B. DESCRIPTION OF PROPOSED PROJECT AND ALTERNATIVES

B.1 INTRODUCTION

Section B describes the Tri-Valley 2002 Capacity Increase Project ("Proposed Project@) that is proposed by PG&E Co. and the project alternatives. The information is intended to provide for a common understanding of the project parameters as they are analyzed in the Environmental Settings, Impacts and Mitigation sections.

Section B.2 describes the components of the Proposed Project. Section B.3 describes the construction process, and Section B.4 describes operation and maintenance procedures.

Sections B.5 through B.7 address project alternatives that were evaluated as required by the California Environmental Quality Act (CEQA). These are alternatives that might have potential environmental advantages over the Proposed Project and could feasibly attain the basic overall project objectives. Section B.5 describes the process through which the potential alternatives to this project were considered and selected. Section B.6 describes each of the alternatives selected for further consideration in this EIR and provides a description of the alternatives. The No Project Alternative is described in Section B.7.

B.2 DESCRIPTION OF THE PROPOSED PROJECT

Throughout this EIR, the components of the Proposed Project are presented in four sections, one for each of the three major geographic areas of the project (Pleasanton, Dublin/San Ramon, and North Livermore), and one for the second phase of PG&E Co.'s Proposed Project (Phase 2) which is not immediately needed. In this description of the Proposed Project, these components are described in the sub-sections listed below. Note that alternatives to the Proposed Project are described in this same order in Section B.6.

- Pleasanton Area (Section B.2.2.1)
- Dublin/San Ramon Area (Section B.2.2.2)
- North Livermore Area (Section B.2.2.3)
- Phase 2 (Section B.2.2.4)

B.2.1 OVERVIEW OF THE PROPOSED PROJECT

The Tri-Valley 2002 Capacity Increase Project is proposed by Pacific Gas and Electric Company (PG&E Co.) to serve the projected electric demand in the Cities of Dublin, Livermore, Pleasanton, and

San Ramon, and in portions of unincorporated Alameda and Contra Costa Counties adjacent to these cities (see Figure B-1). The need for these new transmission and distribution facilities is addressed in Section A.2. The proposed facilities are described in detail in this section. The location of the major elements of the project is illustrated in Figure B-2. They include:

Pleasanton Area:

- Modification of the existing Vineyard Substation (in Pleasanton) to include a 230 kV transmission interconnection.
- Installation of 2.8 miles of new 230 kV overhead double-circuit transmission line and 2.7 miles of 230 kV underground double-circuit transmission line to serve the Vineyard Substation, and a transition structure to convert the 230 kV overhead transmission line to an underground cable system.

North Livermore Area:

- Construction of a proposed North Livermore Substation, located 3 miles north of Interstate 580 at the intersection of May School Road and North Livermore Avenue.

Dublin/San Ramon Area:

- Construction of a proposed Dublin Substation, located 3 miles north of Interstate 580 and 1 mile east of Tassajara Road in Contra Costa County.

