2:
PROJECT ALTERNATIVES

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2.1 ALTERNATIVES OVERVIEW

The CEQA and CEQA Guidelines Section 15126.6(a) require that an environmental impact report describe a range of reasonable alternatives for a proposed project, or to the location of the project that would feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project. However, an environmental document need not consider an alternative that fails to meet most of the basic project objectives, or whose effects cannot be reasonably ascertained, or whose implementation is remote or speculative. Factors that may be used to eliminate alternatives from detailed consideration in an environmental document are: (i) failure to meet most of the basic project objectives, (ii) infeasibility, or (iii) inability to avoid significant environmental impacts (CEQA Guidelines Section 15126.6[c]).

CEQA Guidelines Section 15126.6(d) requires that sufficient information about each alternative be included to allow meaningful evaluation, analysis, and comparison with the proposed project. In addition, CEQA Guidelines Section 15126.6(e) requires that the analysis must include evaluation of a "no project" alternative in order to compare the impacts of approving the proposed project with the impacts of not approving the proposed project (No Project Alternative).

SCE first evaluated whether the existing electrical infrastructure could be modified to meet the project objectives. Since it could not, SCE evaluated what new infrastructure would be required and where it would be located in order to meet project objectives. Two electrical system alternatives and five subtransmission line route alternatives were evaluated through the screening process. One system and one route alternative were eliminated from further consideration, and five subtransmission line route alternatives were carried forward for environmental analysis. The Proposed Project is System Alternative A, which includes the proposed 115 kV subtransmission route alternatives and the proposed 220 kV transmission loop-in, as illustrated in Figure 2.1: Proposed Project and Alternatives.

The following sections describe the methodology used to identify and screen project alternatives and the alternatives considered and eliminated with respect to their ability to meet the project objectives. Electrical system alternatives and transmission line route alternatives are described in Sections 2.2 and 2.3. This chapter concludes with recommendations for system and routing alternatives retained for full analysis in this PEA.

2.2 SYSTEM ALTERNATIVES

2.2.1 System Alternatives Overview

The evaluation of electrical system alternatives is completed using a screening process that consists of four steps. First, technical engineering analyses permit a determination whether the existing electrical infrastructure can be modified to accommodate the forecasted peak electrical demand. If upgrades or additions to the existing infrastructure would not be feasible, the second step is to develop system alternatives. The third step evaluates each system alternative on the

basis of its ability to meet the proposed project objectives and its feasibility, including consideration of capacity limits, the potential for upgrading existing electrical system components, and economic viability. In the fourth step, infeasible alternatives are eliminated from further consideration, and feasible alternatives are retained for full analysis in the PEA.

In addition to the No Project Alternative, two electrical system alternatives, System Alternatives A and B, were considered and evaluated with respect to the project objectives. System Alternative A, the Devers-Mirage 115 kV Subtransmission System Split Project, is the proposed electrical system alternative (Proposed Project).

2.2.2 No Project Alternative

Under the No Project Alternative, no new facilities would be constructed to increase subtransmission capacity, thereby perpetuating the thermal overload conditions on two existing 115 kV subtransmission circuits in the Electrical Needs Area. This would reduce the level of reliability during peak customer demand periods. If the No Project Alternative was selected, SCE would continue to implement existing operating procedures to compensate for the anticipated shortfall in the supply of electric power for the Electrical Needs Area. Operating procedures to relieve base case thermal overloads include transferring load between the substations via distribution circuits, load dropping on one or more distribution circuits, or disconnecting entire substations from the Devers 115 kV Subtransmission System. The latter two operating measures would cause extended outages within the Electrical Needs Area until the base case thermal overload conditions could be eliminated.

Additionally, under the No Project Alternative, the Proposed Devers-Coachella Valley 220 kV Loop-In described in Section 1.2.2 would not be constructed. The proposed 220 kV transmission line loop-in is necessary to address voltage problems that would exist on the Devers 220 kV Transmission System by 2009. The No Project Alternative would render SCE unable to provide sufficient, reliable service to the Electrical Needs Area, in violation of NERC and WECC criteria.

Because the No Project Alternative would not meet the project objectives, it was eliminated from further consideration.

2.2.3 System Alternative A: Devers-Mirage 115 kV Subtransmission System Split

System Alternative A would create two new subtransmission systems: the Devers 115 kV and the Mirage 115 kV Subtransmission Systems (see Figure 2.2a: Proposed Devers 115 kV Subtransmission System Alternative A). The new Devers 115 kV Subtransmission System would serve the Devers, Farrell, Garnet, Thornhill, Banning,[15] Carodean, Hi Desert, Eisenhower, and Yucca substations. The new Mirage 115 kV Subtransmission System would serve the Mirage, Capwind, Concho, Indian Wells, Santa Rosa, and Tamarisk substations. Creation of the two new subtransmission systems would require the modification and upgrade of existing electrical utility infrastructure and the addition of new infrastructure components.

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[15] Banning Substation is proposed to be transferred to the proposed El Casco 220/115kV system in 2010, and will no longer be part of the Devers 115 kV Subtransmission System after the transfer.

Figure 2.1
Proposed Project and Alternatives

LEGEND

- Electrical Needs Area
- Farrell - Garnet Project Area
- Mirage - Santa Rosa Project Area

Proposed Project

- SCE Substations - Proposed Modification
- Subtransmission Line Reconfiguration
- Farrell-Garnet 115 kV Route #1
- Mirage-Santa Rosa 115 kV Route #4
- Devers-Coachella 220 kV Loop-In

Alternative Subtransmission Line Routes

- Farrell-Garnet 115 kV Route #2
- Farrell-Garnet 115 kV Route #3
- Mirage-Santa Rosa 115 kV Route #5

Existing Lines (SCE, 2007)

- 115kV Subtransmission Line
- 220kV Transmission Line

Transportation (TBM, 2006)

- Interstate Highway
- State Highway
- Major Road
- Railroad

0 0.5 1 2
Miles

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Custodian: John Le
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System Alternative A, the Devers-Mirage 115 kV Subtransmission System Split Project, would include the following major components: construction of a 115 kV subtransmission line from the Mirage Substation to the existing Santa Rosa-Tamarisk 115 kV subtransmission line at I-10 (Proposed Mirage-Santa Rosa); construction of a 115 kV subtransmission line from the Farrell Substation to the Garnet Substation (Proposed Farrell-Garnet); installation of a 280 MVA 220/115 kV transformer at Mirage Substation; and looping the existing Devers-Coachella Valley 220 kV transmission line into Mirage Substation (see Figure 2.2a: Proposed Devers 115 kV Subtransmission System Alternative A).

