Pole	Bucket Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install Wood/LWS Pole	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install Wood/LWS Pole	Auger Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install Wood/LWS Pole	Extendable Flat Bed Pole Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Install Wood/LWS Pole	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Install Conductor	1 Ton Crew Cab, 4x4	3	delivery	1	20	0	4.471	0.137	1.272	0.137
Install Conductor	Bucket Truck	4	hhdt	2	20	0	11.846	0.343	3.315	0.343
Install Conductor	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install Conductor	Wire Truck/Trailer	2	hhdt	1	20	0	2.979	0.091	0.846	0.091
Install Conductor	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Install Conductor	3 Drum Sock Line Puller	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Install Conductor	Bull Wheel Puller	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Install Conductor	Lowboy Truck/Trailer	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Install Conductor	Worker Commute	20	passenger	0	60	0	0.912	0.241	0.912	0.241
Guard Structure Removal	3/4 Ton Truck, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Guard Structure Removal	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Guard Structure Removal	Bucket Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Guard Structure Removal	Boom/Crane Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Guard Structure Removal	Extendable Flat Bed Pole Truck	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Guard Structure Removal	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Restoration	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Restoration	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Restoration	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Restoration	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Vault Installation	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Vault Installation	Dump Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Vault Installation	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Vault Installation	Concrete Mixer Truck	3	hhdt	0	20	0	0.052	0.014	0.052	0.014
Vault Installation	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Vault Installation	Flat Bed Truck/Trailer	3	hhdt	0	20	0	0.052	0.014	0.052	0.014
Vault Installation	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Duct Bank Installation	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Duct Bank Installation	Dump Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Duct Bank Installation	Pipe Truck/Trailer	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Duct Bank Installation	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Duct Bank Installation	Concrete Mixer Truck	3	hhdt	0	20	0	0.052	0.014	0.052	0.014
Duct Bank Installation	Lowboy Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Duct Bank Installation	Worker Commute	6	passenger	0	60	0	0.274	0.072	0.274	0.072
Location 1	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 1	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Location 1	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Location 1	3/4 Ton Truck, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 1	Worker Commute	9	passenger	0	60	0	0.410	0.109	0.410	0.109
Location 2	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 2	Single axle Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 2	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 2	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060
Location 1	Bucket Truck	2	hhdt	2	0	0	5.888	0.162	1.623	0.162
Location 1	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Location 1	Splicing Van	1	delivery	1	0	0	1.472	0.041	0.406	0.041
Location 1	Cable-pulling Truck with single axle cable dolly	2	hhdt	2	20	0	5.923	0.171	1.658	0.171
Location 1	Cable Chopping Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Location 1	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 1	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060
Location 2	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 2	1 Ton Crew Cab, 4x4	1	delivery	0	20	0	0.018	0.005	0.018	0.005
Location 2	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Location 2	Concrete Mixer Truck	2	hhdt	0	20	0	0.035	0.010	0.035	0.010
Location 2	40 Ton Crane	1	hhdt	1	20	0	1.489	0.045	0.423	0.045
Location 2	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Location 2	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Telecommunication Facilities										
Fiber Optic Cable Installation	1 Ton Crew Cab, 4x4	2	delivery	1	20	0	2.980	0.091	0.848	0.091
Fiber Optic Cable Installation	Bucket Truck	2	hhdt	2	20	0	5.923	0.171	1.658	0.171
Fiber Optic Cable Installation	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Fiber Optic Cable Installation	Worker Commute	7	passenger	0	60	0	0.319	0.084	0.319	0.084
Fiber Optic Cable Splicing	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Fiber Optic Cable Splicing	Medium Duty Splicing Lab Truck	2	delivery	2	20	0	5.925	0.172	1.659	0.172
Fiber Optic Cable Splicing	Worker Commute	2	passenger	0	60	0	0.091	0.024	0.091	0.024
Underground Conduit	Dump Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005

Activity	Equipment Type	Equipment Quantity	On Road Type	Daily VMT (miles)			Uncontrolled Entrained Dust Emissions (pounds per day)		Controlled Entrained Dust Emissions (pounds per day)	
				On-Site Unpaved	Off-Site Paved	Off-Site Unpaved	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Underground Conduit	Flat Bed Truck/Trailer	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Underground Conduit	1 Ton Crew Cab, 4x4	1	delivery	1	20	0	1.490	0.046	0.424	0.046
Underground Conduit	Water Truck	1	hhdt	2	20	0	2.961	0.086	0.829	0.086
Underground Conduit	Concrete Mixer Truck	1	hhdt	0	20	0	0.017	0.005	0.017	0.005
Underground Conduit	Worker Commute	5	passenger	0	60	0	0.228	0.060	0.228	0.060