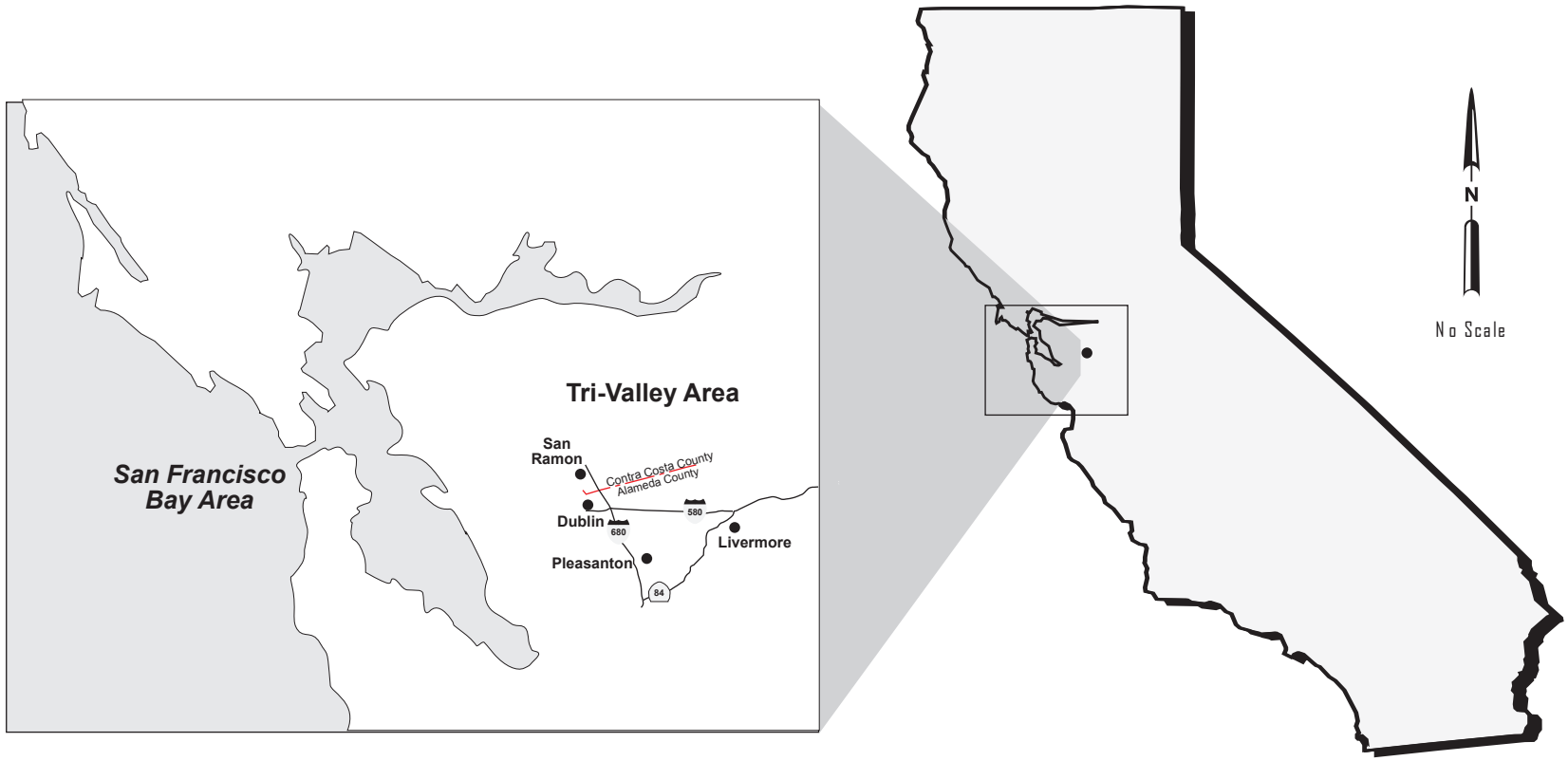
North Livermore and Dublin/San Ramon Areas:

- Installation of 7.9 miles of new 230 kV overhead double-circuit transmission line in PG&E Co.'s existing vacant easement to serve the Dublin and North Livermore substations.

Phase 2 (North Livermore to Tesla):

- Construction of approximately 10 miles of new 230 kV double-circuit transmission line in PG&E Co.'s existing vacant easement from the Contra Costa-Newark 230 kV line southeast to the Tesla Substation. This would connect the Dublin and North Livermore Substations directly to the Tesla Substation but would not be required until the Phase 1 connection to the Contra-Costa Newark 230 kV line becomes overloaded.

Areas within the project region are also referenced as the "South Area" (Pleasanton) and "North Area" (North Livermore, Dublin/San Ramon, and Proposed Phase 2)



Tri-Valley 2002 Capacity Increase Project EIR

Figure B-1

Regional Project Location

Aspen Environmental Group

Source: PEA, 1999

B.2.2 PROPOSED PROJECT COMPONENTS

Table B-1 summarizes the primary facilities and equipment associated with all project components.

