B. Description of Proposed Project

B.1 Introduction

Section B describes the Devers–Palo Verde 500 kV No. 2 Transmission Project (the "Proposed Project") proposed by Southern California Edison (SCE). This section provides a detailed description of the Proposed Project, including proposed route, facilities and equipment, construction methods and schedule, and operations. The potential environmental effects of the project elements identified and described here are analyzed in Section D. Section B.2 provides a description of the Proposed Project and its components. Section B.3 describes the construction that would be associated with the Proposed Project, and Section B.4 describes operation and maintenance procedures.

This section includes overview maps of the Proposed Project that illustrate land ownership and general routing. Volume 3 of the EIR/EIS is a Map Volume, presenting detailed maps that illustrate the preliminary locations of each transmission tower in the Devers-Harquahala segment. For the West of Devers segment, detailed maps are presented at the end of this section, illustrating the locations of towers to be removed as well as towers that would be reconductored or rebuilt.

B.2 Description of the Proposed Project

B.2.1 Overview of the Proposed Project

SCE proposes to construct a new 230-mile, 500 kilovolt (kV) electric transmission line between Devers Substation in California and Harquahala Generating Substation in Arizona and to upgrade 48.2 miles of 230 kV transmission lines in California. The upgraded lines would connect directly to the new line. The entire project would span 278 miles, with approximately 176 miles in California and 102 miles in Arizona. The proposed transmission line and facility upgrades are known collectively as the Devers–Palo Verde 500 kV No. 2 Transmission Project, or DPV2. The location of the Proposed Project is illustrated in Figures B-1 and B-2 (Devers-Harquahala portion) and Figure B-3 (West of Devers portion). The Proposed Project has two major components: a new 500 kV line between Devers Substation and the Harquahala Generating Station (referred to as "Devers-Harquahala" or D-H), and the upgrade of a 230 kV line west of the Devers Substation (referred to as "West of Devers" or WOD). Other system upgrades would occur in certain locations along the route. Each of these components is described below.

Devers-Harquahala

- Construction of a 500 kV transmission line from the Harquahala Generating Station switchyard, located near the Palo Verde Nuclear Generating Station (PVNGS) west of Phoenix, Arizona, to SCE's Devers Substation (Devers), located near Palm Springs, California
- Construction of the Midpoint Substation approximately 10 miles southwest of Blythe, California, and adjacent to the proposed Devers-Harquahala 500 kV transmission line (this is an optional component of the Proposed Project that SCE may not construct)
- Construction of a new optical repeater facility 3 miles west of Blythe, California, within the DPV2 ROW

- Construction of two series capacitor banks, each adjacent to an existing DPV1 series capacitor bank: one in Arizona approximately 55 miles west of the Harquahala Switchyard and one in California approximately 64 miles east of Devers near I-10
- Installation of a 500 kV line shunt reactor, a dead-end structure, circuit breakers, and disconnect switches at the Harquahala Switchyard
- Installation of a 500 kV line shunt reactor, a dead-end structure, circuit breakers, and disconnect switches at the Devers Substation
- Construction and installation of telecommunications systems related to the Proposed Project, including a new telecommunications facility on Harquahala Mountain and a new Optical Ground Wire (OPGW) on the Devers–Harquahala transmission line towers

West of Devers

- Removal of two existing 40-mile 230 kV single-circuit transmission lines
- Construction of a new 40-mile double-circuit 230 kV transmission line
- Upgrade of 40 miles of double-circuit 230 kV transmission line between Devers Substation and San Bernardino Junction in San Bernardino County, California (accomplished by reconductoring[1] the line only)
- Upgrade of 4.8 miles of double-circuit 230 kV transmission line between San Bernardino Junction and Vista Substation, also located in San Bernardino County, California (reconductoring only)
- Upgrade of 6.8 miles of 230 kV transmission line between San Bernardino Junction and San Bernardino Substation located in San Bernardino County, California (reconductoring only, one circuit on each of two existing double-circuit transmission lines)

System Improvements

- Upgrades and replacement of circuit breakers, disconnects, relays, and switchrack conductors within the fenced area at Devers, Vista, Lewis, and San Bernardino Substations and the San Onofre Nuclear Generating Station (SONGS) switchrack
- Installation of Special Protection Scheme (SPS) relays at the Devers, Padua, and Vista Substations in California, and the PVNGS, Hassayampa, and Harquahala Switchyards in Arizona

Table B-1 presents a summary of the major components of the Devers-Harquahala 500 kV segment of the Proposed Project, and Table B-2 presents a summary of the major components of the proposed 230 kV WOD upgrades. The sections that follow provide additional detail about each of the subject components.

[1] Reconductoring involves removal of the existing conductors on an existing tower, and installation of new, larger capacity conductors. This is generally done with no change to the tower itself, although in some cases towers need to be strengthened or replaced.

Figure B-1. Devers-Harquahala Portion: Harquahala to Colorado River Map
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Figure B-2. Devers-Harquahala Portion: Colorado River to Devers Map

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Figure B-3. Overview of West of Devers Segment

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B.2.2 Devers-Harquahala

Between Devers Substation and Harquahala Generating Substation, the project would roughly parallel the route of Interstate 10 (I-10). Figure B-4 shows photographs of the existing ROW in different areas along the Proposed Project route.

Impact analysis in Section D divides the Devers-Harquahala route into six segments. These segments are presented below:

- Harquahala to Kofa National Wildlife Refuge – MP E0.0–MP E53.3
- Kofa National Wildlife Refuge – MP E53.3–MP E77.6
- Kofa National Wildlife Refuge to Colorado River – MP E77.6–MP E102.2
- Palo Verde Valley (Colorado River to Midpoint Substation) – MP E102.2–MP E113.7
- Midpoint Substation to Cactus City Rest Area – MP E113.7–MP E188.2
- Cactus City Rest Area to Devers Substation – MP E188.2–MP E228.0

B.2.2.1 Harquahala to the Colorado River

The Arizona portion of the Proposed Project would consist of 102 miles of 500 kV transmission line between the Harquahala Generating Station switchyard (located near Wintersburg, Maricopa County, approximately 17 miles northwest of the PVNGS) to the Colorado River, as illustrated in Figure B-1. The Proposed Project would terminate at the Harquahala Switchyard and SCE would use the existing Harquahala-Hassayampa 500 kV transmission line and the existing Hassayampa–PVNGS 500 kV interconnection to provide a path to the PVNGS Switchyard.

Table B-1. Proposed Devers-Harquahala 500 kV Transmission Line Summary

Dimensions	
Length of line (miles, rounded to 1 mile)	230
Total ROW area (acres, rounded to 10 acres)	3,910
New Permanent Area Occupied (acres)	
Tower footings	7.4
Access roads	18.1
Spur roads	32.8
Substation	44.0
Series compensation	4.0
Telecommunications	0.8
Total	107.1
New Temporary Area Occupied (acres)	
Transmission line structures	694.0
Access roads	None
Construction yards, pulling/splicing and batch plant areas	134.7
Substation/switchyard (Harquahala and shunt reactor)	7.0
Series capacitor banks (2 sites)	2.0
Telecommunications (optical repeater)	2.0
Total	839.6
Number of Structures (approximate)	
New single-circuit lattice steel towers	709
Existing double-circuit lattice steel towers	13
New single-circuit H-frame structures	39
New single-circuit tubular steel poles	23
Total	784 (771 new)
Land Ownership (miles)	
State, California	0.6
State, Arizona	10.8
Federal (BLM, USFWS, USDOD, USBR)	136.5
Private	81.6
Indian Reservation	0.1
Total	229.6
Existing Utility Corridors (miles)	
Parallel to existing DPV1 500 kV ROW	225
Parallel to existing Harquahala-Hassayampa 500 kV ROW	5.0
Number of Crossings	
Primary highways	4
Secondary highways	15
Rivers and streams	1
Railroads	2

Note: Affected area estimates are based on the following factors:
0.010 acres per lattice steel tower – permanent
0.005 acres per H-frame structure – permanent
0.002 acres per tubular steel pole – permanent
14' (width) x 130' (length) spur roads at every tower – permanent
0.9 acres per tower pad – temporary
0.9 acres per pulling station, one every 3 miles – temporary
0.2 acres per splicing station, one every 3 miles – temporary
5.0 acres per construction yard, one every 40 miles – temporary
2.0 acres per batch plant, one every 30 miles – temporary

Areas occupied by facilities installed within existing substation and communications site properties are not included in estimates.

Source: SCE, 2005a.

Table B-2. Proposed West of Devers 230 kV Upgrade Summary

Length of segment from Devers Substation to San Bernardino Junction	40 miles
Length of segment from Vista Substation to San Bernardino Junction	4.8 miles
Length of segment from San Bernardino Substation to San Bernardino Junction	3.4 miles
Span length (spacing between towers)	1,400–1,500 feet 3.5–3.8 structures/mile (avg)
Number of existing structures removed	415
Total number of new structures to be installed	173
Number of existing structures to be raised	4
Number of existing structures to be reinforced	34
Area affected by structure removal	24.9 acres (temporary)
Area affected by new structure installation	50.2 acres (permanent)
Area affected by new spur roads	2.8 acres (permanent)
Area affected by pulling/splicing sites	27.5 acres (temporary)

Note: Affected area estimates are based on the following factors:
0.06 acres per structure removed – temporary
0.29 acres per new structure installed – permanent
14' (width) by 200' (length) spur roads at 25 percent of new tower sites – permanent
0.6 acres per pulling and/or mile pulling/splicing sites, approximately every 3 miles – temporary
Source: SCE, 2005a.

From the Harquahala Switchyard, the proposed DPV2 500 kV transmission line route would head east, paralleling the existing Harquahala-Hassayampa 500 kV line for approximately 5 miles. At Mile Post (MP) E5.0, the route would turn north and parallel the existing DPV1 single-circuit 500 kV line, which it would then follow to Devers Substation. The route would cross I-10 at MP E7.4, then proceeding 3.7 miles to MP E11.1, northwest of Burnt Mountain. From there the route would turn west and roughly parallel the north side of I-10 and the CAP Canal for approximately 20 miles, passing through the Big Horn Mountains and across the Harquahala Plain to MP E30.4. After entering La Paz County, the route would turn southwest, crossing to the south of I-10 and proceeding approximately 5 miles to MP E35.3, where it would intersect the El Paso Natural Gas Company's existing pipeline ROW near the Wenden Compressor Station north of the Eagletail Mountains.

The route would parallel the El Paso Natural Gas pipeline and DPV1 transmission line for approximately 56 miles. This section of the route would cross the Ranegras Plain, where a series capacitor bank would be constructed at MP E52.9. The route would pass through approximately 25 miles of Kofa NWR (MP E53.3–MP E77.6), and through the La Posa Plain. It would cross over Arizona State Highway 95 (MP E78.5) and proceed into the Dome Rock Mountains and through Copper Bottom Pass (MP E88.1 through MP E93.0). The route would turn southwest, departing from the pipeline. It would descend the western slope of the Dome Rock Mountains to reach the Colorado River (MP E102.2).

Two types of transmission towers, tubular steel poles and lattice steel towers, would be constructed along the route in Arizona. Along the 5-mile segment of the route parallel to the existing Harquahala-Hassayampa 500 kV line, the DPV2 line would be constructed on 23 new single-circuit tubular steel poles, matching the structures of the existing line. These tubular steel poles would be approximately 140 feet tall. From where the DPV2 route turns north at MP E5.0 to parallel the existing DPV1 line, approximately 320 new four-legged single-circuit lattice steel towers would be constructed along the route to Copper Bottom Pass (MP E88.1). Where feasible, the DPV2 towers would match the horizontal alignment and height of the DPV1 towers. These towers would typically be approximately 150 feet tall. No new towers would be required though Copper Bottom Pass. When DPV1 was constructed through the pass it was installed on 13 four-legged double-circuit bundled-conductor lattice steel towers. The DPV2 500 kV transmission line would be located on these existing towers as a second circuit. Table 1 of Appendix 3, Tower Height Tables, provides structure information for the existing towers along the DPV1 500 kV transmission line.

Figure B-4. Photos of Existing ROW – Devers-Harquahala Portion
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Although USFWS issued a CRC in 1989 for the portion of the Proposed Project crossing the Kofa NWR, the USFWS has asked SCE to submit a new application to construct and operate the DPV2 line across the refuge. The USFWS has indicated that they will re-evaluate the project and update the 1989 CRC.

B.2.2.2 Colorado River to Devers Substation

The California portion of the proposed 500 kV transmission line is illustrated in Figure B-2. It would continue to follow the DPV1 ROW, extending 128 miles through Riverside County, California, from the Colorado River south of the City of Blythe, to SCE's Devers Substation, near Palm Springs.

From the Colorado River, the route would pass into Palo Verde Valley, located 5 miles south of Blythe, California. The route would proceed westerly for approximately 10 miles across the Palo Verde Valley. At MP E105.4, adjacent to the transmission line, a fiber optic repeater site would be constructed in the ROW. At the top of the Palo Verde Mesa (MP E113.4), the Midpoint Substation (if included as a part of the project) would be constructed at MP E113.7. The route would turn northwest, running 5.3 miles to MP E118.7, located south of I-10 approximately 5 miles southwest of the Blythe Airport. The route would continue in a westerly direction, generally parallel to I-10 and the DPV1 line, for approximately 38 miles, crossing Alligator Rock near Desert Center at MP E155.5 and continuing west for another 25 miles to MP E184.1 in Shavers Valley. A second series capacitor bank would be constructed in the ROW along this portion of the route at MP E163.7. Here the route would turn north and cross I-10 at MP E185.6, approximately 2 miles east of the Cactus City rest stop. After crossing I-10, the DPV2 route would continue northwest, paralleling SCE's existing DPV1 and other transmission lines for 46 miles to Devers Substation at MP E228.0.

Two types of transmission towers, lattice steel towers and H-frame towers, would be constructed along the route in California. Approximately 389 towers constructed in this portion of the Proposed Project would be four-legged single-circuit lattice steel towers similar to those described for the Arizona segment, approximately 39 H-frame towers would be used to cross farmland in the Palo Verde Valley area. The two-legged H-frame single-circuit towers would be used to minimize impacts to farming operations. Where feasible, the DPV2 towers would match the horizontal alignment and height of the DPV1 towers. The four-legged lattice steel towers would typically be approximately 150 feet tall while the two-legged H-frame towers would be approximately 144 feet tall. Table 1 of Appendix 3, Tower Height Tables, provides structure information for the existing towers along the DPV1 500 kV transmission line.

B.2.3 West of Devers

In addition to the Devers Substation to Harquahala Substation component, the Proposed Project would include improvements to the west of Devers Substation. Figure B-3 presents an overview of the West of Devers component of the project and Figure B-5 presents photographs of the existing corridor within which the WOD project component would be constructed. Maps in Appendix 10 illustrate the details of the route from Devers Substation to the Vista and San Bernardino Substations.

Impact analysis in Section D divides the WOD route into five segments. These segments are presented below:

- Devers Substation to East Border of Banning – MP W0.0–MP W14.3
- Banning and Beaumont – MP W14.3–MP W29.6
- Calimesa and San Timoteo Canyon – MP W29.6–MP W40.1
- San Bernardino Junction to Vista Substation – MP W40.1–MP V4.8
- San Bernardino Junction to San Bernardino Substation – MP W40.1–MP W43.5

B.2.3.1 Devers to San Bernardino Junction

This portion of the Proposed Project would involve the replacement and reconductoring of 40 miles of 230 kV transmission lines from the Devers Substation to the San Bernardino Junction, located in unincorporated San Bernardino County. As illustrated in the detailed West of Devers maps in Appendix 10, the WOD route departs west from the Devers Substation, paralleling to the northern side of I-10 through San Gorgonio Pass. The route crosses portions of the Morongo Indian Reservation and the Cities of Banning and Beaumont. Because part of the route is through the Morongo Indian Reservation, SCE would need to negotiate an agreement with the Morongo Tribal Council to obtain approval for upgrades to the existing lines and for any new construction. Negotiations are in progress for these approvals. As of this writing this approval has not been obtained.

Approximately 26 miles west of Devers, at MP W26.4, the Proposed Project crosses to the south side of I-10, after passing through parts of the Cities of Banning and Beaumont. It would then proceed west across the southern portion of the City of Calimesa and into San Timoteo Canyon. The route would continue northwest through San Timoteo Canyon for approximately 7 miles to MP W36.1, where it enters the County of San Bernardino, crossing the southwestern corner of the City of Redlands. Exiting San Timoteo Canyon, the route enters the City of Loma Linda at San Bernardino Junction, located at MP W40.1.

Proposed Project activities between Devers and San Bernardino Junction include the following:

- Removing an existing 40-mile, single-circuit 230 kV line (approximately 63 percent of structures are wood H-frame and 37 percent are single-circuit lattice steel)
- Removing an existing 40-mile, single-circuit lattice steel 230 kV line
- Constructing a new 40-mile, double-circuit 230 kV transmission line within the existing ROW, which includes approximately 157 new structures
- Reconductoring the existing 40-mile, double-circuit 230 kV lattice steel towers, which includes one additional new structure and raising four structures

Where feasible, the new 230 kV towers would match the horizontal alignment and height of the existing 230 kV towers. These towers would typically be approximately 150 feet tall.

Tower Configuration Between Devers and San Bernardino Junction

Between Devers Substation and San Bernardino Junction, SCE would remove two single-circuit and construct one new double-circuit line, reducing the number of transmission lines in the corridor from two single-circuit lines and a double-circuit line to two double-circuit lines. Currently, to the east of Banning (MP 17.1), the double-circuit line carrying the Devers–San Bernardino No. 2 and Devers-Vista No. 2 circuits is the northernmost line in the ROW. The middle line in the ROW is Devers–San Bernardino No. 1 circuit on a single-circuit lattice steel tower and the southernmost line in the ROW is the Devers-Vista No. 1 circuit on a wood H-frame line. West of Banning, however, the northernmost line in the ROW is Devers–San Bernardino No. 2 on a wood H-frame line, the middle line is the double-circuit line with Devers-Vista Nos. 1 and 2, and the southernmost line in the ROW is Devers–San Bernardino No. 1. The routing of these lines currently requires the crossing of Devers–San Bernardino No. 1 and Devers-Vista No. 1. The top of Figure B-6 presents a schematic diagram of the existing routes of these lines WOD.

Figure B-5. Photos of Existing West of Devers Corridor
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The Proposed Project, however, would eliminate line-crossing with the removal of the single-circuit towers, installation of a new double-circuit line, and reconductoring of the existing double-circuit line. The bottom of Figure B-7 presents a schematic diagram of the new routes of Devers–San Bernardino Nos. 1 and 2 and Devers-Vista Nos. 1 and 2. Under the Proposed Project, east of MP 17.1, the existing double-circuit line would be on the northern side of the ROW and the new double-circuit line would be on the southern side. West of MP 17.1, the new double-circuit line would be on the northern side of the ROW and the existing double-circuit line would be on the southern side. To eliminate the line-crossing at this point, the circuits on the new double-circuit towers east of MP 17.1 would be conductored through the existing double-circuit towers at Tower M17-T1 to continue west of Banning. The circuits on the existing double-circuit towers east of MP 17.1 would be strung across to the new double-circuit towers. With this new configuration, Devers–San Bernardino No. 1 and No. 2 would be conductored on the northern double-circuit towers and Devers-Vista No. 1 and No. 2 would be conductored on the southern double-circuit towers.

From San Bernardino Junction the route divides, with one leg going north to San Bernardino Substation and one leg going west to Vista Substation. Table 2 of Appendix 3, Tower Height Tables, provides structure information for the Devers–San Bernardino #1 230 kV Transmission Line. Table 3 of Appendix 3, Tower Height Tables, provides structure information for the Devers–San Bernardino #2 and Devers-Vista 230 kV Transmission Lines.

B.2.3.2 San Bernardino Junction to San Bernardino Substation

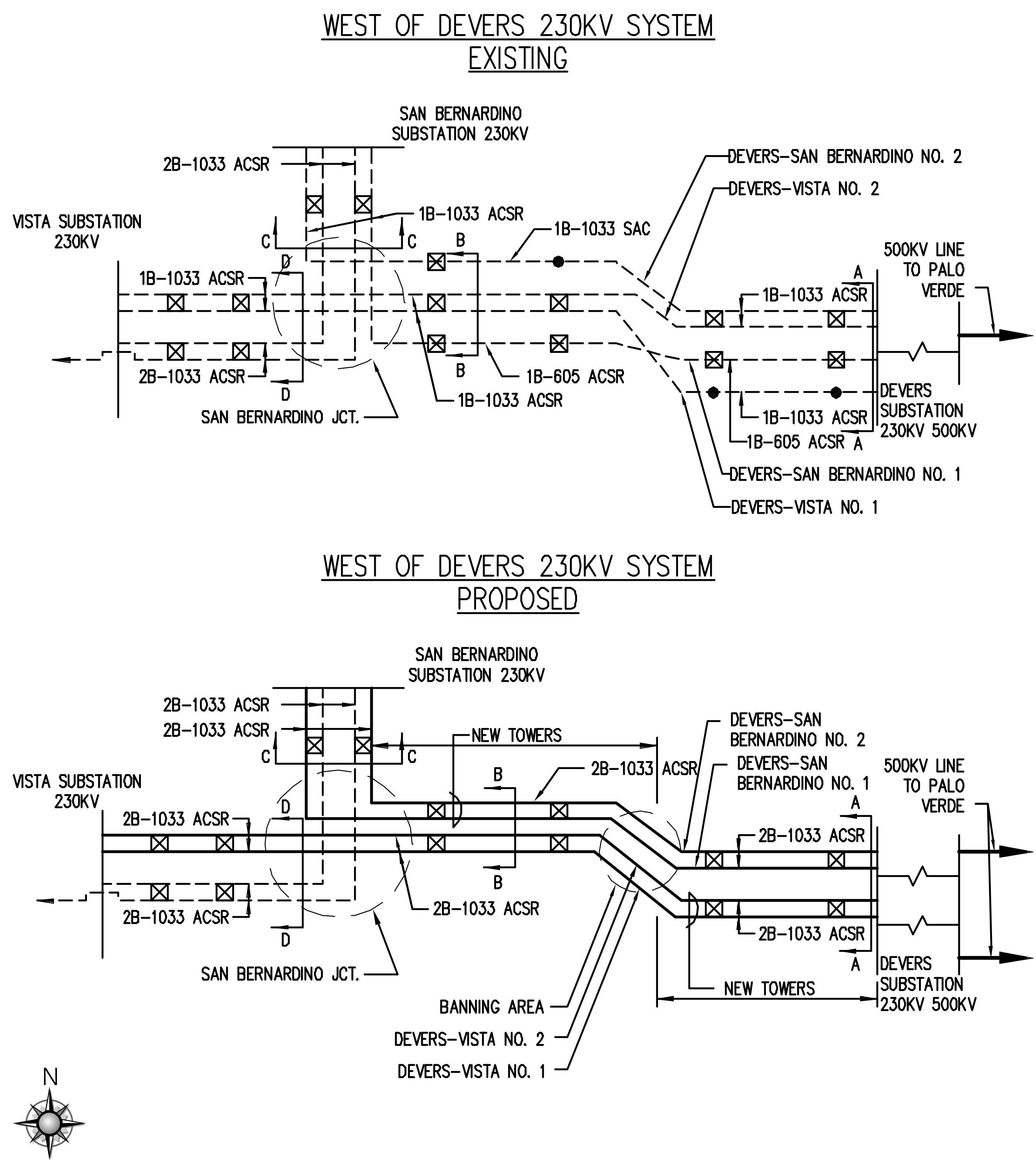
From San Bernardino Junction in Loma Linda, this leg of the route would proceed north 3.4 miles, across I-10 through a section of the city of Redlands and back into unincorporated San Bernardino County where it connects to the San Bernardino Substation. The San Bernardino Junction to San Bernardino Substation portion of the Proposed Project would consist of reconductoring one circuit on each of the two existing 3.4-mile, double-circuit 230 kV lattice steel tower lines. Detailed maps of this segment are presented in Appendix 10.

