

Chapter 3—Alternatives to the Proposed Project

3.1 Introduction

PG&E evaluated a number of alternative methods for achieving the basic project objectives defined in Subsection 2.2 before deciding to recommend the Proposed Project for approval by the CPUC. This chapter describes the decision analysis process PG&E used to select the Proposed Project for recommendation to the CPUC, provides a description of each Project alternative and its ability to meet the need for the Project, and includes a discussion of the potential environmental impacts of each feasible alternative. CEQA does not require in-depth analysis of all Project alternatives, but specifies that a reasonable range of alternatives be considered and evaluated. The environmental impacts for these alternatives have been described qualitatively.

For purposes of describing the alternatives to the Proposed Project route, this chapter divides the Project Area into a northern and southern component for ease of explanation. The southern component is comprised of the area from Jefferson Substation to the intersection of San Bruno Avenue and El Camino Real (Segment 1) (see route map, Figure 3-1). The northern component is comprised of the area from the intersection of San Bruno Avenue and El Camino to the Martin Substation (Segments 2–5) (see route map, Figure 3-1).

The Proposed Project (Alternative 2) and Project alternatives 1 and 3 utilize the existing 60 kV transmission corridor through Segment 1 and, among other things, will involve replacement of a portion of the existing 60 kV double-circuit transmission line, and modification of facilities at the Ralston and Millbrae substations and at the Hillsdale Switching Station. These transmission system modifications are discussed in detail in Project Description, see Chapter 2. Project route alternatives 4, 5, and 6 would require construction of a new 230 kV underground transmission line in a newly-created utility corridor through route Segment 1, and would not involve any changes to the existing 60 kV transmission facilities.

In addition to the system modifications and construction summarized above, the Project under any alternative will require the addition of transmission line protection facilities, including the addition of control equipment at the Monta Vista Substation and the addition of a series reactor and ancillary equipment at the San Mateo Substation (see Project Description, Chapter 2).

This section begins with a brief description of the No Project alternative, and then provides a brief description of the Proposed Project route and five Project route alternatives. This section then includes a brief description of a local generation alternative. A more detailed description of the alternatives is included in later sections of this chapter.

PG&E recognizes that the CPUC may develop additional routing alternatives for the ISO-approved Jefferson-Martin 230 kV Transmission Project following its Initial Study of

PG&E’s Proposed Project, based in part upon input from Responsible Agencies and members of the public. PG&E hopes the following discussion of the alternatives that PG&E considered will assist the CPUC in its own independent analysis of Project alternatives.

The principal Project alternatives PG&E considered were:

No Project—Transmission facilities would not be constructed under the No Project Alternative.

Alternative 1: Overhead Rebuild and Underground Alternative Outside of BART Right-of-Way. Alternative 1 is a hybrid overhead/underground route and is comprised of the following segments: 1A, 2A, 3A, 4A and 5 (see route map, Figure 3-1 and Table 3-1). This alternative differs from the Proposed Project route in that the underground line does not utilize the San Francisco Bay Area Rapid Transit District (“BART”) airport extension right-of-way (ROW). Instead, in Alternative 1, the underground transmission line runs north along El Camino Real from the intersection of San Bruno Avenue to the intersection of McLellan Drive. At the latter intersection the underground transmission line realigns with the Proposed Project route and continues to the terminus at the Martin Substation. A more detailed summary of Alternative 1 is found in Section 3.5 below.

TABLE 3-1
PEA Alternatives and Corresponding Route Options by Segment for Environmental Review (Refer to Figure 3-1)

PEA Alternative	Route Options Comprising PEA Alternative by Segment				
	Segment 1	Segment 2	Segment 3	Segment 4 ¹	Segment 5 ¹
1	1A	2A	3A	4A	5
2 (Preferred Alternative)	1A	2B	3A	4A	5
3	1A	2B	3B	4A	5
4	1B	2A	3A	4A	5
5	1B	2B	3A	4A	5
6	1B	2B	3B	4A	5

¹ Only one alternative was retained for consideration on Segments 4 and 5 as discussed in the text.

- South Area Component.** Replace the existing double-circuit 60 kV overhead line (running from Jefferson Substation north to the northern border of the San Francisco Public Utility Commission/San Francisco Water Department Watershed lands [the “San Francisco Watershed”] in the north) with a 230 kV/60 kV double-circuit overhead line and modify the Jefferson Substation to accommodate the new overhead 230 kV line.

Modify equipment at the Ralston and Millbrae Substations and the Hillsdale Junction switching station.

Construct a transition station at or near the intersection of San Bruno Avenue and Glenview Drive just east of Skyline Boulevard (Highway 35) to transition from the

INSERT FIGURE 3-1

Proposed and Alternative Transmission Line Routes and Substation Sites

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Proposed and Alternative Transmission Line Routes and Substation Sites

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overhead line to the underground line and construct a new underground 230 kV transmission line from the transition station to the intersection of San Bruno Avenue at El Camino Real.

- **North Area Component.** Construct a new underground 230 kV transmission line along route Segments 2A, 3A, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 2: Overhead Rebuild and Underground Alternative Using BART Right-of-Way to McLellan Drive (BART Option 1) (PROPOSED ROUTE). Alternative 2, which was ultimately selected as PG&E's Proposed Project route, is a hybrid of overhead and underground routing and is comprised of the following segments: 1A, 2B, 3A, 4A and 5 (see route map, Figure 3-1). The Proposed Project route would convert a portion of the existing Jefferson to Martin double-circuit 60 kV lattice steel tower line (between Jefferson Substation and a new transition station near the intersection of San Bruno Avenue and Glenview Drive just east of Skyline Boulevard in the City of San Bruno) to a new overhead transmission line capable of carrying one 230 kV circuit and one 60 kV circuit. The line would then transition underground and extend through existing streets to a location near the intersection of San Bruno Avenue and Huntington Avenue, where it would enter the BART ROW. At the intersection with the proposed McLellan Drive extension, the Proposed Project route would leave the BART ROW and continue northeast through the proposed McLellan Drive extension to the intersection of Hillside Boulevard, where it would then travel northwest to the intersection of Hoffman Street. The underground transmission line would then travel northeast through Hoffman Street to Orange Street and then to Guadalupe Canyon Parkway, along which it would continue to the intersection of Bayshore Boulevard. At Bayshore Boulevard the underground transmission line would continue north to the terminus at the Martin Substation. Section 2.3.2 of the Project Description contains a more detailed analysis of the Proposed Project route.

- **South Area Component.** Replace the existing double-circuit 60 kV overhead line (running from Jefferson Substation north to the northern border of the San Francisco Watershed in the north) with a 230 kV/60 kV double-circuit overhead line and modify the Jefferson Substation to accommodate the new overhead 230 kV line.

Modify equipment at the Ralston and Millbrae Substations and the Hillsdale Junction switching station.

Construct a transition station at or near the intersection of San Bruno Avenue and Glenview Drive just east of Skyline Boulevard (Highway 35) to transition from the overhead line to the underground line and construct a new underground 230 kV transmission line for the transition station to the intersection of San Bruno Avenue at El Camino Real.

- **North Area Component.** Construct a new underground 230 kV transmission line along route Segments 2B, 3A, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 3: Overhead Rebuild and Underground Alternative Using BART ROW to Serramonte Boulevard (BART Option 2). This alternative is also a hybrid overhead/underground route and is comprised of the following segments: 1A, 2B, 3B, 4A and 5 (see route map, Figure 3-1). This alternative is the same as the Proposed Project route except that the underground line utilizes a longer section of the BART ROW than the Proposed Project route. Specifically, Alternative 3 would continue along the BART ROW north of the proposed McLellan Drive extension to Serramonte Boulevard. At Serramonte Boulevard the line realigns with the Proposed Project route and continues to the terminus at the Martin Substation. A more detailed summary of Alternative 3 is found in Section 3.6 below.

- **South Area Component.** Replace the existing double-circuit 60 kV overhead line (running from Jefferson Substation north to the northern border of the San Francisco Watershed in the north) to a 230 kV/60 kV double-circuit overhead line and modify the Jefferson Substation to accommodate the new overhead 230 kV line.

Modify equipment at the Ralston and Millbrae Substations and the Hillsdale Junction switching station.

Construct a transition station at or near the intersection of San Bruno Avenue and Glenview Drive just east of Skyline Boulevard (Highway 35) to transition from the overhead line to the underground line and construct a new underground 230 kV transmission line from the transition station to the intersection of San Bruno Avenue and El Camino Real.

- **North Area Component.** Construct a new underground 230 kV transmission line along route segments 2B, 3B, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 4: All-Underground Alternative Outside of BART ROW. This alternative is an all-underground route that transitions the new 230 kV transmission line underground at Jefferson Substation. Alternative 4 is comprised of the following segments: 1B, 2A, 3A, 4A and 5 (reference route map Figure 3-1). The underground transmission line extends through roads located in the San Francisco Watershed lands and other existing streets north to the intersection of El Camino Real and San Bruno Avenue. At this intersection Alternative 4 follows the same route delineated in Alternative 1. A more detailed summary of Alternative 4 is found in Section 3.8 below.

- **South Area Component.** Modify the Jefferson Substation to accommodate the new underground 230 kV transmission line, transition it underground, and construct the new 230 kV line along route segment 1B extending north to the intersection of San Bruno Avenue and El Camino Real.
- **North Area Component.** Construct a new underground 230 kV transmission line along route segments 2A, 3A, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 5: All-Underground Alternative Using BART ROW to McLellan Drive (BART Option 1). This alternative is also an all-underground route and is comprised of the following segments: 1B, 2B, 3A, 4A and 5 (see route map, Figure 3-1). Alternative 5 is the same as Alternative 4 except that the line will be located in the BART right-of-way from the intersection of San Bruno Avenue and Huntington Avenue to the proposed McLellan Drive extension. A more detailed summary of Alternative 5 is found in Section 3.9 below.