Table B-1 Summary Description of Project Facilities

230 kV Overhead Transmission Line Facilities (Pleasanton, Dublin/San Ramon, North Livermore, and Phase 2)
• Voltage: 230 kV • Conductors: double-circuit, 1113 kcmil all aluminum, each circuit with three phases • Minimum ground clearance: 32 feet • Conductor diameter: 1.22 inches • Shield wire diameter: 0.385 inches • Structure types: self-supporting (galvanized gray) lattice towers and tubular steel poles • Structure heights: 80 feet to 150 feet • Approximate distance between structures: 800 to 2,000 feet
Pleasanton Area: Vineyard Substation Modification
• Transformer size at ultimate buildout: four 230/21kV, 75 megavoltamperes (MVA) transformers • 230 kV underground termination structures: 2 positions • Extend bus structure for the new 230 kV line position connection • Line switching equipment; Line traps, control, protection, and communication equipment • Reconnect transformer bank #1 high side to accept 230 kV transmission • Replace transformer bank #2 to accept 230 kV transmission • Install 21 kV breakers and associated equipment for new 21 kV distribution circuits; Capacitor banks
Pleasanton Area: Overhead to Underground Transition Structure
• Support structure type: post and beam steel, low profile termination structure, supports cable terminations and lightning arresters with 2 termination structures • 2 dead-end structures of post and beam steel, low profile type, slack span from dead-end tower double-circuit vertical configuration to a horizontal configuration; structure height: 25 to 30 feet
Pleasanton Area: Underground Transmission Line
• 230 kV cable and fiber optic cable installed in concrete duct bank • 6" PVC conduit and No. 5 rebar, under roadways only
North Livermore and Dublin Substations (Per Station)
• Developed acreage: 5 acres, fenced, with access road • Transformers, line traps, control, protection, and communication equipment • Transformer size: four 230/21kV, 45 megavoltamperes (MVA) transformers per station at ultimate buildout • Line and power transformer switching equipment • Bus structures • Telecommunication facilities (phone line or microwave tower) • Dead-end structures • Four 21 kV switchgear sets • Capacitor banks • Conductors: double-circuit, cross-linked, polyethylene-insulated, solid dielectric, single conductor cable, 2500-kcmil copper conductor, metallic impervious sheath, polyethylene outer jacket, each circuit with three cable phases, six cables total • Cable Diameter: 4 inches or more • Cable terminations: porcelain outer, pre-molded dielectric inner, silicon oil filled, about 9 feet in height • Conduit Type: 6-inch PVC in 9-way concrete duct bank (3 x 3), envelope dimensions 32 inches by 32 inches • Minimum Depth: 36 inches to top of duct • Splice Vaults: Reinforced concrete, 18 ft. long x 5 ft. wide x 8 ft. deep, 3 splices per vault • Total number of splice vaults: 13 per circuit (total of 26) • Total number of cable terminations: 12 • Lightning Arresters: metal oxide varistor type, one per phase, about 6 feet in height • Total number of lightning arresters: 12

Figure B-2 **Placeholder**

Proposed Transmission Line Routes and Substations

Page 1 of 2

Figure B-2 **Placeholder Proposed Transmission Line Routes and Substations (Page 2 of 2)**

B.2.2.1 Pleasanton Area Project Components

The project components in the Pleasanton Area (including South Livermore) are shown in Figure B-2 and listed below. Detailed information on construction methods is provided in Section B.4. The Proposed Project in the Pleasanton Area includes:

- Construction of a 2.8-mile-long overhead and 2.7-mile underground 230 kV double-circuit transmission line loop from PG&E Co.'s existing Contra Costa-Newark transmission line corridor to the Vineyard Substation.
- Modification of the Vineyard Substation to accommodate the new 230 kV transmission circuits.
- Installation of additional 21 kV distribution circuits from Vineyard Substation.

