B. DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

B.1 INTRODUCTION

The Los Banos-Gates 500 kV Transmission Project was first conceived of in the mid-1980s. At that time, PG&E believed that this 500 kV transmission line would be required in order for PG&E to meet its transmission contracts (see Section A.1.2) after the California-Oregon Transmission Project was constructed. The project was evaluated in an EIS/EIR that was completed in 1988. This Supplemental EIR was prepared because much of the information in the original document is 15 years old, so an updated analysis was determined to be required in order to adequately evaluate the transmission line routes and alternatives that were considered in the 1986 Draft EIS/EIR and the 1988 Final EIS/EIR. The PG&E Proposed Project that is evaluated in this Supplemental EIR is the route that was found to be environmentally superior among the alternatives considered at that time.

The following sections present the description of the Proposed Project (the Western Corridor, as evaluated in the EIS/EIR) and the other alternatives considered in that document, which are the same alternatives that are re-evaluated in this SEIR. One full alternative to the Proposed Project is described and analyzed: the Eastern Corridor Alternative. In addition, four segment alternatives to portions of the Western Corridor are evaluated.

This SEIR does not consider any new alternatives. Two considerations under CEQA determine whether new or additional alternatives should be analyzed in a SEIR: (1) If the impacts of the revised project will be adequately addressed based on the alternatives and mitigation measures set forth in the original EIR, then a further alternatives analysis would not be necessary (PRC Section 21081, CEQA Guidelines 15091); or (2) If the basis of the SEIR is new information showing an alternative previously not found to be feasible would in fact be feasible or an alternative considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, then the agency would have to evaluate that alternative in comparison to the alternatives previously discussed it the original EIR, including the No Project Alternative.

This SEIR re-examines the potential impacts of the original alternative transmission line routes because the evaluation of the Proposed Project could result in identification of new impacts (as a result of changed circumstances in the environmental setting over the past 15 years). Without updated analysis of alternatives, comparison of the alternatives to the Proposed Project would be made on an inconsistent basis. No new feasible alternatives were identified which would substantially reduce one or more significant effects on the environment.

Specific tower locations and locations of access roads are not yet available, as PG&E is in the process of completing a detailed design effort. Design is expected to be completed in October 2001.

This section is organized as follows: Section B.2 describes the project that PG&E has proposed to construct; Section B.3 describes the construction activities required for the Proposed Project; and Section B.4 defines operation and maintenance procedures. Section B.5 explains the alternatives process and how alternatives were selected, Section B.6 defines the alternatives considered in this

SEIR; and Section B.7 explains the alternatives that were considered but eliminated from detailed evaluation. Section B.8 defines the No Project Alternative, which is required to be considered under CEQA.

B.2 DESCRIPTION OF THE PROPOSED PROJECT

B.2.1 OVERVIEW OF THE PROPOSED PROJECT

The Proposed Project and the alternative corridors are located in the western portion of the San Joaquin Valley and cross through Merced, Fresno, Kings, and Kern Counties. The location of the Proposed Project is illustrated in Figures B-1a and B-1b.

B.2.1.1 Western Corridor Transmission Line

The major component of the Proposed Project is the approximately 84-mile 500 kV overhead transmission line called the Western Corridor. PG&E's Los Banos Substation, the northern terminus, is approximately 10 miles west of the City of Los Banos, near San Luis Reservoir in western Merced County. PG&E's Gates Substation, the southern terminus, is approximately 5 miles southwest of Huron, in southern Fresno County. The Proposed Project generally parallels the foothills of the Coast Range, Interstate 5 (I-5), and most of the existing Pacific Intertie (two existing 500 kV lines that run between the Los Banos and Gates Substations). The straight-line distance between Los Banos and Gates Substation is approximately 80 miles.

The installation of major electric system additions, such as the Los Banos-Gates Project, may have electric system reliability impacts. A single 500 kV transmission line is capable of carrying so much power that the interruption of only one such line may cause a significant disturbance to the stability of the entire regional electric system. For the bulk high-voltage transmission additions, the project must be so defined that a credible three-line outage cannot occur. To minimize the possibility of a simultaneous three-line outage in the Proposed Project area, a minimum separation of approximately 2,000 feet between the two existing 500 kV lines and the new 500 kV line has been adopted by PG&E. In areas where a 2,000-foot separation may not be possible, a case-by-case evaluation will be made and appropriate improvements, such as extra strengthening of the new or existing towers, will be recommended during final project design.

The Western Corridor's eastern boundary was established roughly 2,000 feet west of existing PG&E 500 kV lines because electrical reliability standards would not allow all three 500 kV lines to be in close proximity to one another. The Western Corridor width varies somewhat to allow flexibility in avoiding constraints on route location, but ranges from 1,500 to 2,000 feet wide. Within that 2,000-foot study corridor, the actual right-of-way (easements obtained from landowners) will be 200 feet wide. The corridor follows gentle to steep slopes covered by shrubs and grasslands. This area supports primarily ranching and grazing. In the north, the corridor crosses the western portion of the recreation area at Los Banos Reservoir in Merced County and the Little Panoche Reservoir in northern Fresno County. In the south, the corridor crosses a variety of land uses that include oil field and operation areas, agricultural land, and rural residential areas.

Figure B-1a

Proposed and Alternative Transmission Corridors – North

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Figure B-1a

Proposed and Alternative Transmission Corridors – North

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Figure B-1b

Proposed and Alternative Transmission Corridors – South

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Figure B-1b

Proposed and Alternative Transmission Corridors – South

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Based on the organization of the previous EIR/EIS, the Proposed Project is described in segments. These segments have been renamed in this document; however, the original segment names from the previous EIR/EIS are noted in parentheses in the descriptions below.

- **Segment 1** (previously West-1) begins at Los Banos Substation. It is a 1.9-mile route segment from Milepost (MP) 0.0 (Los Banos Substation) to MP 1.9 and parallels the existing Moss Landing-Los Banos Intertie in a southwesterly direction for about one mile. Segment 1 then turns southeast to parallel the existing 500 kV lines, part of the Pacific Intertie. PG&E owns a vacant right-of-way that is adjacent to the Moss Landing-Los Banos line.
- **Segment 2** (previously West-2) is 12.7 miles long (MP 1.9 to MP 14.6) and parallels the existing 500 kV Intertie, maintaining the required separation. This segment crosses the western portion of the Los Banos Reservoir. The segment also crosses Ortigalita Creek near MP 13.6.
- **Segment 3** (previously West-4) parallels the 500 kV Intertie for approximately 5.3 miles and ends at the Merced/Fresno County border (MP 20.4) where Segment 4 begins. This segment traverses moderate to steep slopes and is sparsely vegetated.
- **Segment 4** (previously West-5) continues to parallel the 500 kV Intertie and is approximately 8.5 miles long (MP 20.4 to MP 28.9). It crosses east of Little Panoche Reservoir.
- **Segment 5** (previously West-7) continues to parallel the 500 kV Intertie for approximately 41.7 miles (MP 28.9 to MP 70.6 where the line crosses Highway 198). This segment provides an alignment location east of the BLM's Panoche Hills Wilderness Study Area[1] (WSA) while maintaining adequate separation from the existing 500 kV line. East of MP 68.0 the existing Intertie lines cross to the east side of Interstate 5 and parallels an existing 230 kV line. In the southern portion, the segment crosses the Big Blue Hills. In general, moderate to steep slopes with sparse vegetation characterizes this segment. Most of this segment is managed through leases for grazing. Two natural areas are crossed: Tumey Gulch at MP 41.2 and Cantua Creek at MP 57.1.
- **Segment 6** (previously West-9) is approximately 8.6 miles long (MP 70.6 to MP 79.2) and avoids oil wells, oil fields and water extraction wells, but crosses a few evaporation ponds associated with oil operations. Segment 6 is composed of 50 percent agricultural land.
- **Segment 7** (previously West-11) is the southernmost and final segment connecting the Proposed Project route with Gates Substation. It crosses Interstate 5 and runs due east at MP 79.2 then turns south into the Gates Substation. Over 90 percent of this 4.0-mile segment crosses agricultural land.