- **South Area Component.** Modify the Jefferson Substation to accommodate the new underground 230 kV transmission line, transition it underground, and construct the new 230 kV line along route segment 1B, extending north to the intersection of San Bruno Avenue and El Camino Real.
- **North Area Component.** Construct a new underground 230 kV transmission line along route segments 2B, 3A, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 6: All-Underground Alternative Using BART ROW to Serramonte Boulevard (BART Option 2). This alternative is also an all-underground route and is comprised of the following segments: 1B, 2B, 3B, 4A and 5 (reference route map, Figure 3-1). Alternative 6 is the same as Alternative 5, except that the line continues along the BART ROW north of the proposed McLellan Drive extension to Serramonte Boulevard and extends northeasterly on Serramonte Boulevard to Hillside Avenue where it realigns with the Proposed Project route. A more detailed summary of Alternative 6 is found in Section 3.10 below.

- **South Area Component.** Modify the Jefferson Substation to accommodate the new 230 kV transmission line, transition it underground, and construct the new 230 kV line along route segment 1B, extending north to the intersection of San Bruno Avenue and El Camino Real.
- **North Area Component.** Construct a new underground 230 kV transmission line along route segments 2B, 3B, 4A, and 5 between the intersection of San Bruno Avenue and El Camino Real and the terminus at Martin Substation, and modify the Martin Substation to accommodate the new 230 kV line.

Alternative 7: Local Generation. This alternative relies on existing generation facilities and the timely creation of new generation facilities to provide sufficient capacity to serve the Project Area. Transmission facilities would not be constructed under this alternative.

Alternative 7 requires the continued operation of existing generation facilities in the Project Area. Currently, local generation facilities at the Potrero and Hunters Point plants have a combined generating capacity of 570 MW.¹ There is also a small 30 MW co-generation power plant near San Francisco International Airport. However, unit number 3 at the Potrero Power Plant, operated by Mirant, and the Hunters Point Plant, operated by PG&E, are nearing the end of their useful lives and will require significant investment to remain in service and in compliance with environmental regulations.

¹ In 2001, Hunters Point Units 2 and 3 were converted to synchronous condensers for reactive support, thus leaving Hunters Point Units 1 and 4 for generation, with a combined capacity of 213 MW. Potrero Power Plant consists of Unit 3 with a capability of 207 MW net and three gas turbines with a total capacity of about 150 MW.

This alternative also requires development of new power generation facilities in order to meet the Project Area's projected power demand. Mirant has filed an application to construct a new 600 MW generation facility at the existing Potrero plant. Other than Mirant, no other private entity has evidenced an intent to construct new generation facilities in the Project Area.

Summary of PG&E's Findings

PG&E evaluated each alternative for its ability to meet the identified electric needs in the area and analyzed its potential effect on the existing electric transmission system. As discussed below, these analyses determined that neither the implementation of the No Project Alternative or Alternative 7 (Local Generation) would satisfy PG&E's basic project objectives. PG&E concluded that Alternatives 1 through 6 are feasible, however, and are capable of being implemented within the timeframe dictated by the area's electric needs. Each of these alternatives differ according to environmental impacts, engineering feasibility, and cost.

3.2 Decision Analysis Process

3.2.1 Initial Routing and Siting Study

After determining general areas where transmission facilities were needed to increase electric capacity in the Project Area, PG&E developed numerous potential alignments for new 230 kV transmission lines and two different sites for the proposed transition station. PG&E considers several important factors when siting electric facilities. These factors typically include the following:

- Ability to modify or otherwise make use of existing transmission facilities rather than construct entirely new facilities in undisturbed areas.
- Ability to follow established utility corridors.
- Ability to utilize existing right-of-way where practicable.
- Minimization of environmental impacts.
- Accessibility to construct and maintain supporting structures.
- Length of new lines and number of new towers or poles.
- Number of crossings of highways, creeks, and other electric lines.
- Minimization of exposure to geologic hazards.
- Ability to avoid disruption or relocation of existing businesses or residences.
- Compatibility with local planning agencies' vision and/or planning strategy for development in the Project Area.
- Easement acquisition costs.
- Installation and maintenance costs.

- Overall project cost.

Potential locations for new facilities were identified through fieldwork, review of aerial photographs, and information obtained from property owners (i.e., BART, SFPUC and Caltrans), and representatives of local jurisdictions. PG&E identified general corridors for transmission line facilities based on the need to build a new single circuit 230 kV transmission line from one specific point to another. Within these corridors, routes consisting of discrete segments were also identified. All of the transmission line routes considered in the siting study and found to be feasible are shown on Figure 3-1.

By conducting an environmental, engineering, and cost evaluation of each segment, PG&E determined the best route for the proposed transmission line. A transmission line connecting the Jefferson and Martin Substations can be routed numerous different ways along the various segments shown on Figure 3-1. All possible routing options along the various segments were compared against each other. The proposed and feasible alternative transmission line routes and transition station site were determined by rejecting some route segments and transition station site options in favor of others for environmental, engineering or cost reasons.

The technical staff responsible for the impact analysis chapters of the PEA analyzed each segment and transition station site determined by PG&E to be potentially feasible against a variety of environmental criteria (primarily based on CEQA significance criteria as listed in the technical chapters of this PEA). PG&E engineers and construction managers experienced in design and construction of electric transmission lines and transition stations conducted the engineering feasibility evaluation. PG&E engineers and acquisition specialists provided the cost estimates for each route segment and transition station site.

3.3 Development of Alternatives and Selection of the Preferred Project

3.3.1 South Area Component (Segment 1)

The South Area Component comprises the area between Jefferson Substation in the south and the intersection of El Camino Real and San Bruno Avenue in the north. The land uses within this Component vary dramatically from east to west, with the developed communities of Woodside, San Carlos, Belmont, San Mateo, Hillsborough, Burlingame, Millbrae and San Bruno to the east, and the San Francisco Watershed to the west. PG&E considered various overhead, underground and hybrid routes for the new 230 kV transmission line in the South Area Component.

PG&E considered overhead and underground routing alternatives that would run the line through the developed areas to the east and then north to the intersection of El Camino Real and San Bruno Avenue. Early reconnaissance of this route option indicated that these routes would be more expensive due to infrastructure congestion and would involve greater perceived land use conflicts because the existing land use is predominately residential and commercial. PG&E thus rejected these routes as infeasible at the screening stage due to the overwhelming number of environmental, economic and community hurdles that they would present.

PG&E also considered both overhead and underground routes through the San Francisco Watershed. In particular, PG&E considered the following: (1) rebuilding the existing double-circuit 60 kV electric transmission line that extends through the San Francisco Watershed lands with a new double-circuit 60/230 kV transmission line; and (2) construction of a new, all-underground transmission line. Both of these alternatives were determined to be feasible, and are explained in greater detail and analyzed in sections 3.3.1 and 3.3.2 below.

3.3.1.1 South Area Component (Segment 1) Options Analyzed in the PEA

Beyond the screening stage, PG&E considered the following two options for the South Area Component:

- **Rebuilding the existing 60 kV transmission line with a 60/230 kV (“Route Option 1A”)(Proposed).** This option would replace the existing double-circuit 60 kV transmission line which runs through the San Francisco Watershed with a double-circuit 60/230 kV transmission line in roughly the same transmission facility footprint, though it would require raising the existing transmission towers to comply with CPUC General Order 95 safety standards. The current double-circuit 60 kV line is comprised of three wires along each side of the existing towers, for a total of six wires; Route Option 1A would combine the two existing 60 kV circuits (six wires) into a single new 60 kV circuit (three wires) running along the east side of the new towers, and add a new 230 kV circuit (three wires) along the west side. Though the replacement towers would be taller than the existing towers, the total number of wires (six) would remain the same.

Route Option 1A would require the construction of a transition station to transition the overhead line underground at or near the intersection of San Bruno Avenue and Glenview Drive, from which a new 230 kV transmission line would run underground to the northern terminus of the South Area Component at El Camino Real. PG&E considered two potential sites for a station to transition the proposed 230 kV overhead transition line underground: (1) the PG&E Sneath Lane Substation; and (2) a vacant parcel on San Bruno Avenue presently owned by Caltrans. PG&E dismissed as infeasible the possibility of transitioning the overhead line underground at Sneath Lane Substation because the underground portion of the line, extending from this transition site, would require a longitudinal encroachment along an access-controlled State Highway (Highway 35); in accordance with Caltrans policy, Caltrans will only grant such a longitudinal encroachment if no other feasible alternatives are available. Further, locating the transition station at Sneath Lane Substation would require the underground portion of the transmission line to cross the San Andreas fault near the Sneath Lane Substation, and thereby subject the underground line to known geologic hazards. The Caltrans site, on the other hand, located on San Bruno Avenue between Highway 35 and Glenview Drive, would not require a longitudinal encroachment, and is east of the San Andreas fault. By utilizing the Caltrans transition station site, the underground portion of the line would not need to cross the San Andreas fault. PG&E performed a site review and had discussions with local government officials concerning the Caltrans site and determined that this site best serves the Project’s needs.

- **A new 230 kV underground line through public roadways (“Route Option 1B”).**
Under this option the line would transition underground at the Jefferson Substation and continue north through public roadways for the length of the South Area Component.

3.3.1.2 Comparison of Feasible Options—Route Option 1A and 1B

PG&E analyzed the feasible options for the South Area Component according to the criteria delineated in section 3.2.1 above. (A summary of the potential environmental impacts associated with Route Options 1A and 1B is provided in Table 3-3).

Route Option 1A is advantageous because it rebuilds existing transmission facilities, utilizes an established utility corridor and, therefore, requires significantly less disruption in new areas. Route Option 1A would largely replace existing lines, and only requires approximately 1.7 miles of new utility corridor. Route Option 1B, on the other hand, would require approximately 16.1 miles of new utility corridor, roughly one-half of which would be through developed residential and commercial areas. Consequently, Route Option 1A presents less significant potential land use conflicts and fewer anticipated community concerns.