The new Mirage-Santa Rosa 115 kV subtransmission line would be created by installing approximately 55 new support structures, including 11 double-circuit wood poles, 7 double-circuit TSPs, and 37 double-circuit LWS poles, from Mirage Substation south to the I-10 to the existing Santa-Rosa Tamarisk 115 kV subtransmission line, approximately 1.5 miles. The new Farrell-Garnet 115 kV subtransmission line would be created by installing approximately 169 new support structures, including 161 double-circuit LWS poles and 8 TSP, between Garnet and Farrell substations, approximately 5.3 miles. Additionally, the proposed 220 kV transmission line loop-in would be created by installing 8 LSTs and one TSP, from Mirage Substation to the Devers-Coachella Valley 220 kV transmission line, approximately 0.8 mile. A 280 MVA 220/115 kV transformer would be installed at Mirage Substation, and the 220 kV switchrack would be modified. Additional telecommunications equipment, such as channel banks and fiber optic equipment, would be installed at the Concho, Devers, Eisenhower, Farrell, Garnet, Indian Wells, Mirage, Santa Rosa, Tamarisk, and Thornhill substations to provide protection circuits to the substation relays.

Construction of the Devers-Mirage 115 kV Subtransmission System Split Project is scheduled to begin in the second quarter of 2009, with an operating date of mid-2010. The estimated cost of System Alternative A is approximately $33.3 million,[16] based on preliminary engineering. Additional components, such as new telecommunications lines, are not included in the cost estimate.

2.2.4 System Alternative B: No System Split

System Alternative B would include the construction of two new 115 kV subtransmission lines, but would not split the existing Devers 115 kV Subtransmission System. System Alternative B would require construction of one new 115 kV line between Mirage Substation and the existing Santa Rosa-Tamarisk 115 kV circuit south of I-10 (Mirage-Santa Rosa-Tamarisk) and a second 115 kV subtransmission line between Mirage and Concho substations (Mirage-Concho No. 2). Additionally, the proposed 220 kV transmission line loop-in would be created by installing 8 LSTs and one TSP from Mirage Substation to the Devers-Coachella Valley 220 kV transmission

[16] *Total proposed project cost, including telecommunications, is $34 million.*

line, approximately 0.8 mile. A 280 MVA 220/115 kV transformer would be installed at Mirage Substation, and the 220 kV switchrack would be modified (see Figure 2.2b: Proposed Devers 115 kV Subtransmission System Alternative B). SCE would construct the new Mirage-Santa Rosa-Tamarisk 115 kV subtransmission line by installing approximately 40 new double-circuit LWS poles, approximately nine wood poles, and approximately five TSPs. The existing Mirage-Tamarisk 115 kV subtransmission line would be transferred to the new LWS poles. SCE would complete the circuit between the Mirage and Santa Rosa substations by adding approximately 1.5 miles of new conductor between Mirage Substation and the existing Santa Rosa-Tamarisk 115 kV line at the south side of I-10. This work would all be conducted within SCE's existing ROW or franchise locations.

In addition, SCE would construct a second Mirage-Concho 115 kV subtransmission line. Approximately 115 new double-circuit TSPs would be installed, and the existing Devers-Capwind-Concho-Mirage 115 kV subtransmission line would be transferred to the new poles. SCE would add approximately 6.4 miles of new conductor within its existing ROWs or franchise locations to complete the circuit between the Mirage and Concho substations.

Also, under System Alternative B, SCE would modify various line positions and upgrade relay protection at Concho, Santa Rosa, and Tamarisk substations. A new 280 MVA 220/115 kV transformer would be installed at the Mirage Substation. Additional telecommunications equipment, such as channel banks and fiber optic equipment, would be installed at Concho, Mirage, Santa Rosa, and Tamarisk substations to provide protection circuits to the substation relays.

The estimated cost of System Alternative B is approximately $37.6 million, based on preliminary engineering. Additional components, such as new telecommunications lines, are not included in the cost estimate.

2.2.5 System Alternatives Discussion

SCE recommends System Alternative A, the Devers-Mirage 115 kV Subtransmission System Split Project, as the Proposed Project. As discussed below, System Alternative A meets the project objectives and provides superior reliability and operational flexibility when compared to System Alternative B.

2.2.5.1 System Alternative A: Devers-Mirage 115 kV Subtransmission System Split

System Alternative A meets the following project objectives, which are listed below.

- Serve projected electrical demand requirements in the Electrical Needs Area beginning in 2010.

- Maintain electrical system reliability within the Devers 220 kV Transmission System and the Electrical Needs Area.

- Enhance operational flexibility by providing the ability to transfer load between subtransmission lines and the Devers and Mirage substations within the Electrical Needs Area.