B.2.1.2 Transmission Line Components

Table B-1 summarizes the facilities and activities associated with all Proposed Project components. Figure B-2 presents a schematic diagram of the project components and how they fit into the region's electric system.

Conductors and Insulators. The Western Corridor will consist of a single-circuit, 500 kV transmission line with bundled 2,300 kcmil (1.75-inch diameter, 61 strands) all aluminum conductors arranged in a horizontal configuration. The three-phase, bundled transmission line will have two subconductors per phase. Spacing between subconductor centers will be 18 inches.

[1] A Wilderness Study Area, as defined by the Bureau of Land Management, is a designation made through the land use planning process of a roadless area that may have wilderness characteristics as described in Section 2(c) of the Wilderness Act of 1964. The Panoche Hills WSA was found by BLM not to have sufficient wilderness characteristics to be designated as a Wilderness Area, but the WSA designation has not yet been removed by Congress.

At a normal operating voltage of 525 kV, the summer normal capacity is 2,278 MVA. The line will be designed with strengths and clearances equal to or greater than the requirements and safety factors specified by the California Public Utilities Commission (CPUC) General Order No. 95.

Two strings of insulators in the shape of an "I" and a center string in the shape of a "V" will be used to support the conductors and maintain electrical design clearance between the conductors and towers. Each "I" insulator string will contain approximately 34 insulators and will be approximately 18 feet long. "V" insulator strings will have 30 to 36-insulators per side. Dead-end towers have three horizontal ("I") insulator strings, one string per conductor.

Two overhead ground wires, each approximately 3/8 inch in diameter, will be installed on the top of the towers to protect the conductors from direct lightening strikes. The ground wires are designed to safely transfer lightening current through tower structures into the ground.

Towers. The towers are self-supporting, rectangular base, galvanized steel lattice structures. The towers, which weigh from 10 to 35 tons, will vary in height from 100 to 160 feet and average 120 feet. A typical 500 kV tower is represented in Figure B-3. Towers similar to those proposed have been used extensively by PG&E throughout Northern and Central California.

Tower heights, locations, and span lengths vary and are determined by the following factors: natural terrain and topography; structural limitations; costs; visual considerations; existing and proposed land uses; crossings of manmade features such as roads, canals, and telephone lines; and other criteria that may be unique to the project.

Each leg of the tower will be supported by an augered, cast in place concrete footing, 2 to 3 feet in diameter, extending an average of 10 to 15 feet below ground. Each footing will contain a steel stub angle for structure attachment. Soil tests will be conducted along the route to obtain the geotechnical information necessary for detailed foundation design. The base dimensions of a typical tangent tower[2] will range from 16 by 57 feet to 24 by 69 feet. Angle towers[3] and dead-end[4] towers will range between 26 by 56 feet to 42 by 72 feet. The span between towers will average 1,300 feet, ranging from a minimum of 800 feet to a maximum of 1,500 feet, with some longer or shorter spans depending on topography and other factors. There will be an average of four towers per mile or approximately 336 towers.

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2 Tangent towers (also called suspension towers) are those where the transmission line continues in a straight line without angles on either side if the tower.

3 Angle towers are larger and stronger than tangent towers because they must support additional stress that results from the transmission line changing direction.

4 Dead-end towers are stronger than normal towers; they are usually angle towers or towers that for safety reasons require additional strength due to safety concerns.

Table B-1 Summary Description of Proposed Project Facilities and Activities

Los Banos-Gates 500 kV Transmission Line (new)
• Construct approximately 84 miles of single-circuit, overhead 500 kV transmission line from Los Banos Substation to Gates Substation. The proposed line will likely consist of bundled 2300 kcmil aluminum conductors, installed on self-supporting, rectangular-base lattice structures that will vary in height from approximately 100 to 160 feet in a 200 foot right-of-way (ROW).
Los Banos Substation
• Modify existing Los Banos 500 kV Substation by extending the existing 500 kV bus by one bay and installing two new 500 kV circuit breakers in the new line position. • Relocate the existing Los Banos – Moss Landing 500 kV line to the new bus position and terminate the new Los Banos – Gates 500 kV line at the existing Moss Landing line position. • Possible installation of a 500 kV series capacitor bank on the new Los Banos-Gates line at Los Banos Substation. • Install miscellaneous electrical equipment, including 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Gates Substation
• Modify existing Gates 500 kV Substation by extending the existing 500 kV bus by one bay and installing two new 500 kV circuit breakers in the new line position. • Terminate the new Los Banos – Gates 500 kV line at the new bus position. • Install new line positions in existing vacant bays to loop the existing Los Banos – Midway 500 kV #2 line into Gates Substation. Each new position will include installation of two new 500 kV circuit breakers in the new line positions. • Re-align the existing Los Banos – Midway 500 kV #2 line to loop into Gates Substation. This realignment of 7000 feet of existing line will result in the removal of seven towers and the construction of six towers adjacent to the existing Los Banos – Midway 500 kV #1. • Install a 500 kV series capacitor bank on the new Los Banos-Gates line at Gates Substation similar to the 500 kV series capacitor bank at Los Banos Substation. • Install two new 500 kV circuit breakers for the existing 500/230 kV Transformer Bank 11. Modify arrangement of 500 kV bus from a ring bus to a "breaker and a half" scheme. • Install miscellaneous electrical equipment, including 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems. • Install a new 230 kV line position to accommodate the reconfigured 230 kV transmission line between Gates and Midway Substations. • Install miscellaneous electrical equipment, including 230 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Gates Substation Loop
• Re-align the existing Los Banos – Midway 500 kV #2 line to loop into Gates Substation and move the #1 line within the substation., resulting in the removal of seven towers and the construction of six towers adjacent to the existing Los Banos – Midway kV #1.
Gates-Arco-Midway 230 kV Line
• Reconfigure or reconductor the transmission lines between Gates Substation and Midway Substation so as to establish two 230 kV circuits between these substations (one circuit currently exists).
Midway Substation
• Install a 230 kV line position to accommodate the reconfigured 230 kV transmission line between Gates and Midway Substations. • Install miscellaneous electrical equipment, including 230 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems.
Los Banos, Gates, and Midway Substations
• Install 500 kV shunt capacitors at various as yet to be determined substations. Install miscellaneous electrical equipment, including 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems at the locations designated for shunt capacitor installation.

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Figure B-2

Proposed Plan of Service for Path 15

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Figure B-2

Proposed Plan of Service for Path 15

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Figure B-3

Typical 500 kV Tower

[See link on webpage]

B.2.1.3 Los Banos Substation

Los Banos Substation is a transmission substation serving 70, 230, and 500 kV transmission and power lines. The substation is located on the corner of Pacheco Pass Road (State Route 152) and Jasper Sears Road, approximately three miles west of Interstate 5. The substation is manned on a 24-hour basis. PG&E owns approximately 308 acres at Los Banos Substation. However, only 32 acres are within the existing substation fence line; the new transmission line would be connected within the currently fenced area. The remaining acreage, approximately 276 acres, is leased to local farmers for agricultural purposes. Figure B-4 is an aerial photograph of the Los Banos Substation and the approximate location of the proposed new transmission line.