Underground transmission lines are generally more difficult to repair and maintain than overhead lines. Underground transmission lines have the potential to be out of service for a considerable period of time in the event of a failure of the cable insulation, splices, or terminations. This is because the cables are hidden from view and not always easily or safely accessible. A “hot-spot” could develop in the conductor in an area where a heat source is placed near the conduit carrying the conductors, or if the thermal back-fill surrounding the conduit is removed. In such cases, a failure of the line could occur due to deterioration of the cable insulation. Cables can also be damaged by accidental digging, augering, or pile driving activities. Lengthy repair periods could occur because of the time necessary to locate the failed section of cable, excavate the conduit, open up splices or terminations, expose the conductors, and replace the failed conductor section. Even with replacement cable, splices, and terminations available in the PG&E inventory, it could take up to 2 months to find and replace a failed section of underground line. If replacement cable supplies are insufficient, repairs could be delayed up to 6 months. In comparison, overhead lines have the advantage of being able to be replaced in a period of days or weeks. A problem section would be discovered quickly because the conductor is visible. A temporary bypass could be constructed with wood poles and a permanent repair would be made while the transmission line is in service. Route Option 1A, which would only run roughly 1.7 miles of underground line in Segment 1, is thus significantly easier and less expensive to repair and maintain than Route Option 1B.

Route Option 1B would require construction adjacent to a busy, three-way intersection of Cañada Road, Highway 92 and Highway 35, and would require underground installation of the transmission line alongside a portion of State Highway 92. The intersection would require the line to cross the entrance ramp to Highway 92, and thus is more difficult than the highway crossings required under Route Option 1A.

In addition, Route Option 1B would require an underground crossing of an active fault (San Andreas). Underground transmission lines are generally more susceptible to geologic hazards than overhead lines which are not only more stable in the event of a seismic event,

but, as discussed above, are also far easier to repair should they be damaged. An underground line is less flexible than an overhead line and is more likely to incur damage from earth movement. Unlike Route Option 1B, the underground portion of Route Option 1A would not cross an active fault. Accordingly, Route Option 1A would expose the line to a less significant risk of seismic damage than Route Option 1B. Furthermore, Route Option 1B would run the line across Crystal Springs Dam, which would subject the line to failure in the event of dam failure. San Mateo County has also proposed replacement of the bridge traversing the Crystal Springs Dam in order to meet current seismic standards; replacement of the bridge would require grade changes in the approaches, and may require relocation of the line if Route Option 1B were selected. Relocation of the transmission line to accommodate this construction would involve significant cost to ratepayers and could result in service disruption.

Neither of these segment options would require permanent displacement of existing businesses or residences. Both segment options would cause only temporary disruption during construction. However, because Route Option 1B would require more new line running through developed areas, and because underground construction in general involves greater construction-related impacts, Option 1B would cause more disruption in this regard.

The segment options are relatively equal with respect to their compatibility with the SFPUC's Management Plan for the San Francisco Watershed. Route Option 1A is consistent with an SFPUC policy that explicitly favors location of utilities in existing utility corridors. Route Option 1B, while not in an existing utility corridor, would be an underground facility and in that respect appears consistent with the planning policies set forth in the Watershed Management Plan.

Cost considerations argue strongly in favor of Route Option 1A, despite the fact that easement acquisition costs attend to that option. The 230 kV transmission line and the taller towers would require the widening of the existing right-of-way through the San Francisco Watershed in accordance with the CPUC General Order 95 safety standards. Route Option 1B would be built entirely in existing streets pursuant to existing franchise agreements, and would not involve the additional costs of easement acquisition. The use of these roadways, however, has attendant costs and risks, including annual franchise payments and potential relocation at ratepayer expense. Additionally, the portion of Route Option 1B located in El Camino Real (State Highway 82) would require an encroachment permit from Caltrans which likewise involves annual payments. Finally, and most significantly, construction and installation of an underground line is far more costly than that of an overhead line. As a result, even taking into account the costs for easement and land acquisition, construction of the necessary transition station, and modifications to the substations that Route Option 1A would require, the overall cost of Route Option 1A is still approximately \$39 million less than that of Route Option 1B.

After consideration of the criteria set forth in 3.2.1, on balance, PG&E favors Route Option 1A through Segment 1. With the exception of the short stretch of underground cable along San Bruno Avenue, Route Option 1A would be constructed entirely within an existing utility corridor. In addition, Route Option 1A is far more cost-effective from a ratepayer perspective, and has less significant potential environmental impacts than Route Option 1B.

TABLE 3-2

Summary of Primary Environmental Issues for Route Option Comparison by Segment

Primary Environmental Issues	Segment 1		Segment 2		Segment 3		Segment 4	
	1A (Overhead/Underground)	1B (Cañada Road) All Underground	2A (El Camino Real)	2B (BART South)	3A (McLellan)	3B (BART North)	4A (Hoffman/Orange)	4B (East Market)
	Route Options for Segment							
<i>Land Use, Traffic and Transportation</i>	Because the overhead ROW is located almost exclusively in an area where development is already restricted in the park and SF Watershed lands, no land use impacts are expected to result from the widening of the ROW. Temporary disruption to existing land uses would occur during construction from disruption of access and dust and noise production. Some temporary trail closures would be required during helicopter construction.	No permanent impact on land use because the underground installation is in existing city streets. Temporary disruption to existing land uses would occur during construction from disruption of access and dust and noise production. This alternative runs through an estimated 6 additional miles of dense residential and urban development compared to Segment 1A, and would have greater temporary impacts	No permanent impact on land use because the underground installation is in existing city streets. Temporary disruption to existing residential and commercial land uses along El Camino Real would occur during construction from disruption of access and dust and noise production. Substantial temporary impact to El Camino Real, which has traffic volumes of 30000 to 50000 ADT. This segment would have greater potential temporary impact on hospital access to Kaiser Hospital compared to Route Option 2B.	No permanent impact on land use because the underground installation will be in the BART ROW. Temporary disruption to existing land uses would occur during construction from disruption of access and dust and noise production, however, construction in the ROW will have less impact on access to residences and businesses since none front directly on the BART ROW north of Sneath Lane.	No permanent impact on land use because the underground installation is in existing streets. Temporary disruption to the existing residential land uses on the south side of the proposed McLellan Drive Extension from disruption to access and dust and noise production.	Minor permanent potential impacts associated with installation of the line through the cemeteries; easement requirements would not allow planting of deep-rooted trees along the alignment. Temporary disruption to the existing commercial land uses and cemeteries along the BART ROW from disruption to access and dust and noise production.	No permanent impact on land use because the underground installation is in existing streets. Temporary disruption to the existing residential land uses on the north side of Hoffman and along Orange. Susan B. Anthony High School sports fields are located along Orange.	No permanent impact on land use because the underground installation is in existing streets. Temporary disruption to the existing residential and commercial land uses along Hillside Blvd and E Market. Susan B. Anthony High School sports fields are located along E. Market, Pollicita Middle School fronts on the route.
<i>Biological Resources</i>	Effects on sensitive resources include impacts to sensitive serpentine grasslands and associated special-status species including the endangered Bay checkerspot butterfly in Edgewood Park. Potential temporary impacts to upland habitat for San Francisco garter snake and red-legged frog could occur. With implementation of mitigation measures, these would be less-than-significant.	Minimal biological impacts since the transmission line would be placed under an existing roadway and work is limited to existing paved areas. Temporary impacts could occur to San Francisco garter snake or Red legged frog that might cross into construction areas near existing habitat in SF Watershed Lands.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 2A and 2B.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 2A and 2B.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 3A and 3B.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 3A and 3B.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 4A and 4B.	Generally urbanized environment for both route options, no sensitive biological resources are present and therefore no difference between Option 4A and 4B.
<i>Cultural Resources</i>	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.	No known cultural resources would be affected; a cut-stone railroad bridge is located within the BART ROW but the line would be placed above it. Unanticipated discoveries could occur and would be mitigated as described in the PEA.	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.	This option runs through the historic Colma cemetery sites within the restored BART ROW. Disturbance would be temporary and would not affect any structures.	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.	No known cultural resources would be affected; unanticipated discoveries could occur and would be mitigated as described in the PEA.
<i>Visual Resources</i>	Given the presence of the existing 60 kV transmission line and towers, visual changes due to the overhead portion of this segment would be incremental effects that would not substantially alter the overall visual character of the area; with mitigation measures these impacts would be less than significant.	No permanent visual impact would occur associated with underground transmission line,	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.	No permanent visual impacts associated with underground transmission line for either route option, therefore, the options are similar.