B.2.3.3 San Bernardino Junction to Vista Substation

The San Bernardino Junction to Vista Substation leg of the route would leave San Bernardino Junction and continue west for 5 miles through the City of Grand Terrace, crossing I-215 and terminating at the Vista Substation. This portion of the Proposed Project would consist of 4.8 miles of reconductoring both circuits of an existing double-circuit 230 kV transmission line. The reconductoring will require the replacement of approximately 14 structures and one inter-set structure.

B.2.4 Related Transactional Issues

In PEA Section 2.3, SCE describes three issues in which third-party agreements could affect the DPV2 Project. Each of these agreements is described below.



Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

PREPARED BY Aspen Environmental Group

LEGEND

- 500KV LINE
- 230KV LINE
- NEW CONDUCTOR
- DOUBLE-CIRCUIT TOWER
- DOUBLE-CIRCUIT TOWER
- SINGLE-CIRCUIT TOWER
- WOOD H-FRAME

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-6
Banning Junction Switch Diagram/Map

Los Angeles Department of Water and Power

SCE and the Los Angeles Department of Water and Power (LADWP) have an existing contractual arrangement that provides for participation by LADWP in the DPV2 project. The Los Angeles–Edison Exchange Agreement was entered into on December 18, 1987 (Exchange Agreement). The Exchange Agreement is summarized in Table B-3.

Under the Exchange Agreement, LADWP will receive 30.7 percent of the DPV2 line capacity and share in 30.7 percent of the DPV2 project costs. The Exchange Agreement provides that the parties will enter into a participation agreement to more fully describe the parties' respective rights and obligations regarding the ownership of DPV2. Provided LADWP participates in DPV2, its transmission capacity between Palo Verde and Devers will remain essentially the same. LADWP's 368 MW of existing transmission service rights between Devers and Palo Verde will terminate and LADWP will acquire a 30.7 percent ownership interest in DPV2. LADWP's ownership share would equal 368 MW at the planned rating for DPV2 of 1200 MW.

Table B-3. Summary of Exchange Agreement

Eastern Transmission Service

- SCE shall make available to LADWP 368 MW of firm bidirectional transmission service between Devers and Sylmar for the life of DPV1 or upon construction of DPV2 the life of DPV2.
- SCE shall make available to LADWP 368 MW of firm bidirectional transmission service between Palo Verde and Devers beginning June 1, 1990 and shall continue service until the earliest of any of the following events: (i) the in-service date of the DPV2 Line, (ii) the in-service date of any other transmission line connecting Palo Verde and Devers in which LADWP has obtained either an ownership share or entitlement to transmission service, (iii) the date when the DPV1 Line is permanently removed from service, (iv) four years after SCE has obtained the CPUC approval, pursuant to California Public Utilities Code Section 851 to transfer rights of way for DPV2 to LADWP, or (v) upon 12 months' prior written notice by LADWP, on or after January 1, 2003; provided, however, that upon written notice by SCE, provided within three months following the date of such notice by LADWP, such termination date may be extended for an additional period not to exceed 24 months, if and to the extent necessary to allow SCE to reflect fully the revenue impact of such termination in its CPUC and FERC jurisdictional rates.
- SCE shall make available to LADWP 100 MW of firm bidirectional transmission service over SCE's transmission facilities between Palo Verde and Sylmar through May 2012.

Northwest Transmission Rights

- LADWP shall make available to SCE from LADWP's ownership share of the extra-high voltage (EHV) Pacific DC Intertie Line, 500 MW of firm bidirectional Transmission Capacity on the EHV DC Line between Sylmar and the Nevada-Oregon border.
- SCE shall make available to LADWP 320 MW of bidirectional Transmission Capacity on the EHV Pacific AC Intertie Lines.
- The exchange of Pacific Intertie transmission service terminates when SCE's rights to the Pacific AC Intertie terminate.

Castaic Service

- LADWP shall make available to SCE 200 MW from the Castaic Power Plant for a term of five years from the effective date of the Exchange Agreement. This provision expired on December 18, 1992.
- Commencing upon the effective date of the Exchange Agreement and continuing for a term of 22 years, LADWP shall use its best efforts to make Additional Service available to SCE at LADWP sole discretion. Additional Service is any weekly service for spinning reserve, generation and pumping purchased by SCE.

DPV2 Line Ownership

- LADWP has the obligation to acquire a 30.7 percent ownership interest in the DPV2 line.
- SCE shall use its best efforts to construct DPV2 with a minimum 1,200 MW Transmission Capacity Rating. LADWP has the option to purchase firm bi-directional transmission service over DPV2 to make up a total of 368 MW in the event DPV2 Transmission Capacity Rating is less than 1,200 MW.

Source: SCE, 2005a, Section 2.3

LADWP has not yet committed to participate in DPV2; however, SCE stated on April 14, 2006 that it believes that the parties are close to finalizing an agreement that would provide for SCE's construction of DPV2 as proposed. Although most of the outstanding issues have been resolved, some still require further discussion between LADWP and the CAISO.

Harquahala Generating Company Option Agreement

SCE and Harquahala Generating Company (HGC) entered into an Option Agreement on February 13, 2001 (Option Agreement). The Option Agreement provides that SCE has the option to purchase the 500 kV switchyard at Harquahala; the 500 kV transmission line from the Harquahala Switchyard to the Hassayampa Switchyard, and the Harquahala transmission line terminal facilities at the Hassayampa Switchyard.

SCE also entered into a License Agreement with HGC on February 13, 2001 that provides for HGC to construct a portion of the Hassayampa-Harquahala transmission line on SCE right-of-way. The agreement also allows HGC to purchase SCE's land rights between Harquahala and Hassayampa if SCE does not exercise the option by 2011, or if SCE desires to terminate the License Agreement. If SCE exercises the Option Agreement, the License Agreement would terminate.

At the time SCE entered into the Option Agreement, HGC was proceeding to build and own a 500 kV transmission line to interconnect its new 1,040 MW natural gas-fired generating plant in Maricopa County, Arizona, with the regional transmission system in central Arizona at the Hassayampa 500 kV switchyard. SCE was concerned with the potential for HGC building near SCE's DPV2 right-of-way and potentially adversely affecting SCE's ability to build DPV2. SCE entered into the Option Agreement with HGC to preserve the right-of-way for DPV2.

For the DPV2 project, SCE proposes to construct a new 500 kV line from Devers to the Harquahala Switchyard. SCE would then use the existing Harquahala-Hassayampa 500 kV line to complete the connection of the DPV2 Project to the Hassayampa Switchyard. The Hassayampa Switchyard is a satellite switchyard, and is functionally equivalent to connecting at the PVNGS Switchyard.

SCE requested that the SCE Harquahala-West Alternative be evaluated because there is the possibility that the DPV2 line may not be able to be constructed exiting the Harquahala Switchyard to the east.

Arizona Public Service TS-5 Project

At the time that SCE submitted its application to the CPUC, APS had informally proposed to the Arizona Corporation Commission (ACC) that it construct a 45-mile 500 kV transmission facility from the Palo Verde hub to a new TS-5 substation located in western Arizona. Since then, a Certificate of Environmental Compatibility for the project was approved by the ACC (on August 17, 2005; Case 128). The final construction plan has not been determined, although the approval provides for the northern portion of the route to be constructed within a 1,000-foot-wide corridor east of the existing DPV1 centerline (the proposed DPV2 line will be constructed within the existing BLM right-of-way on the west side of the existing DPV1 line).

The ACC decision on the TS-5 project provides APS the flexibility to select from several project routing and scope alternatives for the TS-5 project. APS was granted the ability to interconnect at one or more of the following locations: (1) the Duke Arlington Power Plant; (2) a new Harquahala Junction Switchyard; or (3) the Palo Verde Switchyard. It was the preference of both APS and the ACC staff for APS to interconnect at either the Duke Arlington Plant or a new Harquahala Junction Switchyard. Therefore, subject to a joint project arrangement among SCE, APS and Harquahala Generation Company (HGC), the parties would share the existing Harquahala-Hassayampa transmission line and potentially a Harquahala Junction Switchyard, if constructed. Discussions among SCE, APS and HGC regarding the potential joint project arrangement are ongoing but have not yet resulted in an agreement. APS has stated that it will file a report to the ACC at the time a final decision is reached or no later than December 31, 2006. SCE has stated that the approval of the APS project does not affect the DPV2 project.

B.2.5 Tribal Lands

The Proposed Project ROW and its access roads cross through or are adjacent to lands associated with three Native American groups:

- Colorado River Indian Tribe (CRIT)
- Agua Caliente Band of Cahuilla Indians
- Morongo Band of Mission Indians.

The ROW requirements would be different for the Proposed Project through each of these areas. Figure B-7a shows an overview of tribal lands.

Colorado River Indian Tribe

Under the 2005 Colorado River Indian Reservation Boundary Correction Act (Act), a portion of the southern boundary of the CRIT Reservation in Arizona was expanded south to the existing DPV1 ROW. The language of this Act was amended to protect the existing ROWs issued by the BLM, including SCE's DPV1 and DPV2 ROW easements. Although the DPV ROW is outside the new boundary of the CRIT Reservation, existing access roads for the transmission ROW cross CRIT lands. The access road ROWs for the transmission line are also included under the amendment to the Act. Consequently, both the transmission ROW and the access road ROWs granted by the BLM do not require further permitting by the CRIT. Figure B-7b shows the southern boundaries of the CRIT Reservation.

Agua Caliente Band of Cahuilla Indians

The existing DPV1 ROW in California crosses an approximately 0.1-mile stretch of allottee lands under the jurisdiction of the Agua Caliente Band of Cahuilla Indians east of Palm Springs. Figure B-7c shows the portion of Agua Caliente fee lands crossed by the Proposed Project. On December 16, 2005, the Agua Caliente Band of Cahuilla Indians submitted a letter to the CPUC and the BLM stating that the Proposed Project would cross the exterior boundaries of its lands, and that the project would be subject to a 1979 ordinance passed by the Tribe that regulates the development of public utility projects on tribal lands (see Appendix 8). In its letter, the Tribe states that it will require SCE to secure approval of a Conditional Use Permit (CUP) for this portion of the route, and requested that the requirement for a CUP be added as a mitigation measure to the EIR/EIS. SCE has stated that the Proposed Project would traverse allotments that are owned by tribal members, but that these allotments have not been incorporated into the boundaries of the tribal lands. Land acquisition issues for this portion of the route still need to be resolved between SCE and members of the Agua Caliente Band of Cahuilla Indians.

Morongo Band of Mission Indians

The existing West of Devers 230 kV ROW in California crosses 4.4-mile stretch of Morongo Band tribal lands west of Palm Springs within San Gorgonio Pass. SCE’s ROW across Morongo tribal lands is 450 feet wide with 150 feet for the Devers-Vista No. 1 line and 300 feet for both the Devers–San Bernardino No. 1 line and the double-circuit Devers–San Bernardino No. 2 and Devers-Vista No. 2 lines. The Morongo Tribe lease for the 150-foot Devers-Vista No. 1 ROW expires in 2010 and the lease for the 300-foot ROW expires in 2019. Under the Proposed Project, SCE would remove the Devers–San Bernardino No. 1 line from the 300-foot ROW, reconductor the double-circuit towers in the 300-foot ROW, and would replace the Devers-Vista No. 1 in the 150-foot ROW with a new double-circuit 230 kV line. Consequently, SCE is currently negotiating with the Morongo tribe for renewal of the ROWs. Figure B-7d shows the portion of the Morongo Band tribal lands crossed by the Proposed Project.

B.3 Project Construction

This section describes methods typically used for constructing and installing transmission, substation modifications, and other features of the Proposed Project. An overview of the transmission line structures that SCE expects to use in the Proposed Project is presented in Section B.3.1, followed by descriptions of hardware and ROW requirements necessary to construct the Proposed Project (Sections B.3.2 and B.3.3). Section B.3.4 describes construction activities associated with substations, series capacitors, and switchyards. Section B.3.5 describes the special protection scheme and telecommunications facilities that would be installed as a part of the Proposed Project. Finally, Section B.3.6 details the construction methods and activities associated with different components of the project.

B.3.1 Structures

The proposed 500 kV transmission line and upgraded 230 kV transmission lines would consist of overhead wires (conductors), which form three electrical phases. The conductors would be supported by steel structures and steel poles and would be electrically isolated from the structures by insulators.

The proposed 500 kV transmission line is designed to operate at a nominal voltage of 525 kV phase to phase and a maximum voltage of 550 kV phase to phase. The transmission line capacity rating is limited to 2,700 amps under normal conditions and 3,600 amps under emergency conditions.

The proposed 500 kV line would use four types of structures:

- Four-legged single-circuit lattice steel towers
- Four-legged double-circuit lattice steel towers (these are existing structures in Copper Bottom Pass; no new 500 kV double-circuit lattice steel towers would be constructed under the Proposed Project)
- Two-legged H-frame single-circuit steel towers
- Single-pole, tubular steel poles

Figure B-8 provides a diagram of a typical 500 kV four-legged single-circuit lattice steel tower. The 709 new four-legged single-circuit lattice steel towers would be constructed of galvanized steel angle members connected by bolts. These towers would support one circuit consisting of three phases of conductors arranged in a horizontal (flat) configuration.

Thirteen four-legged double-circuit lattice steel towers were constructed in Copper Bottom Pass during the construction of DPV1. These towers support two circuits, each consisting of three phases of conductors arranged in a vertical configuration. As described in Section B.2.2, the DPV1 line is located on one side of the towers in one circuit location. The DPV2 line would utilize the second circuit location on the other side of the towers. Because of the placement of these existing towers, no new towers would be constructed in Copper Bottom Pass and no double-circuit lattice steel towers would be constructed as a part of the Proposed Project. The tower diagram is shown in Figure B-9.

Figure B-7a. Overview of Tribal Lands
Figure B-7b. Southern Boundaries of the CRIT Reservation
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Figure B-7c. Agua Caliente Allottee Lands
Figure B-7d. Morongo Band Tribal Lands
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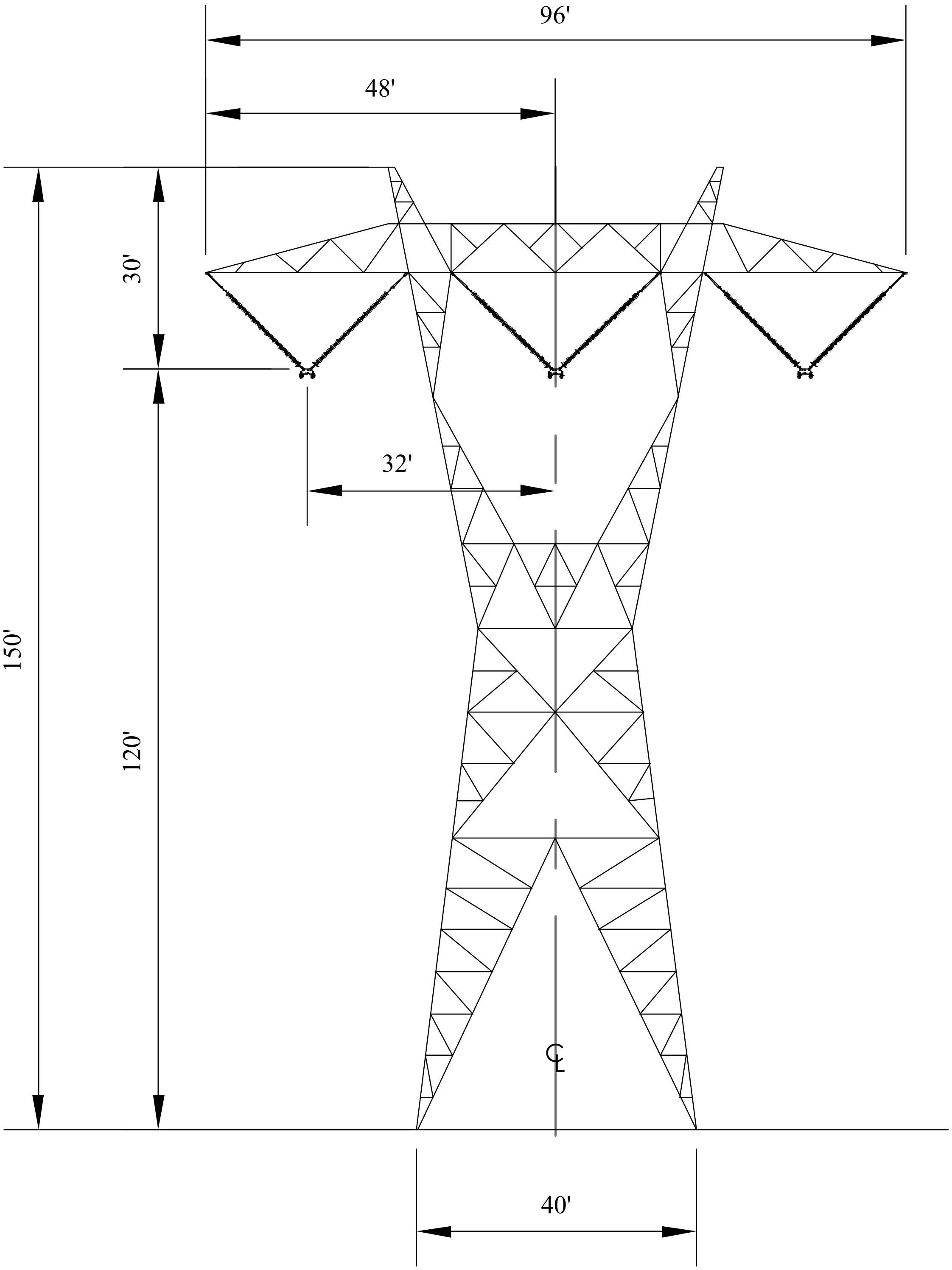


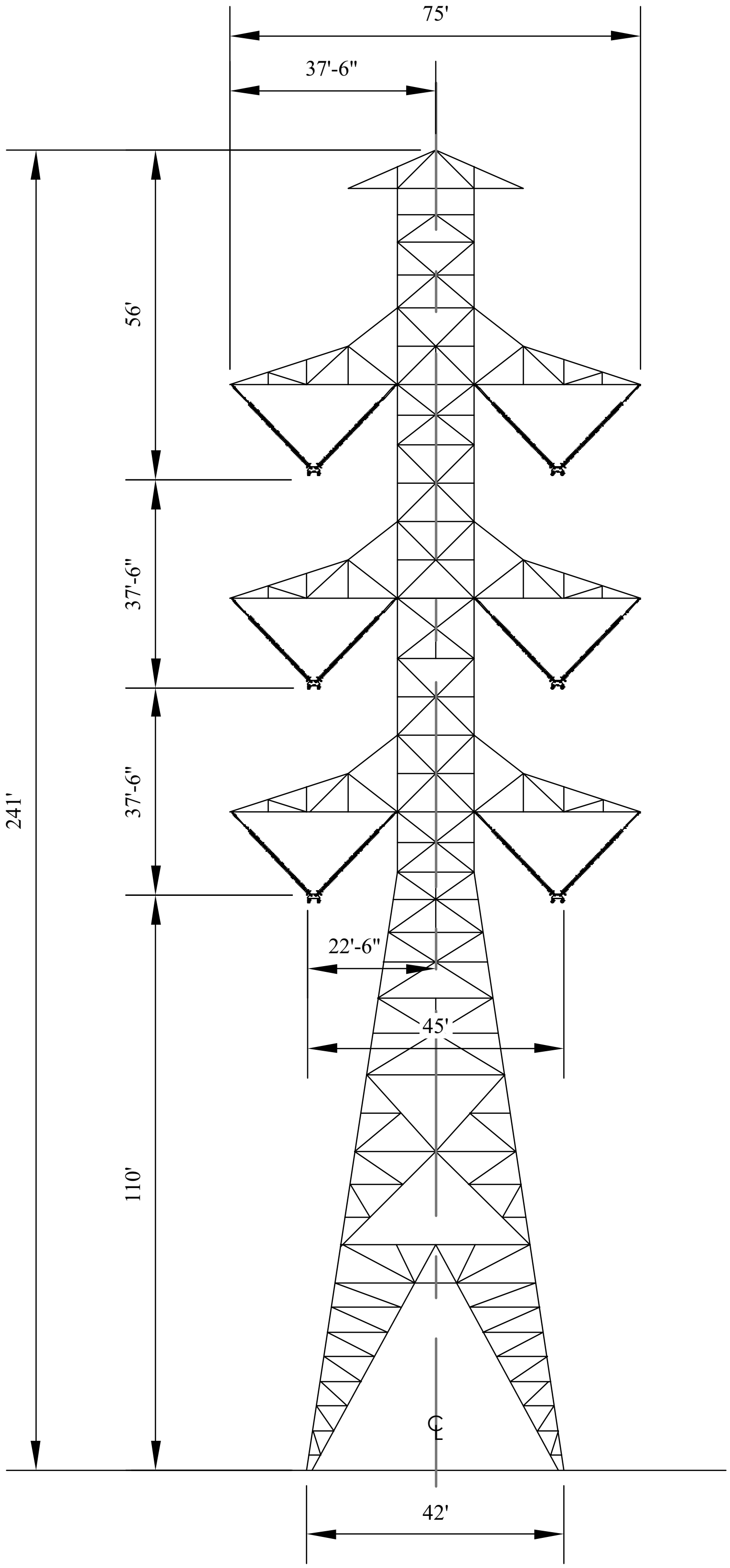
Note:
Dimensions are approximate and may vary with site conditions.