Figure 2.2a: Proposed Devers 115 kV Subtransmission System Alternative A

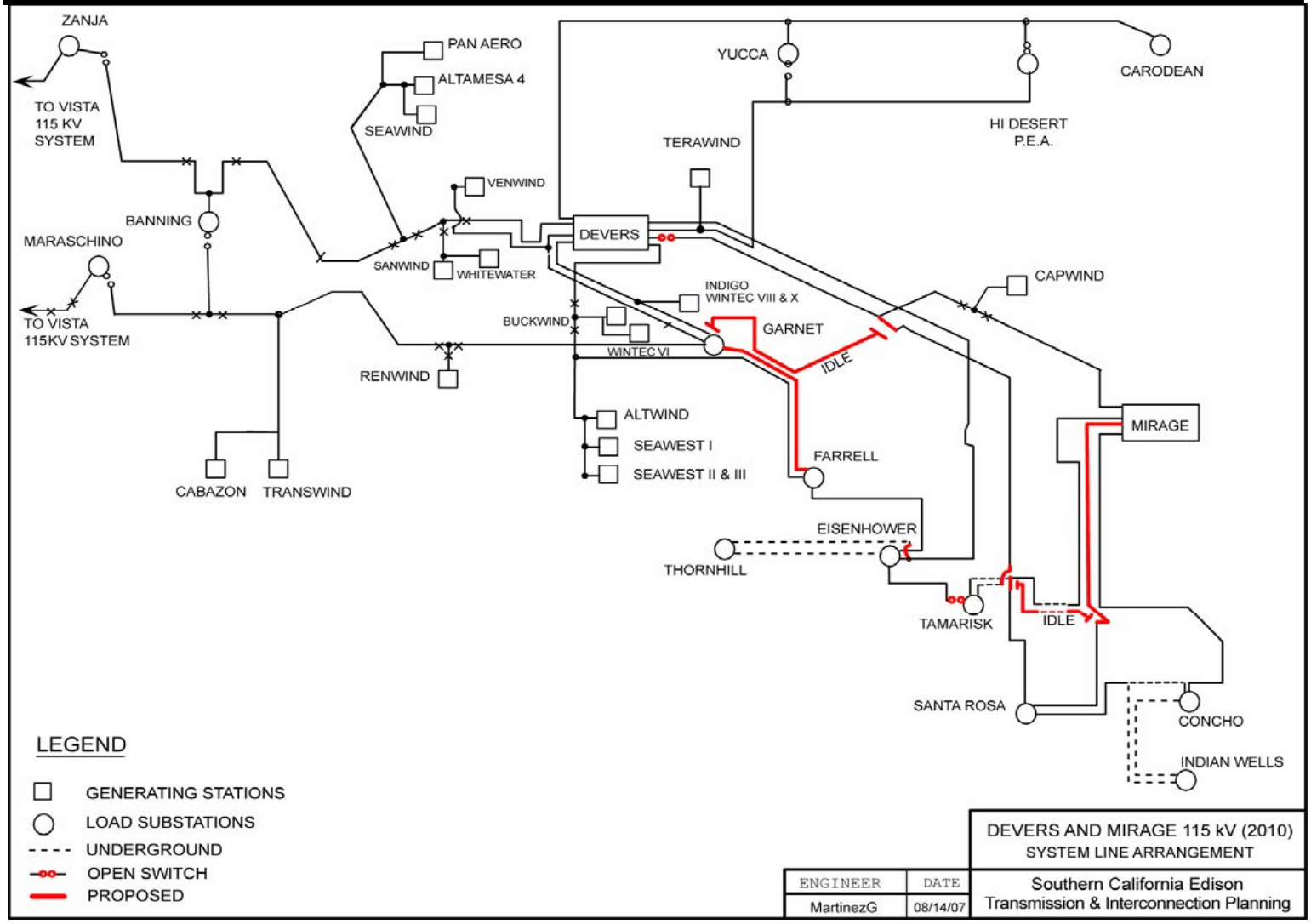

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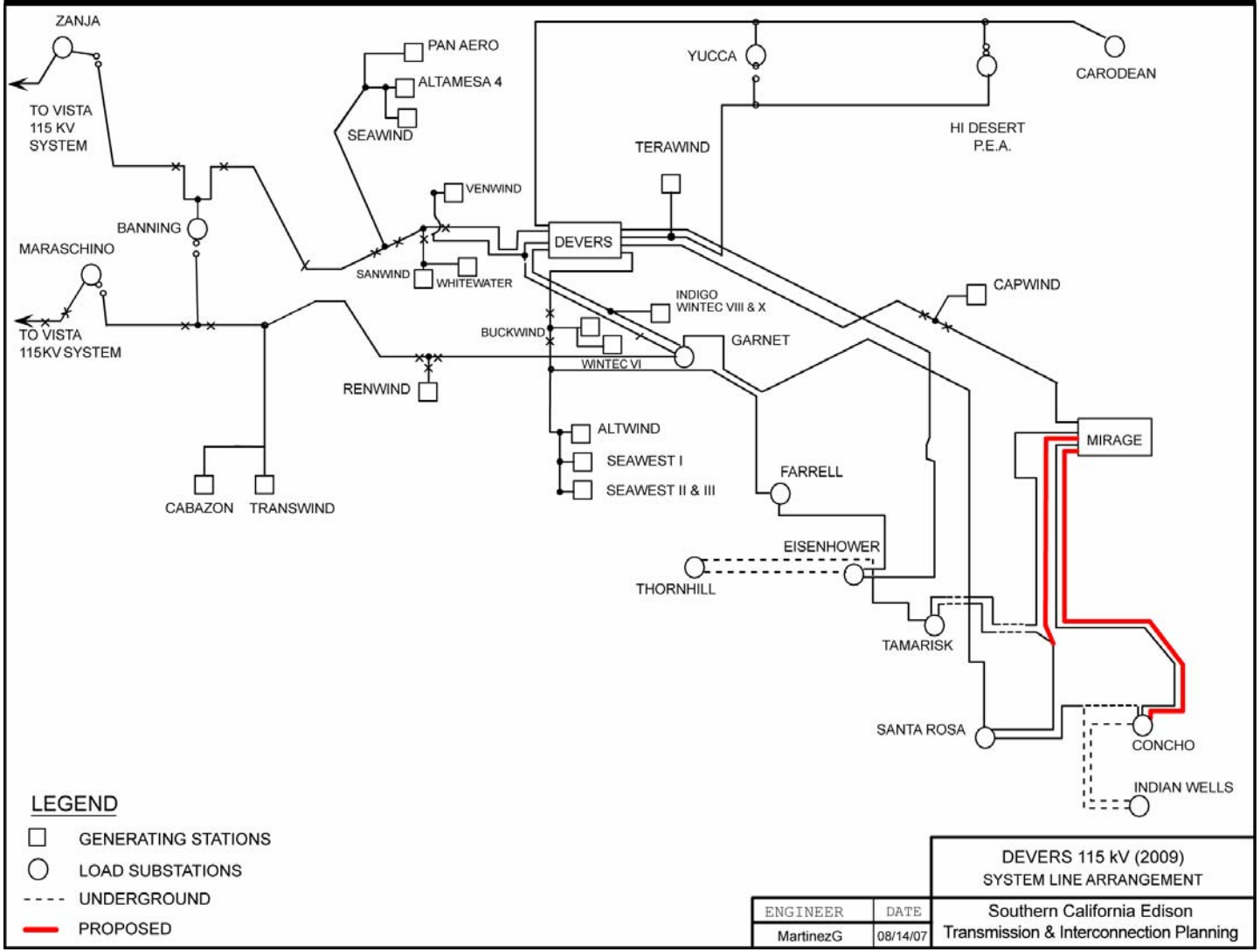
Figure 2.2b: Proposed Devers 115 kV Subtransmission System Alternative B