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Primary Environmental Issues	Segment 1		Segment 2		Segment 3		Segment 4	
	1A (Overhead/Underground)	1B (Cañada Road) All Underground	2A (El Camino Real)	2B (BART South)	3A (McLellan)	3B (BART North)	4A (Hoffman/Orange)	4B (East Market)
<i>Hydrology and Water Quality</i>	Route Option 1A could involve work within the highwater line of San Andreas Lake at 2 tower locations. Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. The towers are located out of the Dam Failure Inundation area for the Crystal Springs Dam	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. However, the transmission line would be attached to the downstream side of the dam and would be subject to failure in the event of a Dam Failure. With proper engineering design and alternate support system, this impact could be mitigated to less-than-significant levels.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 2A or 2B, therefore, the options are similar.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 2A or 2B, therefore, the options are similar.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 3A or 3B, therefore, the options are similar.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 3A or 3B, therefore, the options are similar.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 4A or 4B, therefore, the options are similar.	Temporary impacts to water quality due to erosion during construction will be mitigated through Best Management Practices and would not be significant. No permanent hydrological impacts associated with the underground transmission line for either route option 4A or 4B, therefore, the options are similar.
<i>Geology</i>	On both route options, the San Andreas fault trace could affect the northern portion of this route option. Route Option 1A is in the vicinity of the San Andreas fault zone near the transition station and fault-induced displacement could affect the transmission line. In general, overhead transmission lines are less susceptible to damage as a result of ground movement related to faulting or landsliding than are underground lines. The towers are the only portion of the overhead facility that is susceptible to ground movement since the lines are flexible. Design-level geotechnical studies will evaluate specific geologic hazards and identify appropriate engineering measures for design of tower foundations.	Route Option 1B crosses the Canada trace of San Andreas fault at two locations, and fault-induced displacement there could impact the transmission line. In general, underground lines are more susceptible to damage from ground movement (landslides, fault rupture, seismic ground failure) than overhead lines. While this potentially significant impact can be mitigated with implementation of mitigation measures used for Option 1A. The overhead option is superior in terms of potential geologic impact.	Liquefaction hazards exist for both route options 2A and 2B along the alluvial deposits associated with Colma Creek to a similar degree, but would be less than significant with inclusion of appropriate design measures.	Liquefaction hazards exist for both route options 2A and 2B to a similar degree, would be less than significant with inclusion of appropriate design measures.	Liquefaction hazards exist for both route options 3A and 3B, although route 3A crosses only a small portion of the alluvial deposits associated with Colma Creek, whereas Option 3B cuts through the creek deposits longitudinally for over half a mile. Impacts would be less than significant with inclusion of appropriate design measures.	Liquefaction hazards along Option 3B are greater than Option 3A, as explained for 3A. These are less than significant with inclusion of appropriate design measures.	No known liquefaction hazard.	Liquefaction hazards near corner of Market and Hillside Blvd. These are less than significant with inclusion of appropriate design measures.
<i>Hazards and Hazardous Materials</i>	11 listed contaminated sites were identified along Option 1A, 9 of which were identified on San Bruno Avenue.	27 listed contaminated sites, were identified along Option 1B, 21 of which occur on El Camino Real.	25 listed contaminated sites have been identified along Segment 2A.	37 listed contaminated sites have been identified along option 2B. However, this listing does not reflect the fact that portions of the BART ROW have recently undergone remediation in connection with installation of the BART facilities.	3 listed contaminated sites occur along Option 3A.	4 listed contaminated sites occur along Option 3B.	No listed contaminated sites occur along Option 4A.	No listed contaminated sites occur along Option 4B.

TABLE 3-2

Summary of Primary Environmental Issues for Route Option Comparison by Segment

Primary Environmental Issues	Segment 1		Segment 2		Segment 3		Segment 4	
	1A (Overhead/Underground)	1B (Cañada Road) All Underground	2A (El Camino Real)	2B (BART South)	3A (McLellan)	3B (BART North)	4A (Hoffman/Orange)	4B (East Market)
<i>Air Quality and Noise</i>	Air quality and noise impacts would be limited to construction related dust and noise. Route Option 1A would have less effect on sensitive populations since the line is located primarily in open space lands, as opposed to Option 1B which runs through a greater length of densely developed residential and commercial areas along Trousdale Avenue and El Camino Real. With implementation of appropriate mitigation measures, these temporary impacts are less than significant.	No permanent air quality or noise impacts would occur for either route option. Route Option 1B would have a somewhat greater temporary impact for air quality and noise than Option 1A, given its more extensive residential and commercial development, and the greater construction-related impacts in connection with construction generally.	No permanent air quality effects would result from either route option. However, construction under Option 2A El Camino Real would be slower than in the BART ROW, because of the need to remove and replace pavement, traffic control needs, street cleaning and potential utility conflicts; these temporary impacts would therefore be expected to last somewhat longer near a given location along El Camino Real than along the BART ROW.	Temporary air quality and noise impacts would be less than for Option 2A given the faster construction in this area, as explained under Option 2A.	No permanent air quality effects would result from either route option. However, construction under Option 3A would be slower than in the BART ROW, because of the need to remove and replace pavement, traffic control needs, and potential utility conflicts; these temporary impacts would therefore be expected to last somewhat longer near a given location along the McLellan Drive extension and Hillside Boulevard than along the BART ROW through the cemeteries and along Serramonte Boulevard. With mitigation measures, these impacts would be less-than-significant.	This option would generally have less temporary air quality and noise impacts than Option 3A, as explained under that option; with implementation of mitigation measures, impacts would be less than significant.	This option would generally be similar to 4B, but would not pass directly in front of the Middle School, a sensitive receptor. With implementation of mitigation measures, impacts would be less than significant.	Construction under Option 4A may be slower due to heavy traffic on East Market; increased temporary impacts to Middle School which fronts on Market.
Summary of Route Alternative Comparison for Segments 1 –3	Route Option 1A is preferred.		Route Option 2B is preferred.		Route Option 3A is preferred.			

Note: For Segment 5, refer to the PEA for the primary environmental effects. Route alternatives were not reviewed for environmental purposes for Segments 4 and 5.

3.3.2 North Area Component (Segments 2-5)

For purposes of comparison, PG&E divided the North Area Component into four route segments, described below. Within each segment, PG&E examined route options and, where PG&E identified more than one feasible segment option, performed comparative analyses. By stringing together the preferred route options from each segment, PG&E arrived at the Proposed Project route (see Section 3.1; Chapter 2, generally).

The North Area Component is comprised of four segments:

- (1) The area between the intersection of El Camino Real and San Bruno Avenue, and the intersection of El Camino Real and McLellan Drive (Segment 2);
- (2) The area between the intersection of El Camino Real and McLellan Drive and the intersection of Hillside Boulevard and Hoffman Street (Segment 3);
- (3) The area between the intersection of Hillside Boulevard and Hoffman Street and the intersection of Orange Street and Guadalupe Canyon Parkway (Segment 4); and
- (4) The area between the intersection of Orange Street and Guadalupe Canyon Parkway and the Martin Substation in the City of Brisbane.

The North Area Component travels through the developed communities of San Bruno, South San Francisco and Colma, and extends over San Bruno Mountain to Martin Substation in the City of Brisbane. In its initial screening analyses, PG&E reviewed the possibilities of constructing all-overhead or overhead/underground hybrid routing for each segment within the North Area Component, but those routing possibilities were dismissed at the screening stage due to the overwhelming amount of community disruption and prohibitive cost that would attend to any such option for the reasons explained below.

Route Segments 2, 3, and 4 extend through highly developed residential and commercial areas. PG&E investigated the possibility of utilizing existing transmission facilities and utility corridors through those areas as a way to minimize potential land use conflicts and potentially reduce Project costs. The existing utility corridors crossing Segments 2, 3, and 4, however, are too narrow to accommodate a new overhead 230 kV transmission line. Expansion of the existing utility corridors to accommodate a new 230 kV overhead line would require PG&E to condemn and remove a significant number of existing residences and businesses. PG&E determined that expansion of these existing corridors was infeasible because of dislocations that would be necessary to expand the corridor, and the associated community impacts and economic costs. Similarly, PG&E was unable to identify any new utility corridor in Segments 2, 3, and 4 that would accommodate a new overhead 230 kV transmission line. Accordingly, all of the Project route alternatives utilize an underground transmission line through route segments 2, 3, and 4.²

The northernmost segment of the North Area Component (Segment 5) requires the new 230 kV transmission line to travel either around or over San Bruno Mountain to the Martin Substation in the City of Brisbane. PG&E performed site reviews to identify preliminary

² While each of these alternatives would face the challenges discussed in Section 3.3.1.2 above with respect to the location and repair of damage to underground cable, PG&E's analysis of all of the relevant considerations led to the conclusion that, on balance, an underground installation is appropriate in this particular application.

routes for the line to either circumnavigate or traverse the mountain and considered both overhead and underground route alternatives. A number of factors unique to Segment 5, however, greatly limit routing options therein—namely, the location of Martin Substation with respect to San Bruno Mountain, a congested utility corridor along Bayshore Boulevard, environmental concerns on San Bruno Mountain and existing land uses.

Specifically, PG&E rejected as infeasible at the screening stage an option that would run the line underground via Bayshore Boulevard; the right-of-way along Bayshore currently contains a 230 kV transmission line as well as a major gas transmission line, which make the utility corridor too congested to accommodate the proposed 230 kV line. PG&E considered, but also rejected as infeasible, an option that would rebuild an existing overhead 60 kV transmission line that traverses San Bruno Mountain. PG&E rejected the overhead route option through Segment 5 at the screening stage due to the land use conflicts that would result from the construction of a transition station on state and county park lands, and potentially significant adverse environmental impacts on San Bruno Mountain. PG&E explored numerous other route options but likewise rejected them at the screening stage due to community, financial and environmental concerns that make such routes undesirable. PG&E thus concluded that the only feasible route through Segment 5 is the underground option via Guadalupe Canyon Parkway, discussed below.

3.3.2.1 North Area Component (Segments 2, 3, 4, and 5) Options Analyzed in the PEA

Segment 2—El Camino Real/San Bruno Avenue Intersection to El Camino Real/ McLellan Drive Intersection

Beyond the screening stage, PG&E analyzed the following two options for Segment 2:

- **A new 230 kV underground line via El Camino Real (“Route Option 2A”).** Under the Route Option 2A, the line would run beneath El Camino Real from the intersection with San Bruno Avenue and McLellan Drive. PG&E has existing franchise agreements with San Mateo County and the applicable cities that allow PG&E to run the transmission lines under El Camino Real.
- **A new 230 kV underground line via the southern portion of the BART right-of-way (“Route Option 2B”) (Proposed).** Route Option 2B would locate the new transmission line in a portion of the newly constructed BART airport extension right-of-way. Implementing this option would require that PG&E acquire right-of-way from BART.

Between Route Option 2A and 2B, PG&E prefers Route Option 2B. These two options are relatively equal with respect to many of the criteria considered under PG&E’s analyses. There are significant differences, however, with respect to environmental impacts and cost. (See Table 3-2 for a summary of potential environmental impacts). Route Option 2A would require the installation of underground line through a busy commercial and residential area, and would thus cause disruption, albeit temporary, to existing businesses and residences during construction. Additionally, though the Route Option 2B would require PG&E to acquire new land rights, the Route Option 2B still presents a more cost-effective solution than the El Camino option because of increased construction expenses associated with construction in a highly developed commercial/residential area. The Route Option 2B, by contrast, is predominantly within open space areas and would have lower overall construction costs. Further, the Route Option 2B is more compatible with the development

planning strategy for the City of San Bruno, which has requested that PG&E use the Route Option 2B as opposed to running the line via El Camino Real.