The Proposed Project would require the installation of the following types of electrical equipment at the Los Banos Substation: 500 kV disconnecting switches, reactors, instrument transformers, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current and direct current power system, electrical grounding system, and underground conduits or trench systems at the locations designated for shunt capacitor installation.

B.2.1.4 Gates Substation

Gates Substation is a transmission substation serving 70, 230, and 500 kV transmission and power lines. The substation is located on Jayne Avenue approximately 2 miles east of Interstate 5 near the City of Huron. The substation is manned during normal business hours. PG&E owns approximately 267 acres at Gates Substation; however, only 44 acres are within the existing substation fence line. The Proposed Project would primarily require electrical equipment modifications within the currently fenced area, but a few tower locations would also be changed outside of the substation boundaries. The remaining 223 acres are leased to local farmers for agriculture. Figure B-5 is an aerial photograph of the Gates Substation illustrating the approximate location of the proposed new transmission line and other equipment.

The changes at the Gates Substation required by the Proposed Project are similar to those described above for the Los Banos Substation.

Figure B-4

Los Banos Substation Layout

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Figure B-4

Los Banos Substation Layout

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Figure B-5

Gates Substation Layout

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Figure B-5

Gates Substation Layout

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B.2.1.5 Gates-Arco-Midway 230 kV Upgrade

If the proposed 500 kV transmission line is installed between the Los Banos and Gates Substations, additional transmission improvements to the 230 kV transmission system south of Gates would also be required to accommodate the additional power flow from the north. PG&E is considering two options in this area; both would apply to the existing 230 kV transmission line between the Gates and Midway Substations (about 70 miles apart), including the transmission line loop that serves the Arco Substation northwest of Midway (see Figure B-6). The Gates-Arco-Midway 230 kV line is approximately 70 miles long and parallels the Los Banos-Midway Nos. 1 and 2 500 kV lines and Interstate 5 for most of its length. The line extends from the Gates Substation south to the Midway Substation (west of Bakersfield) with a 7.3-mile loop to the Arco Substation. Before explaining the Proposed Project in this area, the existing transmission system must be described.

While the existing line between the Gates Substation and the Midway Substation was originally constructed as a double circuit 230 kV line, it has been modified over time so it now includes:

- The #1 circuit on the Gates-Arco-Midway line is a 230 kV line. This circuit is enhanced in the northern portion by installing 6 to 8 jumpers that connect the two circuits to each other.
- What was constructed as the #2 circuit of the Gates-Arco-Midway line has now been divided into two separate parts. The northern portion is connected to the #1 circuit with jumpers. The southern portion of the #1 circuit is currently operated at 115 kV from Midway Substation to Goose Lake Substation, and is no longer connected to Gates Substation.

PG&E's first option (the "reconfiguring option") for reestablishing the double circuit 230 kV line between Midway and Gates would only require: (a) removal of the 6 or 8 jumpers that connect the two circuits at the north end, and (b) reconnection of the line that now leads to Goose Lake (115 kV Substation) back to its original position on the #2 line (while this line now provides 115 kV service, the conductors are rated for 230 kV service). This option would have no environmental impacts and could be accomplished without disruption to any ground surfaces. Therefore, this option is preferred by PG&E, but the final determination cannot be made until power flow studies are completed.

PG&E's second option (the "reconductoring option") would require that the entire double circuit 230 kV line serving Gates-Arco-Midway be reconductored[5]. This option would increase the rating of this line and allow increased power flow, but it would be significantly more expensive than the reconfiguring option and would only be required if power flow modeling shows that the reconfiguring option would not provide sufficient transmission capacity. Reconductoring can generally be completed with minimal environmental impacts due to use of existing towers and access roads. According to PG&E, it is unlikely that this reconductoring would require structural enhancements to the existing towers or installation of new towers. A network of local paved and dirt roads provides access in the reconductoring areas. Principal access to the line is along Interstate 5.

[5] Reconductoring requires removal of the existing conductors and installation of new conductors with greater capacity. It is generally accomplished by pulling the new conductors from tower to tower using a truck on the existing transmission line right-of-way (see Section B.2.2.2).

B.2.1.6 Gates Loop

If the Proposed Project becomes operational, power flow in the Los Banos-Midway No. 1 and No. 2 500 kV lines would be highly unbalanced. During peak conditions the Los Banos-Midway No. 1 line would be overloaded while the No. 2 line would be loaded at less than 70 percent of its rating. This imbalance would increase power losses. Looping the Los Banos-Midway No. 2 line into Gates Substation would relieve the overload of the No. 1 line by balancing the power flow with the No. 2 line. The work includes the realignment of approximately 7,000 feet of the existing Los Banos-Midway No. 2 500 kV transmission line into Gates Substation along an existing right-of-way.

The Gates Loop portion of the Proposed Project consists of moving several existing 500 kV towers and conductors in the vicinity of PG&E's existing Gates Substation to allow space for the new Los Banos-Gates 500 kV line to enter the Gates Substation. The three components of this element of the project are:

- The realignment of the existing Los Banos-Midway No. 2 500 kV line into Gates Substation (this line currently does not enter the Gates Substation but passes east of it). Realignment of the line begins approximately 2,000 feet northwest of Gates Substation. The line will turn south for a distance of 1,800 feet where it will tie into the substation. The line will then leave the substation and turn to the southeast for a distance of 2,500 feet to the point of intersection with the original alignment. The line will then turn to parallel No. 1 to Midway Substation.
- Moving the Los Banos-Midway No. 1 500 kV line slightly to the west to connect to a new bus structure.
- Installation of the new Los Banos-Gates 500 kV line at the far west end of the 500 kV bus structure.

The realignment will result in the removal of seven towers and the construction of six new towers. Three of the towers being removed are on PG&E property. Two of the remaining four towers are on private agricultural land to the north of the substation and two of the towers are on agricultural land to the south of the substation. The six new towers would be constructed on PG&E property.

B.3 PROPOSED PROJECT CONSTRUCTION

This section describes the specific activities that would occur during project construction. Information presented here is used in the analysis of construction impacts in Section C of this SEIR.

B.3.1 500 KV OVERHEAD TRANSMISSION LINE (LOS BANOS TO GATES SUBSTATION)

The construction of a transmission line involves several phases of work: surveying, clearing, determining access requirements, establishing construction facilities, foundation installation, tower assembly, conductor installation, and cleanup and removal of construction facilities. Each of these phases is described in more detail below.

Surveying. Surveying for construction of a transmission line includes property, right-of-way, ground profile, access road, and construction surveys. A typical survey crew includes three people. Four crews would likely be needed to complete necessary surveying for the Proposed Project in six months.

Figure B-6

Gates-Arco-Midway 230 kV Transmission Line

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Figure B-6

Gates-Arco-Midway 230 kV Transmission Line

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***Clearing Requirements*[6].** A vegetation management program would keep as much vegetation on the right-of-way as possible. The vegetation removed would depend on the type of plants present, their current and projected heights, and the distances needed to maintain safe clearances between the conductors and trees and shrubs, as defined by Section 4293 of the Public Resources Code of the State of California. For example, in much of the Los Banos-Gates area, clearing would be minimal because low growing shrubs and grasslands cover most of the land. Except for the temporary disruption during construction, clearing is not required on agricultural lands.

Clearing requirements depend on existing vegetation and construction requirements. In brush and grasslands, clearing is generally not required except for tower sites and helicopter pads adjacent to the tower sites, if required for installation of towers in areas with steep slopes. Figure B-7 shows the typical relationship of the tower to the working area and where clearing would be required. At pulling and splicing sites, most vegetation would be removed. Low growing trees are only trimmed to allow for ease and efficiency in laying out lead lines and sock lines for conductor installation.