Table 10: Operational Emissions

Equipment Type	On Road Type	Trips Per Year	Trip Length (miles)			Annual Emissions (pounds per year)							
			Paved	Unpaved	Total	VOC	CO	NO_x	SO_x	PM_{10}	$PM_{2.5}$	CO_2	CH_4
Source Line and Telecommunications Inspection	passenger	1	20	0	20	0.012	0.108	0.010	0.000	0.018	0.005	22.125	0.001
Mira Loma-Jefferson Inspection	passenger	1	40	10	50	0.030	0.269	0.026	0.001	10.152	1.021	55.314	0.003
Substation Site Visit	passenger	52	60	0	60	1.875	16.782	1.600	0.034	2.794	0.722	3,451.578	0.165
Total	**--**	**--**	**--**	**--**	**--**	**1.917**	**17.159**	**1.636**	**0.034**	**12.964**	**1.748**	**3,529.017**	**0.169**

Table 11: Uncontrolled LST Emissions and Thresholds

Category	CO	NO_x	PM_{10}	$PM_{2.5}$
Circle City Substation Emissions (pounds per day)	66.74	130.67	19.85	5.95
Distance (meters)	100	100	100	100
Size (acres)	5	5	5	5
Threshold (pounds per day)	3,964	378	14	5
Exceeded?	No	No	**Yes**	**Yes**
Mira Loma Substation Emissions (pounds per day)	5.76	21.40	2.28	0.77
Distance (meters)	500	500	500	500
Size (acres)	5	5	5	5
Threshold (pounds per day)	22,490	778	55	28
Exceeded?	No	No	No	No
Mira Loma-Jefferson 66 kV Subtransmission Line Emissions (pounds per day)	22.25	65.21	10.97	2.77
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	647	118	1	1
Exceeded?	No	No	**Yes**	**Yes**
Source Line Routes 1 and 2 Emissions (pounds per day)	22.24	65.17	10.93	2.47
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	674	118	1	1
Exceeded?	No	No	**Yes**	**Yes**
Telecommunications Facilities Emissions (pounds per day)	3.86	17.92	2.84	0.61
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	647	118	1	1
Exceeded?	No	No	**Yes**	No

Table 12: Controlled LST Emissions and Thresholds

Category	CO	NO_x	PM_{10}	$PM_{2.5}$
Circle City Substation Emissions (pounds per day)	85.77	73.70	18.17	4.65
Distance (meters)	100	100	100	100
Size (acres)	5	5	5	5
Threshold (pounds per day)	3,964	378	14	5
Exceeded?	No	No	**Yes**	**Yes**
Mira Loma Substation Emissions (pounds per day)	10.62	9.48	1.98	0.52
Distance (meters)	500	500	500	500
Size (acres)	5	5	5	5
Threshold (pounds per day)	22,490	778	55	28
Exceeded?	No	No	No	No
Mira Loma-Jefferson 66 kV Subtransmission Line Emissions (pounds per day)	37.73	33.85	9.00	2.05
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	647	118	1	1
Exceeded?	No	No	**Yes**	**Yes**
Source Line Routes 1 and 2 Emissions (pounds per day)	37.72	33.82	8.63	1.97
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	674	118	1	1
Exceeded?	No	No	**Yes**	**Yes**
Telecommunications Facilities Emissions (pounds per day)	10.00	8.97	2.78	0.58
Distance (meters)	25	25	25	25
Size (acres)	1	1	1	1
Threshold (pounds per day)	647	118	1	1
Exceeded?	No	No	**Yes**	No

Table 13: Total GHG Emissions

Construction	CO_2 (metric tons)	CH_4 (metric tons)	CO_2e (metric tons)
Construction Equipment Use	1,512.27	0.45	1,521.82
Motor Vehicle Use	1,130.94	0.04	1,131.67
Total	**2,643.21**	**0.49**	**2,653.50**

Operation	CO_2 (metric tons)	CH_4 (metric tons)	SF_6 (metric tons)	CO_2e (metric tons)
On-Road	1.60	0.00	-	1.60
Circuit Breaker Fugitive Emissions	-	-	0.00	6.94
Construction (amortized over 30 years)	88.11	0.02	-	88.45
Total	**89.71**	**0.02**	**0.00**	**96.99**