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-8
Typical 500kV Single-Circuit Lattice Steel Tower



Note:
Dimensions are approximate and may vary with site conditions.

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-9
Typical 500kV Double-Circuit Lattice Steel Tower

Approximately 39 new two-legged H-frame single-circuit towers would be used in farm lands. They would be constructed of galvanized steel angle members bolted together. These towers would support one circuit consisting of three phases of conductors arranged in a horizontal (flat) configuration. The tower diagram is shown in Figure B-10. Along the portion of the Proposed Project paralleling the existing Harquahala-Hassayampa 500 kV line, 23 new single-circuit tubular steel poles would be used, matching the type of poles used for the existing line. The pole diagram is shown in Figure B-11. Photos of all tower types are presented in Figure B-12.

The proposed 230 kV transmission system modifications west of Devers Substation include use of the existing double-circuit lattice steel towers between Devers and San Bernardino Junction and between San Bernardino Junction and the San Bernardino and Vista Substations. A new double-circuit line between Devers and San Bernardino Junction would be constructed on lattice steel structures similar in size and appearance to the existing towers. In addition, approximately four existing lattice steel towers may be raised by installing lattice steel extensions set on new concrete foundation under the existing structures. Two new towers would be set between existing towers to support new conductors.

Each of the 230 kV transmission lines is designed to operate at a nominal voltage of 230 kV phase to phase. When upgrades are completed, each 230 kV circuit would be capable of transferring nominally 988 MW of power on a continual basis and 1,335 MW under emergency conditions. For a nominal power flow of 988 MW, each of the upgraded lines would have a current of 2,480 amps. Using an assumed annual load growth of 2.5 percent, the two 230 kV lines to San Bernardino Substation would reach 2,480 amps in the 2067 and the two 230 kV lines to Vista Substation would reach 2,480 amps in the year 2051.

The existing and proposed placement and configurations of towers are shown in Figures B-13a through B-13d. Lattice towers, as shown in Figures B-14 and B-15 would be constructed of galvanized steel angle members bolted together. Each tower would support two circuits consisting of three phases of conductors arrayed in a vertical configuration.

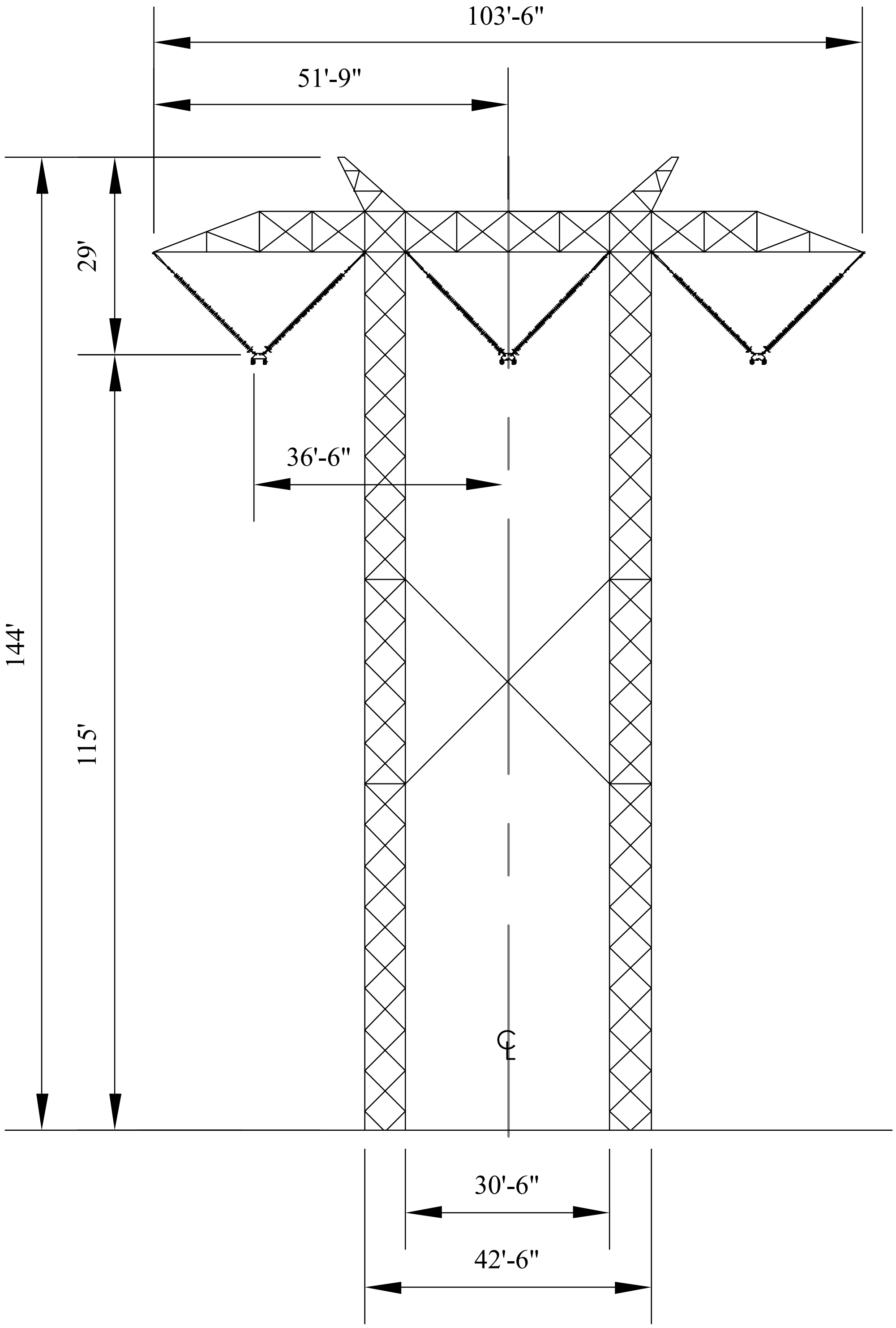
The transmission line would be composed primarily of tangent (suspension) type structures, where conductors approach and depart the structures in a straight line. Some towers would be heavier structures. These would be either angle structures allow for a limited change in line direction, or dead-end structures used for major changes in line direction. Structure weights vary with height and specific load requirements, the approximate weight of each type of structure is listed in Table B-4.

The heights of the structures would vary depending upon the terrain, span length, and the presence of other facilities or features that the transmission line may cross, such as rivers, roads, highways, railroads, telephone lines, or other power transmission and distribution lines.

Table B-4. Structure Type and Weight

Structure Type	Weight (pounds)
500 kV Transmission Line Structures	
Four-legged single-circuit tangent	32,000
Four-legged single-circuit angle	50,000
Four-legged single-circuit dead-end	80,000
Four-legged double-circuit tangent	125,000
Four-legged double-circuit dead-end	200,000
Two-legged single-circuit tangent	55,000
Tubular steel pole	38,000
230 kV Transmission Line Structures	
Four-legged double-circuit tangent	35,000
Four-legged double-circuit dead-end	65,000

Source: SCE, 2005a.



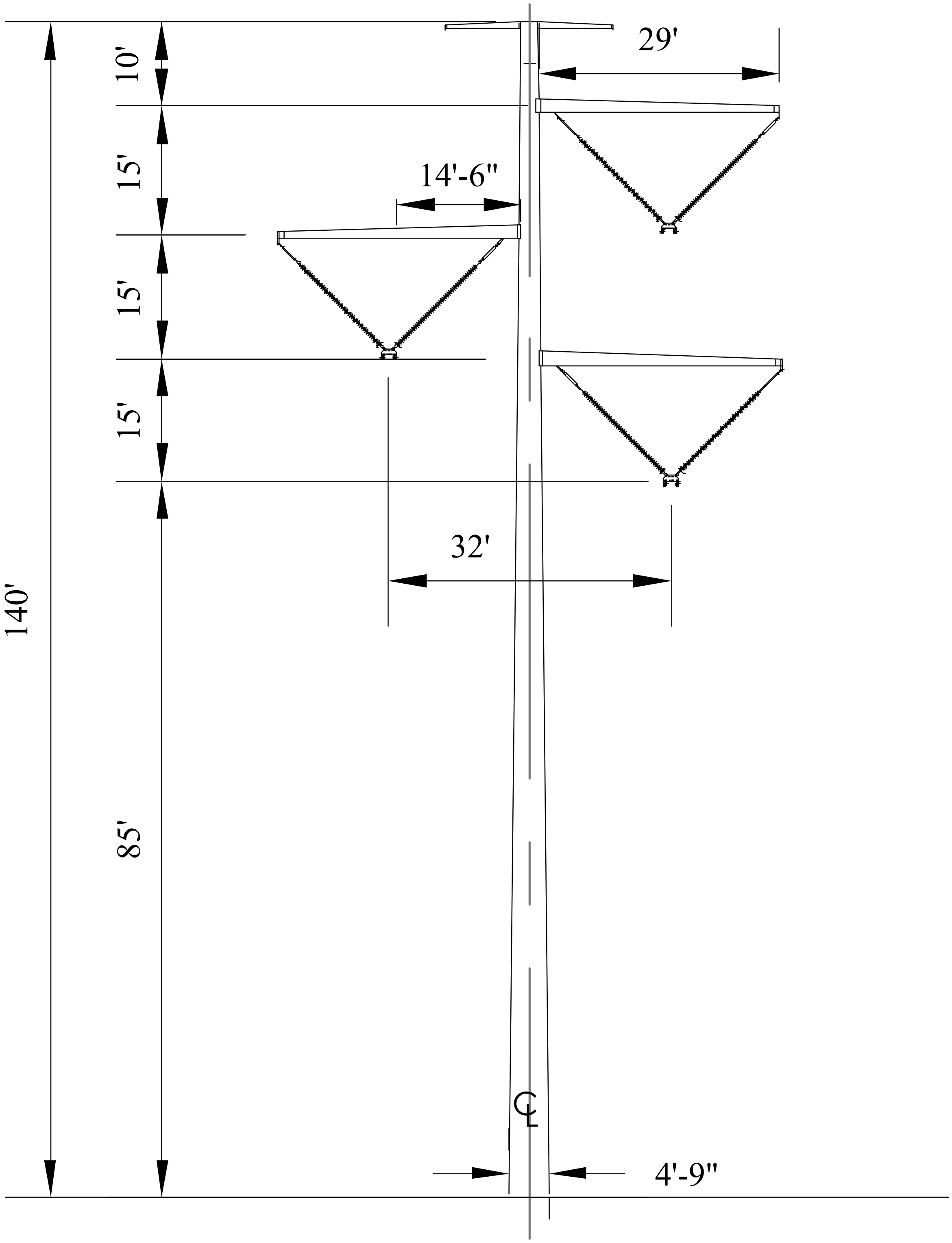
Note:
Dimensions are approximate and may vary with site conditions.

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-10
Typical 500kV Single-Circuit "H-Frame" Tower



Note:
Dimensions are approximate and may vary with site conditions.

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-11
Typical 500kV Single-Circuit Tubular Steel Pole

Typical 500 kV structures would be approximately 150 feet tall for the four-legged single-circuit lattice steel towers, approximately 144 feet tall for the two-legged H-frame towers, and 140 feet tall for the tubular steel poles. Typical 230 kV towers would be approximately 150 feet tall. The final heights of the DPV2 towers may differ from the existing DPV1 towers by approximately 5 to 10 feet, due to operating system requirements.

The new towers would be aligned horizontally with the existing towers where feasible. However, the capacity rating specified by the ISO necessitates that the heights of some of the Devers-Harquahala towers be slightly taller than the adjacent DPV1 towers. Also, tower spacing may not correspond to the DPV1 structures in order to provide adequate conductor ground clearance. Minimum conductor height would be at least 35 feet above the ground for the 500 kV line and 30 feet for the 230 kV lines.

The average tower-to-tower spacing (span length) for the 500 kV line would be approximately 1,550 feet. For steel lattice towers, this would result in an average of approximately 3.4 towers per mile. Span lengths generally range from a minimum of 400 feet to a maximum of 2,200 feet. The typical span length for the 500 kV tubular steel poles would be 1,320 feet, or four towers per mile. The average tower-to-tower span length for the new 230 kV line would be approximately 1,350 feet, resulting in approximately 3.9 towers per mile. Towers would be placed at the maximum feasible distance apart at crossings of all highway and recreation routes-of-travel, including the Colorado River. Where feasible, towers would be located within the ROW to avoid skyline situations through placement of towers below a ridge or by adjusting tower placement to avoid highly visible locations and use visual screening provided by nearby landforms. Although the exact quantity and placement of the structures is determined by the final detailed design of the transmission line, detailed maps in Volume 3 (Maps) show preliminary locations of the towers.

During project construction, SCE will utilize a procedure to adjust and finalize transmission tower and stub road locations to ensure that final tower sites are located to maximize stability of the towers while minimizing construction, right-of-way and environmental issues and to accommodate future operations and maintenance needs. The procedure is also utilized to finalize the location of splicing, tensioning, and pulling sites. Under this siting procedure, a multidisciplinary SCE team would visit each proposed structure site following the completion of preliminary engineering and prior to the commencement of detailed, final engineering of the structures. Each tower site and associated stub road would be reviewed by the team to assess the suitability of the site and a buffer area along each stub road and around each tower site would be inspected. If no environmental sensitivities are identified and there are no other issues affecting construction, maintenance, or real estate, the site would be marked as approved and the team would move to the next tower site and stub road. Final engineering would proceed on that tower at the approved location. If an environmental sensitivity is identified (e.g., a desert tortoise burrow or a tower leg would be located in a dry stream channel), the team would move the proposed structure site in-line to avoid the sensitivity (in general, towers would not be moved side to side, but only in-line). In most cases, the team would be able to move a tower site away from sensitivities to a new site. Typically, this could be accomplished with a move of 50 feet or less. The recommended new tower site would then be inspected by the team. If no environmental sensitivities and no construction, maintenance or real estate issues are identified, preliminary engineering for this new site would be checked and the new tower site and associated stub road route would be approved by the team. Once proposed structure sites are approved, final detailed engineering would proceed. During detailed engineering, no further tower site adjustments would occur without consultation with the interdisciplinary team.

Figure B-12. Photos of 500 kV Towers
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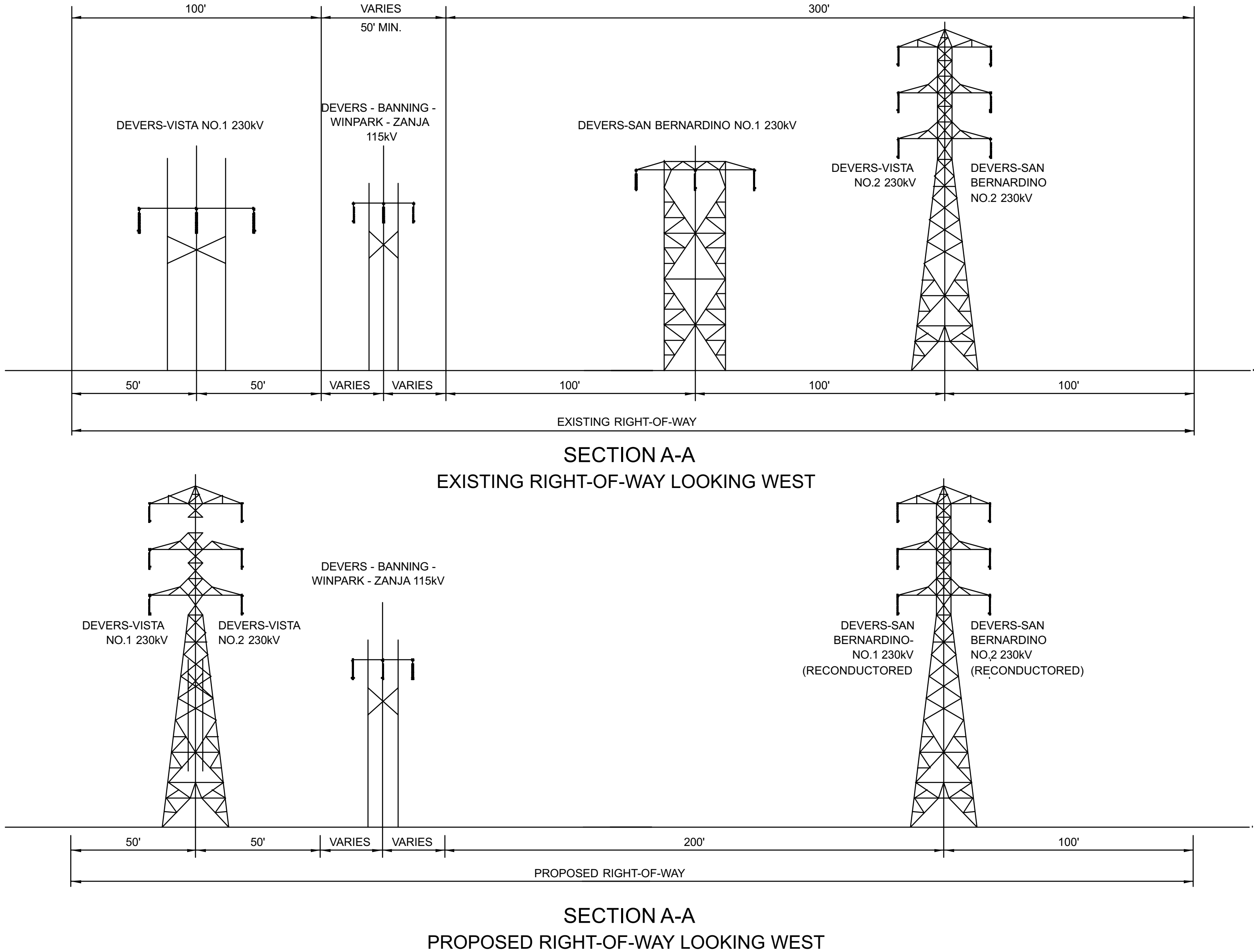
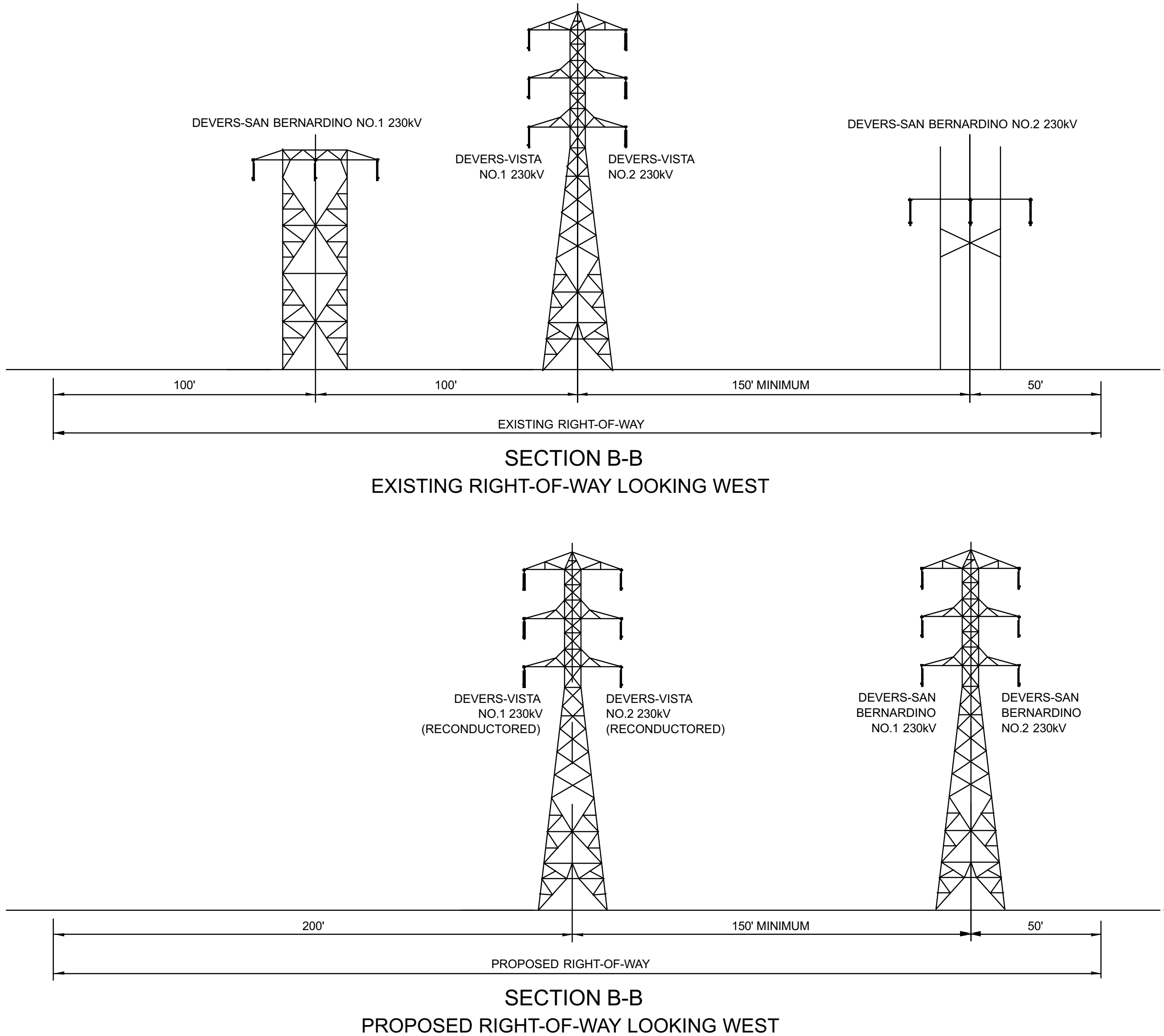


PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-13a
West of Devers: Typical Section between Devers Substation and Banning Junction

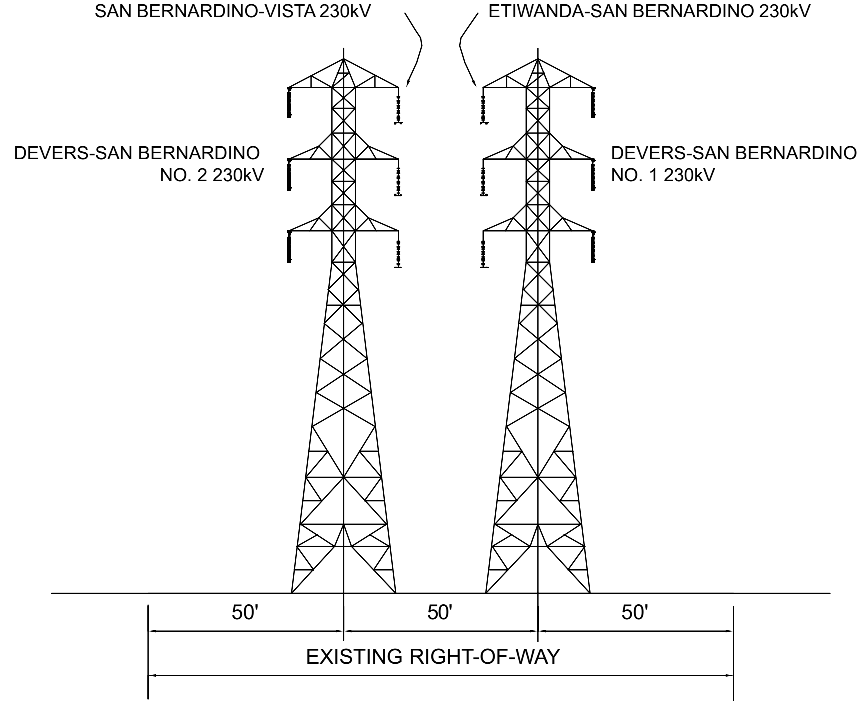


PREPARED BY **Aspen** Environmental Group

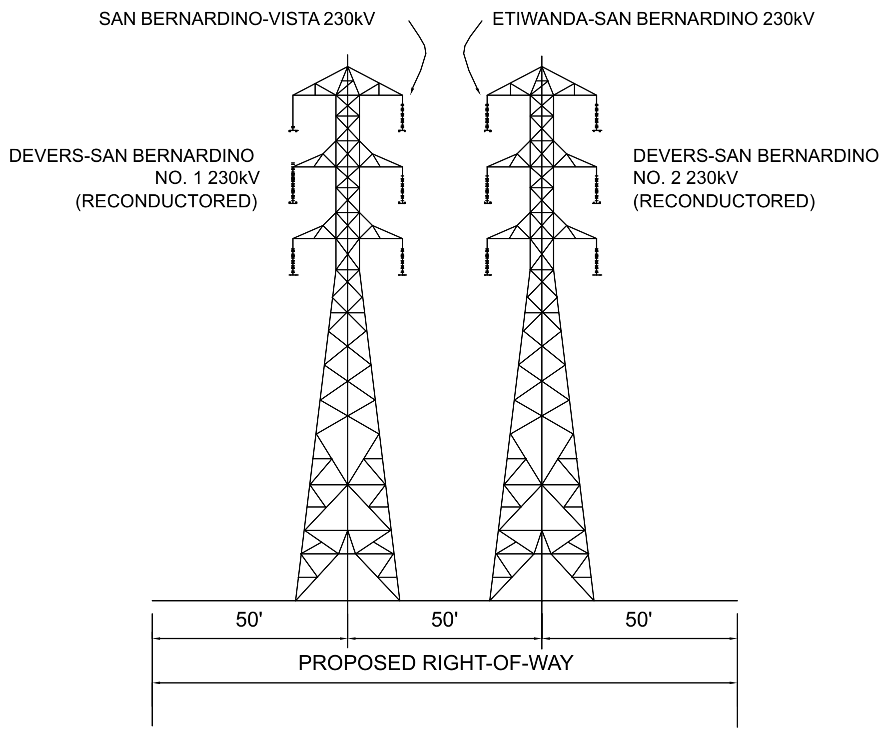
Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-13b
West of Devers: Typical Section between Banning Junction and San Bernardino Junction



SECTION C-C
EXISTING RIGHT-OF-WAY LOOKING NORTH



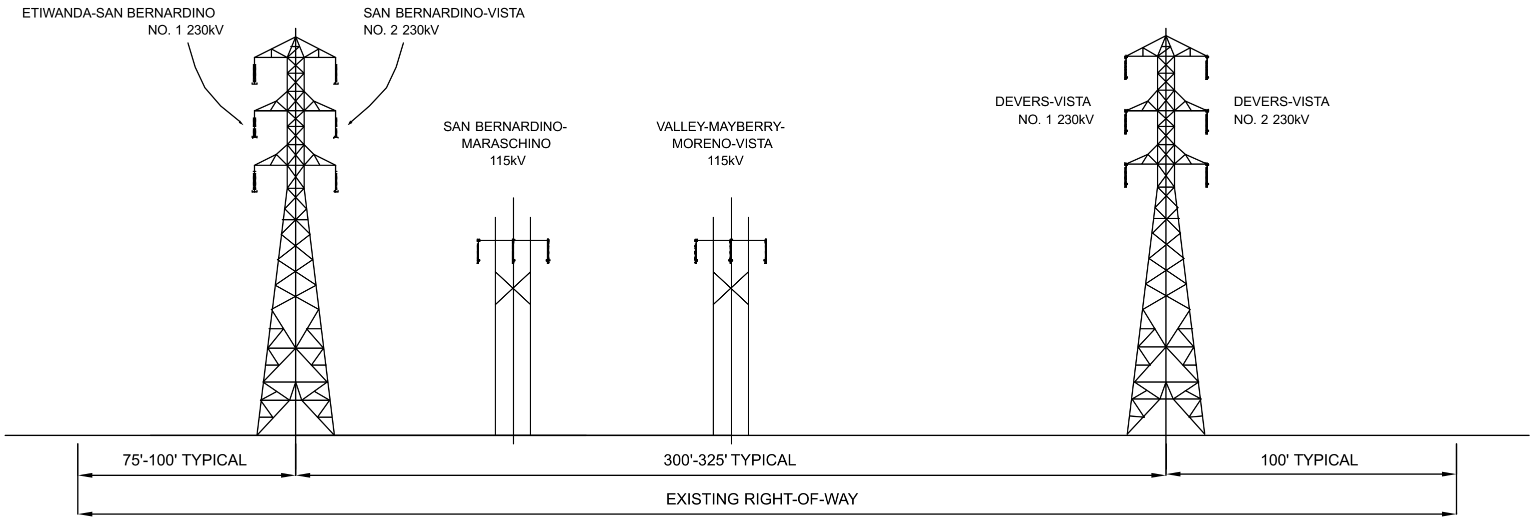
SECTION C-C
PROPOSED RIGHT-OF-WAY LOOKING NORTH

PREPARED BY Aspen Environmental Group

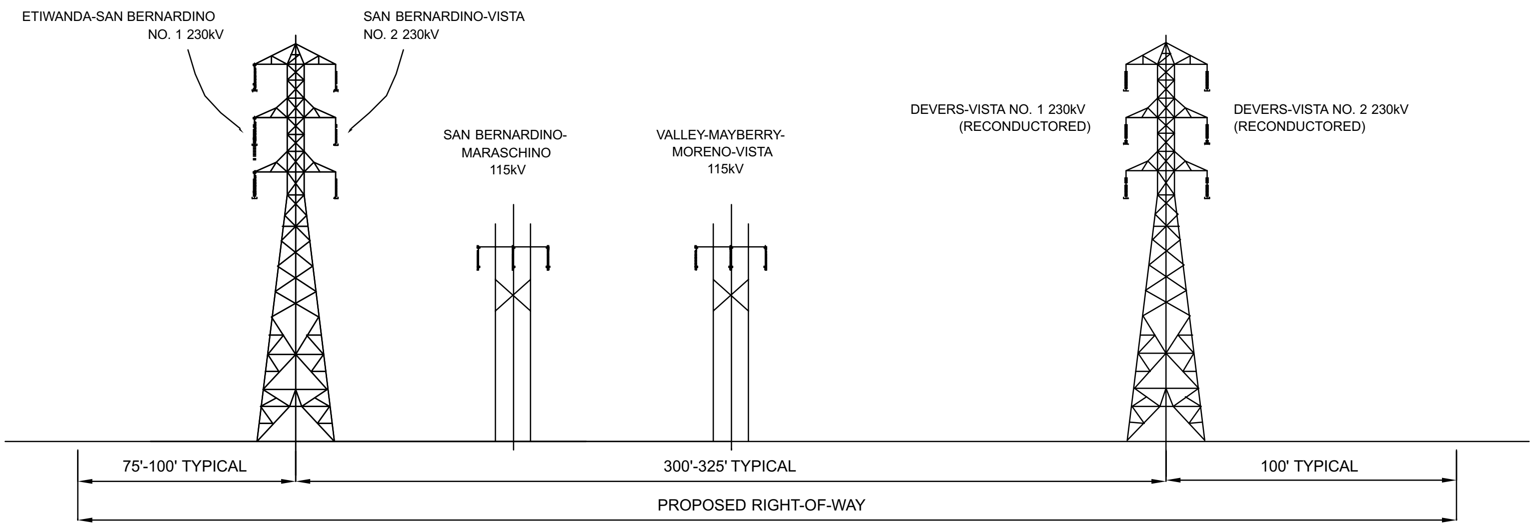
Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-13c
West of Devers: Typical Section between San Bernardino Junction and San Bernardino Substation



SECTION D-D
EXISTING RIGHT-OF-WAY LOOKING WEST



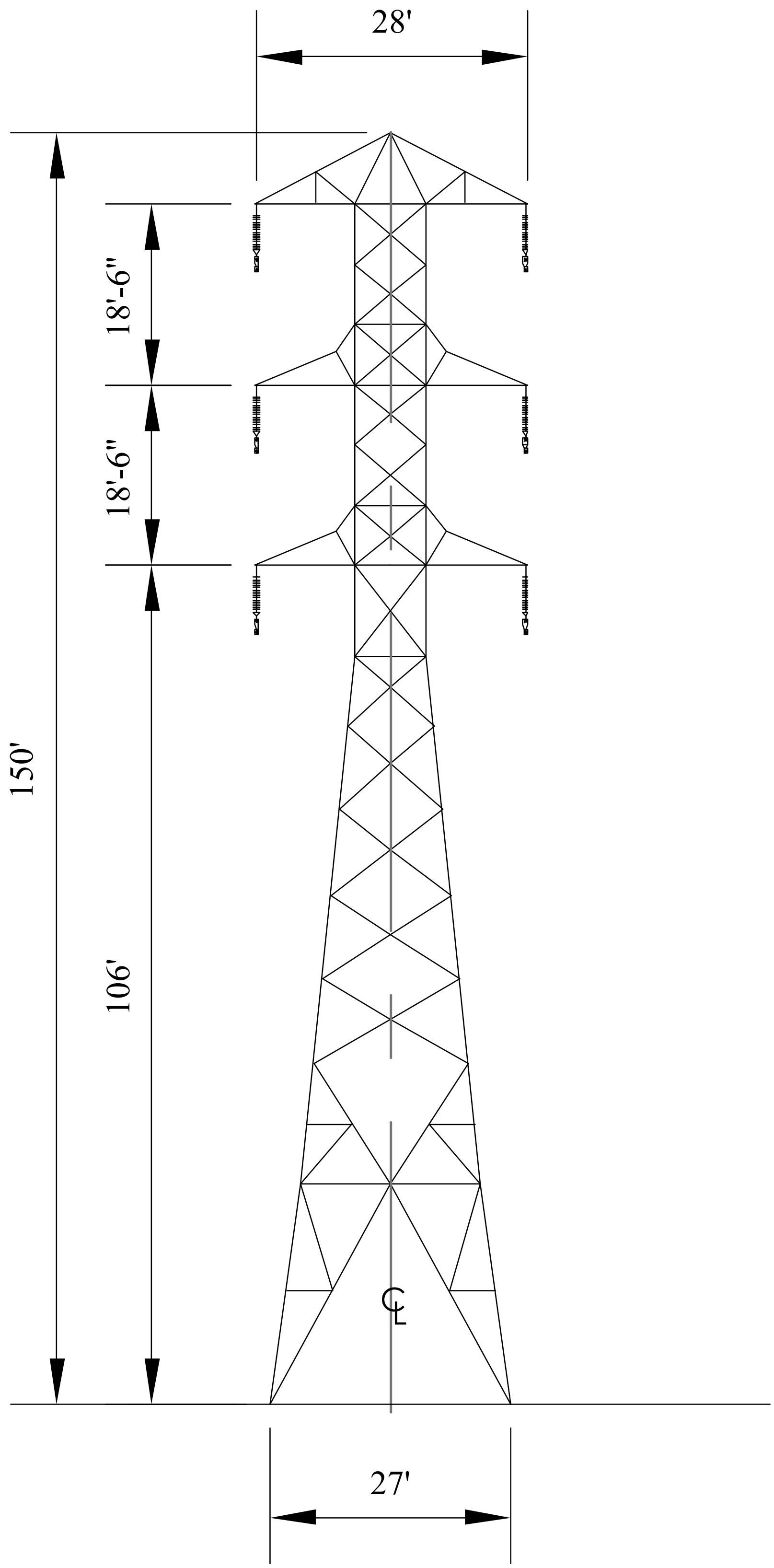
SECTION D-D
PROPOSED RIGHT-OF-WAY LOOKING WEST

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-13d
West of Devers: Typical Section between San Bernardino Junction and Vista Substation



Note:
Dimensions are approximate and may vary with site conditions.

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-14
Typical 230 kV Double-Circuit Lattice Steel Tower

Approximately 24 to 48 hours prior to construction equipment being moved onsite, a team of biologists would inspect each site to detect and remove desert tortoises. If a tortoise burrow is detected, it would be cleared of tortoises that could be inside and then closed to prevent additional tortoises from entering the burrow. This would be accomplished consistent with U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) incidental take authorizations.

The foundations for the 500 kV towers could require up to eight augured, cast-in-place concrete piles. Tubular steel poles would require one pile, lattice steel towers four piles, and H-frame towers eight piles. Foundations for the 230 kV towers would consist of four cast-in-place concrete piles, the size of which would depend on the type of structure and soil conditions at each tower site. With excavations for structure foundations, tower sites may, on rare occasion, need to be moved due to excavation difficulties or discovery of some new sensitivity. During this phase of the work, site adjustments are made only if necessary to avoid an environmental sensitivity or to maintain tower integrity and sustainability. Generally, these site adjustments amount to a few feet.

B.3.2 Hardware (Conductors/Insulators/Overhead Groundwires)

B.3.2.1 Conductors

Each 500 kV phase would consist of a two-conductor bundle with the conductors spaced horizontally 18 inches between their centers. Each 230 kV phase would consist of a two-conductor bundle with the conductors spaced horizontally 16 to 18 inches between conductor centers. Installed on towers, typical conductor bundle spacing would be from 15 to 37.5 feet vertically and from 18 to 45 feet horizontally. Conductor spacing for each type of line and structure is listed below.

- 500 kV four-legged single-circuit tower as shown in Figure B-8 — 32 feet
- 500 kV four-legged double-circuit tower as shown in Figure B-9 — 37.5 feet vertically and 45 feet horizontally
- 500 kV two-legged H-frame tower as shown in Figure B-10 — 36.5 feet
- 500 kV tubular steel poles as shown in Figure B-11 — 15 feet vertically and 32 feet horizontally
- 230 kV four-legged double-circuit tower as shown in Figure B-14 — 18.5 feet vertically and 28 feet horizontally.

Each 500 kV conductor would be 1.762 inches in diameter, 2,156 kcmil, ACSR and each 230 kV conductor would be 1.244 inches in diameter, 1,033 kcmil ACSR. With these types of conductor, the current flows through aluminum strands formed in a helix around a core of steel strands. The steel strands provide the mechanical strength to support the aluminum strands.

B.3.2.2 Insulators

As shown in Figures B-8 through B-11, tangent and angle insulator assemblies for the 500 kV line consist of two strings of insulators in the form of a "V." These strings are used to suspend each conductor bundle (phase) from the structure, maintaining the appropriate electrical clearance between the conductors, the ground, and the structure. The "V" string also restrains the conductor so that it will not swing into the structure during winds. Each leg of the "V" assembly contains one or two one-piece gray polymer insulators, depending on the conductor electrical loads. On dead-end structures, insulators are arranged in a barrel configuration consisting of four polymer insulators. The polymer insulators are similar in appearance to the porcelain type insulators used on the DPV1 line, but are easier to install and maintain.

Figure B-15. Photo of 230 kV Double-Circuit Lattice Steel Tower
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Figures B-13a through B-13d and B-14 show tangent and angle insulator assemblies for the 230 kV line, consisting of one or two one-piece gray polymer insulators hung from tower crossarms in the form of an "I." These strings are used to suspend each phase from the structure while maintaining the necessary electrical clearance of the line from both the tower and the ground. Unlike the "V" conductor assemblies used on the 500 kV structures, the "I" assemblies would swing with the conductor during winds. Each insulator is approximately 84 inches long and approximately 6 inches in diameter. Similar to 500 kV structures, 230 kV dead-end structures would also use insulators arranged in a barrel configuration, but consisting of two polymer insulators rather than four.

B.3.2.3 Overhead Groundwires

Overhead groundwires, located on the peaks of transmission line structures, are used to intercept lightning that would otherwise strike the conductors. The groundwire is approximately one-half inch in diameter. The 500 kV structures would have two overhead groundwires, while the 230 kV structures would have one. Electric current from a lightning strike would be transferred to the ground through the groundwires and the structure itself. One of the overhead groundwires on the 500 kV structures also would contain optical fibers for communication and line protection purposes. The groundwire for the Devers-Vista No. 2 230 kV line would contain optical fibers as well.

The approximately vertical distance between the overhead groundwire and the highest conductor is different for each type of transmission tower as follows:

- 500 kV four-legged single-circuit tower as shown in Figure B-8 — 30 feet
- 500 kV four-legged double-circuit tower as shown in Figure B-9 — 56 feet
- 500 kV two-legged H-frame tower as shown in Figure B-10 — 29 feet
- 500 kV tubular steel poles as shown in Figure B-11 — 25 feet
- 230 kV four-legged double-circuit tower as shown in Figure B-14 — 15 feet.

B.3.2.4 Other Associated Hardware

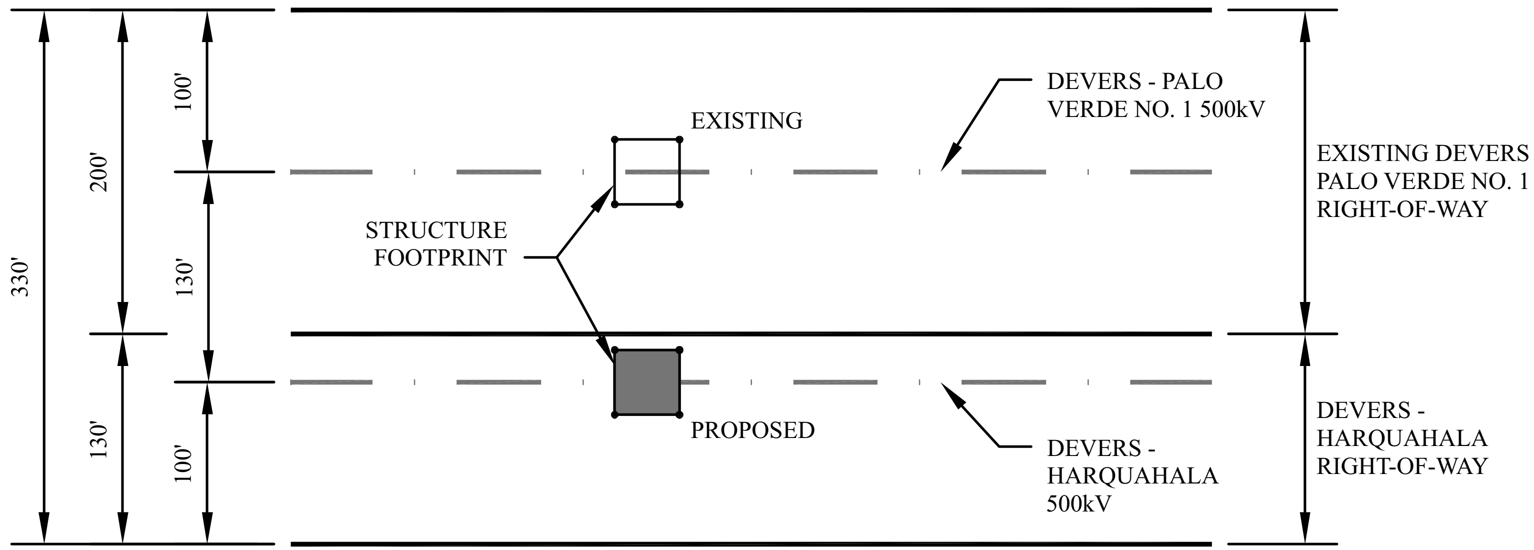
Hardware needed for the Proposed Project would include suspension clamps, dead-end assemblies, spacers, armor rods, vibration dampers, and other miscellaneous parts. All of the hardware used on the Proposed Project would be designed for corona-free operation up to the maximum designated voltages.