Vineyard Substation Modification

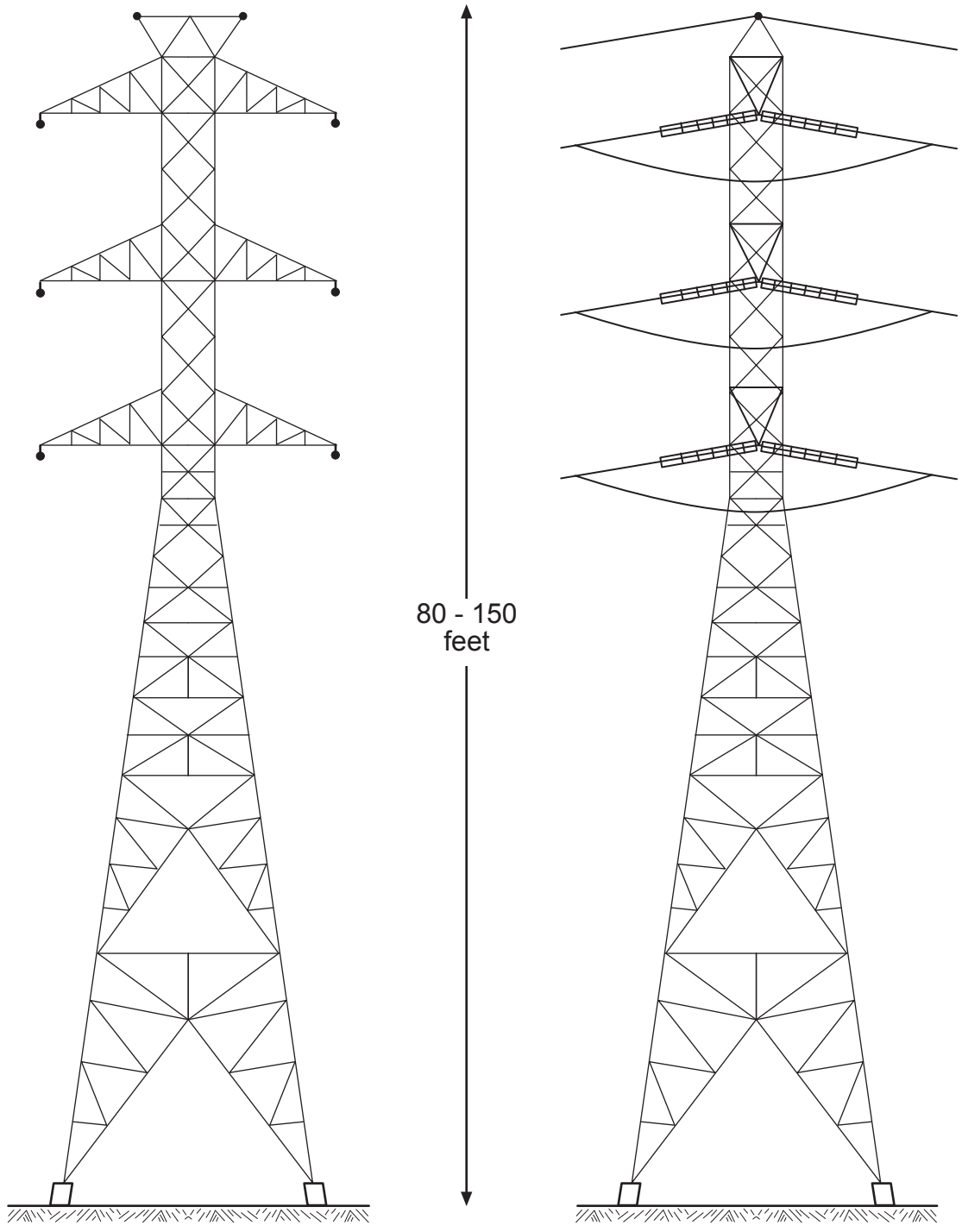
One existing 60/21 kV transformer bank would be replaced with a 230/21 transformer bank. Accordingly, the existing 230/60/21 kV transformer bank would be changed from 60 kV to 230 kV**.** The existing 60 kV circuit switches would be changed to 230 kV switches. Three existing 60 kV overhead line terminations would be removed and two new 230 kV underground cable termination stations would be installed. One 230 kV power circuit breaker would be installed for 230 kV underground cable line. Two 21 kV outlet circuits would be built. The area that would be occupied by the new equipment is within the existing footprint of the substation.

230 kV Transmission Line

Overhead Segment. The proposed overhead 230 kV transmission line route would originate approximately 1.0 mile east of the entrance to the Vallecitos Nuclear Center along Route 84 (see Figure B-2). The line would originate in PG&E Co.'s existing Tesla-Newark transmission line corridor, which is occupied by four rows of standard lattice steel towers. It would connect with the existing Contra Costa–Newark transmission line and travel north for approximately 2.8 miles through moderately steep sloped rangeland toward the City of Pleasanton from the south. The route would transition to underground approximately halfway to the Vineyard Substation. This portion of the transmission line route would use only lattice steel towers, as shown in Figure B-3.