The typical amount of land temporarily disturbed during transmission line construction is estimated below in Table B-2.

Table B-2 Temporarily Disturbed Land During Construction

Land Use	Amount of Disturbed Land
Tower Base	100 x 100 feet (0.23 acre)
Conductor Tensioning Sites *On Right-of-Way*	200 x 200 feet (0.9 acre) *3-5 mile intervals (3-miles in hilly terrain, 5 miles in flat terrain)*
Conductor Splicing Sites *On Right-of-Way*	20 x 50 feet (0.02 acre) *per 2 miles*
Construction Yards	500 x 500 feet (5.7 acres) • Los Banos Substation • Panoche (Western Corridor MP 45) • Gates Substation
Work Camps	300 x 300 feet (2.0 acres) • Mercy Springs (Western Corridor MP 25) • Highway 198 (Western Corridor MP 72)

***Access Requirements*.** Surface access to each tower location will be required during construction. Access roads (generally unpaved) were built for the construction of the existing 500 kV transmission lines many years ago. Many of these roads are still used for transmission line maintenance. These roads, with necessary repair, could again be used for access with construction only of spur roads that would be necessary to reach individual tower locations. Existing road will be used wherever possible, and they are generally available for segments that parallel or are near existing lines.

Requirements for access roads vary according to the terrain. In flat, open terrain, relatively little earthwork may be required. In hilly or mountainous terrain, more cut and fill, leveling, and surface work may be necessary. Heavy equipment such as bulldozers and road graders would be used to construct access roads.

[6] Clearing of the right-of-way is done for the following reasons: to construct access roads and construction yards; to assemble and erect structures; to prepare for efficient installation of conductors; and to provide for adequate and required electrical clearance for energized lines.

Figure B-7

Typical Relationship of Tower to Work Area

[See link on webpage]

Typically, one mile of new road per mile of new transmission line may be needed depending on the existing road network, topography, and the location of individual towers. New access road widths are generally 10 to 14 feet wide and increased to 20 feet in turns. In hilly country, access roads can have up to 25 percent gradient. The number and location of new access roads is not known at this time because they will vary depending on the specific route that PG&E designs.

Where tower access for heavy construction equipment is particularly difficult due to soil or other conditions, helicopter construction may be considered. Permanent roads would probably not be established in areas where helicopter construction is required, but limited clearing and grading would still be required so that maintenance equipment could be flown or driven to each tower. The amount of helicopter construction required is not known at this time, because it will vary depending on the specific route that PG&E defines.

Construction Facilities. The Proposed Project is estimated to require the construction of three construction yards, two work camps, and a headquarters facility (all temporary facilities). The construction of a tower line is performed out of a construction yard headquarters. The construction yard headquarters is the base station where employees report at the start and end of each day's activities along the tower line. Headquarters facilities are used for other activities and functions including field office location, laydown areas, storage of materials, storage of equipment and vehicles, mechanic's garage, and security for the above items. Work camps are smaller than construction yards and typically used as an assembly point and supply center and contain an office trailer, storage facilities, and possibly a small laydown area. Construction yards generally comprise about 5 to 6 acres of land while a work camp would contain about 2 acres. Two mobile batch plants will be used and likely placed at the construction yards or other convenient locations, if available. Cement may also be hauled from Los Banos and Coalinga.

The construction yards will likely be used at the following locations:

- Los Banos Substation (north end of the transmission line)
- Panoche, at the midpoint of the line near Western Corridor MP 44
- Gates Substation (south end of the transmission line).

The two work camps would most likely be located at Mercy Springs near Western Corridor MP 24 and at Highway 198, west of Interstate 5, near MP 70.5.

When a construction project like the Los Banos-Gates Project is remote from a location where board and lodging is readily available, PG&E generally installs a temporary headquarters camp for employees' use. The camp is usually adjacent to the construction yard. The employee camp would consist of one or two 8-man sleeping trailers, kitchen and dining facilities, and restrooms. An employee camp may be located near the middle of the line, likely adjacent to the Panoche construction yard.

Foundation Installation. The next phase in the construction of the transmission line would be the excavation, drilling, forming, and pouring of concrete for the tower foundations. The installation of the foundation requires boring holes in the ground, placing form work where necessary, and placing reinforcing steel and base stubs in the holes. Each hole is then filled with concrete to a predetermined height. While the concrete is curing, the forms are removed and backfill is placed around the foundations. Also, during this period, the structure members are delivered to each tower site.

Tower Assembly. The next major construction activity would be the assembly and erection of the transmission towers. The steel would be hauled from laydown areas to the tower sites on trucks and trailers. After the foundation concrete is cured, the towers are assembled and erected. Lattice tower erection can be performed by one of the following methods:

- Crane erection requiring the use of a mobile crane to lift each tower or assembled subsection into place.
- Erection with gin poles and hoists, which use the same procedures, except the subsections are made into smaller units. The advantage of the gin pole is that it is portable and eliminates the need for heavy equipment at the tower site.
- Helicopter construction, which is used to deliver both equipment and manpower to those sites where an access road is not available. Due to the high expense, helicopter construction is used only when adequate access is not available.

Conductor Installation. Conductor installation involves setting up stringing equipment; hauling cable reels to the tensioning site; and distributing, assembling, and installing insulators and insulator hardware at the tower sites.

Before conductor installation (or removal) begins, temporary clearance structures to hold the conductors are installed at road and rail crossings and at locations where the conductors might otherwise contact existing electrical or communication facilities and vehicular traffic during installation.

The method that would be used to install conductors is tension stringing. Tension stringing is generally used to prevent the conductors from touching the ground or objects underneath the transmission line. Material and equipment will be delivered by truck or helicopter. Conductors, tensioner, puller, and other related equipment and material are assembled at payout and pull sites. These sites, about one acre in size, are located along the route at 3 to 5 mile intervals. A sock line is pulled between towers through the conductor sheaves by construction personnel, vehicles, tractors, or helicopter, and the conductor is pulled to a pre-calculated tension. Conductor splicing sites are located at two-mile intervals along the right-of-way. The final phase of construction would include final alignment of the conductors, termination, and final attachment.

Cleanup and Removal of Construction Facilities. As sections of the transmission lines are completed, PG&E makes thorough inspections of the work to verify that it is built according to specifications and standards. Anything that does not comply is corrected.

The cleanup work consists of:

- Removing all crossing structures and backfilling the remaining holes;
- Disposing of packing crates, reels, shipping material, and debris;
- Returning to preconstruction condition access roads not required for line maintenance or desired by the landowner;
- Dressing roads, work sites, and tower and structure sites to remove ruts and leveling, discing, and preparing areas for seeding, if required;
- Repairing gates and fences to their original condition or better;
- Grounding of fences and trellises, as needed;
- Seeding and revegetation, undertaken as specified in the mitigation steps;
- Repairing any damage that can be accomplished with PG&E construction forces;
- Removing construction facilities and restoring the land according to the terms of the easement; and
- Contacting property owners and processing any claims for settlement.

B.3.2 CONSTRUCTION PROCEDURES FOR GATES-ARCO-MIDWAY 230 KV RECONDUCTORING

As described in Section B.2.1.4, after the new 500 kV transmission line is installed between the Los Banos and Gates Substations, transmission improvements to the existing 230 kV transmission line between the Gates and Midway Substations (about 70 miles), including the transmission line loop that serves the Arco Substation northwest of Midway the 230 kV transmission system south of Gates, would also be required. One of the two options PG&E is considering is reconductoring the existing line.