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- Utilize existing SCE facilities and ROWs, where feasible.
- Meet projected need while minimizing environmental impacts.
- Meet project need in a cost-effective manner.

System Alternative A would result in greater system reliability and the ability to meet customer demand within the Electrical Needs Area through increased system capacity and operational flexibility. The addition of new 954 SAC within the line segment between the Mirage Substation and the existing Santa Rosa-Tamarisk line would increase the 115 kV subtransmission line maximum capacity out of Mirage Substation from 2,930 amps to approximately 4,020 amps. System Alternative A would remove Indian Wells, Concho, Tamarisk, and Santa Rosa substations from the existing Devers 115 kV Subtransmission System (creating the new Mirage 115 kV Subtransmission System) and eliminate the forecasted base case thermal overload on the existing Mirage-Tamarisk 115 kV subtransmission line. Accordingly, SCE's current operating procedures that are in place to transfer or drop load would no longer be required, thus increasing system reliability.

Constructing the new Farrell-Garnet 115 kV subtransmission line with 954 SAC would increase the maximum subtransmission line capacity out of Farrell Substation, from 1,770 amps to 2,860 amps, and out of Garnet Substation, from 3,880 amps to 4,120 amps due to the increased conductor size and greater cross section allowing for more current flow. Accordingly, this new 115 kV subtransmission line would increase reliability of the proposed Devers 115 kV Subtransmission System. Additionally, System Alternative A provides a direct path from Garnet Substation to Farrell Substation that eliminates the power flow from Garnet Substation to Santa Rosa Substation, and creates a new path for power flow from Devers to Thornhill Substation. This would create a balanced power flow between Devers Substation and the distribution substations (Eisenhower, Farrell, Garnet, and Thornhill substations).

System Alternative A would increase operational flexibility by providing the ability to use existing 115 kV subtransmission lines as tie-lines between the two 115 kV subtransmission systems. These tie-lines could serve as alternative sources lines for distribution substations if peak customer demand caused a thermal overload condition on a 115 kV subtransmission line. If a thermal overload condition were to occur, then customer load could be transferred through these tie-lines, without dropping load.[17]

[17] *The "tie-lines" that could manually parallel the proposed Devers 115 kV Subtransmission System and the Mirage 115 kV Subtransmission System are shown graphically (with a break in the single-line and two circles) in Figure 1.6: Proposed Devers and Mirage 115 kV Subtransmission Systems. The names of these circuits are proposed to be the Mirage-Capwind-Devers-Tamarisk and Eisenhower-Tamarisk 115 kV subtransmission lines.*

Additionally, splitting the existing Devers 115 kV Subtransmission System into two separate subtransmission systems would eliminate the 220 kV transmission system power flow on the existing Devers 115 kV subtransmission lines. Elimination of the 220 kV transmission system power flow would enhance operational flexibility for managing future outages on the Devers 220 kV Transmission System, as well as the two new 115 kV subtransmission systems.

Another benefit to splitting the existing Devers 115 kV Subtransmission System into two separate 115 kV subtransmission systems would be the reduction in, or maintenance of, short-circuit duty[18] levels on the 115 kV subtransmission components. The Proposed Project effectively would increase the short-circuit duty capacity, which would defer costly future short-circuit duty upgrades. These upgrades would be necessary if additional lines were to be added to the existing Devers 115 kV Subtransmission System, as proposed in System Alternative B, instead of a system split.

System Alternative A includes looping of the Devers-Coachella Valley 220 kV transmission line into Mirage Substation to meet mandatory NERC and WECC standards for maintaining transmission voltage levels on the Devers Area transmission system. In order to meet these standards, the Devers-Coachella Valley 220 kV transmission line loop-in must be constructed on the west side of the existing 220 kV LSTs within the existing Devers-Mirage 220 kV ROW (see Figure 3.3-3 Existing and Proposed 220 kV Transmission Line Tower Configurations). The existing ROW is 290 feet wide. The eastern portion of this ROW is occupied by existing LWS structures. Thus, there is no room in the existing ROW to place an additional LWS tower on the eastern side of the ROW and placement further east would require substantial acquisition of new ROW. In addition, constructing the Devers-Coachella Valley 220 kV transmission line loop-in east of the existing towers would result in violation of NERC criteria and substantial reconfiguration of existing lines and Mirage Substation and would be cost prohibitive. Specifically, construction of the Devers-Coachella Valley 220 kV transmission line loop-in east of the existing towers would result in several days of customer outages due to reconfiguring and crossing the lines, and would require taking Mirage Substation out of service for approximately one month in order to reconfigure the switchrack and circuit breakers, which would result in substantial reliability issues, thus violating NERC criteria. For these reasons, the Proposed Devers-Coachella Valley Loop-In would be constructed on the westerly side within the existing ROW.