To connect the new 230 kV transmission line that would connect to the Vineyard Substation with the existing Contra Costa-Newark 230 kV line (located in the Tesla-Newark corridor), a new single-circuit lattice tower and two short dead-end1 towers would be installed in a parallel position just south of, and adjacent to, the Contra Costa-Newark line. Each dead-end tower would carry two circuits northward under the existing transmission line to a new tower located between the Contra Costa-Newark line and the Stanislaus-Newark line. From this tower, the double-circuit lines would pass over the lines in the corridor and northward to the Vineyard Substation.

1 "Dead-end" towers are the structures at the termination point of a transmission line, or at the overhead/ underground transition point.



Not to Scale

Tri-Valley 2002 Capacity Increase Project EIR

Figure B-3

Typical Lattice Steel Tower

Aspen Environmental Group

Source: PEA, 1999

Overhead-to-Underground Transition Structure. The transition structure (illustrated in Figure B-4) would be constructed below the natural ridgeline where, in part due to landscape screening, visibility from the City of Pleasanton would be minimized. The transition structure would consist of two dead-end structures for terminating both 230 kV overhead circuits, two low-profile support structures for cable terminations and lightning arresters, and two splice vaults for splicing cables and facilitating access for future repairs to the cables or cable terminations. Other equipment located at the site would include cable sheath arresters, conductor jumpers, grounding conductors, fiber-optic facilities, fencing, and outdoor lighting. The layout would require an area of approximately 0.2 to 0.5 acres, including vehicle access, and would be graded flat or in a terraced layout. An access road to the transition structure would be built from the City of Pleasanton Kottinger Ranch water storage tank site.

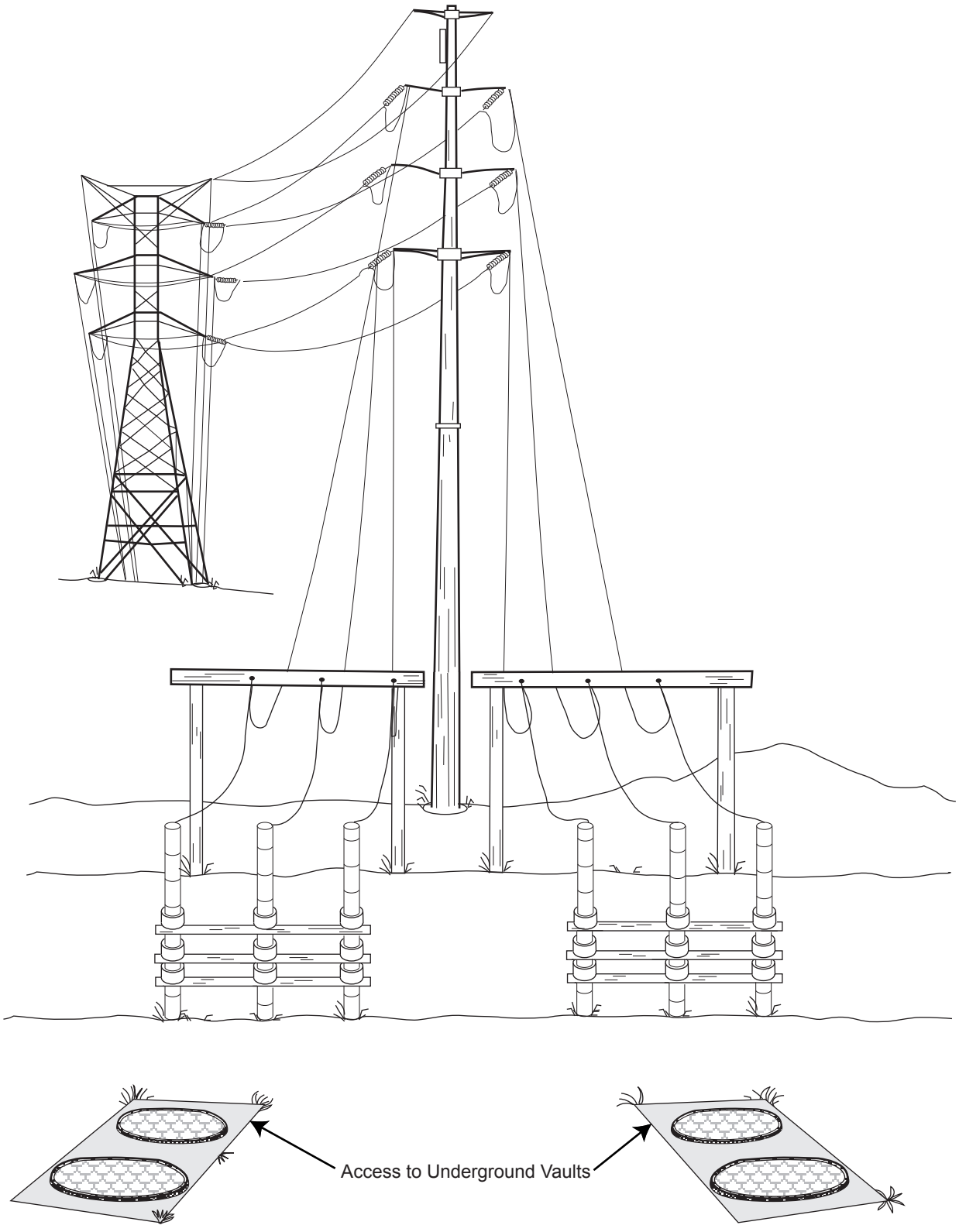
Underground Segment. The underground segment begins at Milepost M2.8 (see Figure B-2) and traverses the ridge to the existing Kottinger Ranch water tank in south Pleasanton. To obtain overhead transmission line easements north of the access road to the city's water tank, residents would have to be displaced from their homes. PG&E Co. therefore determined that an underground transmission line was the most feasible option.