Prior to reconductoring, landowners would be contacted to secure permission to obtain access to the right-of-way. Some land areas would be temporarily disturbed by vehicle use, but additional grading is not anticipated. Disturbed areas would include areas for stringing and tensioning as well as areas within and adjacent to the right-of-way, which would be used for reconductoring work. The right-of-way is approximately 360 feet wide for the approximately 70-mile segment, which includes the right-of-way for the 230 kV and the two 500 kV lines. The right-of-way width for the 230 kV Arco tap is about 100 feet.

Before conductor removal, a temporary clearance structure would be installed at road crossings (I-5) and at other locations where the conductors might otherwise contact existing electrical or communication facilities and vehicular traffic during removal.

Pulling and tensioning sites would be established along the right-of-way at about 5-mile intervals. The existing conductor would be detached from the tower structures and placed in a stringing sheave. As the conductor is pulled from the towers, it would be used to pull the new conductor into place. After the new conductor is attached, the crews move onto a new location; clearance structures are removed; the site is cleaned up, and the land is returned to the original state. Any need for equipment storage or laydown areas will be accommodated within the fence lines of either Midway or Arco Substations.

B.3.3 CONSTRUCTION PROCEDURES FOR THE GATES LOOP

As described in Section B.2.1.5, two of the six new towers will be located on PG&E owned land, one on land leased for agricultural purposes and one within the existing fence line. A third tower will be located on agricultural land to the north of the substation and three towers will be located on agricultural land south of the substation. All of the new towers will be located within an existing PG&E right-of-way, immediately adjacent to the Los Banos-Midway No. 1 line. This right-of-way was acquired in 1972. At that time compensation was provided to the landowner. Seven existing towers will be removed. Although PG&E will likely retain the right-of-way, the former tower sites could be returned to agricultural use.

B.3.4 CONSTRUCTION OF SUBSTATION IMPROVEMENTS (LOS BANOS, GATES, AND MIDWAY SUBSTATIONS)

To accommodate the Los Banos-Gates 500 kV Transmission Project, the substation improvements defined in Table B-1, and discussed in Sections B.2.1.2 and B.2.1.3, will need to be completed. All of the substation improvements being proposed will be within the existing substation fence line. All of the construction activities and laydown areas will also be within the existing fence line.

B.3.5 CONSTRUCTION WORKFORCE AND EQUIPMENT

The total construction workforce is separated into two workforces that work concurrently during the construction period: one for substation improvements and another for transmission line construction. As illustrated in Figure B-8, the total construction workforce for the Los Banos-Gates Project will average approximately 110 workers over 27 months. The substation workforce is small and relatively stable in size for the length of the construction period, except for the last three months as construction on the substations is completed. Table B-3 lists typical equipment used during construction.

Because the transmission line construction period is only about 14 months long, that workforce will peak and decline rapidly. In the first two months, the workforce will range from 20 to 40 when site clearing and grading are beginning. As different phases of work begin, the workforce will increase to about 90 in the third and fourth months and eventually peak between 150 and 200 workers in the sixth and seventh months, and gradually decline over the next 7 months to a minimal workforce that will remain after operation to finish cleanup activities.

All construction crews are expected to come from within PG&E. Use of subcontractors is not expected and hiring of new employees will be minimal, if at all. Although construction crews will come from all over the PG&E system, an emphasis will be made to use workers from the local San Joaquin Valley area. Even so, about 50 percent of the workers would likely come from outside the local area and commute on a weekly basis. No workers are expected to permanently relocate their families to the San Joaquin Valley.

Figure B-8

Labor Workforce

[See link on webpage]

Table B-3 Equipment Used During Construction

Equipment	Use
Access, Clearing and Cleanup	
Crawler tractor	Road construction
Motorized grader	Maintain Roadways
Tractor-mounted backhoe	Install drainage
Truck-mounted auger	Install fences
½-ton pickup truck	Transport personnel
Crew-cab truck	Transport personnel
Air compressor	Drive pneumatic tools
2-ton truck	Haul materials
Tower Construction	
½-ton pickup trucks	Transport personnel
Crew-cab trucks	Transport personnel
Mechanics service trucks	Service vehicles
Truck-mounted auger	Excavate foundations
Crawler-mounted auger	Excavate foundations
Compressors	Drive pneumatic tools
5-ton and 10-ton trucks	Haul materials
20-ton trailer	Haul materials
Tiltbed trailer	Haul equipment
Backhoe	Excavate foundations
Crawler tractor	Excavate foundations
Concrete mixer trucks	Haul concrete
Tool van	Tool storage
Mobile office trailer	Supervision and clerical office
Assembly	
½-ton pickup trucks	Transport personnel
Crew-cab trucks	Transport personel
Tensioners (truck mounted)	Install conductor
Pullers (truck-mounted)	Install conductor
Reel trailers with reel stands (semitrailer type)	Haul conductor
Tractors (semi-type)	Haul conductor
Low-bed trailers	Haul materials
5-ton and 10-ton trucks	Haul materials
20-ton trailer	Haul materials
Take-up trailers (sock line)	Install conductor
Reel winders	Install conductor
Crawler tractors	Install conductor
Auger (truck-mounted)	Excavate pole holes
15-, 30-, and 80-ton cranes (mobile)	Erect structures
Line truck	Install clearance structures
Tool vans	Tool storage
Mobile office trailer	Supervision and clerical office

B.3.6 RIGHT-OF-WAY ACQUISITION

If the CPUC approves PG&E's Application for a CPCN, and PG&E proceeds with the project, PG&E will need to negotiate and complete contracts for right-of-way easements[7] with affected landowners. New easement rights would be required for transmission lines and access roads. For a new right-of-way, an easement to build, operate, and maintain the transmission line would be acquired. A typical PG&E easement would consist of a 200-foot right-of-way. The right of ingress and egress would also be acquired from adjacent landowners to maintain access to the right-of-way during construction and operation of the transmission line. Access would be established at a mutually convenient location for both the landowner and PG&E.

Several steps are involved in obtaining a transmission line right-of-way. First, a right-of-way agent contacts each owner and requests permission for PG&E employees or consultants to enter the property and conduct necessary surveys and other engineering or environmental studies.

Following surveying and mapping of the land to be crossed, an appraisal is prepared to provide a basis for determining the market value of the land rights to be acquired. The appraisal is based upon an evaluation of recent sales of comparable properties and is the basis for the payment offered by PG&E for easement rights. The right-of-way agent provides information about the type and location of the proposed line, width of the easement, conditions of the easement agreement, and the basis for payment.

Transmission line easements are always purchased, except when service is provided to a single customer. An easement value is generally determined by comparing the value of the property without the easement to the value with the easement. Claims for construction damage to land or crops, if any should occur, are generally resolved after construction is completed. PG&E attempts to minimize any such damage that may occur during construction.

PG&E pays taxes on all of its improvements within the easement area. The landowner is responsible for real property taxes on land within the easement, as determined by the local assessor's office. Under the acquired easements, the landowner would retain title to the land. Except for the land used for the tower footings (estimated to be less than one percent of the right-of-way), the landowner may continue to use the land for any compatible purpose consistent with the terms of the easement and the safety of the transmission line.

No buildings or structures may be erected within the easement. Buildings and other structures could damage the line in the event of fire or interfere with access needed for line maintenance. Additionally, wells may not be placed in the easement area because of overhead hazards associated with well drilling and maintenance. As explained above under right-of-way clearing, trees in excess of 15 feet in height that could interfere with line operation would also be prohibited. Other activities that are not inconsistent with the operation and maintenance of the transmissions line may be conducted on the easement. Farming and grazing are generally encouraged within the right-of-way if appropriate

[7] Easements are the land rights acquired for a transmission line, which are needed for construction, maintenance, and operation.

precautions are observed. If necessary, appropriate techniques would be used within the right-of-way to control vegetation that might interfere with reliable service.