Conductor spacers would be installed along the lines to keep the bundled two-phase subconductors from contacting each other. Armor rods would be installed at the points where suspension clamps support the conductors to increase the safety and reliability of the lines by minimizing the possibility of conductor damage from flashovers of the insulator string which could mechanically weaken the support point. Vibration dampers located on the conductor help prevent fatigue of the conductor's metal strands by reducing vibration caused by the wind.

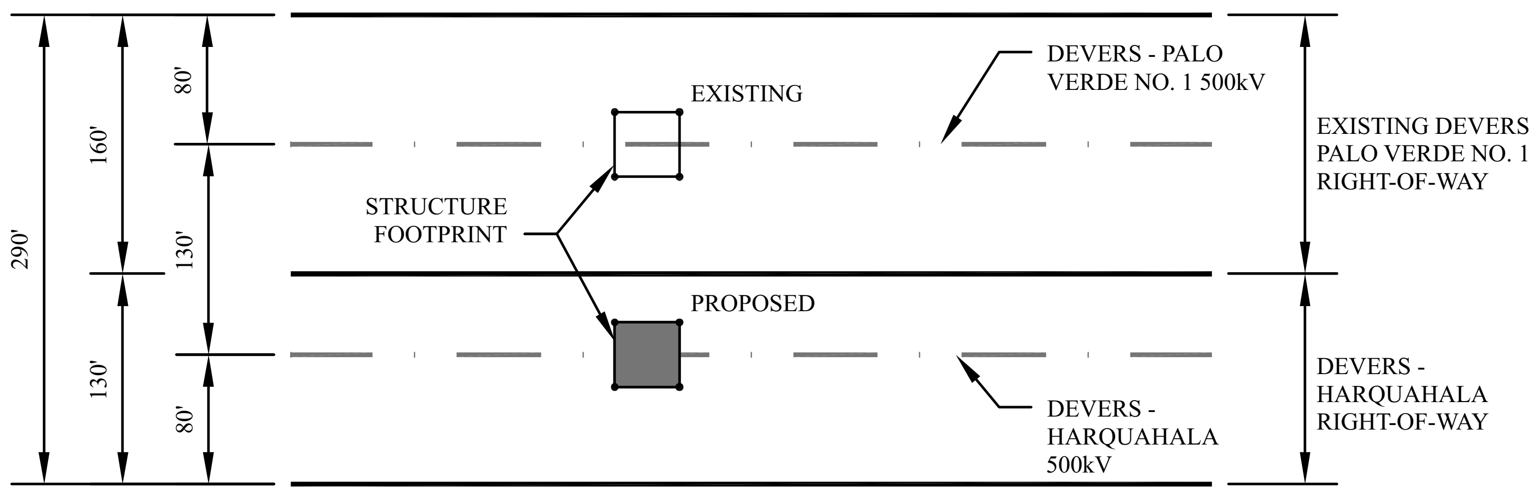
B.3.3 ROW Requirements and Access Roads

B.3.3.1 ROW

The majority of the ROW for DPV2 500 kV line is located adjacent to existing 500 kV transmission line ROWs. It includes approximately 225 miles of DPV1 ROW and 5 miles of the Harquahala-Hassayampa 500 kV ROW. As shown in Figure B-16, where located adjacent to the existing DPV1 ROW, the pro-



TYPICAL RIGHT-OF-WAY ADJACENT TO DPV1 ON PRIVATE LAND, INDIAN RESERVATION, AND CALIFORNIA STATE LAND



TYPICAL RIGHT-OF-WAY ADJACENT TO DPV1 ON BLM AND ARIZONA STATE LAND

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-16
Typical Devers-Harquahala 500 kV Transmission Line ROW

posed 500 kV transmission line would be constructed within a 130-foot-wide ROW on federal and State land, and within a minimum 130-foot-wide ROW on private land and Indian Reservation land. In 1989, the BLM granted a ROW to SCE for the DPV2 transmission line proposed at that time. This ROW includes land managed by the BLM and USFWS. The proposed 500 kV line would be constructed within the ROW previously granted by the BLM.

In some locations, the presence of utility or canal structures may require that the 500 kV ROW be separated from the DPV1 ROW or widened to accommodate those structures. In locations where a separate ROW would be required, the ROW width would be 160 feet on federal or State land, and a minimum of 200 feet on private land. As shown in Figure B-16, a minimum of 130 feet would separate the centerline of the proposed 500 kV transmission line structures from the centerline of the existing 500 kV transmission line structures.

SCE currently owns the ROW required for the majority of the project route, but will need to acquire additional ROW in a number of areas. SCE will need to acquire additional ROW in the Palo Verde Valley south of Blythe, California. At the site of existing series capacitor banks at MP E52.9 in Arizona and MP E163.7 in California, the DPV2 ROW would need to be expanded to include an area 75 feet by 320 feet in order to allow construction of new series capacitor banks adjacent to the existing ones. Within Copper Bottom Pass, however, for a distance of approximately 3 miles, no additional ROW would be necessary as existing double-circuit structures along the route have already been conductored on both sides.

The new 230 kV double-circuit line between Devers Substation and San Bernardino Junction would be constructed within the existing ROW along approximately the same centerline as the single-circuit H-frame 230 kV transmission line and the single-circuit lattice steel 230 kV transmission line being removed as part of the project. No additional ROW would be needed where reconductoring is proposed between San Bernardino Junction and Vista and San Bernardino Substations.

B.3.3.2 Access and Spur Roads

Construction of a new transmission line requires access to each tower site for construction crews, materials, and equipment. After project construction, these roads would be used by maintenance crews and repair vehicles for access to each tower for inspection and maintenance activities.

Wherever possible, existing streets and access roads would be used for construction of the Proposed Project. Where needed, existing access roads would be improved as required.

At the end of project construction, these roads would be left in a condition equal to or better than existed prior to the start of construction. Loose rock and slide material would be removed from existing roads and used to construct dikes, fill washouts, or flatten fill slopes. All washouts, ruts, and irregularities would be filled or obliterated.

In determining the final location of new roads, large trees or other natural features will be avoided. The intersection of a new access road with an existing road would be constructed in accordance with the requirements of the agency having authority over the existing road.

Road gradients would be leveled so that any sustained grade does not exceed 12 percent. Grades of 14 percent would be permitted when such grades do not exceed 40 feet in length and are located more than 50 feet from any other excessive grade or any curve. Steeper grades may be permitted on spur roads. All curves would have a radius of curvature of not less than 50 feet, measured at the center line of the usable road surface. Where tubular steel poles would be used, the minimum radius of curvature of access roads would be 75 feet to allow for hauling pole structures to the job site. All dead-end spur roads over 500 feet long would include a Y-type or circle-type turnaround.

Although over 18 miles of new spur roads will be required for the project, only one new main access road is expected to be needed on the transmission line route. This new road would be constructed north of and adjacent to the part of the existing Harquahala-Hassayampa 500 kV transmission line between the Harquahala Generating Station Switchyard and the line's intersection with the existing DPV1 transmission line at MP E5.0.

Spur roads would be needed between existing access roads and new tower sites. Access and spur roads are generally 14-foot wide unimproved roads. The main access road follows the transmission ROW with spur roads branching off to each tower site. Spur roads would be an average of 130 feet long and would usually have turnabout areas near the tower sites. Up to 25 percent of the new tower sites would require spur roads approximately 200 feet long. While longer or wider spur roads may be needed in some locations due to local terrain, limited clearing or earthwork would be required in most locations. The existing access roads would be maintained so as to permit their being used by construction equipment. Some road modifications may be required to allow use of heavy equipment. All access and spur road improvements, whether on or off the ROW, would comply with applicable permits and approvals.

Copper Bottom Pass. Due to the sensitive nature of the environment in Copper Bottom Pass, project vehicles would access the pass only by the existing through road. No new towers are to be constructed in the pass. Vehicles would access the existing structures for conductor stringing using existing spur roads. Requirements to minimize disturbance to habitat would be incorporated into project specifications. It is expected that the guidelines would incorporate storm water pollution prevention plans (SWPPPs), best management practices (BMPs), environmental requirements from all supervising agencies, and internal SCE-adopted construction practices.

West of Devers. The WOD 230 kV transmission system would use existing access roads wherever possible. Installation of new structures at some locations would require the construction of spur roads between existing roads and new tower sites.

B.3.4 Substations, Series Capacitors, and Switchyards

The proposed 500 kV transmission line would terminate at existing facilities: in the west at the Devers Substation in California and in the east at the Harquahala Switchyard in Arizona. In addition, the line would connect with the Midpoint Substation (if Midpoint Substation is constructed) at MP E113.7, two new series capacitor banks, and two new shunt banks. The new series capacitor banks (see Figure B-17) would be located adjacent to the existing DPV1 series capacitor banks located in Arizona (MP E52.9) and California (MP E163.7). One new shunt reactor bank would be located at Devers Substation and the second would be located on a new site at the Harquahala Switchyard. One 500 kV SVC would be installed and terminate at the 500 kV switchrack at Devers Substation and another 500 kV SCV would be installed and terminate at the 500 kV switchyard inside the Valley Substation.

In addition, other equipment needed for the 230 kV upgrade would be installed within the existing fenced areas at Devers, Vista, Lewis (in Orange County), and San Bernardino Substations, and at the San Onofre Nuclear Generating Station (SONGS) Switchyard in San Diego County. These upgrades would include the installation of conductor replacements, wave traps, disconnect switches, and line relays.

Prepared by Aspen Environmental Group

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-17
Photo of Series Capacitor

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B.3.4.1 Devers Substation

The proposed modifications to the Devers Substation would be installed in the existing switchyard. Modifications include the installation of a new 133-foot-high by 90-foot-wide dead-end structure, circuit breakers, and disconnect switches. Disconnect switches associated with the new 500 kV Devers-Harquahala transmission line would be installed adjacent to and northwest of the existing DPV1 500 kV shunt reactors. With the Proposed Project, the terminating transmission tower or turning pole would be the tallest structure at the substation, ranging between 150 and 180 feet tall.

A new transformer bank and a 500 kV shunt line reactor bank and associated disconnect switches would be installed within Devers Substation. A 500 kV SVC would be installed north of the 500 kV switchyard within the existing Devers Substation. The SVC would terminate at the 500 kV switchrack.

Within the Devers Substation, the Proposed Project would permanently disturb approximately 19.2 acres more than are currently disturbed. Approximately 2 acres would be required temporarily for laydown and construction uses.

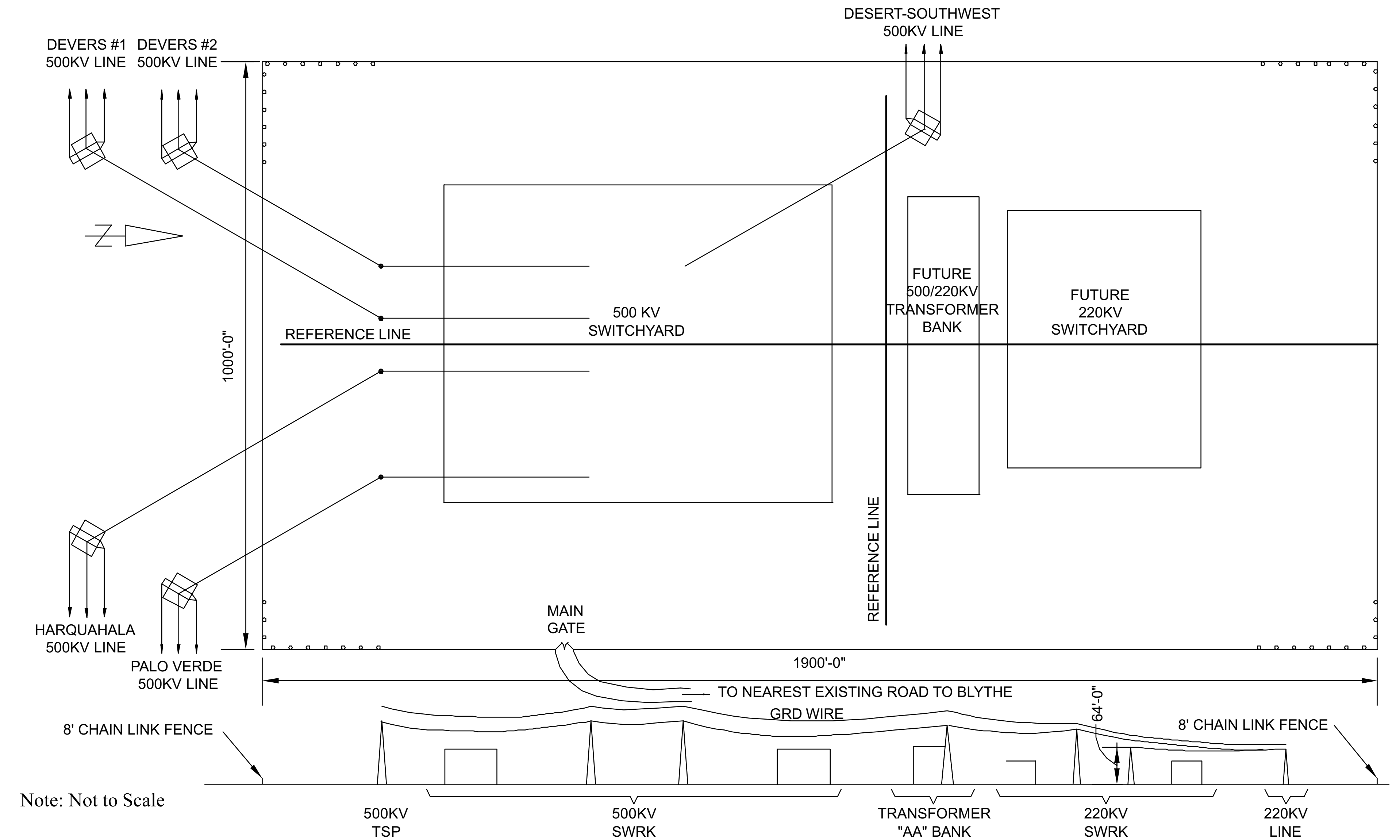
Upgrades to the existing 220 kV switchrack are also required. Work on the 220 kV switchrack would include circuit breaker upgrades or replacements; disconnect replacements; and circuit breaker conductor upgrades.

B.3.4.2 Midpoint Substation

The Midpoint Substation is being considered as a possible project component by SCE. Its location is shown in Figure B-2. It would be located approximately 10 miles southwest of Blythe, California, adjacent to SCE's DPV1 ROW. The site is located on BLM land immediately west of IID's Blythe-Niland 161 kV transmission line and WAPA's Blythe-Knob 161 kV transmission line. A preliminary block diagram for the Midpoint Substation is presented in Figure B-18. Under the Proposed Project, the terminating transmission tower or turning pole would be the tallest structure at the substation, ranging between 150 and 180 feet tall. The tallest component in the switchrack, the dead-end, would be approximately 133 feet. The substation would be constructed within a rectangular area approximately 1,000 feet by 1,900 feet, resulting in approximately 44 acres permanently disturbed. The switching facilities would be constructed within the Midpoint Substation property. The 500 kV switching station would include buses, circuit breakers, and disconnect switches. The switchyard would be equipped with 108-foot-high dead-end structures. Outdoor night lighting would be designed to illuminate the switchrack when manually switched on.

A new telecommunications facility would be installed on the Midpoint Substation site to provide microwave and fiber optic communications needed for the protective relaying and SPS. Three new microwave paths would be installed, requiring a microwave tower onsite. Two fiber optic systems would be installed at the Midpoint Substation as well. The proposed fiber optic systems are between Midpoint–Buck Boulevard Substation and Midpoint-Devers-Harquahala.

A 45-foot by 70-foot mechanical-electrical equipment room would be installed on the Midpoint Substation site to house all controls and protective equipment and a telecommunications room.



Note: Not to Scale

PREPARED BY Aspen Environmental Group

Source: Proposed Devers-Palo Verde No. 2 Transmission Project, Proponent's Environmental Assessment, March 2005

Devers-Palo Verde No. 2 Transmission Line Project

Figure B-18
Midpoint Substation Block Map

B.3.4.3 Harquahala Switchyard

There are presently four 500 kV lines terminating in the Harquahala Switchyard, including the Harquahala-Hassayampa 500 kV line and lines to each of the generator transformers for the three units at Harquahala Generating Station.

A new 145-foot-high by 100-foot-wide line dead-end structure, circuit breakers, disconnect switches, and associated equipment such as relays and control cable would be installed in the existing switchyard in a double-breaker configuration, allowing continued operation in the event of a breaker failing. With the Proposed Project, the terminating transmission tower or turning pole would be the tallest structure at the substation, ranging between 150 and 180 feet tall. Equipment for System Control and Data Acquisition (SCADA) would be installed. Most of the equipment required for this function would be contained in a new telecommunications room.

Approximately 2 acres adjacent to the eastern side of the Harquahala property would be required temporarily for laydown and construction purposes.

B.3.4.4 Valley Substation

A 500 kV SVC would be installed and terminate at the 500 kV switchyard inside the existing Valley Substation property line. With the Proposed Project, the terminating transmission tower or turning pole would be the tallest structure at the substation, ranging between 150 and 180 feet tall. The western substation fence would be relocated to the west property line. The Proposed Project would permanently disturb approximately 16 acres within the substation. An area of approximately 2 acres within the substation property would be used for temporary laydown and construction.

B.3.4.5 San Bernardino Substation

Equipment needed for the 230 kV upgrade would be installed within the existing fenced areas at San Bernardino Substation. With the Proposed Project, the 60-foot-high 220 kV circuit breakers' conductors would be the tallest component added at the site. The Proposed Project would permanently disturb approximately 5,000 square feet within the substation. An area of approximately 1 acre within the substation property would be used for temporary laydown and construction.

B.3.4.6 Vista Substation

Equipment needed for the 230 kV upgrade would be installed within the existing fenced areas at Vista Substation. With the Proposed Project, the 60-foot-high 220 kV circuit breakers' conductors would be the tallest component added to the site. The Proposed Project would permanently disturb approximately 1,500 square feet within the substation. An area of approximately 20,000 square feet within the substation property would be used for temporary laydown and construction.

B.3.4.7 Series Capacitor Banks

Two new 500 kV series capacitor banks would be installed for the Proposed Project. Each of the new series capacitor banks would be constructed adjacent to an existing DPV1 series capacitor bank, one in Arizona and one in California, at MP E52.9 and MP E163.7, respectively. Figure B-17 is a photograph of the existing series capacitor bank.

Each of the two series capacitor banks would consist of the following major components:

- Series capacitors
- Dead-end structures located on either side of the series capacitor banks, where the transmission line conductors enter the series capacitor sites
- Telecommunications equipment
- AC and DC power to operate facility equipment
- Manually switched outdoor night lighting to illuminate the series capacitors
- Grounding grid placed beneath the surface of the facility as a safety measure
- Mechanical-electrical equipment room.

The proposed California series capacitor site would be located approximately 64 miles east of the Devers Substation, on BLM land in the Chuckwalla Valley (as shown in Figure B-2). The new site would be adjacent to the south side of the existing DPV1 series capacitor bank, between Towers M173-T2 and M173-T3. The site is approximately 0.4 miles south of I-10 and is accessed from the nearby Red Cloud Mine Road. The tallest structure at the site would be the dead-end, which would be 110 feet. The new series capacitor bank would occupy approximately 2 acres inside the fenced area. In addition, 1-acre fenced material laydown areas for storage and staging would be required for temporary use.

The proposed Arizona series capacitor site would be located approximately 55 miles west of the Harquahala Switchyard on the Ranegras Plain on BLM land (as shown in Figure B-1). The new site would be adjacent to the south side of the existing DPV1 series capacitor bank, between Towers M61-T3 and M61-T4. The site is approximately 7 miles south of I-10 and is accessed from the nearby El Paso Natural Gas Pipeline road. As with the California series capacitor bank, the Arizona facility would occupy approximately 2 acres inside the fenced site and would temporarily use a 1-acre fenced area for material laydown, storage, and staging.

B.3.4.8 500 kV Shunt Reactor

A 500 kV shunt line reactor bank and associated disconnect switches would be installed for the Proposed Project at a location immediately adjacent to the north side of the Harquahala Switchyard, within the Harquahala Generating Station property. Outdoor lighting for the shunt reactor would be designed to illuminate the rectors and would be manually switched. The shunt reactor would be installed on approximately 2 acres of property to be acquired for this purpose. Laydown and construction would require temporary use of approximately 1 acre.

B.3.5 Special Protection Scheme

An SPS is proposed as a component of the project to protect the transmission system in the event of a simultaneous loss of DPV1 and the Proposed Project. This SPS would be designed to drop approximately 900 MW of generation in the PVNGS area and approximately 900 MW of SCE load.

Most of the relays needed to support the SPS would be installed within an existing relay room or mechanical-electrical equipment room at each substation. These may include Devers, Padua, and Vista Substations in California, and the PVNGS, Hassayampa, and Harquahala Switchyards in Arizona. Other locations in Arizona may require new relays or relay upgrades and/or new circuit breakers or circuit breaker upgrades.

B.3.6 Telecommunications System

The proposed telecommunications system would consist of both existing and new facilities. The new facilities would be required to increase the reliability of the microwave system intertie between SCE and APS, as well as provide primary and backup telecommunications services for the new 500 kV transmission line. The system would include protective relaying, SPS, SCADA, system dispatching, data, and telephone services. Table B-5 indicates the equipment that would be installed at the new facilities as a part of the project.