After passing the water tank, the route continues down an existing paved road and into city streets. The precise route for the underground trench within the streets cannot be determined until final exploration or "potholing" takes place. This is not normally done until the project is approved due to the invasive nature of opening up the pavement. However, PG&E Co. secured subsurface infrastructure mapping from the City of Pleasanton and other utilities, and has determined that a route is feasible within the paved area of these streets. The exception is the Arroyo Valle waterway crossing, which will be constructed by the horizontal dry boring method adjacent to the Bernal Street Bridge.

The city streets that the Proposed Project is located within include Benedict, Smallwood, Hearst, and Bernal. The section of Benedict Court on the proposed route is approximately 1,100 feet in length. The Smallwood Court segment is approximately 300 feet in length. The Hearst Drive segment is approximately 2,500 feet in length and the Bernal Road segment is approximately 4,300 feet in length. Many segments of these streets only have homes on one side of the street. The Project would be constructed on the opposite side of the street in these cases. The underground segment would continue down Bernal until reaching the existing Vineyard Substation.

One trench approximately 3 to 5 feet wide by 6 to 8 feet deep would be required.[2] The minimum depth of cover would be 32 inches as required by CPUC General Order 128. The 230 kV underground transmission line would consist of six cross-linked, polyethylene-insulated, solid dielectric cables (two

[2] Although the 230 kV underground transmission line would only require a 3-foot-wide trench, the portion of the route that is between Hearst Drive and Arroyo Valle may require a wider trench to accommodate future distribution circuits. The 230 kV circuit would need to be offset from the anticipated 21 kV distribution circuit due to access and heat rejection requirements. Therefore, the trench in this portion of the route would be constructed to a 5-foot width. By constructing a combined trench, PG&E Co. proposes to minimize construction impacts in the City of Pleasanton by reducing future construction requirements.



Tri-Valley 2002 Capacity Increase Project EIR

Figure B-4

Typical Transition Structure

Source: PEA, 1999

Aspen Environmental Group

circuits) in a double-circuit duct bank. The duct bank would consist of nine 6-inch polyvinyl chloride (PVC) ducts, encased in concrete in a trench between the transition structure at Milepost M2.8 and the Vineyard Substation at Stanley Boulevard and Bernal Avenue.

Transmission Line Right-of-Way. As described above, the 230 kV transmission line from the Tesla-Newark corridor to the Vineyard Substation would require the modification of an existing tower and two short dead-end tap towers within PG&E Co.'s existing Tesla-Newark corridor south of Route 84. Once the proposed line travels north and clears the existing PG&E Co. easements, a new 120-foot easement would be required. This easement would place basic restrictions on development within its boundaries. The present and foreseeable land use for the proposed alignment is cattle grazing with a County General Plan minimum development requirement of 200 acres per dwelling unit. The majority of the alignment traverses fairly rugged terrain with side slopes exceeding 35 percent. Once the alignment crosses over the ranch property, it approaches a ridgeline that approximates the southern boundary of the City of Pleasanton. PG&E Co. selected the proposed overhead alignment south of this point back to Route 84 so it would not be visible from within the city.