Finally, System Alternative A is consistent with SCE's planning criteria and operating philosophy of providing service to subtransmission systems from a single-source transmission substation.[19]

2.2.5.2 System Alternative B: No System Split

System Alternative B would serve customer demand in the Electrical Needs Area by increasing 115 kV subtransmission line capacity. With the construction of the new 954 SAC Mirage-

[18] *Short-circuit duty is the current that flows when a transmission system component (line, bus, disconnect) is disturbed. Protective relays and circuit breakers operate quickly to de-energize the faulted system component.*

[19] *A single-source substation is a substation that provides the only source of power to the subtransmission system.*

Tamarisk-Santa Rosa and the second Mirage-Concho 115 kV subtransmission lines, System Alternative B would increase the 115 kV subtransmission line capacity out of the Mirage Substation from 2,930 amps to approximately 5,110 amps. The addition of the second 954 SAC Mirage-Concho 115 kV line would increase the 115 kV subtransmission line capacity out of the Concho Substation from 2,710 amps to approximately 3,800 amps.

However, this Mirage-Concho No. 2 115 kV subtransmission line into Concho Substation is only necessary because of the 220 kV power-flow congestion occurring on the Devers 115 kV Subtransmission System while operating parallel to Devers and Mirage substations. System Alternative B would not eliminate the 220 kV power flow from the 115 kV subtransmission system. Failure to eliminate the 220 kV power flow from the 115 kV subtransmission system would negatively impact system operation flexibility. Operational procedures for the Devers 220 kV Transmission System and the existing Devers 115 kV Subtransmission System would need to be modified to address the impacts of the 220 kV power flow associated with the existing Devers 115 kV Subtransmission System. As discussed previously, these operating procedures would include, but would not be limited to, rolling blackouts at the distribution-circuit level or interruptions of the entire 115 kV subtransmission line that would lead to eventual load-dropping of substation transformers.

Moreover, System Alternative B would not create two separate 115 kV subtransmission systems that would create tie lines between two 115 kV subtransmission systems that could serve as alternative sources for distribution substations when peak customer demand causes a thermal overload condition on a 115 kV subtransmission line. Without such tie-lines, the existing operating procedures would still require dropping customer load when emergency loading limits were exceeded on any one of the 115 kV subtransmission lines on the existing Devers 115 kV Subtransmission System within the Electrical Needs Area.

Finally, System Alternative B also would increase short-circuit duty on 18 substations within the Devers 115 kV Subtransmission System. The increase in short-circuit duty may accelerate the need for costly future system short-circuit duty upgrades (e.g., higher short-circuit duty rated circuit breakers).

System Alternative B, like System Alternative A, includes the Proposed Devers-Coachella Valley 220 kV Loop-In work at Mirage Substation to meet mandatory NERC and WECC standards for maintaining transmission voltage levels on the Devers Area transmission system.

2.2.6 System Alternatives Recommendation

SCE selected System Alternative A as the Preferred System Alternative for further evaluation in this PEA.

System Alternative A would enhance operational flexibility by providing the ability to use existing 115 kV subtransmission lines as tie-lines between the proposed Devers and Mirage 115 kV subtransmission systems. These tie-lines could be utilized to transfer load between subtransmission systems during planned and unplanned outages and to balance load during periods of peak customer demand. System Alternative B would not achieve this objective. Furthermore, System Alternative A would enhance operational flexibility by eliminating the migration of the 220 kV power flow onto the 115 kV subtransmission system. As stated in

Section 2.2.5.2, System Alternative B would not enhance operational flexibility because the 220 kV power flow would not be eliminated from the 115 kV subtransmission system.

Both System Alternatives A and B would increase reliability by preventing 115 kV subtransmission line thermal overloads during periods of peak customer demand. Moreover, construction of the system upgrades required for either system alternative would utilize existing SCE ROWs and franchise locations. However, System Alternative A has a lower cost than System Alternative B, and System Alternative B may require additional future costs for system upgrades due to higher short-circuit duty forecasted on the Devers 115 kV Subtransmission System. Accordingly, System Alternative B is eliminated from further consideration.

As stated previously, the No Project Alternative does not meet any of the project objectives, and therefore, is eliminated from further consideration.

2.3 SUBTRANSMISSION LINE ROUTE ALTERNATIVES

System Alternative A would include the creation of two new 115 kV subtransmission lines, the Farrell-Garnet 115 kV subtransmission line and the Mirage-Santa Rosa 115 kV subtransmission line. SCE considered several route alternatives for System Alternative A. These routes are discussed in Sections 2.3.2 and 2.3.3.

2.3.1 Route Evaluation Methodology

SCE initiated a route evaluation process to identify potential subtransmission line route alternatives between the Farrell and Garnet substations and the Mirage and Santa Rosa substations. SCE identified several potential routes connecting these substations and developed a screening criteria process that included evaluation of the following factors to analyze the route alternatives:

- Ability to meet critical engineering requirements
- Ability to utilize existing SCE facilities, franchise locations, and existing ROWs where feasible
- Ability to meet project need in a cost-effective manner
- Ability to meet project objectives while minimizing environmental impacts

Each of the route alternatives considered and evaluated is discussed below and shown on Figures 2.3: New Devers 115 kV Subtransmission System – Proposed Project and Alternatives and 2.4: New Mirage 115 kV Subtransmission Area – Proposed Project and Alternatives.

2.3.2 Farrell-Garnet 115 kV Subtransmission Line

2.3.2.1 Alternative Route 1

The scope of Alternative Route 1 would include the replacement of approximately 5.3 miles of existing single-circuit 115 kV subtransmission lines with new, higher capacity double-circuit 115 kV subtransmission lines and the replacement of support structures within existing SCE ROWs and franchise locations between the Farrell and Garnet substations in the City of Palm Springs (Figure 2.3: New Devers 115 kV Subtransmission System – Proposed Project and Alternatives) to form the Farrell-Garnet 115 kV subtransmission line. The portion of the existing Devers-Farrell-Windland 115 kV subtransmission line between the Farrell and Garnet substations would be transferred to the new double-circuit structures, and the existing support structures would be removed. Approximately 161 LWSs and 8 TSPs would be required for Alternative Route 1.