Table B-5. Components of New Telecommunication Facilities

	New Facility Components					
Facility	Building	Tower/ Antenna	Power Supply	Generator/ Fuel Tanks	Air Conditioning System	Communications System
Harquahala Mountain	12-foot by 36-foot pre-fabricated building	110-foot self-supporting tubular steel tower	30 kilowatt solar panel direct current power system	Emergency generator with 2 500-gallon fuel tanks	2 air conditioning systems	3 microwave systems
Blythe Optical Repeater Site	12-foot by 36-foot pre-fabricated building		120/240-volt alternative current service and direct current power system	Emergency generator with 1 500-gallon fuel tank	2 air conditioning systems	Conduits to the OPGW termination and 1 SONET system
Midpoint Substation	12-foot by 36-foot pre-fabricated building	110-foot self-supporting tubular steel tower				3 microwave systems and 2 fiber optic systems

Source: SCE, 2005a.

B.3.6.1 Harquahala Mountain

The primary telecommunications system for the proposed Devers-Harquahala 500 kV segment would involve constructing a new telecommunications facility on BLM land at Harquahala Mountain in Arizona (see Figure B-19). The facility would be adjacent to an existing facility owned and operated by CAWCD.

The new Harquahala Mountain facility would be located on BLM land, 1 mile northwest of Salome in La Paz County, Arizona (as shown in Figure B-1). There is an existing telecommunications facility owned, maintained, and operated by the CAWCD at this site. This facility was built in the early 1980s by the U.S. Bureau of Reclamation (USBR) and is surrounded by wilderness area. Electronics at the site are powered by solar energy, as there is no available commercial power. The site would be unmanned. An existing 10-mile dirt road leads to Harquahala Mountain. A temporary construction area adjacent to the new facility would be established for vehicle parking and material storage. This area would be fenced and gated. It is estimated that the temporary construction area would occupy approximately 1 acre and the permanent facility would occupy approximately 0.5 acres.

The Harquahala Mountain Peak Solar Observatory, an Historic Property listed on the National Register of Historic Places (NRHP), is located approximately 100 feet to the south of the proposed telecommunication site. Also located nearby is an existing Central Arizona Project (CAP) microwave facility and solar panels. SCE's proposed telecommunication facility would be approximately 100 feet west of the solar observatory and approximately 35 feet south of the existing CAP facility. The area was proposed by SCE because it is fairly level and minimal grading would be required.

B.3.6.2 Blythe Optical Repeater Site

The backup telecommunications system for the proposed Devers-Harquahala 500 kV segment would involve installation of a new OPGW on the new 500 kV transmission line structures. An Optical Repeater facility would be constructed approximately 3 miles west of Blythe, within the ROW of the new 500 kV transmission line (as shown in Figure B-1). The tallest component on the site would be approximately 15 feet tall. The site would be unmanned during operations.

A temporary construction area adjacent to the new facility would be established vehicle parking and material storage. This area would be fenced and gated. It is estimated that the temporary construction area would occupy approximately 1 acre and the permanent facility would occupy approximately 0.25 acres.

B.3.6.3 Substations and Series Capacitor Banks

SONET and channel equipment would need to be installed within the existing Devers, Mirage, and Harquahala Substations and the California and Arizona Series Capacitor Banks to support the primary and backup protection circuits. In addition, 5-inch conduits would be installed from the telecommunications rooms of these facilities to the OPGW termination point on the adjacent new Devers-Harquahala 500 kV transmission tower. In the case of the Mirage Substation, a 5-inch conduit would be installed from the telecommunications room to the substation fence. From there, a new fiber optic cable would be installed between the substation and the new transmission tower. The Arizona Series Capacitor Bank would require installation of a new MDR-8000 microwave terminal to replace the analog terminal and replacement of the existing 8-foot grid microwave antenna with two 10-foot high performance microwave antennas. The existing 65-foot microwave tower would be raised and upgraded to 85 feet tall to support two new 10-foot, high-performance microwave antennas. At the Harquahala Substation, a new telecommunications facility, microwave equipment, and a microwave tower would be constructed within the switchyard.

For the Midpoint Substation, a new telecommunications facility would be constructed within the substation to provide microwave and fiber optic communications for protective relaying and SPS requirements. Conduits would be required between the telecommunications room and the 230 kV mechanical-electrical equipment room, 500 kV mechanical-electrical equipment room, OPGW termination point on the new 500 kV transmission tower, and OPGW termination point on the Buck Boulevard–Midpoint 230 kV transmission tower.

Figure B-19. Devers-Harquahala Portion: Harquahala Mountain
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B.3.6.4 Communication Sites

Upgrades to APS' existing microwave equipment and antennas would be required at the Black Peak and Smith Peak Communication Sites to provide additional bandwidth to support the primary protection circuits. The overall system capacity would be shared between SCE and APS through a contractual agreement.

The Black Peak and Smith Peak Communication Sites would replace the APS existing Alcatel MDR-6000 terminals with MDR-8000 terminals for the Black Peak–Smith Peak microwave path. These new terminals would occupy one-third of the space currently occupied by the MDR-6000 terminals. The existing 8' High Performance microwave antennas on the towers would be re-used with the new MDR-8000 terminal.

SCE's existing analog microwave system at Smith Peak would also be replaced with a new digital microwave system between the Smith Peak and Harquahala Mountain Communications Site. The analog microwave terminal would be replaced with a MDR-8000 terminal. The existing 8' grid microwave antenna would be replaced with a new 8' standard antenna and would be installed at the same elevation on the existing tower.

In addition, the Chuckwalla and Cunningham Communications Sites would require installation of new Alcatel MDR-8000 microwave terminals and two new 10-foot microwave antennas on the existing microwave towers pointing towards Midpoint Station. Permanent disturbance within the sites would be approximately 200 square feet and temporary staging areas would be approximately 100 square feet inside the facilities.

B.3.6.5 West of Devers 230 kV Upgrade

Currently, the fiber optic cable carrying SONET System 47 is wrapped around the ground wire of the existing Devers-Vista No. 2 230 kV transmission towers. The proposed upgrade to the double-circuit 230 kV transmission line between Devers and Vista would require replacement of the existing fiber wrap cable with a new OPGW on the existing double-circuit towers. This would require installation of a temporary fiber cable between SCE's Timoteo Substation and San Bernardino Junction. New fiber optic splice cases at San Bernardino Junction would also be installed for splicing purposes.

In order to provide redundant protective relaying circuits for the Devers–San Bernardino 230 kV line, a new OPGW would be installed on the Devers–San Bernardino double-circuit towers between San Bernardino Substation and San Bernardino Junction. The primary protection circuits would be carried via existing microwave systems and the backup protection circuits would be carried via SONET System 47.

B.3.7 Construction Activities

The proposed operational date for the DPV2 transmission line project is June 2009. Work activities would commence upon approval of the Proposed Project by the CPUC and other permitting agencies. Construction on the Devers-Harquahala 500 kV line segment would commence March 2007 and take approximately 24 to 28 months to complete. Construction within the 230 kV segment west of Devers Substation would commence after June 2006 and be completed in June 2009. The time between completion of construction and the operation date would be used to inspect and test the project.

In populated areas, SCE would post notices on the ROW or at other sites where the public would be affected by construction activities. Notices would be posted approximately one month prior to commencing work. At parks, pathways, and ROW ingress and egress points, postings would be placed along the ROW and at work sites approximately two weeks prior to the closing of public access.

B.3.7.1 Labor and Equipment

Construction of the Proposed Project is planned to be performed by contract personnel with SCE responsible for project administration and inspection. The estimated number of persons and types of equipment required for each phase of construction on the Devers-Harquahala 500 kV segment of the project is shown in Table B-6. It is estimated that a total of 211 workers (full-time equivalent personnel) will be needed to construct the proposed 500 kV line. Personnel and equipment required for the WOD segment of the project is shown in Table B-6. It is estimated that a total of 177 workers would be required for the WOD upgrade.

Table B-6. 500 kV Transmission Line Labor Force and Equipment Requirements

Construction Element	Personnel	Equipment		Duration (months)
Management/Office	9	6 – office trailers 6 – portable generators	9 – pickup trucks	24
Inspection and Environmental	14	14 – pickup trucks		24
Support	9	6 – mechanic trucks 2 – lube service trucks	6 – tool trailers 2 – fire suppression trucks	24
Survey Tower Sites	3	2 – pickup trucks		8
Marshalling Yards	6	2 – pickup trucks 2 – 2 ton flatbed truck 3 – truck cranes 6 – tractor trucks w/trailers	1 – flatbed pickup truck 4 – forklifts 1 – portable generator	24
Road Work	12	2 – road graders 2 – dozers 2 – grad-all excavators	1 – water truck 2 – 10-yard dump trucks 6 – pickup trucks	24
Foundation Installation	23	5 – pickup trucks 2 – 2½ ton flatbed trucks 2 – backhoes 3 – drill rigs 3 – boom trucks	2 – off-road loaders 2 – tractor trucks w/trailers 1 – water trucks 2 – portable generators 4 – concrete trucks	24
Tower Assembly/Erection	75	9 – pickup trucks 9 – 2½ ton flatbed trucks 9 – truck cranes 9 – crew cab pickup trucks 6 – air compressors	1 – water truck 2 – portable generators 2 – 150 ton cranes 4 – large RT cranes	18
Conductor Operations	54	8 – pickups 8 – crew cab pickup trucks 2 – pole truck and trailers 6 – truck cranes 6 – bucket trucks 1 – digger 1 – backhoe 2 – conductor tensioners 2 – static tensioners	2 – sockline pullers 2 – conductor pullers 4 – sagging units (skidders) 12 – reel stand trailers 6 – tractor trucks w/trailers 2 – helicopters 4 – portable generators 1 – water trucks	18
Final Cleanup	6	1 – pickup 1 – flatbed pickup truck 1 – backhoe 1 – 2 ton flatbed truck 1 – boom truck 1 – road grader	1 – dozer 1 – grad-all excavator 1 – water truck 1 – portable generator 1 – 10-yard dump truck	
TOTAL	211			24

Source: SCE, 2005a.

Table B-7. 230 kV Transmission Line Labor Force and Equipment Requirements

Construction Element	Personnel	Equipment		Duration (months)
Management/Office	3	2 – office trailers 2 – portable generators	3 – pickup trucks	24
Inspection and Environmental	6	3 – pickup trucks		24
Support	5	3 – mechanic trucks 1 – lube service truck	4 – tool trailers 1 – fire suppression truck	24
Survey Tower Sites	3	2 – pickup trucks		6
Material Processing	6	1 – pickup truck 1 – flatbed pickup truck 1 – 2 ton flatbed truck 2 – forklifts	2 – large RT cranes 1 – portable generator 4 – tractor trucks with trailers	24
Road Crew	4	1 – road graders 1 – dozers 1 – grad-all excavator 1 – water truck	2 – 10-yard dump trucks 1 – tractor truck with trailer 2 – pickup trucks	16
Foundation Crews	23	5 – pickup trucks 2 – 2 ton flatbed trucks 2 – backhoes 3 – drill rigs 2 – boom trucks 2 – off-road loaders	2 – tractor trucks with trailers 1 – water truck 4 – concrete trucks 2 – portable generators	12
Tower Assembly/Erection	64	4 – pickup trucks 8 – 2 ton flatbed trucks 5 – crew cab pickup trucks 6 – air compressors 1 – water truck	2 – portable generators 1 – 150 ton crane 4 – truck tractors with trailers 4 – large RT cranes	9
Conductor Operations	54	8 – pickups 8 – crew cab pickup trucks 4 – truck cranes 8 – bucket trucks 1 – rewinder 1 – digger 2 – backhoes 2 – conductor tensioners 2 – static tensioners	2 – sockline pullers 2 – conductor pullers 4 – sagging units (skidders) 12 – reel stand trailers 6 – tractor trucks with trailers 2 – helicopters 4 – portable generators 1 – water truck	24
Final Cleanup	6	1 – pickup 1 – flatbed pickup truck 1 – backhoe 1 – 2 ton flatbed truck 1 – boom truck 1 – road grader	1 – dozer 1 – grad-all excavator 1 – water truck 1 – truck tractor with trailer 1 – 10-yard dump truck	6
TOTAL	174			24

Source: SCE, 2005a.

At some stages of the project, multiple locations would be under construction simultaneously. This may involve independent construction teams.

B.3.7.2 Siting and Construction Yards

Once the route has been approved, a detailed survey would be conducted, additional ROW acquired, and detailed engineering designs started. A control centerline would be established, based on field survey measurements. Control monuments, consisting of 2-inch-diameter iron pipes sealed with a stamped brass cap would be set at maximum intervals of approximately 2 miles. Visual reference points parallel and perpendicular to the control line would be established so that photogrammetric profiles of the area's topography could be compiled. Approximate tower locations would be spotted on the profiles according to the engineering design criteria. Siting of new towers for the West of Devers 230 kV system would use existing survey monuments established for the existing lines.

Once approximate tower locations have been selected, exact positions would be field surveyed. Survey crews would also locate spur road centerlines and grades. Final determinations of road location curvature, cuts and fills, grades and drainage, and necessary erosion controls would be made in accordance with design standards and practices and/or landowner requirements

Construction of the 500 kV transmission line would begin with the establishment of approximately seven temporary construction yards located at strategic points along the route. Four of these construction yards, including the Desert Center yard, would be in California, while three would be in Arizona. Table B-8 lists the location and current condition of each yard; the location of these yards is shown on Figures B-1 and B-2.

Table B-8. Construction Yards, Devers-Harquahala 500 kV Segment

Name	Location	Condition	Area
Palm Springs Yard	West side of Diablo Road at Devers Substation, CA	Area consists of two fenced areas and one unfenced area.	5.9 acres (270' x 935')
Indio Yard	East side of Dillon Road, 300' north of Fargo Canyon Road, 1,500' north of the Devers–Palo Verde 1 500 kV line, CA	Area is fenced and lighted.	3.2 acres (250' x 550')
Desert Center Yard	1,000' northwest of the intersection of Rice Road and Ragsdale Road, CA	Area is fenced and being used by current owner miscellaneous storage.	3.2 acres (250' x 550')
Blythe Yard	North side of Hobson Way, 1 mile west of Neighbors Boulevard, on the west side of Blythe Substation, CA	Area is fenced and currently contains miscellaneous pipe and steel.	3.2 acres (250' x 550')
Quartzsite Yard	1,000' north of the intersection of Quartzsite Road and Main Street, AZ	Area is being used for overflow recreational vehicle parking.	5 acres are estimated to be available.
Vicksburg Yard	South of a fuel station on the south side of Interstate 10, AZ.	Original fencing has been removed and property is abandoned.	5 acres are estimated to be available.
Tonopah Yard	Northwest of the intersection of West Indian School Road and North 411th Avenue, AZ.	Fencing has been removed. Some development has occurred on the original property used for Devers–Palo Verde 1 Project. The Harquahala-Hassayampa 500 kV transmission line project construction yard is nearby, and is currently used as a tree nursery.	

Source: SCE, 2005a.

Each yard would be used as a reporting location for workers, and for vehicle and equipment parking and material storage. The yards would have offices for supervisory and clerical personnel. Normal maintenance of construction equipment would be conducted at these yards. The maximum number of workers reporting to any one yard is not expected to exceed 144 at any one time. Each yard would be 3 to 10 acres in extent, depending on land availability and intended use.

Possible construction of the Midpoint Substation (an optional component in SCE's Proposed Project) would require a temporary laydown area of approximately 5 acres. The laydown area would be located at or near the existing roadway at the site.

Construction of the 230 kV system west of Devers Substation would be done in several stages. Since existing lines and structures must be removed, the construction sequence would be influenced by circuit outage availability. Construction yards would be set up at existing facilities such as Devers, Mira Loma, Vista, and San Bernardino Substations, as well as Etiwanda Generating Station. If it is determined that the land available at these SCE-owned properties is either unavailable due to competing projects or is insufficient, up to two additional yards may be required, each with approximately 3 to 10 acres. These would be located on previously disturbed parcels.

At peak construction, most of the vehicles listed in Table B-7 could occupy the yards WOD. Approximately 10 private commuting vehicles would also be parked at the yard. Crews would load materials onto work trucks and drive to the line position being worked. At the end of the day, they would return to the yard in their work vehicles and depart in their private vehicles.

Materials stored at the construction yards would include:

- Hardware
- Steel
- Insulators
- Signage
- Consumables such as fuel and joint compound
- SWPPP materials such as straw wattles, gravel, and silt fences
- Waste materials for recycling or disposal.

B.3.7.3 Clearing and Grading

With the exception of the approximately 5-mile segment east of the Harquahala Switchyard, no new main access roads are expected to be required for the Devers-Harquahala 500 kV segment. Where overland vehicle travel is not possible, upgrades to main access roads and extensions to existing spur roads would be needed to allow passage of construction vehicles. Such upgrades may require vegetation clearing and grading based on site conditions. There are approximately 260 miles of existing main access roads. Approximately 19.3 miles of new spur roads would be needed, disturbing approximately 32.8 acres. The spur roads would be a minimum of 14 feet wide.

For the existing 230 kV system upgrade west of Devers Substation, construction access is available within the existing ROW. New spur roads would be required for new structures that are not at or adjacent to existing towers. Between the San Bernardino Substation, San Bernardino Junction, and Vista Substation, access is available and no new tower construction is planned, therefore no new access roads would be required.

For the possible Midpoint Substation, a permanent 24-foot-wide, two-lane access road would be constructed between an existing paved road and the substation site, a distance of approximately 3 miles.

B.3.7.4 Foundation Installation

As described in Section B.3.1, the Devers-Harquahala 500 kV line would require the construction of 709 new lattice steel towers, 39 H-frame towers, and 23 tubular steel poles. Each structure would require augured cast-in-place concrete piles. The maximum augur depth below ground surface for the various types of towers are expected to be as follows:

- 500 kV four-legged single-circuit tower as shown in Figure B-8 — 35 feet
- 500 kV two-legged H-frame tower as shown in Figure B-10 — 45 feet
- 500 kV tubular steel poles as shown in Figure B-11 — 32 feet
- 230 kV four-legged double-circuit tower as shown in Figure B-14 — 36 feet.

Actual foundation depths would depend on the soil conditions and topography at each site and would be determined during final engineering. The majority of towers would have foundations depths substantially less than the maximum depths listed above.

During construction, existing concrete supply facilities would be used where feasible. If concrete supply facilities exist in certain areas, a temporary concrete batch plant would be set up. If necessary, approximately 2 acres of property would be sub-partitioned from the marshalling area of the Desert Center yard for a temporary concrete batch plant. Equipment would include a central mixer unit (drum type); three silos for injecting concrete additives, fly ash, and cement; a water tank; portable pumps; a pneumatic injector; and a loader for handling concrete additives not in the silos. Dust emissions would be controlled by watering the area and by sealing the silos and transferring the fine particulates pneumatically between the silos and the mixers.

Concrete would be hauled to tower sites in standard concrete trucks. For the Devers-Harquahala 500 kV segment, up to 16 concrete trucks, each with a capacity of approximately 8 to 11 yards, would be working simultaneously at peak construction. At any given lattice steel tower no more than eight concrete trucks would be working to support the installation of the needed four footings. A second lattice steel tower footing project could be under way at the same time, thus doubling the quantity of trucks working. One footing on a 500 kV lattice steel tower could require as much as 16 to 20 yards of concrete depending on the nature of the rock voids in the bore hole. With eight trucks supporting one site, each truck would be expected to make one round trip.

For the WOD segment of the project, peak construction could require up to eight concrete trucks working simultaneously, each with a capacity of approximately 8 to 11 yards of cement. At any given lattice steel tower, however, at most, four concrete trucks would be working to support the installation of four footings. Consequently, two sites or eight trucks would likely be working simultaneously. One footing on a 230 kV lattice steel tower could require as much as 13 to 15 yards of concrete depending on the nature of the rock voids in the bore hole. With four trucks supporting one site, each truck would be expected to make one round trip.

Prior to auguring for foundations in California, SCE would contact Underground Service Alert to identify any underground utilities in the construction zone. In Arizona, a similar organization, called Arizona Bluestake Incorporated, would be contacted for the same purpose.

The proposed 230 kV modifications for the WOD system would require the construction of foundations for approximately 173 structures. Foundation installation for the 230 kV upgrade would be similar to that of the 500 kV segment as described above.

B.3.7.5 Structure Assembly and Erection

At the structure fabrication plant, structural members would be bundled and shipped by rail or truck to the construction yards, and then trucked to the individual sites. Tower section subassemblies would be built at the construction yards would be assembled at the job site with the aid of a crane.

Assembly and erection of the structures required would consist of three main activities:

- Assembly of the tower sections
- Erection of the tower sections
- Final cleanup.

Tower sections would be lifted into place with a crane and erected on their foundations. Installation of insulators and travelers and final checkout and cleanup would then conclude structure assembly and erection.

B.3.7.6 Stringing Activities

Prior to stringing activities temporary protective netting systems or wood pole guard structures would be erected at crossings for roads, streets, railroads, highways, or other transmission, distribution, or communication facilities, as required. On roads where traffic is light, guard structures may not be necessary; however, the use of barriers, flagmen, and/or temporary stopping of traffic would be required.

The stringing of conductor and overhead groundwire on new transmission lines typically commences once a number of structures had been erected and inspected. Stringing equipment locations would be temporarily setup between towers. These would be areas up to 150-foot by 300-foot in size adjacent to the access roads and spaced approximately every 5,000 to 15,000 feet along the line.

For new transmission lines, a helicopters would pull small and lightweight pilot lines through the stringing travelers. These lightweight lines would be used to subsequently pull larger steel cable. The conductor or groundwire would then be pulled from the established setup points by wire stringing equipment.

For existing lines and overhead groundwire in the WOD segment of the project, stringing would initially involve replacing insulators, installing travelers, then transferring the existing conductor to the installed travelers. The existing conductor or groundwire would be pulled from the towers and new conductor or groundwire would be pulled in. The conductor or groundwire would then be transferred into suspension hardware on the towers.

No construction of new towers would occur in Copper Bottom Pass; however, stringing for conductors and OPGW would be required. Ground disturbance would occur in the preparation of primary conductor pulling positions adjacent to M101-T2 and M98-T2, at either end of Copper Bottom Pass. These sites would be used to pull conductor between towers in the pass. If grading or excavation were required at the line pulling points for both western and eastern positions, each disturbed area would measure approximately 100 by 200 feet.