At the approximate city limit line, PG&E Co. would transition the overhead electrical circuits to a solid dielectric underground cable system (Appendix B summarizes underground transmission line technology and history). PG&E Co. proposes to install a solid dielectric cable underground system, including cable in a PVC duct, installed within a concrete duct bank. PG&E Co. is working with representatives of the owners of the property on which the transition structure would be located to construct the underground alignment with consideration for future access plans. On open land areas of the cable route, the temporary construction easement of 30 feet would consist of fifteen-foot strips on each side of the centerline of trench. One side would be needed for access along the trench by heavy equipment and vehicles where there are no permanent roads, while the other side would be used for temporary piling of spoils and lay down areas for pipe and other equipment. Where ten-foot wide excavations for splice vaults are made, ten feet of clearance would remain on either side of the excavation for access and lay down areas. Thus, the 30-foot wide temporary construction easement allows for the passage of vehicles and material around open trench segments to allow for an economical installation of the conduit. PG&E Co. would construct an all-weather road over the top of the cable system for access and protection.

By contrast, a 20-foot workspace is acceptable because the public roadway franchise agreement protects the utility installation from adjacent encroachment, thereby not requiring specific easement protection. Encroachments can prevent the utility from opening the conduit trench for maintenance or repair requirements. The basis for a 30-foot easement in open country is to provide future access and protection from building encroachment. Placing the conduit in the center of the easement provides a minimum 15-foot working area on both sides to place excavation equipment and spoil material.

After the cable system traverses the undeveloped property, it would enter city streets and be designed and constructed to comply with City of Pleasanton franchise requirements. The proposed underground line would be installed in the following streets:

- Benedict Court;
- Smallwood Court;
- Hearst Drive; and
- Bernal Road.

B.2.2.2 Dublin/San Ramon Area Project Components

Dublin Substation

The Dublin Substation, a new 230 kV substation, would be constructed to serve the load growth north of Interstate 580. A new 230 kV transmission line in PG&E Co.'s existing vacant right-of-way would serve this substation. The Dublin Substation would have an associated distribution system to provide power to customers. Detailed information on construction methods is provided in Section B.3.

As shown on Figure B-2, the Dublin Substation would be located just north of PG&E Co.'s existing right-of-way, approximately one mile east of the proposed extension of Tassajara Road in Contra Costa County. The proposed substation site is located in rolling rangeland used for cattle grazing. PG&E Co. proposes to construct the Dublin Substation without landscape screening during its initial years of operation. According to PG&E Co., the remote ranch parcel is north of an approved development within Alameda County, and south and east of approved development in Contra Costa County. PG&E Co. estimates that it may be 10 to 15 years before the Dublin Substation site becomes surrounded by residential development. Once development agreements have been finalized, PG&E Co. would install landscape measures appropriate to the surrounding setting and uses. The original purchase of 5 acres would allow for the additional placement of appropriate screening around the working substation without service interruptions. Approximately 0.4 miles of existing rocked farm road would be improved to allow for two-way construction traffic. An additional 0.5 miles of new all-weather access road would need to be built to the substation.

The Dublin Substation would be an un-staffed and fenced, remote-controlled facility on 5-acre parcels (see Figure B-5 for a plan view of the substation). The substation would require weekly inspections of equipment for normal maintenance. During emergency operations, there may be numerous visits by up to 10 persons for switching and repair work.

Substation Design and Equipment. Within the fenced perimeter of the Dublin Substation would be paved with a 20-foot wide ring road to allow for maintenance and access to all large equipment within the substation. The remainder of the substation surface would be compacted and rocked with gravel to provide an all-weather surface. Four 21-foot by 36-foot metal-clad switchgear buildings would also be included. The spill prevention, control, and countermeasure (SPCC) ponds would be consistent with Title 40 of the Code of Federal Regulations. Oil containment facilities would be sized to contain 110%

of the oil volume of the largest oil filled equipment (45 MVA transformers). The substation would ultimately consist of four 230/21 kV, 45 MVA transformers with a total capacity of approximately 180 MW. Major equipment at both the Dublin Substation would include the following:

- 230 kV bus structures including 230 kV bus sectionalizing switches (for transmitting 230 kV power)
- Two 230 kV circuit breakers (for switching and protecting 230 kV transmission lines from the Newark Substation and Contra Costa Power Plant)
- Four 230/21 kV power circuit breakers (for switching and protecting four 230/21 kV power transformers)
- Four 230 kV distribution power transformers
- Four 21 kV metal-clad switchgears
- Capacitor banks.