The Public Utilities Code grants regulated public utilities, including PG&E, the right of eminent domain. This gives utilities the power to acquire property rights through the courts for facilities to be built in the public interest. As a last resort, eminent domain proceedings, sometimes called condemnation actions, are used if an agreement cannot be reached between a landowner and PG&E or, occasionally, when an owner cannot for some reason legally grant an acceptable easement. Because PG&E has the right of eminent domain, its acquisition of the land required for this project is assumed in this SEIR.

B.4 OPERATION AND MAINTENANCE PROCEDURES

B.4.1 OPERATIONAL CHARACTERISTICS AND PROCEDURES

The proposed transmission line would be energized and operated at a nominal voltage of 525 kV, plus or minus five percent. Changes in load flow would cause minor fluctuations in the actual operating voltage. System dispatchers in power control centers would direct the day-to-day line scheduling and equipment operation by supervisory control to operate, maintain, and protect the system. Circuit breakers would operate automatically in an emergency to help ensure the safety of the system.

B.4.2 GENERAL SYSTEM MONITORING AND CONTROL

According to information presented in the Draft EIR/EIS, a maintenance program would be established to ensure continued reliable service of the transmission system. The proposed transmission line structures, access roads, and rights-of-way would be regularly inspected by air patrol or, if necessary, by foot or vehicle, one to three times per year. Emergency repairs would be made if the transmission line were damaged and required immediate attention. Maintenance crews of fewer than 10 persons would use tools, trucks, assist trucks, aerial lift trucks, cranes and other equipment necessary for repairing and maintaining insulators, conductors, structures and access roads.

B.5 ALTERNATIVES OVERVIEW AND SCREENING

Following is a description of alternatives based on the analysis performed for the Los Banos-Gates Transmission Project portion of the California-Oregon Transmission Project Final EIR/EIS January 1988. The alternatives defined in that document are being reassessed in this Supplemental EIR since the Proposed Western Corridor is being evaluated for new impacts.

B.5.1 CEQA REQUIREMENTS FOR ALTERNATIVES

A requirement of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a Proposed Project. In addition to mandating consideration of the No Project Alternative, the CEQA Guidelines emphasize the selection of a reasonable range of technically feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers:

> **15126(d) Alternatives to the Proposed Action.** Describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.

CEQA requires that alternatives meet most of the project objectives. PG&E's April 13, 2001 Application to the CPUC states that the objective of the Proposed Project is to decrease congestion on Path 15, allowing increased transmission capacity between Southern and Northern California. Related objectives are to improve system reliability by reducing or eliminating the need for load interruptions in Northern California due to constraints on Path 15, reduce overall energy supply costs to consumers in the ISO grid, primarily in Northern California, and unify the California energy market by allowing increased power transfers between Northern and Southern California.

An alternative cannot be eliminated simply because it is more costly or could impede the attainment of all project objectives to some degree. However, the CEQA Guidelines declare that an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote or speculative. An alternative may be rejected because it fails to meet project objectives, is infeasible, or will not avoid significant environmental effects (CEQA Guidelines 15126.6).

Unlike NEPA, CEQA does not require that discussion of alternatives be at the same level of detail as the proposed action. However, CEQA does require that an EIR include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Proposed Project.

When a Supplemental EIR is prepared, an update of the No Project Alternative analysis is necessary at a minimum, because the No Project Alternative is specifically required to "discuss the existing conditions at the time the notice of preparation is published." [(CEQA Guidelines 15126.6(c)(2)]

B.5.2 ALTERNATIVES SCREENING METHODOLOGY

The Los Banos-Gates Transmission Project siting process for the 1986 Draft EIR/EIS was a five-step process that simultaneously considered many complex factors, including:

- PG&E's existing transmission system
- Identification of potential delivery points
- Potential environmental and land use impacts
- Project economics, as affected by construction, operation, and maintenance costs
- Electric system reliability, including line vulnerability to electric outages.

The objective of the siting process was to systematically reduce a large geographic study area to alternative transmission corridors (2 to 5 miles wide) and then down to alternative routes (approximately 1,500 feet wide). Throughout the process, as the study area narrowed to a defined corridor, environmental data was collected, the public and agencies were consulted, and fieldwork was conducted. The information and results gathered from these efforts were continually refined and re-evaluated. The three steps used in transmission line route selection are briefly described below.

Step 1: Project Definition

PG&E identified the need for the project, defined electrical alternatives and suitable termini, conducted electrical performance studies and economic analyses, and specified the transmission line characteristics.

Step 2: Regional Study and Corridor Identification

A study area, which includes delivery points and areas likely to be influenced, was established. Environmental characteristics and existing and proposed land uses were mapped and used to identify opportunities and constraints for line location. The information was then used by routing engineers to locate transmission corridors.

Step 3: Corridor Analysis

Additional environmental and land use information was gathered for each corridor and mapped in greater detail than in Step 2. Guidance was solicited from individuals with technical expertise in the various disciplines of study. If major issues developed that diminished a corridor's suitability, the corridor was re-evaluated and adjusted.

B.5.3 SUMMARY OF SCREENING RESULTS

A screening of alternatives occurred at two phases when this project was first evaluated. The first screening occurred at the Project Definition phase when several alternatives were evaluated at the electrical and engineering feasibility level to determine whether they would reasonably fulfill PG&E's transmission obligations.

A second level of screening occurred during the transmission line corridor selection and routing process. Several corridor and route segment alternatives were evaluated for their environmental and technical suitability.

The original EIS/EIR evaluated the feasibility of both electrical alternatives and route alternatives and compared them based on the following considerations:

- The ability of the alternative to technically and reasonably meet PG&E's transmission obligations.
- A cost analysis and comparison of each alternative to determine its economic feasibility.
- When appropriate, an environmental comparison or evaluation of each alternative.

B.6 ALTERNATIVES EVALUATED IN THIS SEIR

As illustrated in Figures B-1a and B-1b, this SEIR evaluates the same alternatives considered in the original EIS/EIR: one complete corridor alternative (the Eastern Corridor Alternative) and four segment alternatives to the Proposed Western Corridor. These alternatives and the reasons for their selection are described below.

B.6.1 EASTERN CORRIDOR ALTERNATIVE

One alternative corridor was identified from environmental and land use data available in the Central California Environmental Inventory Report (CCEI). The CCEI, developed by PG&E and used for the first time when the 1986 Draft EIS/EIR was prepared, provides an environmental database of sufficient detail and geographic scope to support any major utility project in the San Joaquin Valley. The Eastern Corridor Alternative, connecting the two delivery points—Los Banos and Gates Substations—is generally located on the east side of Interstate 5 on the western fringe of the San Joaquin Valley and is approximately 84 miles long.

The primary objective in the corridor identification process was to minimize the potential impact of a new transmission line on agricultural land and other environmentally sensitive areas. One effective way to achieve this objective was to parallel existing transmission lines to the extent possible. The Eastern Corridor diverges from the existing transmission corridor in only two places:

- Between MP 15 and MP 22, the route leaves the parallel to avoid crossing the California Aqueduct, commercial establishments, two highway rest stops, and to reduce visual impacts on Interstate 5. The route is located west of a ridgeline west of Interstate 5 in southern Merced County.
- From MP 69.5 to the Gates Substation, the eastern corridor route diverges from the existing 230 kV corridor and heads due east and turns south toward the Gates Substation just before the California Aqueduct. As discussed previously, this orientation reduces impacts on existing agricultural practices by allowing for route location along section lines and/or crossings or agricultural lands in a north-south or east-west direction.