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Figure 2.3
New Devers 115kV Subtransmission Area
Proposed Project and Alternatives

DEVERS
GARNET
PALM SPRINGS
FARRELL
CATHEDRAL CITY
VISTA CHINO
INDIAN AV
LITTLE MORONGO RD
PALM DR
MOUNTAIN VIEW RD
INDIAN CANYON DR
VARNER RD
FOUR SEASONS BLVD
SAN RAFAEL RD
RACQUET CLUB RD
GENE AUTRY TR
PALM CANYON DR
AVENIDA CABALLEROS
SUNRISE WY
FARRELL DR
LANDAU BLVD
DATE PALM DR
Union Pacific Railroad
10
111

Alternative Route #3

Alternative Route #2

Proposed Route #1

See Inset Map

Palm Springs International Airport

EXISTING SINGLE CIRCUIT 115KV

PROPOSED ROUTE #1

OPTION A

Alternative Route 1 Options
Devers-Mirage 115 kV System Split Project
Existing Single Circuit 115 kV
Alternative Route 1 (Proposed)
Alternative Route 1 Option A
BLM Land
0 100 200 400 Feet

LEGEND

- Farrell - Garnet Project Area
- SCE Substations - Proposed Modification
- Subtransmission Line Reconfiguration

Proposed Project

- Farrell-Garnet 115 kV Route #1

Alternative Subtransmission Line Routes

- Farrell-Garnet 115 kV Route #1 Option A
- Farrell-Garnet 115 kV Route #2
- Farrell-Garnet 115 kV Route #3

Transmission Lines (SCE, 2007)

- 115kV Subtransmission
- 220kV Major Transmission

Transportation (TBM, 2006)

- Interstate Highway
- State Highway
- Major Road
- Railroad

N

0 0.5 1 2
Miles

LOS ANGELES
SAN BERNARDINO
ORANGE
RIVERSIDE
Pacific Ocean
SAN DIEGO
IMPERIAL

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Custodian: John Le
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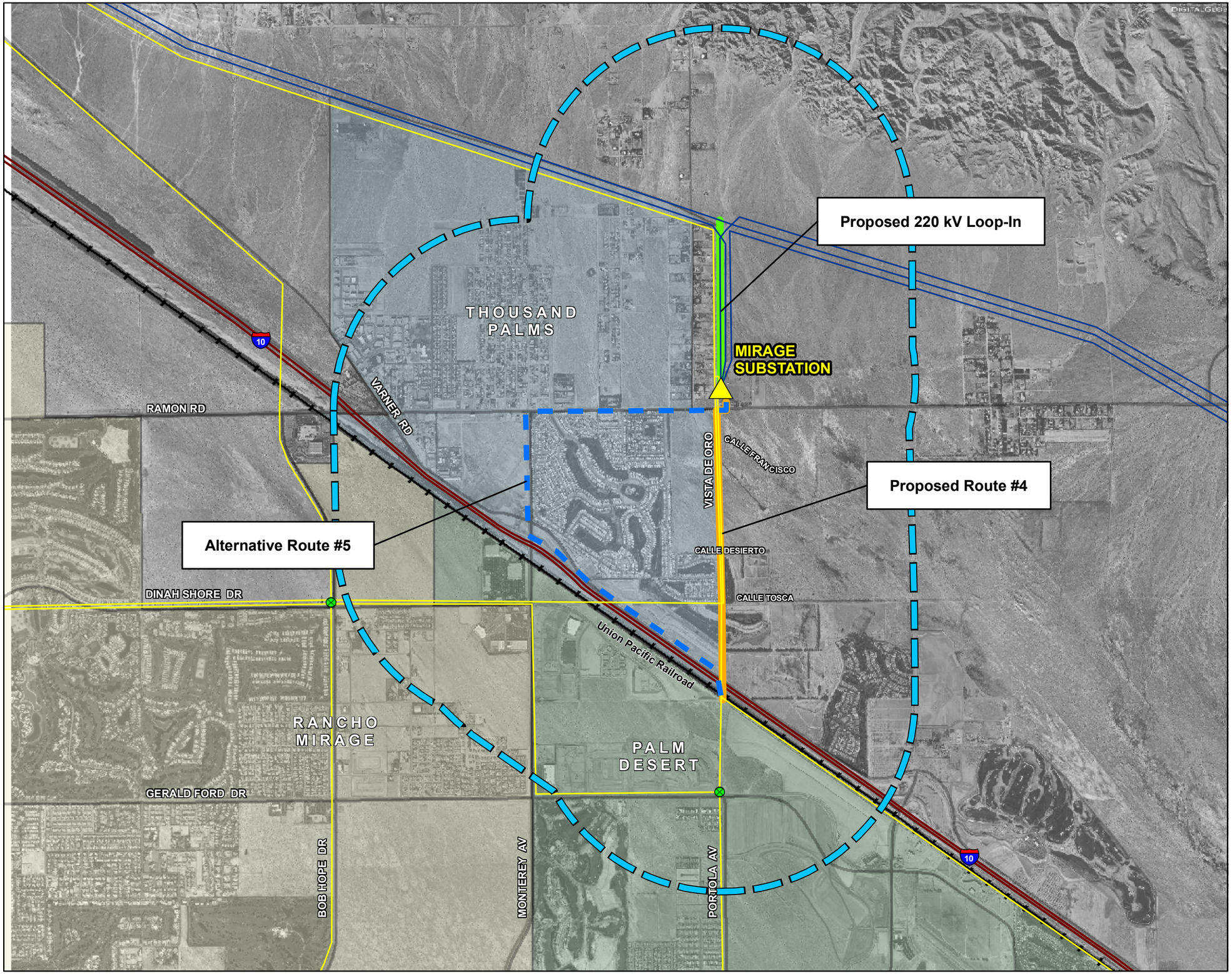

Figure 2.4
New Mirage 115kV Subtransmission Area
Proposed Project and Alternatives

LEGEND

- Mirage - Santa Rosa Project Area
- SCE Substations - Proposed Modification
- Subtransmission Line Reconfiguration

Proposed Project

- Mirage-Santa Rosa 115kV Route #4
- Devers-Coachella 220 kV Loop-In

Alternative Subtransmission Line Route

- Mirage-Santa Rosa 115 kV Route #5

Existing Lines (SCE, 2007)