Segment 3—El Camino Real/McLellan Drive Intersection to Hillside Boulevard/ Hoffman Street Intersection

Beyond the screening stage, PG&E analyzed the following two options for Segment 3:

- **A new 230 kV underground line via the proposed McLellan Drive extension and Hillside Boulevard (“Route Option 3A”) (Proposed).** Route Option 3A would extend the transmission line northeast through the proposed McLellan Drive extension and then northwest on Hillside Boulevard to Hoffman Street. PG&E has existing franchise agreements with the City of South San Francisco that would allow PG&E to construct the transmission lines through city streets.
- **A new 230 kV underground line via the northern portion of the BART ROW (“Route Option 3B”).** Route Option 3B would locate the line in a portion of the newly constructed BART airport extension right-of-way north of McLellan Drive to Serramonte Boulevard, then extending northeast to Serramonte to Hillside Boulevard, then northwest on Hillside to Hoffman Street. Implementing this option would require that PG&E acquire a right-of-way from BART.

Between these two Segment 3 route options, PG&E prefers using Route Option 3A as opposed to the Route Option 3B. The two options are relatively equal with respect to the majority of the criteria considered under PG&E’s analyses. There are significant differences, however, with respect to potential land use conflicts, traffic impacts and other environmental factors, as well as consistency with the planning and development visions of affected communities (See Table 3-2). The City of South San Francisco has expressed concern that further construction in the BART ROW north of McLellan Drive would negatively impact local businesses. As a result, the City of South San Francisco has requested that PG&E utilize the proposed McLellan Drive extension for Segment 3, as that segment option presents fewer inconsistencies with its vision and planning strategy for development. Recognizing these legitimate concerns of the City of South San Francisco, PG&E has proposed to utilize Route Option 3A, despite somewhat higher costs than the Route Option 3B.³ PG&E has also consulted with the Town of Colma, which is also affected by the placement of the transmission line in Segment 3. The Town of Colma also prefers Route Option 3A to Route Option 3B.

Segment 4—Hillside Boulevard/ Hoffman Street Intersection to Orange Street

Beyond the screening stage, PG&E analyzed the following two options for Segment 4:

- **A new 230 kV underground line via Hoffman Street (“Route Option 4A”) (Proposed).** Route Option 4A would locate the line along Hoffman Street east to Orange Street, then along Orange Street to Guadalupe Canyon Parkway.
- **A new 230 kV underground line via East Market Street (“Route Option 4B”).** Route Option 4B would locate the line along Hillside Boulevard northeast to the intersection

³ Based on PG&E’s current cost estimates, the cost of Route Option 3A is approximately \$1.3 million more than Route Option 3B.

with East Market Street, and then northwest along East Market Street to Orange Street (East Market becomes Guadalupe Canyon Parkway at Orange Street).

These two route options are nearly identical with respect to the majority of the criteria considered under PG&E's analyses. The cost of constructing Route Option 4A and Route Option 4B are roughly equivalent. The primary difference between the two route options lies in the fact that pursuing Route Option 4B would result in greater traffic disruption during construction (See Table 3-2). As such, PG&E selected Route Option 4A for the Proposed Project route.

Segment 5—Southern Terminus of Guadalupe Canyon Parkway to Martin Substation (Proposed) PG&E concluded, after screening numerous options for Segment 5, that the only feasible option available is to run a new 230 kV underground transmission line over San Bruno Mountain via Guadalupe Canyon Parkway. As such, each of the complete routing alternatives (1-6) runs the new 230 kV transmission line underground via Guadalupe Canyon Parkway through Segment 5, and connect to Martin Substation in the City of Brisbane via Brisbane Boulevard. PG&E has existing franchise agreements that would allow PG&E to construct such a line.

As discussed above, environmental factors and existing utility lines, combined with the physical constraints presented by San Bruno Mountain, made all other route options infeasible. Environmental factors relevant to Segment 5 are discussed in greater detail throughout the remainder of the PEA.

3.3.2.2 Conclusion

For the reasons stated above, PG&E prefers that the North Area Component be comprised of Route Options 2B, 3A, 4B, and 5.

3.4 No Project Alternative

3.4.1 Description

Under the No Project Alternative, there would be no facility upgrades to the electric transmission system. If no new facilities would be in place by the year 2006, the electric transmission system will no longer be able to reliably serve customers in the area. In addition, the transmission facilities in the Project Area would fail to meet ISO and NERC transmission planning criteria. The system would continue to be subject to the risks attendant upon an "all eggs in one basket" transmission scheme in that all of the major electric transmission lines serving northern San Mateo County and the City and County of San Francisco would emanate from PG&E's San Mateo Substation and would utilize a single utility corridor. As demand in the Project Area increases over time, the electric transmission system in the Project Area would become increasingly unreliable, and the likelihood of a system failure would increase.

To prevent system failure, it would be necessary to institute a program of controlled load shedding, which means that a portion of the system load would be disconnected to avoid equipment overload or system failures. This will result in interruption of electric service to customers. As customer demand continues to grow in the Project Area, electric service

interruption will become more frequent and widespread due to worsening electric transmission system overload.

In short, the No Project Alternative fails to meet any of PG&E's basic Project objectives. PG&E therefore rejected this alternative as infeasible.

3.4.2 Potential Environmental Impacts

As described in Section 2.2, Project Purpose and Need, the Proposed Project is necessary to meet the local electric demand. If the Project is not implemented, direct impacts to the environment would not occur because no new construction would take place. However, if the Project is not developed, indirect impacts to human health and safety could potentially occur as a result of prolonged power outages.

The No Project Alternative would not be consistent with the General Plans of the cities in the Project Area regarding future development in the Project service area. Under the No Project Alternative, reliable electrical service to existing, approved, and proposed development would not be provided.

3.4.3 Ability to Meet Project Need

This alternative would not meet the identified electrical needs in the project area. As discussed in Section 2.2, Project Purpose and Need, the existing system will not be able to reliably serve any new electric customers or meet the additional electric demands of existing customers beyond the year 2006 unless new facilities are added.

3.5 Alternative 1: Overhead Rebuild and Underground Alternative Outside of BART ROW

3.5.1 Description

This alternative is a hybrid of overhead and underground routing and consists of Route Option 1A in the South Area Component and Route Options 2A and 3A in the North Area Component as well as the common segments 4A and 5. The alternative would convert a portion of the existing Jefferson to Martin double-circuit 60 kV lattice steel tower line to a new tower line capable of carrying one 230 kV circuit and one 60 kV circuit. The line would transition underground near the intersection of San Bruno Avenue and Glenview Drive and run through city streets to the Martin Substation.

The overhead portion of Alternative 1 begins at the Jefferson Substation. From the Jefferson Substation, the line extends north 14.7 miles through the SFPUC's Watershed Lands to a proposed transition station at or near the intersection of San Bruno Avenue and Glenview Drive, just east of Highway 35.

The underground portion of Alternative 1 begins at the transition station and runs east along San Bruno Avenue to El Camino Real and then north approximately three miles along El Camino Real to the intersection of McLellan Drive Extension. The line then continues northeast along the approved McLellan Drive extension to Hillside Boulevard and then northwest 1.5 miles on Hillside Boulevard to Serramonte Boulevard. The route then

continues through Colma to Guadalupe Canyon Parkway along which the line travels to Bayshore Boulevard and its terminus at Martin Substation.

3.5.2 Potential Environmental Impacts

Overview of South Area Component Impacts

For Route Option 1A, (overhead/underground from Jefferson to San Bruno Avenue, underground to El Camino Real), the primary impacts will consist of temporary impacts related to construction of both the overhead and underground portions of the line. During overhead construction activities, occasional temporary traffic disruptions primarily related to temporary closures during helicopter sky-crane activities would occur. Adjacent residential and recreational land uses would be temporarily affected by disruptions to access, and impacts associated with noise and dust during construction.

Permanent impacts associated with biological resources and visual resources also were identified for Route Option 1A, but would be less than significant with mitigation. Route Option 1A would be affected by geotechnical conditions, as summarized in Table 3-3 and design-level geotechnical studies will evaluate specific geologic hazards and identify appropriate engineering measures for design of tower foundations. Direct impacts to cultural resources were not identified based on literature and field surveys. Refer to Chapters 5 through 15 of the PEA for a detailed discussion of potential impacts associated with Route Option 1A and to Table 3-3 for a summary of engineering feasibility, potential environmental impacts, and estimated costs.

Overview of North Area Component Impacts

For Route Options 2A and 3A, the primary environmental impacts would be temporary and associated with land use. Route Options 2A and 3A would be minimally affected by geotechnical conditions associated with liquefaction potential and with inclusion of appropriate design measures, the impact would be less than significant. No impacts associated with biology, visual resources, and cultural resources were identified. Refer to Chapters 5 through 15 of the PEA for detailed discussion of potential impacts associated with Route Option 3A; the following discussion describes the primary environmental impacts associated with Route Option 2A, the only segment that differs from the Proposed Project described in detail throughout the PEA. Alternative 1 environmental impacts are summarized in Table 3-2; impacts by segment are summarized in Table 3-3.

Alternative 1: Land Use, Traffic and Transportation.

The first 14.7 miles of this alternative, Route Option 1A-Overhead, are located in an existing utility corridor running through Edgewood County Park and San Francisco Watershed lands. A minor amount (1.7 miles) of the route is located adjacent to or near residential areas. Although the existing ROW will typically be widened from 50 feet to 100 feet in width, no land use impacts are expected to result from the widening of the ROW because development is already restricted in the park and Watershed lands. Refer to Chapter 5 of the PEA for more detailed discussion of land use issues for Route Option 1A.

The underground portion of this alternative continues through residential and commercial development from the transition station along San Bruno Avenue to Route Option 2A (El

Camino North UG), which then passes through commercial and residential areas for approximately 3.1 miles and crosses directly in front of the Kaiser Hospital on El Camino Real north of Chestnut Avenue. No permanent impacts to land use would occur because the underground installation would be in existing streets. Temporary disruption to existing residential and commercial land uses along El Camino Real would occur during construction, however, from disruption of access and dust and noise production. Compared to alternatives which include Segment 2B, Alternative 1 with Segment 2A would have greater potential temporary impact on hospital access. Additionally, the high average daily traffic (ADT) volumes (30,000 to 50,000) on El Camino Real would necessitate considerable traffic control during utility work.