B.3.7.7 Telecommunications Facilities

Contractors and subcontractors construct new buildings and antenna towers for the telecommunications facilities. SCE's telecommunications construction crews would be used for telecommunications equipment installation.

Three trucks and six workers would be needed during peak construction periods. A medium duty crane would be required for the construction of the antenna tower. Construction of the new facilities and antennas would take approximately 12 to 16 weeks to complete at each site. Construction would consist generally of the following steps:

- Site preparation
- Erect temporary fencing area
- Set the foundations
- Install prefab building, fuel tanks, and emergency generator
- Erect the antenna tower (where necessary)
- Install telecommunications equipment and/or antennas
- Erect permanent fencing
- Site cleanup

The prefabricated building would be pre-assembled at the manufacturing plant and delivered to the job site. The building would be set on a concrete pad using a crane. A photovoltaic power system would also be installed at the Harquahala Mountain site.

B.3.7.8 Removal of Facilities and Waste Disposal

Two existing single-circuit transmission lines would be removed between Devers Substation and San Bernardino Junction. Guard structures would be erected for the conductor removal activities. In accordance with prearranged outages, facilities would be taken offline, conductor would be removed, and structures disassembled and hauled to staging yards for disposal. Guard structures would then be disassembled and removed. Removal would be coordinated with new line construction, structure rearrangement, and reconductor work.

Materials would be recycled where feasible. Approximately 1.5 million pounds of tower steel and hardware and approximately 4.1 million pounds of conductor would be recycled as part of the Proposed Project.

Approximately 33,660 feet of treated wood poles would be removed and disposed of as part of the Proposed Project. For wood pole disposal, SCE would use landfill facilities authorized to accept treated wood products: Waste Management, Inc. (McKittrick Landfill) and Clean Harbors Environmental Services (Buttonwillow Landfill). Typically, at a jobsite where wood pole waste would be generated, SCE would contract with McFarland Cascade for all aspects of disposal, including hauling and paperwork. In the future, SCE could use other landfill facilities that are authorized to accept treated wood waste in accordance with the California Health and Safety Code Section 25143.1.5.

Insulators and other non-recyclable materials would be hauled by a third party to local landfills. Concrete waste would be disposed of by the subcontractor hired by the principal contractor. Typically, rejected concrete is hauled back to the batch plant in the delivery truck. Concrete truck equipment would be washed out into shallow lined pits or bins. Once the material dries, it would be broken into small pieces and disposed of per local regulations by the contractor.

B.4 Operation and Maintenance

Following the completion of project construction, operation and maintenance of the new lines would commence. These activities would occur at about the same frequency and intensity as are currently done by SCE for the existing Devers–Palo Verde No. 1 transmission line. Inspection and maintenance activities would include the following:

- Routine line patrols by both aircraft and truck
- Routine, patrol identified, tower and wire maintenance
- Routine line washing

- Routine, patrol identified, earth and sand abatement from footings
- Routine ROW road maintenance

The frequency of inspection and maintenance would depend on various conditions including length of the line and weather effects.

Inspection and maintenance activities typically include senior patrolman, foreman, lead lineman, journeyman lineman, apprentices, groundmen, helicopter pilots, equipment operators, and laborers. If the magnitude of repairs identified by routine patrols is substantial, other specialized employees such as surveyors, engineers, clerical personnel, and technicians would be attached to maintenance crews as required to address any unique problem that may arise due to such variables as substantial storm damage or vandalism. Labor force requirements are summarized in Table B-9.

SCE operates two types of helicopters for patrols of the DPV lines: American Eurocopter AS-350D (B-2) (B-3) and Hughes 500. During a typical patrol, a helicopter would fly at or near the elevation of the point of support of the conductor. In populated areas, patrols would fly at higher elevations or away from the centerline of the transmission lines, in order to avoid flying close to houses or penned animals. In cases where flying near a home cannot be avoided, the patrolman would use gyro-binoculars so as to increase the inspection distance between the structures and the helicopter to the greatest extent possible. In rural areas, unless designated otherwise, proximity to the ground is not restricted with the exception of safety and environmental concerns.

Yearly patrols during operation of the Proposed Project would be combined with the yearly patrols for the existing line. A second separate yearly trip would not be necessary. The entire DPV transmission line corridor would be patrolled every year. The yearly patrol alternates each year between helicopter and truck. In one year, the patrol would be by helicopters and would take approximately one full day (8 hours) to accomplish. The next year, the patrol would be performed by truck and would take 3 weeks. The addition of another circuit to the corridor would increase the helicopter patrol time by approximately 4 additional hours each year for a total of 12 hours of helicopter patrol time. Patrol time by truck would be increased to 4 weeks of total patrol time per year. A yearly patrol is a minimum patrol requirement. Increases in pollution and population density in the vicinity of portions of this transmission line corridor have caused SCE to increase the patrol frequency of some portions of the DPV corridor. This would also be the case for the Proposed Project as well. Currently, there is no consistency between helicopter and truck patrol for these additional patrols, although patrols are handled by each approximately 50 percent of the time. In some cases crews prefer to use a helicopter and in other cases, the preference is to use a patrol truck. This decision would be made based on availability of resources and criticality of time.

For the Devers-Harquahala 500 kV line, it is expected that there would be a minor increase in operation and maintenance activity compared to the existing operation and maintenance activity along the existing corridor. The new DPV2 line would result in an estimated 50 percent increase in maintenance activity. As time passes and the new line ages, maintenance levels on the DPV2 line would approach the maintenance levels of the existing DPV1 line. Starting approximately 15 years after the operational date, maintenance on the new line would be expected to increase. Parity in the amount of maintenance required for both lines would occur approximately 30 years after the operational date of DPV2. Initial additional corridor maintenance would be due principally to weather and vandalism to the new line. As insulators and steel age on the new line, the frequency of lattice steel tower hardware maintenance activities such as bolt torquing will increase. No significant increase in patrols or grading would be required, however.

Table B-9. Operation and Maintenance Labor Force

Activity	Frequency	Duration	Personnel Required	Note
Devers-Harquahala 500 kV Transmission Line (DPV1 and DPV2)				
Routine Patrol, Aircraft	Every 2 years	12 hours	Pilot x 1 Senior Patrolman x 1 Lineman x 1	Lines are patrolled annually; patrol alternates yearly between helicopter and truck.
Routine Patrol, Truck	Every 2 years	4 weeks	Senior Patrolman x 1 Lineman x 2	Lines are patrolled annually; patrol alternates yearly between helicopter and truck.
Routine repairs identified by Senior Patrolman	Every year	20 days	Foreman x 3 Senior Lineman x 3 Lead Lineman x 3 Journeyman Lineman x 6 Apprentice x 6 Groundmen x 3 Equipment Operator x 3 Laborer x 3	Repair unique items identified by senior patrolman during annual patrols, varies year to year. As many as three 8-man crews plus operators.
Remove Windblown Sand from Tower Footings	Every 2 years	1.5 weeks	Foreman x 1 Equipment Operator x 1 Laborer x 1	Windblown sand and earth removed from LST steel by contract crew under direction of senior patrolman.
Routine Right-of-Way Grading	Every 3 years	2.25 months	Foreman x 1 Equipment Operator x 1 Laborer x 1	Grade all approved areas only.
Routine Washing (DPV1 only)	Every year	2 weeks	Senior Patrolman x 3 Journeyman Lineman x 3	Wash insulators in all areas as required. Wash insulators every year as indicated in Blythe farm area and Devers open mine pit area, with frequency increasing as air quality continues to deteriorate in desert areas.
West of Devers 230 kV Transmission System				
Routine Patrol, Aircraft	Seldom	8 hours	Pilot x 1 Senior Patrolman x 1 Lineman x 1	Lines are patrolled annually; patrol alternates yearly between helicopter and truck.
Routine Patrol, Truck	Every year	1 week	Senior Patrolman x 1 Lineman x 1	Lines are patrolled annually; patrol alternates yearly between helicopter and truck.
Routine repairs identified by Senior Patrolman	Every year	2 days	Foreman x 1 Lead Lineman x 1 Journeyman Lineman x 2 Apprentice x 2 Groundmen x 1 Equipment Operator x 1 Laborer x 1	Repair unique items identified by senior patrolman during annual patrols, varies year to year. One 8-man crew plus operators.
Routine Right-of-Way Grading	Every 3 years	2 months	Foreman x 1 Equipment Operator x 1 Laborer x 1	Grade all approved areas only.
Routine Washing	Every year	3 weeks	Foreman x 1 Lineman x 5	Wash insulators as required.

Source: SCE, 2005a.

For the WOD upgrade, it is expected there would be a small decrease in operation and maintenance activity because there would be a reduced number of structures to patrol or maintain. Due to the replacement of 40 miles of old lattice steel towers on the Devers–San Bernardino #1 line, replacement of approximately 40 combined miles of old wooden pole H-frame construction on the combined Devers–San Bernardino #2 and Devers-Vista #1 lines, and reconductoring of a combined 40 miles of existing double-circuit transmission line corridor, routine repairs identified by senior patrolman on the final new lines should decrease from 3 days annually to 2 days annually. The configuration of two separate double-circuit lattice steel towers under the Proposed Project would provide an easier patrol corridor and maintain itself with less age related failures than the current configuration. Further, maintenance is expected to decrease an additional 3 weeks per year due to insulator washing no longer being required on the new lines as they would be built with polymer insulators which do not require washing, unlike older ceramic or glass insulators. Maintenance of the Proposed Project would consist of periodic patrols by ground and air to locate any damage that might adversely affect the integrity and reliability of the line. Other non-emergency maintenance would involve the occasional replacement of insulators damaged by lightning or gunfire, the replacement of tower steel members due to gunfire or wind, and the repair of access and spur roads due to erosion or landslides. Crews would wash insulators, as necessary, using a specialized truck for the 230 kV lines WOD. In the future, if levels of air pollution increase, the 500 kV lines east of Devers Substation would require washing as well. Crews would also remove windblown sand and dirt from footings in areas where it has a tendency to accumulate.

B.5 Applicant Proposed Measures

The following tables list the Applicant Proposed Measures (APMs) for the different issue areas analyzed in this document. These measures come from the following sources:

- Measures that SCE included in its PEA in the Description of the Proposed Project in Chapter 3.0 which would be implemented on federal, State, and private lands
- APMs that SCE included in Chapter 6.0 of the PEA, Significant and Potentially Significant Impacts and Mitigation of the Proposed Project, which would be implemented on federal, State, and private lands
- Measures described by SCE in response to data requests by the CPUC which would be implemented on federal, State, and private lands
- Mitigation measures required by the BLM in the BLM Right of Way Grant CA-17905/AZ-23805 dated August 11, 1989, contained in Appendix B of the PEA (these BLM mitigation measures apply to federal lands crossed by the Devers-Harquahala portion of the project and do not apply to State and private land crossed by the Devers–Harquahala portion of the line)

SCE committed to implementing these measures in order to reduce the direct and indirect impacts that would result from Proposed Project activities. The tables for each issue area are listed below:

- Table B-10 – Biological Resources APMs
- Table B-11 – Cultural Resources APMs
- Table B-12 – Paleontological Resources APMs
- Table B-13 – Air Quality APMs
- Table B-14 – Water Resources APMs
- Table B-15 – Geology and Soils APMs
- Table B-16 – Visual Resources APMs
- Table B-17 – Land Use APMs
- Table B-18 – Noise APMs

Table B-10. Applicable Proposed Measures – Biology

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM B-1 Vegetation	Avoid direct disturbance of highly sensitive features (as identified in E. Linwood Smith's (1985) Impact Assessment/Mitigation Planning Chart; see Appendix E) with spanning and careful local adjustment in tower footing placement. (BLM B-5.1 Vegetation)[4] [Note: The reference to Appendix E is unknown. There is no Appendix E as part of the BLM right-of-way grant (provided from PEA Appendix A). However, the Smith report itself is found in FSEIS (1988) as Appendix B, Study of Desert Bighorn Sheep.]	✓	
APM B-2 Vegetation	Avoid the introduction of noxious weeds and/or other invasive species through standard noxious weed measures. This will benefit most of the species covered by the [Coachella Valley Multiple Species Habitat Conservation] plan. (SCE)	✓	
APM B-3 Vegetation	Vehicular travel must be on established roads to the maximum extent practicable. Any off-road vehicle use should be strongly discouraged. This will benefit many of the species covered by the [Coachella Valley Multiple Species Habitat Conservation] plan. (SCE)	✓	
APM B-4 Vegetation/ Wildlife	Avoid sand compaction at all sites in the Coachella Valley. This will benefit such species as the giant sand treader cricket, Coachella Valley Jerusalem cricket, and Coachella Valley milkvetch. (SCE)	✓	
APM B-5 Vegetation/ Wildlife	Copper Bottom Pass: • Maintenance of low speed limit on right of way ROW to protect desert animals and reduce dust • Continuous application of water to ROW roads to reduce dust • Requirement that stopped vehicles stop engines if stationary for a determined period of time • Requirement that operators of vehicles, if stopped for longer than a determined period of time, inspect under their vehicles to ensure that no animals have taken shelter from the sun; this requirement has been implemented before by requiring that vehicles with stopped engines have their keys placed under the vehicle thus forcing the operator to inspect • Flagging of all disturbed areas if needed to clarify drive-able or walk-able areas • Tight control of the Copper Bottom Pass area to ensure that only planned construction traffic is allowed in the area and that minimal trips are planned • Restricted use of the area to periods outside of any animal breeding seasons • Tight control on electrical workers for approved hours of access • Ensure that all workers accessing this area have completed environmental awareness training for biological and cultural sensitivities; all trained workers would be equipped with stickers for their hardhats to provide for easy-to-spot inspection • Removal of all construction debris from the area at the conclusion of the work	✓	
APM B-6 Vegetation	Avoid vehicular travel in washes to protect triple-ridged milkvetch. (SCE)	✓	
APM B-7 Vegetation/ Wildlife	No activities whatever should occur in wetland areas. (SCE)	✓	
APM B-8 Vegetation	Provide additional detailed surveys and tower-specific adjustments as needed prior to construction for major sensitive feature sites (e.g., concentrations of sensitive plants, individual palm trees, woody dune or wash communities) which cannot be easily avoided by spanning. (See Appendix B of the Devers–Palo Verde No. 2 EIR [1987] and Appendix E of the SEIS [1988].) The methodologies and results of these surveys must be submitted to and approved in writing by the BLM Authorized Officer. (BLM B-5.2 Vegetation)	✓	
APM B-9 Vegetation	Initiate transplant efforts for *Ferocactus* and *Coryphantha* as soon as probable losses can be determined. Any plans for transplanting must be developed in consultation with a BLM botanist and approved in writing by the BLM Authorized Officer. (BLM B-5.4 Vegetation)	✓	

Table B-10. Applicant Proposed Measures – Biology

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM B-10 Vegetation	The right-of-way Holder[5] will have the Arizona State Department of Agriculture and Horticulture identify native plants that would otherwise be destroyed by construction and sell them to the Holder. (BLM B-5.5 Vegetation)	✓	
APM B-11 Vegetation	The Authorized Officer may require vegetation in certain areas to be cleared by hand tools. Scalping of top soil and removal of low growing vegetation will not be allowed unless authorized by the Authorized Officer. (BLM B-5.6 Vegetation)	✓	
APM B-12 Vegetation	Where possible, towers or access roads will be located so as to avoid sensitive plants or plant communities. Where this is not feasible, affected individual plants will be transplanted. Towers will also be placed so that lines will span critical wildlife habitat. (BLM B-5.7 Vegetation)	✓	
APM B-13 Vegetation	Tower sites will be selected to allow maximum spacing of sensitive features. (BLM B-5.8 Vegetation)	✓	
APM B-14 Vegetation	Minimize the area needed for equipment operation and material storage and assembly. (BLM B-5.3 Vegetation)	✓	
APM B-15 Wildlife	In the vicinity of the Colorado River, existing tower spacings and conductor heights will be matched to the extent practical. This would reduce the potential for bird collisions with the power line. (BLM B-5.1 Wildlife)	✓	
APM B-16 Wildlife	Surveys – When access along the utility corridor already exists, pre-construction surveys for transmission lines should provide 100 percent coverage for any areas to be disturbed and within a 100-foot buffer around the areas of disturbance. When access along the utility corridor does not already exist, pre-construction surveys for transmission lines should follow standard protocol for linear projects. (SCE)	✓	✓
APM B-17 Wildlife	Access – To the maximum extent possible, access for transmission line construction and maintenance should occur from public roads and designated routes. (SCE)	✓	✓
APM B-18 Wildlife	Disturbed areas – To the maximum extent possible, transmission pylons and poles, equipment storage areas, and wire-pulling sites should be sited in a manner that avoids desert tortoise burrows. (SCE)	✓	✓
APM B-19 Wildlife	Restoration – Whenever possible, spur roads and access roads and other disturbed sites created during construction should be recontoured and restored. (SCE)	✓	✓
APM B-20 Wildlife	Ravens – All transmission lines should be designed in a manner that would reduce the likelihood of nesting by common ravens. Each transmission line company should remove any common raven nests that are found on its structures. Transmission line companies must obtain a permit from USFWS's Division of Law Enforcement to take common ravens or their nests. (SCE)	✓	✓
APM B-21 Wildlife	No clearing of or other disturbance to riparian habitats. If unavoidable, riparian habitats must be replaced or restored. This action will benefit several riparian bird species including summer tanager, yellow warbler, yellow breasted chat, least Bell's vireo, and southwestern willow flycatcher. (SCE)	✓	
APM B-22 Wildlife	Avoid impact to mesquite-dominated habitats to protect crissal thrasher. (SCE)	✓	
APM B-23 Wildlife	Minimize impact to or removal of creosote bush to benefit LeConte's thrasher. (SCE)	✓	
APM B-24 Wildlife	Avoid any alterations to the vegetation structure of Washington fan palm oases to benefit southern yellow bat. (SCE)	✓	
APM B-25 Wildlife	Avoid any alterations of mesquite hummock habitat to benefit Coachella Valley round-tailed ground squirrel. (SCE)	✓	
APM B-26 Wildlife	Wash communities along the entire route and sand dune communities in the Coachella Valley (see Map 10-AZ in the Draft SEIS and Figure 4.5-1 in the CPUC Draft EIR, 1987) will be spanned to the extent possible. (BLM B-5.2 Wildlife)	✓	

Table B-10. Applicant Proposed Measures – Biology

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM B-27 Wildlife	Prior to construction activities, the Holder shall have a qualified tortoise biologist present a class or briefing to construction workers. Subjects addressed shall include tortoise sensitivity to human disturbance, daily and seasonal activity patterns, and proper handling for removal from roadways. (BLM B-5.4 Wildlife)	✓	
APM B-28 Wildlife	The Holder shall hire a qualified tortoise biologist to conduct daily inspections of roads and work areas within tortoise habitat during the tortoise season of activity (February 15 to June 15, July 15 to October 15). Tortoises found to be in jeopardy will be removed to a nearby site. Tortoises may be held for short periods, if judged necessary, to allow construction crews to pass through an area. The Holder will provide proper facilities for such temporary holding. (BLM B-5.6 Wildlife)	✓	
APM B-29 Wildlife	The Holder shall restrict the speed on all roads within tortoise habitat to a maximum of 25 miles per hour. The Holder is responsible for ensuring compliance with this limit by its employees. (BLM B-5.6 Wildlife)	✓	
APM B-30 Wildlife	Within tortoise habitat in California, spur roads shall not be bladed except where necessary to allow access for construction vehicles. Required vehicles shall enter on one pathway which is flagged and developed only by the passage of vehicles crushing vegetation. The spur shall be flagged by a qualified tortoise biologist prior to use. The spur shall avoid tortoise burrows and large perennial plants, yet be as short as possible within these requirements. Due to the presence of silty soils in Arizona, blading may occur. (BLM B-5.7 Wildlife)	✓	
APM B-31 Wildlife	Any desert tortoise observed on access roads or work areas will be moved immediately 100 yards away from the roadway into safe areas. (BLM B-5.8 Wildlife)	✓	
APM B-32 Wildlife	In areas considered to comprise suitable tortoise habitat, or other areas where tortoise are observed, all access roads and tower construction sites will be surveyed by a qualified biologist to delineate burrows or individuals for protection. Burrows near construction sites will be clearly delineated on the ground. Road, footing, and work area alignments should be modified to the extent possible to avoid adversely affecting any tortoise burrows encountered during these surveys. Where tortoise burrows will be unavoidably destroyed, they should be excavated carefully using hand tools, under the supervision of a field biologist with demonstrated prior experience with this species. See Map 11-AZ in Appendix F in the Draft EIS (1988) and Figure 4.5-2 in the Devers–Palo Verde No. 2 EIR (1987). Also see Appendix E for link and milepost descriptions and mitigation measures. (BLM B-5.9 Wildlife)	✓	
APM B-33 Wildlife	If possible, no new roads, tower sitings, or spur roads will be built in blow sand areas. However, if new spur roads are required through wind-blown sand habitat, the road will be returned to natural conditions and effectively closed (gated or bermed) following construction. Pre-construction surveys will identify wind-blown sand dune habitats. (BLM B-5.10 Wildlife)	✓	

Table B-10. Applicant Proposed Measures – Biology

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM B-34 Wildlife	Where the project crosses through the Coachella Valley Preserve, the Holder will cooperate with the Preserve in closing (gating) existing access roads. (a) A qualified biologist will also be present with work crews to survey and clear work areas daily for Coachella Valley fringe-toed lizard (CVFTL), flat-tailed horned lizard (FTHL), and other sensitive species in the Preserve and sand dune communities from Link 14 (Milepost 7.6) to Link 16 (Milepost 5.0) to identify if ay additional areas of occupied CVFTL and FTHL habitat are present along the route or at construction staging areas. (b) This survey will be conducted during appropriate seasons (March 15 to May 15) and conditions for species identification. For any areas of suitable habitat, this measure will apply. In the Coachella Valley, compacted soils should be scarified and seeded with a mix of native plant seeds, including bugseed (*Dicoria canescens*), to promote revegetation of plant species valuable to the lizard. Construction activity and surface disturbance will be prohibited during the period from January 1 to March 31 for the protection of the bighorn sheep lambing areas. These areas along the proposed route include Link 2 (Milepost 29.0 to 34.0) and Link 6 (Milepost 0.0 to 6.0). (BLM B-5.11 Wildlife)	✓	
APM B-35 Wildlife	Avoid upland areas where desert tortoises might occur and/or have a biologist present during construction activities that involve earth moving in order to move any tortoises (in burrows or cover-sites, or on the surface) that would likely be impacted. (BLM B-5.17 Wildlife)	✓	
APM B-36 Wildlife	Avoid construction activities that would tend to create wind barriers that might result in sand stabilization in order to minimize impacts to populations of the Coachella Valley fringe-toed lizard. (BLM B-5.18 Wildlife)	✓	
APM B-37 Wildlife	Mitigation for the coastal California gnatcatcher should include protocol-driven pre-construction surveys. If gnatcatchers are found to be present, suitable habitat should be avoided, including relocating towers and access. If habitat cannot be avoided, SCE should either restore damaged habitat, as at the Weapons Support Facility, Fallbrook Detachment, San Diego County (Soil Ecology and Research Group, 2004), or participate in land set-aside programs such as the Natural Community Conservation Planning program (NCCP). Another potential mitigation action would be that of assisting in the provision of funding for monitoring programs that may be undertaken through the Western Riverside County Multiple Species Habitat Conservation Plan. (SCE)		✓
APM B-38 Wildlife	For least Bell's vireo, suitable habitat would be completely avoided by relocating tower sites and/or associated access roads. There would be approximately 0.8 acres of suitable habitat potentially affected by the proposed west of Devers 230 kV upgrade; this small area should be entirely avoided. If avoidance is not possible and the habitat is damaged or lost, SCE should participate in habitat banking programs or provide funding through the Western Riverside County Multiple Species Habitat Conservation Plan for plan-related monitoring of this species. (SCE)		✓
APM B-39 Wildlife	Stephens' kangaroo rat habitat would be avoided, where possible. (SCE)		✓

Source: SCE, 2005.