- 115kV Subtransmission
- 220kV Transmission

Transportation (TBM, 2006)

- Interstate Highway
- Major Road
- Railroad

N

0 0.25 0.5 1
Miles

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From Farrell Substation, the proposed route would head north, following the east side of Gene Autry Trail along flat, unimproved desert land for approximately 1.8 miles, before crossing to the west side of Gene Autry Trail. The route would continue north on Gene Autry Trail, then follow the south side of Salvia Road in a northwesterly direction until reaching I-10, where the route would continue on the south side of I-10 to Garnet Substation. The majority of this route is within undeveloped and unpopulated desert land. This route would cross approximately 750 feet of Bureau of Land Management (BLM) land south of the Union Pacific Railroad. There is light commercial development at the intersection of Gene Autry Trail and Vista Chino. The route also would cross the Whitewater River drainage area. Proceeding northwest to Garnet Substation, Alternative Route 1 would be located within the existing Devers-Farrell-Windland 115 kV subtransmission line ROW and would traverse through hilly terrain (i.e., the Garnet Hills).

2.3.2.2 Alternative Route 1 - Option A

Alternative Route 1 - Option A would follow the proposed route for Alternative Route 1 from Farrell Substation, with the exception of an area near the intersection of Gene Autry Trail and the Union Pacific Railroad (see inset map on Figure 2.3: New Devers 115 kV Subtransmission System – Proposed Project and Alternatives). Instead of crossing Gene Autry Trail, south of the railroad, Option A route would head north from Farrell Substation, on the east side of Gene Autry Trail, until reaching Salvia Road. Option A would then cross Gene Autry Trail on the south side of Salvia Road and follow Salvia Road until reaching I-10, where the route would follow the route for Alternative Route 1. Option A would require new easements along Salvia Road but would not cross BLM land. The majority of this route lies within undeveloped and unpopulated desert land. There is light commercial development at the intersection of Gene Autry Trail and Vista Chino. The total distance from Farrell Substation to Garnet Substation using Option A would be approximately 5.5 miles. Approximately 168 LWSs and 8 TSPs would be required for Option A.

2.3.2.3 Alternative Route 2

The scope of Alternative Route 2 would include the construction of approximately 6 miles of a new single-circuit 115 kV subtransmission line within existing SCE ROWs and franchise locations in the City of Palm Springs between the Farrell and Garnet substations. Approximately 1.5 miles would be built on new double-circuit support structures, and a portion of the existing Devers-Farrell-Windland 115 kV subtransmission line would be transferred to the new support structures. Approximately 4.0 miles would be constructed on single-circuit support structures, and approximately 0.5 mile would be constructed underground. Existing distribution circuits would be transferred to the new single-circuit support structures. Construction of this route would require installation of approximately 170 new LWS, 6 TSP double-circuit structures, and 2 TSP riser poles for the underground segment (Figure 2.3: New Devers 115 kV Subtransmission System – Proposed Project and Alternatives).

From Farrell Substation, Alternative Route 2 would head south on Gene Autry Trail to Vista Chino. The line would then head west and would overbuild existing distribution lines on new support structures for approximately 1.25 miles along Vista Chino. At Sunrise Way, the route would turn north, and the new 115 kV subtransmission line would overbuild existing distribution line on new support structures (LWS) for approximately 1.0 miles to San Rafael Road. From San Rafael Road to Four Seasons Boulevard, approximately 0.5 mile would be constructed

underground[20]. From Four Seasons Boulevard to the intersection of the existing Devers-Farrell-Windland 115 kV subtransmission line, for approximately 2.5 miles, the new line would overbuild the existing distribution line on new support structures within existing SCE ROWs. The route would then turn west, and the new line would be constructed with the existing Devers-Farrell-Windland 115 kV subtransmission line on new double-circuit support structures on the south side of I-10 to Garnet Substation.

Alternative Route 2 would primarily cross low-density residential communities north of Vista China Avenue and along the east and west sides of Sunrise Way. Along the SCE ROWs, north of Four Seasons Boulevard, Alternative Route 2 would cross the Whitewater River Floodplain Preserve and foothills south of I-10 before intersecting the Devers-Farrell-Windland 115 kV subtransmission line route.

2.3.2.4 Alternative Route 3

The scope of Alternative Route 3 would include the construction of approximately 6.5 miles of single-circuit 115 kV subtransmission lines on approximately 175 new LWS poles, between the Farrell and Garnet substations in the City of Palm Springs (see Figure 2.3: New Devers 115 kV Subtransmission System – Proposed Project and Alternatives).

From Farrell Substation to San Rafael Road, the scope of Alternative Route 3 would be the same as Alternative Route 2. The route would turn west on San Rafael Road and then north on Indian Canyon Drive, to Garnet Substation. As with Alternative Route 2, this alternative would primarily cross undeveloped and unpopulated desert land and existing low density residential communities. The route would cross the Whitewater River drainage, adjacent to the Whitewater River Floodplain Preserve, along Indian Canyon Drive.

2.3.3 Mirage-Santa Rosa 115 kV Subtransmission Line

2.3.3.1 Alternative Route 4

The scope of Alternative Route 4 would include the replacement of approximately 1.5 miles of existing single-circuit 115 kV subtransmission lines with new, higher capacity double-circuit 115 kV subtransmission lines and the replacement of support structures within existing SCE ROWs and franchise locations between the Mirage Substation and the existing Santa Rosa-Tamarisk 115 kV subtransmission line (see Figure 2.4: New Mirage 115 kV Subtransmission Area – Proposed Project and Alternatives).