The third segment of Alternative 1, Route Option 3A, also passes through commercial and residential areas along El Camino Real, McLellan Drive Extension (currently under construction) and along Hillside Boulevard. Temporary disruption to existing residential and commercial land uses would occur during construction from disruption of access and dust and noise production.

Alternative 1 - Biological Resources

For Alternative 1, Primary environmental effects on sensitive resources include impacts to sensitive serpentine grasslands and associated special-status species including the endangered Bay checkerspot butterfly, in Edgewood Park. The overhead portion of the Alternative could have potential temporary impacts to upland habitat for San Francisco garter snake and California red-legged frog during construction, in areas near known wetland habitats for these species. Mitigation measures will reduce this potential impact to less than significant. Replacement of the transmission towers would result in disturbance around each tower and minimal permanent loss of about 800 square feet due to the slightly larger tower footings. With implementation of mitigation measures, impacts to biological resources would be less than significant.

Alternative 1 - Air Quality and Noise

PG&E performed a qualitative evaluation of the relative amount of unabated dust produced by soil disturbance, and sensitivity to temporary construction noise, based on route segment distance and density and proximity to sensitive receptors (residences, schools, libraries, hospitals etc.).

This evaluation compared Route Options by Segment, e.g. Route Option 1A compared with Route Option 1B (all underground transmission line installation for Segment 1). This analysis concluded that air quality and noise impacts would be limited to construction related dust and noise. Route Option 1A would have less effect on sensitive populations since the line is located primarily in open space lands and only fronts approximately 1.7 miles of developed parcels, as opposed to Option 1B which runs through 14.7 miles of densely developed residential and commercial areas along Trousdale Avenue and El Camino Real. With implementation of appropriate mitigation measures, these temporary impacts are less than significant.

The evaluation also compared Route Option 2A with the 2B BART ROW Option, and concluded that impacts would be similar between these two options. However, Alternative 1 includes El Camino Real, where construction would proceed more slowly than in the

BART ROW, because of the need to remove and replace pavement, and potential utility conflicts; these temporary impacts would therefore be expected to last somewhat longer near a given location along El Camino Real than along the BART ROW.

For the third portion of Alternative 1, Route Option 3A, the evaluation compared Route Option 3A with Route Option 3B and determined that no permanent air quality effects would result from either route option. However, construction under Option 3A would be slower than in the BART ROW, because of the need to remove and replace pavement, traffic control needs, and potential utility conflicts; these temporary impacts would therefore be expected to last somewhat longer near a given location along the McLellan Drive Extension and Hillside Boulevard than along the BART ROW through the cemeteries and along Serramonte Boulevard. With mitigation measures, these impacts would be less than significant.

Alternative 1: Hazards and Hazardous Materials

An environmental data report was obtained from Environmental Data Resources (EDR) and review was performed for federally and state recognized contamination sites (e.g., National Priority List, Leaking Underground Storage Tank) within one quarter to one mile of the route options. The majority of the potential areas of concern among all route options are leaking underground storage tanks, primarily associated with gasoline stations. A total of approximately 39 sites were identified within ¼ mile of Alternative 1. Within one of quarter to one mile of Route Option 1A, 11 listed contaminated sites were identified. Of those 11, 9 sites are located along the underground portion of Route Option 1A on San Bruno Avenue. For Route Option 2A, 25 listed contaminated sites were identified within one quarter to one mile of the route option. Approximately 25 listed contaminated sites were identified within ¼ mile of Route Option 2A. Route Option 3A involved fewer sites; three listed contaminated sites were identified within ¼ mile of Route Option 3A.

3.6 Alternative 2: Overhead Rebuild and Underground Alternative Using BART ROW to McLellan Drive (BART Option 1) [Proposed Alternative].

3.6.1 Description

Alternative 2 is also a hybrid overhead/underground route, and is PG&E's Proposed Project Alternative. Alternative 2 is comprised of Route Options 1A, 2B and 3A, and the common Route Options 4A and 5.

This alternative differs from Alternative 1 in that the underground line would be located in the BART SFO Extension ROW from the intersection of San Bruno Avenue and Huntington Avenue to the proposed McLellan Drive extension. The divergence from Alternative 1 begins at the intersection of El Camino Real and San Bruno Avenue, from which the line runs east to the BART ROW just east of Huntington Avenue. The line then turns north into the BART ROW, continues to near the South San Francisco BART Station, and then realigns with the Alternative 1 route at the proposed McLellan Drive extension to Hillside Boulevard and Hoffman Street. The proposed route then follows Guadalupe Canyon Parkway, along which it continues to the intersection of Bayshore Boulevard to Martin Substation. The

TABLE 3-3
Comparison of PEA Alternatives

Comparison Category/Criteria	Alternative 1 1A, 2A, 3A, 4A, 5	Alternative 2 (Proposed Project) 1A, 2B, 3A, 4A, 5	Alternative 3 1A, 2B, 3B, 4A, 5	Alternative 4 1B, 2A, 3A, 4A, 5	Alternative 5 1B, 2B, 3A, 4A, 5	Alternative 6 1B, 2A, 3B, 4A, 5
Engineering Feasibility	<p>South Area Component (OH/UG)</p> <p>Standard overhead construction is faster, less expensive, and more predictable than underground construction; overhead construction is more typical and there is likely a larger number of contractors available to perform the work than underground construction</p> <p>North Area Component (CUG)</p> <p>Utilizes El Camino Real in Segment 2, a congested right-of-way in a dense urban area. Construction is substantially more difficult in a dense urban area. Local jurisdictions may require boring under major intersections</p>	<p>South Area Component (OH/UG)</p> <p>Standard overhead construction is faster, less expensive, and more predictable than underground construction; overhead construction is more typical and there is likely a larger number of contractors available to perform the work than underground construction</p> <p>North Area Component (UG)</p> <p>Minimizes construction through dense urban area and utilizes undeveloped BART and uncongested McLellan Drive corridors</p>	<p>South Area Component (OH/UG)</p> <p>Standard overhead construction is faster, less expensive, and more predictable than underground construction; overhead construction is more typical and there is likely a larger number of contractors available to perform the work than underground construction</p> <p>North Area Component (UG)</p> <p>North Area utilizes more BART ROW than the Proposed Project, technical feasibility is comparable to Alternative 2 (Proposed project)</p>	<p>South Area Component (OH/UG)</p> <p>Construction more expensive and difficult than Proposed Project. Underground line would have more crossings of active and potentially active faults. Requires crossing Crystal Springs Dam, and possible relocation to accommodate planned bridge replacement.</p> <p>North Area Component (UG)</p> <p>Utilizes El Camino Real in Segment 2, a congested right-of-way in a dense urban area. Construction is substantially more difficult in a dense urban area. Local jurisdictions may require boring under major intersections</p>	<p>South Area Component (OH/UG)</p> <p>Construction more expensive and difficult than Proposed Project. Underground line would have more crossings of active and potentially active faults. Requires crossing Crystal Springs Dam, and possible relocation to accommodate planned bridge replacement.</p> <p>North Area Component (UG)</p> <p>Minimizes construction through dense urban area and utilizes undeveloped BART and uncongested McLellan Drive corridors</p>	<p>South Area Component (OH/UG)</p> <p>Construction more expensive and difficult than Proposed Project. Underground line would have more crossings of active and potentially active faults. Requires crossing Crystal Springs Dam, and possible relocation to accommodate planned bridge replacement.</p> <p>North Area Component (UG)</p> <p>Utilizes more BART ROW than the Proposed project. Technical feasibility comparable to Alternative 2 (Proposed Project)</p>
Summary of Environmental Impacts	<p>South Area Component (OH/UG)</p> <p>Minimal land use impacts in the overhead portion due to rebuild of the 60kV to a 230kV/60kV line in an existing utility corridor. Moderate temporary impacts due to disruption of traffic access and/or limited trail closures while skycranes convey material/equipment. Temporary impacts due to construction-related noise and air quality to adjacent residences along 5.6 miles of ROW.</p> <p>Impacts to sensitive serpentine grasslands and associated special-status species including the endangered Bay checkerspot butterfly in Edgewood Park. Potential temporary impacts to upland habitat for San Francisco garter snake and red-legged frog could occur. With implementation of mitigation measures, these would be less than significant.</p> <p>Given the presence of the existing 60kV power line and towers, visual changes due to the overhead portion of this segment would be incremental effects that would not substantially alter the overall visual character of the area; with mitigation measures these impacts would be less than significant.</p> <p>Minor impacts from temporary construction access work within the highwater line of San Andreas Lake at 2 tower locations. Will be mitigated through Best Management Practices and would not be significant.</p> <p>Moderate impact due to potential for fault-induced displacement at the transition station located near the San Andreas Fault.</p>	<p>South Area Component (Overhead)</p> <p>Same as Alternative 1</p>	<p>South Area Component (Overhead)</p> <p>Same as Alternative 1</p>	<p>South Area Component (underground)</p> <p>Moderate temporary impacts due to disruption of traffic access impacts along Cañada Road, Trousdale and El Camino Real; Major intersection crossing at SR 92/I-280/SR 35. Greater temporary impacts due to construction-related noise and dust to adjacent residences along 7.8 miles of ROW</p> <p>Minimal impacts to biological resources given location in existing streets</p> <p>Minimal temporary visual impacts</p> <p>The transmission line would be attached to the downstream side of the dam and would be subject to failure in the event of a Dam Failure. With proper engineering design and alternate support system, this impact could be mitigated to less than significant.</p> <p>Route Option 1B crosses the Cañada trace of San Andreas fault at two locations, and fault-induced displacement there could impact the transmission line. In general, underground lines are more susceptible to damage from ground movement (landslides, fault rupture, seismic ground failure) than overhead lines. This potentially significant impact can be mitigated with implementation of mitigation measures used for Option 1A.</p>	<p>South Area Component (underground)</p> <p>Same as Alternative 4</p>	<p>South Area Component (underground)</p> <p>Same as Alternative 4</p>