1 APM refers to Applicant Proposed Measure. If there is a measure in the 1989 BLM ROW Grant that is not specified in the PEA as an APM, this FLM Grant measure is listed in shaded rows at the end of the table and is labeled BLM followed by its reference in the ROW Grant.

2 Refers to the Devers-Harquahala 500 kV transmission line.

3 Refers to the West of Devers 230 kV transmission line upgrade.

4 Reference in parentheses denotes the origin of the APM. "(SCE)" is a Proponent's mitigation measure. "(BLM)" is a Proponent's measure derived from a requirement in the BLM Right-of-Way Grant 1989. Numbers such as B-4.1 refer to the specific BLM measure in the 1989 Grant.

5 Holder is BLM's reference to the ROW Grant holder. Holder is SCE, the project proponent.

Table B-11. Applicant Proposed Measures – Cultural Resources

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM C-1	Prior to construction and all other surface disturbing activities, the Holder[5] shall have conducted and submitted for approval by the Authorized Officer an inventory of cultural resources within the project's APE. The nature and extent of this inventory shall be determined by the Authorized Officer in consultation with the appropriate State Historic Preservation Officer (SHPO) and shall be based upon project engineering specifications. (BLM B-9.1)[4]	✓	
APM C-2	As part of the inventory, the Holder shall conduct field surveys of sufficient nature and extent to identify cultural resources that would be affected by tower pad construction, access road installation, and transmission line construction and operation. At a minimum, field surveys shall be conducted along newly proposed access roads, new construction yards, and any other projected impact areas outside of the previously surveyed corridor. Site-specific field surveys also shall be undertaken at all projected areas of impact within the previously surveyed corridor that coincide with previously recorded cultural resource locations. The selected right-of-way shall be staked prior to the cultural resource field surveys. (BLM B-9.2)	✓	
APM C-3	As part of the inventory report, the Holder shall evaluate the significance of all affected cultural resources and provide recommendations with regard to their eligibility for the NRHP. Determinations of NRHP eligibility will be made by the Authorized Officer in consultation with the appropriate SHPO. (BLM B-9.3)	✓	
APM C-4	Upon approval of the inventory report by the Authorized Officer, the Holder shall prepare and submit for approval a cultural resource treatment plan for NRHP-eligible cultural resources to mitigate identified impacts. Avoidance, recordation, and data recovery will be used as mitigation alternatives. (BLM B-9.4)	✓	
APM C-5	The Authorized Officer may require the relocation of the line, ancillary facilities, or temporary facilities or work areas, if any, where relocation would avoid or reduce damage to cultural resource values. (BLM B-9.5)	✓	
APM C-6	If avoidance of specific cultural resources is not feasible, treatment shall be carried out as determined by the Authorized Officer in consultation with the appropriate SHPO. (BLM B-9.6)	✓	
APM C-7	When necessary to relocate the proposed line, ancillary facilities, temporary facilities, or work areas as a result of inventory, onsite avoidance decisions, or the Holder's approved request for relocation, the Holder shall inventory the proposed new locations for cultural resources and provide inventory results to the Authorized Officer prior to construction. Any mitigation deemed necessary by the Authorized Officer shall be completed prior to undertaking any surface disturbing activities. (BLM B-9.7)	✓	
APM C-8	All cultural resource work undertaken by the Holder on public lands shall be carried out by qualified professionals designated on a currently valid Cultural Resource Use Permit for the appropriate state. (BLM B-9.8)	✓	
APM C-9	Notices to proceed will be issued following completion, and approval by the Authorized Officer, of any fieldwork determined necessary through the inventory, evaluation, and consultation process described above. (BLM B-9.9)	✓	
APM C-10	Vehicles and equipment shall be confined and operated only within areas specified by the Authorized Officer. (BLM B-9.10)	✓	
APM C-11	Unauthorized collection of artifacts or other cultural materials on or off the right-of-way by the Holder, his representatives, or employees will not be allowed. Violators will be subject to prosecution under the appropriate State and federal laws. Unauthorized collection may constitute grounds for the issuance of a stop work order. (BLM B-9.11)	✓	

Source: SCE, 2005.
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Table B-12. Applicant Proposed Measures – Paleontological Resources

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM P-1	Impacts to significant paleontological resources will be mitigated by conducting a pre-construction survey in areas of high or undetermined paleontological sensitivity to identify and collect surface specimens that could be affected by project construction. Paleontological monitoring of earth-disturbing construction activities and salvage of significant specimens will occur in project areas of high sensitivity. (SCE)		✓

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Table B-13. Applicant Proposed Measures – Air Quality

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM A-1	Heavy duty off-road diesel engines would be properly tuned and maintained to manufacturers' specifications to ensure minimum emissions under normal operations. (SCE)[4]	✓	✓
APM A-2	Water or chemical dust suppressants would be applied to unstabilized disturbed areas and/or unpaved roadways in sufficient quantity and frequency to maintain a stabilized surface. (SCE)	✓	✓
APM A-3	Water or water-based chemical additives would be used in such quantities to control dust on areas with extensive traffic including unpaved access roads; water, organic polymers, lignin compounds, or conifer resin compounds would be used depending on availability, cost, and soil type. (SCE)	✓	✓
APM A-4	Surfaces permanently disturbed by construction activities would be covered or treated with a dust suppressant after completion of activities at each site of disturbance. (SCE)	✓	✓
APM A-5	Vehicle speeds on unpaved roadways would be restricted to 15 miles per hour. (SCE)	✓	✓
APM A-6	Vehicles hauling dirt would be covered with tarps or by other means. (SCE)	✓	✓
APM A-7	Site construction workers would be staged offsite at or near paved intersections and workers would be shuttled in crew vehicles to construction sites. As part of the construction contract, SCE would require bidders to submit a construction transportation plan describing how workers would travel to the job site. (SCE)	✓	✓
APM A-8	Emissions credits would be purchased to offset any emissions levels which are over the emissions thresholds. (SCE)	✓	✓

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Table B-14. Applicant Proposed Measures – Water Resources

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM W-1	During the first year following construction, potential soil erosion sites will be inspected by the Holder[5] after each major rainstorm as access permits. For the purpose of this measure, a major rainstorm is defined as any singular storm where the total precipitation exceeds the arithmetic mean for similar events in the area and results in flooding. Examples include cloudbursts (high quantity – short duration) or storms where saturated soils produce runoff (high quantity – long duration). (BLM B-4.1)[4]	✓	
APM W-2	Construction equipment will be kept out of flowing stream channels except when absolutely necessary to construct crossings. (BLM B-4.2)	✓	
APM W-3	Erosion control and hazardous material plans will be incorporated into the construction bidding specifications to ensure compliance. (BLM B-4.3)	✓	
APM W-4	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, will be used to prevent scour and/or inundation by a 100-year flood. (BLM B-4.4)	✓	
APM W-5	Towers will be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows. (BLM B-4.5)	✓	
APM W-6	Diversion dikes will be required to divert runoff around a tower structure if (a) the location in an active channel cannot be avoided; and (b) where there is a very significant flood scour/deposition threat, unless specifically exempted by the BLM Authorized Officer. (BLM B-4.6)	✓	
APM W-7	Runoff from roadways will be collected and diverted from steep, disturbed, or otherwise unstable slopes. (BLM B-4.7)	✓	
APM W-8	Ditches and drainage concourses will be designed to handle the concentrated runoff, will be located to avoid disturbed areas, and will have energy dissipations at discharge points. (BLM B-4.8)	✓	
APM W-9	Cut and fill slopes will be minimized by a combination of benching and following natural topography where possible. (BLM B-4.9)	✓	
APM W-10	Construction equipment would be kept out of flowing stream channels except when absolutely necessary to construct crossings. (SCE)		✓
APM W-11	Erosion control and hazardous material plans would be incorporated into the construction bidding specifications to ensure compliance. (SCE)		✓
APM W-12	Appropriate design of tower footing foundations, such as raised foundations and/or enclosing flood control dikes, would be used to prevent scour and/or inundation by a 100-year flood. (SCE)		✓
APM W-13	Towers would be located to avoid active drainage channels, especially downstream of steep hillslope areas, to minimize the potential for damage by flash flooding and mud and debris flows. (SCE)		✓
APM W-14	Diversion dikes would be required to divert runoff around a tower structure if (a) the location in an active channel cannot be avoided, and (b) where there is a very significant flood scour/deposition threat. (SCE)		✓
APM W-15	Runoff from roadways would be collected and diverted from steep, disturbed, or otherwise unstable slopes. (SCE)		✓
APM W-16	Ditches and drainage concourses would be designed to handle the concentrated runoff, would be located to avoid disturbed areas, and would have energy dissipations at discharge points. (SCE)		✓
APM W-17	Cut and fill slopes would be minimized by a combination of benching and following natural topography where possible. (SCE)		✓

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Table B-15. Applicant Proposed Measures – Geology and Soils

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM G-1	The line will be located to minimize the disruption of any active mining operations. (BLM B-2.1)[4]	✓	
APM G-2	Transmission towers will not be sited on nor straddle the mapped traces of any known fault that has been designated active or potentially active. In areas where known faults are present, the Holder[5] will visually check the tower site area before clearing, and will check the tower footing holes for any trace of a previously unmapped fault. If manifestations of a fault are found, construction will immediately stop at that site and the Holder will consult with the BLM Authorized Officer. The BLM Authorized Officer will determine if it is a fault trace and if so, will ascertain if it is active, potentially active, or inactive. (BLM B-2.2)	✓	
APM G-3	Towers will be located so that the line will span the surface traces of active and potentially active faults such that a relative lateral surface displacement would shorten the span between towers, and thus avoid potential line breaks. Where this is not feasible, the Holder will incorporate slack spans to bridge the fault(s) such that the projected lateral surface displacement, as forecast by the Holder's geologist and accepted by the BLM Authorized Officer, will not structurally affect the associated towers. (BLM B-2.3)	✓	
APM G-4	Appropriate tower design will be used to mitigate the potential for very strong seismic groundshaking. In general, an appropriate tower design which accounts for lateral wind loads and conductor loads during line stringing exceeds any credible seismic loading (groundshaking). (BLM B-2.4)	✓	
APM G-5	Towers will be located to avoid areas of highly sensitive dune sand areas. Where these areas cannot be avoided, towers will be located to minimize disturbance to the deposits at a site approved by the BLM Authorized Officer. (BLM B-2.5. Note: Text here omits references to specific figures and maps in the original (1987-88) DEIR and DEIS.)	✓	
APM G-6	Wherever possible to minimize the potential for slope instability, towers will be located to avoid gullies or active drainages, and over-steepened slopes. (BLM B-2.6)	✓	
APM G-7	The Authorized Officer may require, on a site-specific basis, helicopter assisted construction in sensitive areas. Sensitive areas are those that exhibit both (1) high erosion potential and/or slope instability; and (2) a lack of existing access roads within a reasonable distance of the tower site (generally no more than ¼ mile), or existing access that is not suitable for upgrading to accommodate conventional tower construction or line stringing equipment, and where it is determined that, after field review, the issues of erosion and/or slope instability cannot be successfully mitigated through implementation of accepted engineering practices. (BLM B-2.7)	✓	
APM G-8	Mitigation of potentially significant impacts to the western end of the proposed transmission line due to (1) potential surface fault rupture along the Banning, Mission Creek, and Mecca Hills faults, and (2) potential for severe seismic shaking can be achieved by standard design methods listed below: a. Towers will be sited so as not to straddle active fault traces. b. The alignment will be designed to cross an active fault such that future rupture on the fault would not cause excessive stress on the line or the towers. c. Standard foundation and structural design measures will be utilized to minimize the impact from severe seismic shaking. (BLM B-2.8)	✓	
APM G-9	Appropriate design of tower foundations will be used to reduce the potential for settlement and compaction. (BLM B-2.9)	✓	

Table B-15. Applicant Proposed Measures – Geology and Soils

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM G-10	New access roads and soil disturbance will be avoided or minimized in all areas designated as having high erosion hazards or potential slope instability. If the Authorized Officer, after consultation and review of alternatives (including helicopter or helicopter assisted construction), deems the proposed new access road feasible, design plans must be submitted for approval, in writing, prior to construction. (BLM B-3.1. Note: Text here omits references to specific figures and maps in the original (1987-88) DEIR and DEIS.)	✓	
APM G-11	New access roads, which are required, will be designed to minimize ground disturbance from grading. They will follow natural ground contours as closely as possible and include specific features for road drainage, including water bars on slopes over 25 percent. Other measures could include drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings are constructed, the crossings will be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line in the area. (BLM B-3.2)	✓	
APM G-12	Side casting of soil during grading will be minimized. Excess soil will be properly stabilized or, if necessary, end-hauled to an approved disposal site. (BLM B-3.3)	✓	
APM G-13	During grading operations, care would be exercised to minimize side casting. No earth would be removed below final elevations, and no cuts would be made deeper than necessary for clearing and road construction. (SCE)	✓	✓
APM G-14	Upon completion of construction, any drainage deficiencies would be corrected to prevent future erosion. Trees and brush would be cleared only when necessary to provide electrical clearance, line reliability, or suitable access for maintenance and construction. (SCE)	✓	✓
APM G-15	Counterpoise may need to be installed if the local soil conditions indicate that the soil has a resistance above 30 ohms. This is accomplished by attaching a 0.375-inch cable to the tower steel. The cable is installed 1 foot underground and extends approximately 100 feet within the ROW from two or more footings.	✓	✓
APM G-16	The line would be located to minimize the disruption of any active mining operations. (SCE)		✓
APM G-17	Appropriate tower design would be used to mitigate the potential for impacts from very strong seismic groundshaking. In general, an appropriate tower design which accounts for lateral wind loads and conductor loads during line stringing exceeds any credible seismic loading (groundshaking). (SCE)		✓
APM G-18	Whenever possible to minimize the potential for slop instability, towers would be located to avoid gullies or active drainages, and over-steepened slopes. (SCE)		✓
APM G-19	New access roads, where required, would be designed to minimize ground disturbance from grading. They would follow natural ground contours as closely as possible and include specific features for road drainage, including water bars on slopes over 25 percent. Other measures could include drainage dips, side ditches, slope drains, and velocity reducers. Where temporary crossings are constructed, the crossings would be restored and repaired as soon as possible after completion of the discrete action associated with construction of the line. Side casting of soil during grading would be minimized. Excess soil would be properly stabilized, or if necessary, hauled to an approved disposal site. (SCE)		✓

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Table B-16. Applicant Proposed Measures – Visual Resources

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM V-1	Non-specular conductors will be used [to reduce glare and visual contrast]. (BLM B-6.1)[4] [bracketed text added by SCE]	✓	✓
APM V-2	For the proposed alignment, tower spacing will correspond to the spacing of the existing transmission line structures. Additionally, new tower heights will be adjusted such that the top elevations of each set of towers (new and existing) are horizontal with each other. This will coordinate perceptions of towers and conductors as one element. Site-specific conditions will determine when such mitigation is feasible. Other exceptions to these two measures are where towers will be sited to avoid sensitive features and/or to allow conductors to clearly span features. (BLM B-6.2) [PEA adds: "SCE will comply with the above mitigation measure to the extent possible. However, the ISO has specified that the capacity of the line be 2700 amps under normal conditions and 3600 amps under emergency conditions. This capacity rating is an increase from the 1988 DPV2 capacity rating. This capacity rating necessitates that the heights of some of the proposed Devers-Harquahala towers be slightly taller than [adjacent towers], and in some locations tower spacing may not correspond to the adjacent DPV1 structures, to provide adequate ground clearance." (PEA, p. 6-31)	✓	
APM V-3	At all highway and recreation routes-of-travel crossings, including the Colorado River, towers will be placed at the maximum feasible distance, and when feasible, [except in locations where matching existing tower spacing is deemed appropriate]. (BLM B-6.3) [From "and where feasible," the BLM text reads "...at right angles, from the crossing." SCE has replaced this phrase in the bracketed text.]	✓	
APM V-4	Improvements to existing access and new access will be accomplished according to Mitigation Measures 1 and 2 as identified under soils. (BLM B-6.4)	✓	
APM V-5	Standard tower spacing would be modified to correspond with spacing of existing transmission line towers where feasible and within limits of standard tower design to reduce visual contrast. (BLM B-6.8a)	✓	
APM V-6	Towers would be placed so as to avoid features and/or to allow conductors to clearly span the feature (within limits of standard tower design) to minimize the amount of sensitive feature disturbed and/or reduce visual contrast (e.g., avoiding skyline situations through placement of tower to one side of a ridge or adjusting tower location to avoid highly visible locations and utilize screening of nearby landforms). (BLM B-6.8b)	✓	
APM V-7	The proposed steel lattice towers would be constructed using a dulled galvanized steel finish, which would result in visual contrast reduction. (SCE)		✓
APM V-8	Non-specular conductors would be used to reduce glare and resulting visual contrast. (SCE)		✓
APM V-9	Towers would be located adjacent to existing structures where feasible. Exceptions are at locations where the tower heights and/or spans would be modified based on terrain features allowing for adequate conductor clearance to ground and other facilities within the right-of-way. (SCE)		✓
APM V-10	At all highway and recreation routes-of-travel crossings, including the I-10 crossing, towers would be placed at the maximum feasible distance, except in locations where matching existing tower spacing is deemed appropriate, and when feasible, at 90 degree angles from the crossing. (SCE)		✓

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Table B-17. Applicant Proposed Measures – Land Use

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM L-1	Impacts in crossing of the KOFA NWR (Link 2) would be minimized through utilization of existing utility access (gas and transmission) roads during the construction and operational phases of the project. All vehicular traffic would be limited to approved access or spur roads. (SCE)[4]	✓	
APM L-2	Although the Holder[5] may restore and maintain existing access roads, they cannot be either widened or upgraded without approval of the Authorized Officer. (BLM B-1.1)	✓	
APM L-3	New access road construction will be kept to a minimum. (BLM B-1.2)	✓	
APM L-4	Where feasible, the following additional mitigation measures would be implemented: • Matching of tower spans • Aligning towers adjacent to or parallel to agricultural field boundaries • Using tubular steel pole structures in agricultural fields instead of lattice steel towers to reduce the footprint of the structure • Specific tower placement to avoid span-sensitive features. (SCE)	✓	
APM L-5	Along Link 10 in the Palo Verde Valley, H-frame structures, similar to the existing DPV1 structures, would be installed in this segment to reduce the amount of farmland permanently removed from production and minimize impacts to farm operations. Where feasible, additional mitigation measures would include matching tower spans, and aligning towers adjacent or parallel to field boundaries. (SCE)	✓	
APM L-6	In the agricultural area of the Palo Verde Valley, towers would be located to allow for canal dredging by the Palo Verde Irrigation District. This also could include canal modifications. (SCE)	✓	
APM L-7	Link 10 crosses an (unoccupied) single-family dwelling unit at Milepost 5.3. Two additional single-family dwelling units and one mobile home would be impacted due to the alignment of Link 10 at Milepost 6.2. Mitigation measures would include purchase of the parcel and relocation or, if practical, adjusting the transmission line alignment and placing towers to avoid the affected dwelling units. (SCE)	✓	
APM L-8	Link 14 crosses an open pit gravel operation. Potential impacts would be mitigated during construction by coordinating with the owner/operator to avoid critical mining periods and high volume earth-moving days. Operational mitigation would include spanning the mine. (SCE)	✓	
APM L-9	Link 100 crosses the Pacific Crest National Trail, causing a potential temporary impact during construction. Temporary impacts also may occur where Link 102 crosses Noble Creek Regional Park and the Oak Valley Golf Course. Mitigation for construction includes avoiding high use periods and holidays. Mitigation for operation would require construction using structures placed parallel to existing structures to span and avoid displacement of recreational facilities. (SCE)		✓

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Table B-18. Applicant Proposed Measures – Noise

Measure Number and Description[1]		Applicable To: 500 kV Transmission Line[2]	Applicable To: 230 kV Upgrade[3]
APM N-1	The proposed construction would comply with local noise ordinances. There may be a need to work outside of the aforementioned local ordinances in order to take advantage of low electrical draw periods during the nighttime hours. SCE would comply with variance procedures requested by local authorities if required. (SCE)[4]	✓	✓

Source: SCE, 2005.

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