The Eastern Corridor's western boundary is located to include PG&E's existing 230 kV line (see Figures B-1a and B-1b). The corridor parallels the 230-kV line that originates at the Los Banos Substation and continues to parallel for approximately 68 miles. Continued paralleling of the 230 kV lines in the southernmost part of the route was not possible due to the proximity of the 500 kV lines in this area. Therefore, Segment 6 of the Eastern Corridor route allows location along section lines and/or crossings of agricultural lands in a north-south or east-west direction. This orientation reduces the impacts on existing agricultural practices by siting the route parallel or perpendicular to established agricultural practices. These practices include: harvesting, irrigation, and agricultural aircraft operations.

Approximately 90 percent of the Eastern Corridor is composed of intensive, irrigated farmlands. The California Aqueduct, a Delta-Mendota Canal, and the Outside Canal are within the northern third of the corridor and represent the major water conveyance systems present within the corridor.

The Eastern Corridor is approximately 1,500 feet wide. As for the Proposed Western Corridor, within that 2,000-foot study corridor, the actual right-of-way (easements obtained from landowners) will be 200 feet wide. The minimum separation between the existing 230 kV lines and the Eastern Corridor 500 kV line would be 130 feet (with the 500 kV line located east of the 230 kV lines).

B.6.2 WESTERN CORRIDOR SEGMENT ALTERNATIVES

The primary routing objective for the west route was to parallel the existing 500 kV line wherever possible while maintaining the required minimum separation of approximately 2,000 feet. The following segment descriptions are alternatives to the Proposed Western Corridor transmission line Segments 2, 4, and 6 (see Figures B-1a and B-1b).

- **Segment 2A** (previously West-3). This segment is 12.9 miles long and provides a route option avoiding the Los Banos recreation area while maintaining adequate separation from the Intertie. To accomplish this, Segment 2A makes an angle turn west of the reservoir. This segment crosses habitat for prairie falcon and golden and bald eagle, sensitive plant habitat, and one pre-historic archaeological resource. Segment 2A is an alternative to Segment 2 of the Proposed Project route.
- **Segment 4A** (previously West-6). This segment is 9.0 miles long and provides a route option to the west of Little Panoche Reservoir. Segment 4A makes an angle turn at the reservoir, south of Little Panoche Creek and then turns eastward to resume the parallel with the Intertie. The segment crosses steep terrain and areas of erosion hazard. One recorded paleontological site occurs within the segment and contains marginal habitat potential for the San Joaquin kit fox. A potential for bird strike also occurs within this route. Segment 4A is an alternative to Segment 4 of the Proposed Project route.
- **Segment 6A** (previously West-8). This segment provides the easternmost routing option through the southern terminus area. This segment is 10.3 miles long. Approximately 75 percent of this segment crosses agricultural land. Segment 6A avoids an oil tank farm and oil fields and is located west of the Coalinga Canal. This route option crosses the proposed Coalinga Air Cargo Port site. Segment 6A is an alternative to Segment 6 of the Proposed Project route.
- **Segment 6B** (previously West-10)**.** This 11.7-mile segment represents the westernmost routing option in the southern terminus area. Segment 6B crosses several oil and water wells. The segment is generally to the west of most cultivated agricultural land. Segment 6B is the second alternative to Segment 6 of the Proposed Project route.

Section E presents a comparison of the impacts of each segment alternative to the segment of the Proposed Project that it would replace (i.e., Alternative Segment 2A is compared to Proposed Segment 2).

B.7 ALTERNATIVES ELIMINATED FROM EVALUATION

During the evaluation of alternatives for the 1986 Draft EIR/EIS, several alternatives were considered but eliminated from detailed analysis. These alternatives, and the reasons for their elimination, are described below.

B.7.1 LOS BANOS-GREGG-GATES 500 KV TRANSMISSION LINE

The Los Banos-Gregg-Gates 500 kV Transmission Line alternative would include building a new 500 kV line from Los Banos Substation, east across the San Joaquin Valley to Gregg Substation (immediately north of Fresno), and then south to Gates Substation. This line would be approximately 125 miles long and cross predominantly prime agricultural farmlands. This alternative would increase the capacity between Tesla and Midway to meet PG&E's transmission obligations, as well as provide additional transmission service to the Fresno area. Project facilities would include:

- Construction of approximately 125 miles of series compensated 500 kV line;
- Construction of a 500 kV station at Gregg;
- Installation of a 500/230 kV transformer at Gregg;
- Realignment of the existing Los Banos-Midway No. 2 500 kV line into Gates Substation;
- Modification of Los Banos and Gates Substations to accommodate the new 500 kV line, the realignment of the Los Banos-Midway No. 2 500 kV line into Gates, and other new electrical equipment;
- Installation of shunt capacitors at various existing substations;
- Possible installation of series capacitors at Gates or Midway Substations or both to compensate the 500 kV lines connecting to Diablo Canyon; and
- Reconductoring portions of the Gates-Arco-Midway 230 kV line.

The evaluation of the electrical feasibility of this alternative in 1986 showed that the load growth in the Fresno area did not require major new transmission service at that time. If and when the Fresno area required additional transmission service, the need could be met by the construction of a double circuit 230 kV transmission line (rather than a 500 kV line) between Gates and Gregg Substations. This would eliminate the need for the 500 kV station at Gregg Substation. Therefore, to make a direct comparison, this alternative should be compared to the preferred Los Banos-Gates transmission line plus the double circuit 230 kV line between Gates and Gregg.

Load growth studies did not support new service into Fresno in the 1980s and economics clearly favored the Proposed Project route. Therefore, the Los Banos-Gregg-Gates 500 kV alternative was eliminated from further consideration.

B.7.2 COASTAL/SALINAS VALLEY TRANSMISSION ALTERNATIVE

The Coastal/Salinas Valley Transmission alternative looked at two options to provide additional transmission capability south of Tesla Substation. The options are outlined below.

Option 1: Moss Landing-Diablo Canyon 500 kV Transmission Line. Build a 500 kV transmission line between Moss Landing Power Plant and the Diablo Canyon Nuclear Power Plant. Facilities for this option would include:

- Construction of approximately 140 miles of 500 kV line along the Pacific Coast, through the Coastal Range, or through Salinas Valley;
- Modification of Moss Landing and Diablo Canyon switchyards to accommodate new electrical equipment and the new 500 kV line;
- Installation of shunt capacitors at various existing substations;
- Possible installation or series capacitors at Gates or Midway Substations or both to compensate the 500 kV lines connecting to Diablo Canyon; and
- Reconductoring portions of the Gates-Arco-Midway 230 kV line.

This option was eliminated because of the excessive length of transmission line that would be required (75 percent longer than the Proposed Project) to meet the needs of the project. The extra line length would substantially increase the cost of the project. Furthermore, this option would not provide any opportunities to eliminate or avoid any significant environmental effects. Therefore, this option was determined to be unreasonable for further consideration.

Option 2: 500 kV Transmission Line Between the Moss Landing-Los Banos and Gates-Diablo Canyon Lines. Build a 500 kV transmission line connecting the existing Moss Landing-Los Banos 500 kV line with the existing Gates-Diablo Canyon 500 kV transmission line. Facilities for this option would include:

- Construction of a new 500 kV switching station between Moss Landing and Los Banos;
- Looping of the existing Moss Landing-Los Banos 500 kV line into this new switching station;
- Construction of a new 500 kV switching station between Gates and Diablo Canyon;
- Looping of the existing Gates-Diablo Canyon 500 kV line into this new switching station;
- Construction of approximately 105 miles of 500 kV transmission line between the Moss Landing-Los Banos and Gates-Diablo Canyon switching stations through the Salinas Valley or surrounding foothills;
- Installation of shunt capacitors at various existing substations;
- Possible installation of 500 kV series capacitors at Gates or Midway Substation or both to compensate the 500 kV transmission lines connecting to Diablo Canyon; and
- Reconductoring portions of the Gates-Arco-Midway 230 kV line.