TABLE 3-3
Comparison of PEA Alternatives

Comparison Category/Criteria	Alternative 1 1A, 2A, 3A, 4A, 5	Alternative 2 (Proposed Project) 1A, 2B, 3A, 4A, 5	Alternative 3 1A, 2B, 3B, 4A, 5	Alternative 4 1B, 2A, 3A, 4A, 5	Alternative 5 1B, 2B, 3A, 4A, 5	Alternative 6 1B, 2A, 3B, 4A, 5
	Northern Component (Underground Portion 2A, 3A, 4A, 5)	Northern Component (Underground Portion 2B, 3A, 4A, 5)	Northern Component (Underground 2B, 3B, 4A, 5)	Northern Component (Underground 2A, 3A, 4A, 5)	Northern Component (Underground 2B, 3A, 4A, 5)	Northern Component (Underground 2B, 3B, 4A, 5)
	Temporary disruption to existing residential and commercial land uses along El Camino Real during construction from disruption of access and construction dust and noise. Substantial temporary impact to El Camino Real, which has traffic volumes of 30000 to 50000 ADT.	Impacts same as Alternative 1 except for Segment 2B, which runs along the BART ROW. Temporary disruption from disruption of access, potential utility conflicts, construction dust and noise will be less than Alternative 1. Less traffic disruption since work will not occur along El Camino Real.	Impact same as Alternative 2, except for Segment 3B (BART North). Temporary disruption to traffic would be greater than for Alternative 2 given the large volumes of traffic on Serramonte Boulevard. Temporary dust and noise impacts would be similar.	Same as Alternative 1	Same as Alternative 2	Same as Alternative 3
	No significant biological or cultural resources. No visual resources impacts.	Liquefaction hazards along alluvial deposits associated with Colma Creek; less than significant with inclusion of appropriate design measures.	This option runs through the historic Colma cemetery sites within the restored BART ROW. Disturbance would be temporary and would not affect any structures.			
	Liquefaction potential along alluvial deposits associated with Colma Creek, less than significant level with inclusion of appropriate design measures.		Higher liquefaction potential than Alternative 2 since Route Option 3B cuts through alluvial deposits longitudinally for over half a mile; impacts less than significant with inclusion of appropriate design measures.			
Total Costs¹	\$180,901,026	\$180,773,665	\$179,512,971	\$219,810,316	\$219,995,983	\$220,380,302

Note: PG&E found Alternative 7 to be infeasible, and except as discussed in Chapter 3, Alternative 7 was not analyzed in detail for potential environmental effects.

¹Based upon further design and engineering review, these estimated costs have changed from the estimated costs provided to the ISO in April 2002. The revisions to the April 2002 estimated costs include: (1) the cost to install two shunt reactors (\$9,015,270) has been removed from each of Alternatives 1-3 and the cost to install one shunt reactor (\$4,507,635) has been removed from each of Alternatives 4-6, as further design and engineering information allowed a determination that such facilities will not be needed; (2) the cost of purchasing a BART easement has been reduced in Alternatives 2 and 5 by \$500,000 to reflect the shorter-than-expected distance of the BART easement required for those Alternatives; (3) certain costs of installing the required series reactor at the San Mateo substation have been added to each of Alternatives 1 to 6; (4) a change in PG&E internal labor rates to reflect the latest quarterly labor rate, which fluctuate each quarter and may be higher or lower, depending upon category of worker, as of the time of construction; (5) costs of painting/finishing certain towers and strategically planting trees and shrubs as visual mitigation measures have been added, consistent with the recommendations made in the September 2002 PEA for the Proposed Project; (6) amounts reflecting 4% of the estimated transmission line project costs and the estimated substation project costs for each Alternative have been added pursuant to CPUC Decision 93-11-013 and PG&E's Transmission Line EMF Design Guidelines, and PG&E's Substation EMF Design Guidelines to budget for "no cost" and "low cost" EMF reduction measures to be determined in consultation with the CPUC Energy Division once the CPUC has selected the routing and PG&E has completed engineering for the selected route.

substation modifications needed to accommodate the construction of Alternative 2 are identical to those listed in Alternative 1.

3.6.2 Potential Environmental Impacts

The potential environmental impacts for Alternative 2 are summarized in Table 3-3 and discussed in detail in Sections 5 through 14 of the PEA. Section 4 of the PEA also identifies the effects of the proposed project in the format of the CEQA checklist. Impacts associated with Alternative 2 would be identical to Alternative 1, except for Segment 2, which is within the BART ROW instead of along El Camino Real. For Route Option 2B, the primary environmental impacts are temporary and associated with traffic, air quality and noise. The following analysis focusses on Segment 2, Route option 2B.

Alternative 2(Proposed): Land Use, Traffic and Transportation

The South Area Component of Alternative 2 is identical to that of Alternative 1 and would have similar impact. Within the North Area, this alternative avoids El Camino Real, instead continuing along the BART SFO Extension ROW. No permanent land use impact would occur with Route Option 2B because the installation of the underground transmission line would occur in the BART ROW. Temporary impacts to existing land uses would occur during construction from disruption of access and dust and noise production. Construction in the BART ROW would be faster than under El Camino Real in Route Option 2A, because construction in the BART ROW would not require the need to remove and replace pavement, and have less potential utility conflicts. Because the construction work in the BART ROW is likely to progress more quickly compared to construction along Route Option 2B, and through most of this area the residences and businesses do not front directly on the BART ROW, construction in the ROW will have less temporary access and traffic impacts than along El Camino Real.

Alternative 2 (Proposed): Air Quality and Noise

As discussed in Section 3.5, PG&E performed a qualitative evaluation of the relative amount of unabated dust produced by soil disturbance, and sensitivity to temporary construction noise, based on route segment distance and density and proximity to sensitive receptors (residences, schools, libraries, hospitals etc.).The evaluation determined that temporary air quality and noise impacts associated with Route Option 2B would be less than for Option 2A given the faster construction in this area, as explained above.

Alternative 2 (Proposed): Hazardous Materials

Approximately 37 listed contaminated sites were identified within ¼ mile of Route Option 2B, based on the EDR database search described in Section 3.5, 12 more sites than were identified for Route Option 2A. As discussed in Chapter 11, Hazards and Hazardous materials, all impacts in this category are less than significant.

3.7 Alternative 3: Overhead Rebuild and Underground Alternative Using BART ROW to Serramonte Boulevard (BART Option 2).

3.7.1 Description

This alternative is also a hybrid overhead/underground route. This alternative is the same as Alternative 2 except that the underground line continues in the BART ROW north of McLellan Drive Extension through several of the Colma Cemeteries to Serramonte Boulevard. At Serramonte Boulevard, the line exits the BART ROW and continues east to Hillside Boulevard. At Hillside Boulevard the line realigns with the route delineated in Alternative 1. As described for Alternatives 1 and 2, the route then follows Guadalupe Canyon Parkway, along which it continues to the intersection of Bayshore Boulevard to Martin Substation. The substation modifications needed to accommodate the construction of Alternative 3 are identical to those listed in Alternative 1.

3.7.2 Potential Environmental Impacts

The potential environmental impacts associated with Alternative 3 (summarized in Table 3-3) are comprised of Route Options 1A, 2B and 3B and the common route Segments 4A and 5. The potential environmental impacts associated with Alternative 3, would be the same as Alternative 2, the Proposed Project, except for Segment 3 where the alignment would use the BART ROW north to Serramonte Boulevard, instead of the McLellan Drive Extension to Hillside. For Route Option 3B, the primary environmental impacts are temporary and associated with land use, traffic, air quality and noise.

Alternative 3 - Land Use and Traffic

Alternative 3 follows the BART ROW from San Bruno Avenue north, as does Alternative 2, but continues along the BART ROW through to Serramonte. Installation of the underground transmission line for Route Option 3B would not have a permanent impact on land use because the line would be installed in the BART ROW. Similar to the case for Route Option 2B discussed above, Route Option 3B construction in the BART ROW would be faster than under McLellan Drive and Hillside Boulevard because construction in the BART ROW would not require the need to remove and replace pavement, and have fewer potential utility conflicts. Because the construction work in the BART ROW is likely to occur more quickly compared to Route Option 3B, construction in the ROW would be expected to have less temporary access and traffic impacts. Temporary impacts to the existing commercial land uses and cemeteries along the BART ROW would occur from disruption to access and dust and noise production would occur. Additionally, Serramonte Boulevard is an extremely busy, major street in the area, which could cause attendant construction delays and traffic disruptions.

Alternative 3 - Air Quality and Noise

As discussed in Section 3.5, PG&E performed a qualitative evaluation of the relative amount of unabated dust produced by soil disturbance, and sensitivity to temporary construction noise, based on route segment distance and density and proximity to sensitive receptors

(residences, schools, libraries, hospitals etc.). In comparing Option 3B to 3A, construction under Option 3B in the BART ROW would be faster than on McLellan Drive to Hillside, because it would not be necessary to remove and replace pavement, fewer traffic control measures would have to be implemented, and potential utility conflicts would be less. These temporary impacts would therefore be expected to be of shorter duration near a given location along the BART ROW through the cemeteries compared to McLellan Drive and Hillside Boulevard. With mitigation measures, these impacts would be less than significant. The evaluation determined that temporary air quality and noise impacts associated with Route Option 3B would be less than for Option 3A given the faster construction in this area, as explained above.

3.8 Alternative 4: All-Underground Alternative Outside of BART ROW

3.8.1 Description

This alternative is an all-underground route and is comprised of Route Options 1B, 2A, 3A and common segments 4A and 5. Under this alternative, PG&E would construct a new underground 230 kV transmission line between the Jefferson and Martin Substations. This alternative would transition the transmission line underground at Jefferson Substation and extend it north to Martin Substation through public roadways.