Alternative Route 4 would be built from Mirage Substation to Calle Francisco. SCE would rebuild the existing single-circuit 115 kV subtransmission line to a double-circuit 115 kV subtransmission line on new structures. From Calle Francisco to an area south of Calle Tosca, SCE would install new structures and a new single-circuit 115 kV subtransmission line within the existing ROW. From south of Calle Tosca to the south side of I-10, SCE would rebuild an

[20] *Residential developers in this area were required by the City of Palm Springs to underground existing distribution lines. These lines were undergrounded in accordance with SCE's Rule 20B.*

existing single-circuit 115 kV subtransmission line as a double-circuit 115 kV subtransmission line on new structures. The line would utilize an existing line section to the corner of Portola Avenue and Gerald Ford Drive, where it would intersect the existing Santa Rosa-Tamarisk 115 kV subtransmission line. The new 115 kV subtransmission line would traverse undeveloped desert land on the east of Tri-Palm Estates, between Ramon Boulevard and Calle Desierto. Between Calle Desierto and approximately 0.25 mile north of Varner Road, the line would traverse the Tri-Palm Estates golf course. From where the line exits the golf course to the intersection of Gerald Ford Drive and Portola Avenue, the line route traverses undeveloped, desert land.

2.3.3.2 Alternative Route 5

The scope of Alternative Route 5 would include the installation of approximately 1.9 miles of underground and approximately 500 feet of overhead single-circuit 115 kV subtransmission lines, between the Mirage Substation and the existing Santa Rosa-Tamarisk 115 kV subtransmission line (see Figure 2.4: New Mirage 115 kV Subtransmission Area – Proposed Project and Alternatives).

Alternative Route 5 would include approximately 1.9 miles of underground cable, installed from Mirage Substation west on Ramon Road to Monterey Avenue, south on Monterey Avenue to Varner Road, then southeast on Varner Road to a point where it would join the Mirage-Concho-115 kV overhead subtransmission line. This portion of Alternative Route 5 would be constructed underground due to the existence of an overhead IID 92 kV line on the south side of Ramon Road and the west side of Monterey Avenue and overhead IID distribution lines on the east side of Monterey Avenue. Alternative Route 5 would cross the I-10 overhead on TSPs and would connect to an existing overhead line south of the I-10. At the corner of Portola Avenue and Gerald Ford Drive, Alternative Route 5 would connect to the existing Santa Rosa-Tamarisk 115 kV subtransmission line. Alternative Route 5 would pass under the middle of three streets that run through light commercial, industrial, and residential neighborhoods.

2.3.4 Recommendations – Proposed Route Alternatives

2.3.4.1 Farrell-Garnet 115 kV Subtransmission Line

SCE recommends Alternative Route 1 as the proposed route for the new Farrell-Garnet 115 kV subtransmission line. The proposed 115 kV subtransmission line would be built within an existing ROW and would replace existing single-circuit wood poles with new double-circuit LWS and TSP poles. Alternative Route 1 would be the most cost-effective alternative with the least environmental impacts.

Alternative Route 1 – Option A would require a greater number of structures and would result in greater environmental impacts, including visual and ground disturbance, than Alternative Route 1. In addition, Alternative Route 1 – Option A would require the acquisition of ROWs outside of the franchise area for necessary guying of LWSs, avoidance of existing underground telephone cable, and current road grade conditions. Option A would also increase the cost of the proposed route. Therefore, Option A was eliminated from further consideration.

Alternative Route 2 would require the acquisition of a new ROW south of the existing Devers-Farrell-Windland 115 kV subtransmission line ROW. New access and spur roads would need to be constructed within the new ROW. Additionally, Alternative Route 2 would require construction of approximately 0.5 mile of underground subtransmission line in a recently developed residential area and would require hillside grading at the northern end of the Devers-Farrell-Windland 115 kV subtransmission line ROW. Alternative Route 2 would cross a greater expanse of the Whitewater River Basin than Alternative Route 1. This crossing would require additional civil construction to prevent erosion and washout of support structures (e.g. larger structure foundations) and would require additional construction equipment on-site. Alternative 2 would result in greater costs and would likely result in greater environmental impacts (air quality and ground disturbance) than Alternative Route 1.

Alternative Route 3 would traverse through undeveloped area and adjacent to existing residential areas. Alternative Route 3 would require SCE to upgrade its rights for existing ROW. Alternative 3 would cross a greater expanse of the Whitewater River 100-year Federal Emergency Management Agency (FEMA) flood zone than Alternative Routes 1 and 2, which would require additional civil construction to prevent erosion and washout of support structures (e.g. larger structure foundations) and would require additional construction equipment on-site. Additionally, Alternative Route 3 may require some of the new LWS poles to be located on one side of Indian Canyon Drive, while existing distribution circuits would reside on wood poles on the other side of Indian Canyon Drive, thus increasing visual impacts to this major street. Otherwise, new ROWs would most likely be required on the east side of Indian Canyon Road to over build the existing distribution circuits causing an increased visual impact to this major street. Alternative Route 3 would result in greater costs than Alternative Route 1 and would likely result in greater environmental impacts than Alternative Routes 1.

Therefore, Alternative Route 1 has been carried forward as the proposed route alternative for the Farrell-Garnet 115 kV subtransmission line in this PEA.

2.3.4.2 Mirage-Santa Rosa 115 kV Subtransmission Line

SCE recommends Alternative Route 4 as the proposed route for the new Mirage-Santa Rosa 115 kV subtransmission line. The proposed line would be built within existing ROWs. SCE would replace an existing wood-pole, single-circuit, 115 kV subtransmission line with a new double-circuit subtransmission line with LWS and TSP and poles. Alternative Route 4 would be the most cost effective alternative with the least environmental impacts.

Alternative Route 5 would require extensive excavation to install the underground facilities and substructures in Ramon Boulevard, Monterey Avenue and Varner Road to avoid interference with IID 92 kV circuits. Alternative 5 would result in greater costs (approximately $6.5 million as compared to approximately $2 million for Alternative Route 4) and would likely result in greater environmental impacts (ground disturbance, noise, air quality, traffic) than Alternative Route 4.

Therefore, Alternative Route 4 has been carried forward as the proposed route alternative for the Mirage-Santa Rosa 115 kV subtransmission line in this PEA.

2.3.5 Summary

The subtransmission line route alternatives discussed above are feasible and meet some or most of the project objectives.

Therefore, all five route alternatives have been carried forward for environmental analysis in this PEA. System Alternative A, with Route Alternatives 1 and 4, comprise the Proposed Project.

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