This option was not considered for several reasons. It would require about 25 percent more transmission line than the Proposed Project route, and it would not allow the use of existing system infrastructure. It would require the construction of two new switching stations, rather than using the existing facilities at Los Banos and Gates. These new facilities and the extra line length would substantially increase the cost of the project. In addition, this option would not provide any opportunities to eliminate or avoid environmental effects.

B.7.3 WESTERN CORRIDOR ALTERNATIVE ROUTE SEGMENTS ELIMINATED

Section B.6.2 describes the four alternative route segments that would replace segments of the Proposed Western Corridor. Two other alternative route segments were considered in 1986, but eliminated because the issues that gave rise to these options were resolved. These segments are "crossover options": route segments that would allow a transition from the Western to the Eastern Corridor at different points along the route. They were developed so that they could be used in the event that severe environmental constraints were found along the Western Corridor. A brief description of these crossover options and their associated issues is provided below.

North Crossover. A north crossover was located just north of the Panoche Hills Wilderness Study Area (WSA). It was created for two reasons. The first was separation distance from the existing 500 kV line and the second was proximity to the WSA. At the point where the Western Corridor passes east of the WSA, the existing 500 kV line is approximately 2,000 feet from the WSA boundary. As a general siting guideline, proposed routes are sited so that a minimum separation distance of 2,000 feet (from the existing 500 kV line) is possible for system reliability. Initially, there was concern that there was not sufficient distance between the existing 500 kV line and the WSA boundary to allow the location of another 500 kV line. There was also a concern that the close proximity of the corridor to the WSA boundary would be perceived by the BLM as degrading the aesthetics and visual quality of the WSA.

Further analysis of system reliability by PG&E's electrical engineers had determined that there was sufficient separation between the WSA boundary and the existing 500 kV line to allow for the siting of another 500 kV line. Although transmission line separation may be less than the recommended 2,000 feet in two places, proper mitigation through strengthening new and existing towers resolves the issue. Additional review of the regulatory requirements pertaining to the WSA and further consultations with the BLM had resolved the potential issue of encroachment on the WSA boundary. Since both issues that led to the identification of the north crossover as a routing option were resolved, the north crossover was dropped from further analysis.

South Crossover. A south crossover was located just south of the intersection of Interstate 5 and State Route 145. This crossover was developed in response to early concerns that it would be difficult to locate a route through the oil fields and agricultural lands east of Coalinga. Upon further evaluation of land use data, two alternative route segments (Segments 6A and 6B) were located through this area (see Section B.6.2), eliminating the need for a crossover option to the east route. Therefore, the south crossover was also dropped from further analysis.

B.8 NO PROJECT ALTERNATIVE

CEQA requires an evaluation of the No Project Alternative that must include (a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and (b) the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. These two scenarios are addressed in Sections B.8.1 and B.8.2 below.

B.8.1 NO ACTION TAKEN BY PG&E

In this scenario, PG&E would not implement any of the proposed facility upgrades to the electric transmission system, nor would any alternatives be implemented. As described in Section A.2, PG&E states that this project is needed to improve system reliability by reducing or eliminating the need for load interruptions in Northern California due to constraints on Path 15, reduce overall energy supply costs to consumers in the ISO grid, primarily in Northern California, and unify the California energy market by allowing increased power transfers between Northern and Southern California.

The constraints on Path 15 have been in existence for some time, but a specific set of coincident circumstances is required for these constraints to result in severe problems (as were evidenced in January of 2001). Therefore, it is possible that no action at all could be taken and the outages required in January of 2001 might not re-occur. If outages do occur again, either infrequently or with increasing frequency, economic impacts to the State would be increasingly severe. However, under this scenario, there would be no environmental impacts associated with the No Project Alternative, since no new construction would occur.

B.8.2 REASONABLY FORESEEABLE ACTIONS

If neither the Proposed Project nor any alternative were approved by the CPUC, PG&E or other entities could implement alternative courses of action that could improve the Path 15 capacity problem. These actions are very speculative at this time; however, PG&E has identified the following actions that could be considered in the event that the CAISO determines that the Path 15 is needed but this Proposed Project does not proceed. These possible actions are described below.

B.8.2.1 New Generation North of Path 15

New generation projects are likely to be constructed North of Path 15; in fact, several projects are currently under construction. New generation, while it also places its own demands on the transmission system, would reduce the need for the south-north power transfer increase, which is one of the major reasons for constructing Path 15 improvements. Table B-4 presents a list of new generation projects that are located north of Path 15, based on information from the California Energy Commission. The status of each project is also listed.

Table B-4 Northern California Energy Facility Siting Status

Power Plant Name	County	Megawatts	On-Line Date*
Construction Completed in 2001			
Sutter Power Project	Sutter	540	July 2001
Los Medanos Energy Center	Contra Costa	555	July 2001
Under Construction in 2001			
Delta	Contra Costa	880	April 2002
Moss Landing	Monterey	1,060	June 2002
Calpine King City	Monterey	50	December 2001
Calpine Gilroy Phase I	Santa Clara	90 and 45	September 2001
Contra Costa	Contra Costa	530	July 2003
Three Mountain	Shasta	500	December 2003
Woodland Generating Station II	Stanislaus	80	October 2003
	Subtotal	**4,330 MW**	
Under Environmental Review			
Russell City Energy Center	Alameda	600	February 2004
East Altamont Energy Center	Alameda	1,100	May 2004
Colusa Power Project	Colusa	500	July 2004
Tracy Peaking Power Plant Project	Alameda	169	July 2002
Roseville Energy Facility	Placer	900	August 2004
Rio Linda/Elverta	Sacramento	560	May 2004
Sacramento Municipal Utility District	Sacramento	1000	May 2005
Potrero Unit 7	San Francisco	540	November 2003
Morro Bay	San Luis Obispo	1,200	January 2004
Metcalf	Santa Clara	600	July 2003
Spartan I Energy Center	Santa Clara	96	July 2002
Calpine Gilroy Phase II	Santa Clara	135	August 2002
Los Esteros Critical Energy Facility	Santa Clara	180	December 2002
Valero Cogeneration Project	Solano	102	April 2002
Total Megawatts		**12,012**	

* Estimated on-line date if approved and constructed

Source: CEC website (www.energy.ca.gov/sitingcases/status_all_projects.html)

As shown above, over 12,000 MW of generation are under construction or undergoing environmental review. This list includes only projects whose transmission connections would be at or north of the Los Banos Substation. To put these generation projects in the context of the Path 15 project, remember that the Proposed Path 15 Project would add 1,500 MW of transmission capacity to the Path 15 system.

However, several caveats should be noted about new generation. First, the addition of a certain amount of generation capacity north of Path 15 does eliminate the need for the additional transmission capacity between northern and southern California or the reliability benefits provided by this project (see Section A.2). Also, each new generator changes the region's power flow characteristics and the system must be reevaluated for its performance under the changing circumstances. Finally, new generation theoretically encourages older and less efficient power plants to retire, so the addition of 1,500 MW of new generation would not necessarily result in a 1,500 MW net increase in generating capacity.

B.8.2.2 Smaller Transmission System Upgrade

If the CAISO determines that a 1,500 MW increase in transmission capacity is required, a transmission line similar to the Proposed Project would need to be constructed. However, if the CAISO determines

that a smaller capacity increase is needed (e.g., 400 to 500 MW), PG&E could meet that need by installing a second 500 kV/230 kV transformer bank at the Gates Substation and reconductoring of the Gates-Panoche 230 kV transmission line.