The routing from the Jefferson Substation for Segment 1 runs along Cañada Road and Skyline Boulevard paralleling I-280 to the east. At Golf Course Road the line crosses I-280 and continues north to Trousdale Drive where it runs east to the intersection with El Camino Real for a total of approximately 16 miles. The remainder of the route for Alternative 4 is identical to Alternative 1.

3.8.2 Potential Environmental Impacts

The potential environmental impacts associated with the Alternative 4 are summarized in Table 3-3, and would be the same as Alternative 1, except for Segment 1. In Alternative 4, the alignment would be installed underground along Cañada Road and Skyline Boulevard paralleling I-280 to the east north to Trousdale Drive, rather than replacing the existing transmission line as is the case for Alternative 1. Alternative 4 then runs under Trousdale Drive east to the intersection with El Camino Real. For Route Option 1B, the primary environmental impacts are temporary and associated with land use, traffic, air quality and noise, hazards and hazardous materials. Minimal impacts to biological resources associated with species that could cross into construction areas near existing habitat in San Francisco Watershed Lands i.e., the San Francisco garter snake or California Red legged frog could occur, but would be less than significant with mitigation.

Impacts associated with Segments 2 through 5 are as discussed in Section 3.5.2 for Alternative 1.

Alternative 4 - Land Use, Traffic and Transportation

Land use, traffic and transportation impacts for Segments 2 through 5 would be the same as the preferred alternative. For Route Option 1B, the primary environmental impacts are

temporary and associated with land use, traffic, air quality and noise. Temporary disruption to existing land uses would occur during construction from disruption of access and dust and noise production. This route option runs through an estimated 6 additional miles of dense residential and urban development compared to Route Option 1A, and would have somewhat greater temporary impacts, but with mitigation these would be less than significant. Land use, traffic and transportation impacts for Segments 2 and 3 would be the same as for Alternative 1 and would not be significant with mitigation.

Alternative 4 - Biological Resources

Biological impacts for Segments 2 through 5 would be the same as for the Proposed Project. In the South Area, biological impacts associated with Route Option 1B are expected to be minimal because the transmission line would be placed under an existing roadway and work is limited to existing paved areas. Temporary impacts could occur to San Francisco garter snake or California Red Legged Frog individuals that might cross into construction areas near existing habitat in San Francisco Watershed Lands. As summarized in Table 3-3, no sensitive resources are present in the urbanized environments for Route Segments 2 through 5.

Alternative 4 - Geology

This alternative, like Alternatives 5 and 6, includes an underground transmission line that would cross the Canada trace of the San Andreas fault at two locations, and fault-induced displacement there could impact the transmission line. In general, underground lines are more susceptible to damage from ground movement (landslides, fault rupture, seismic ground failure) than overhead lines. As summarized in Table 3-3, design-level geotechnical studies will evaluate specific geologic hazards and identify appropriate engineering measures for design, reducing this potentially significant impact to less than significant.

Alternative 4 - Hazards and Hazardous Materials

As discussed in Section 3.5, an environmental data report was obtained from Environmental Data Resources (EDR). A total of approximately 56 listed contaminated sites have been identified with Alternative 2. Of those 56, 27 are associated with Route Option 1B, 25 with Route Option 2A, and 4 with Route Option 3A.

Alternative 4 - Air Quality and Noise

Compared to Route Option 1A, Route Option 1B would be adjacent to more extensive residential and commercial development that could be affected by temporary air quality and noise impacts associated with construction. The impact would be less than significant with mitigation. As discussed in Section 3.5.2, temporary air quality and noise impacts would be less than significant with mitigation for Route Options 2A and 3A.

3.9 Alternative 5: All-Underground Alternative Using BART ROW to McLellan Drive.

3.9.1 Description

Alternative 5 is comprised of Route Options 1B, 2B and 3A and the common segments 4A and 5. This alternative is also an all-underground route, and is the same as Alternative 2 except that the line will be underground in Segment 1. As discussed in Section 3.8 for Alternative 4, Segment 1 from Jefferson Substation runs approximately twelve miles along Cañada Road and Skyline Boulevard paralleling I-280 to the east. At Golf Course Road the line crosses I-280 and continues north to Trousdale Drive where it runs east to the intersection with El Camino Real. The remainder of the route is the same as for Alternative 2, the Proposed Project.

3.9.2 Potential Environmental Impacts

For Segment 1 (South Area Component), Alternative 5 would be comparable to Alternative 4 since it would use the same underground route. For the North Area Component of the route, Alternative 5 would be comparable to Alternative 2 because Route Options 2B (BART ROW) and 3A (McLellan Drive) would be used.

As discussed for Alternative 4 in Section 3.8.2, primary impacts associated with Route Option 1B are temporary and associated with land use, traffic, air quality, and noise, and hazards and hazardous materials. Minimal biological resources impacts would occur. Impacts associated with potential geologic hazards are as described in Section 3.8.2.

The potential environmental impacts associated with Route Option 2B are the same as discussed for Alternative 2, the Proposed Project, which uses BART ROW for this segment. As discussed in Section 3.6.2, temporary impacts to land use associated with existing land uses would occur during construction from disruption of access and dust and noise production. These temporary impacts would be less than significant with mitigation.

The potential environmental impacts associated with Segment 3 are the same as for Alternative 2, because Route Option 3A (McLellan Drive to Hillside), would be used. As described in Section 3.6.2, impacts associated with Route Option 3A are temporary and associated with traffic, air quality and noise.

3.10 Alternative 6: All-Underground Alternative Using BART ROW to Serramonte Boulevard

3.10.1 Description

This alternative is also an all-underground route, and is the same as Alternative 5, except that the line continues in the BART ROW north of the proposed McLellan Drive extension to Serramonte Boulevard. Alternative 6 is comprised of Route Segments 1B, 2B, 3B and the common Segments 4A and 5. At Serramonte Boulevard the line exits the BART ROW and continues east to Hillside Boulevard, then continues with the common route for Segments 4

and 5. The modifications needed to accommodate the construction of Alternative 6 are the same as those listed in Alternative 4.

3.10.2 Potential Environmental Impacts

Potential environmental impacts for Alternative 6 would be similar to Alternative 4 except for Segment 3, as summarized in Table 3-2.

As discussed for Alternative 4, primary impacts associated with Segment 1 are temporary and associated with land use, traffic, air quality and noise, hazards and hazardous materials. Impacts have been identified associated with biological resources, and related to the geotechnical properties of the route, as described in Section 3.8.2.

The potential environmental impacts associated with Segment 2 are the same as discussed for Alternative 1 because Route Option 2A, (El Camino Real), would be used. Refer to Section 3.5.2.

The potential environmental impacts associated with Segment 3 for Alternative 5 are the same as for Alternatives 1,2 and 4, because, similarly, Route Option 3A (McLellan Drive to Hillside) would be used. As summarized in Section 3.5.2, temporary impacts to land use would occur because of disruption to the existing residential land uses on the south side of proposed McLellan Drive from access interruptions and dust and noise production. The impacts would be temporary and less than significant with mitigation.

3.11 Alternative 7

3.11.1 Description

Local Generation. This alternative would involve the use of local generation in the Project Area to satisfy the need for new load serving capacity. In order for this alternative to meet any of PG&E's basic Project objectives, all existing in-City generation would have to remain in service and significant new generation resources would need to be approved and constructed. However, following deregulation of the electric utility industry, new merchant generation facilities in PG&E's former service territory are now licensed by the CEC or local governments and proposed, constructed, and operated by independent power producers. As a result, neither the CPUC nor PG&E has significant influence over whether private entities will construct additional or modify existing generation facilities to serve the Project Area.

The continued operation of both the Hunters Point facility and Unit Number 3 at the Potrero Plant is uncertain, thereby bringing into question the existence of sufficient generation capacity to meet Project Area need. Both facilities are nearing the end of their useful lives, and would require significant investment to remain in service and in compliance with applicable environmental regulations. There is no guarantee that Mirant will make the requisite investment to keep Potrero Unit Number 3 in operation. Further, PG&E has agreed with the City and County of San Francisco to shut down the Hunters Point plant as soon as replacement electrical supply is available. While the ISO has not yet authorized PG&E to shutdown the Hunters Point plant, in such an event, there will be a loss of approximately 213 MW of generation capacity in the Project Area.

This alternative would also require the development of new power generation facilities in order to meet the Project Area's power demand. Currently, Mirant has filed an Application for Certification with the CEC for a new 600 MW power plant at the existing Potrero Power Plant location. There is no process to ensure however, either that the facility will, in fact, be constructed, or that it will be operational within a certain timeframe. Even if such a facility were constructed and operational within the timeframe of immediate need, the new facility would merely defer, not eliminate, the need for additional transmission capacity in the Project Area.

Other than Mirant, no other private entity has evidenced an intent to construct new generation facilities in the Project Area. It would therefore be speculative to rely on the development of new local power plants as a viable alternative to the Project. Absent a process to ensure that private entities agree to construct the necessary generation facilities, the installation of any generation as an alternative to PG&E's Project would be a matter of speculation and under the control of outside parties.

3.11.2 Potential Environmental Impacts

Impacts typically associated with fossil fuel electric generation plants include increased air emissions, increased noise levels, traffic congestion, and the potential for releases of hazardous substances. Sulfur dioxides, unburned hydrocarbons, NO_x, CO, and particulates emitted by the gas turbines cause air quality impacts. Noise impacts are caused by the air intakes, gas turbine-generators, turbine exhausts, and cooling towers. Visual impacts vary depending on the plant structures, exhaust stacks, cooling towers, steam plume, fuel, and electric facilities to be used at the plant. Hazardous substance impacts can result from aqueous ammonia used with the selective catalytic reduction system to reduce nitric oxide emissions. Plant personnel entering and leaving the plant at peak traffic times can cause potential traffic impacts.

3.11.3 Ability to Meet Project Need

Depending upon the pace of load growth and when older generating facilities are retired, the construction of Mirant's proposed new plant and other similar plants either will not solve the reliability needs of the area or will postpone the need for increased transmission capacity only for a short period of time. (See generally Section 2.3, Table 2-2.) As such, it fails to meet PG&E's basic Project objectives and is rejected as infeasible.