In addition to the above, PG&E Co. would install related electrical equipment at the Dublin Substation, such as 230 kV disconnecting switches, reactors, instrument transformers, metal-clad switchgear, protective relaying, metering and control equipment, supervisory control and data acquisition equipment, telemetering equipment, auxiliary alternating current (ac) and direct current (dc) power system, electrical grounding system, and underground conduits or trench systems. Figure B-5 provides a plan view of the equipment to be installed at the Dublin Substation (as well as at the North Livermore Substation).

230 kV Transmission Line

The proposed 230 kV transmission line route serving the Dublin Substation is shown on Figure B-2. The first 4 miles of the line, through North Livermore, traverse due west. At the 4-mile mark, the route turns 20 degrees in the southwest direction. It continues 0.7 miles and then makes a 12 degree turn towards the north and continues for 1.3 miles. The route makes a final 8 degree turn north, heading almost due west, and traverses 0.9 miles before terminating at the Dublin Substation site. The total distance for the route between the Contra Costa-Newark line and the Dublin Substation would be 6.9 miles.

It would connect to PG&E Co.'s existing Contra Costa-Newark transmission line north of the City of Livermore and would terminate in the west at the proposed Dublin Substation. The route is described in Section B.2.2.3, and crosses primarily grassland within an existing PG&E Co. vacant right-of-way that is approximately 75 feet wide. The maximum right-of-way needed is 50 feet on each side of the centerline (or 100 feet total). Approximately 25 additional feet of right-of-way would need to be acquired (or about 12 feet on each side of the existing easement).

Distribution Lines

Ultimate distribution circuit construction from the Dublin Substation would involve the installation of twelve 21 kV distribution circuits, with some potentially located in PG&E Co. easements. The 21 kV distribution circuits would be a combination of overhead conductors on poles and underground cable in conduit.

B.2.2.3 North Livermore Area Project Components

North Livermore Substation

The North Livermore Substation would be identical to the Dublin Substation (see Section B.2.2.2) in terms of the size, layout, and equipment. It would be constructed inside an earthen landscaped berm, with a precast concrete wall structure and vegetation appropriate for the setting. The substation would be set back approximately 60 feet from North Livermore Avenue to allow for any future widening of the roadway. The setback would also accommodate the length of driveway required to handle a mobile tractor trailer in the event of a transformer exchange, which would allow the normal traffic flow on North Livermore Avenue to be uninterrupted.

230 kV Transmission Line to North Livermore Substation

The proposed 230 kV transmission line (which would serve both the Dublin and North Livermore Substations) between the Contra Costa-Newark line and the new substations would support two circuits of conductor known as 1,113,000 circular mils of all-aluminum conductor (1113 kcmil AAC). This conductor is 1.22 inches in diameter. Each circuit would consist of three phases (three wires) and one shield wire at the top of the tower to protect the system from lightning strikes.[3] A new 80- to 150-foot lattice-type steel tower structure compatible with the existing Contra Costa-Newark 230 kV double-circuit transmission line, as shown in Figure B-3, would be used to intercept circuit #2 of the Contra Costa-Newark 230 kV transmission line (which, in this location, has diverged from the Tesla-Newark Corridor and runs north-south through Livermore). A new 60- to 80-foot single-circuit lattice tower would be installed on each side of the new double-circuit structure to allow each of the two circuits of the new line to pass under circuit #1 of the Contra Costa-Newark line. This configuration of three lattice-type steel structures would facilitate the transition to lattice towers or tubular steel pole structures (ranging in height from 80 to 150 feet), as shown in Figures B-3 (lattice tower), B-6 (tubular steel pole) and B-7 (tubular steel pose with distribution underbuild), which would be used from the intersection point to the new Dublin and North Livermore Substations.

From the Contra Costa-Newark Line, the transmission line route to the North Livermore Substation heads west for 2.1 miles and then turns south on North Livermore Avenue. It continues south one mile to the substation location just west of May School Road.

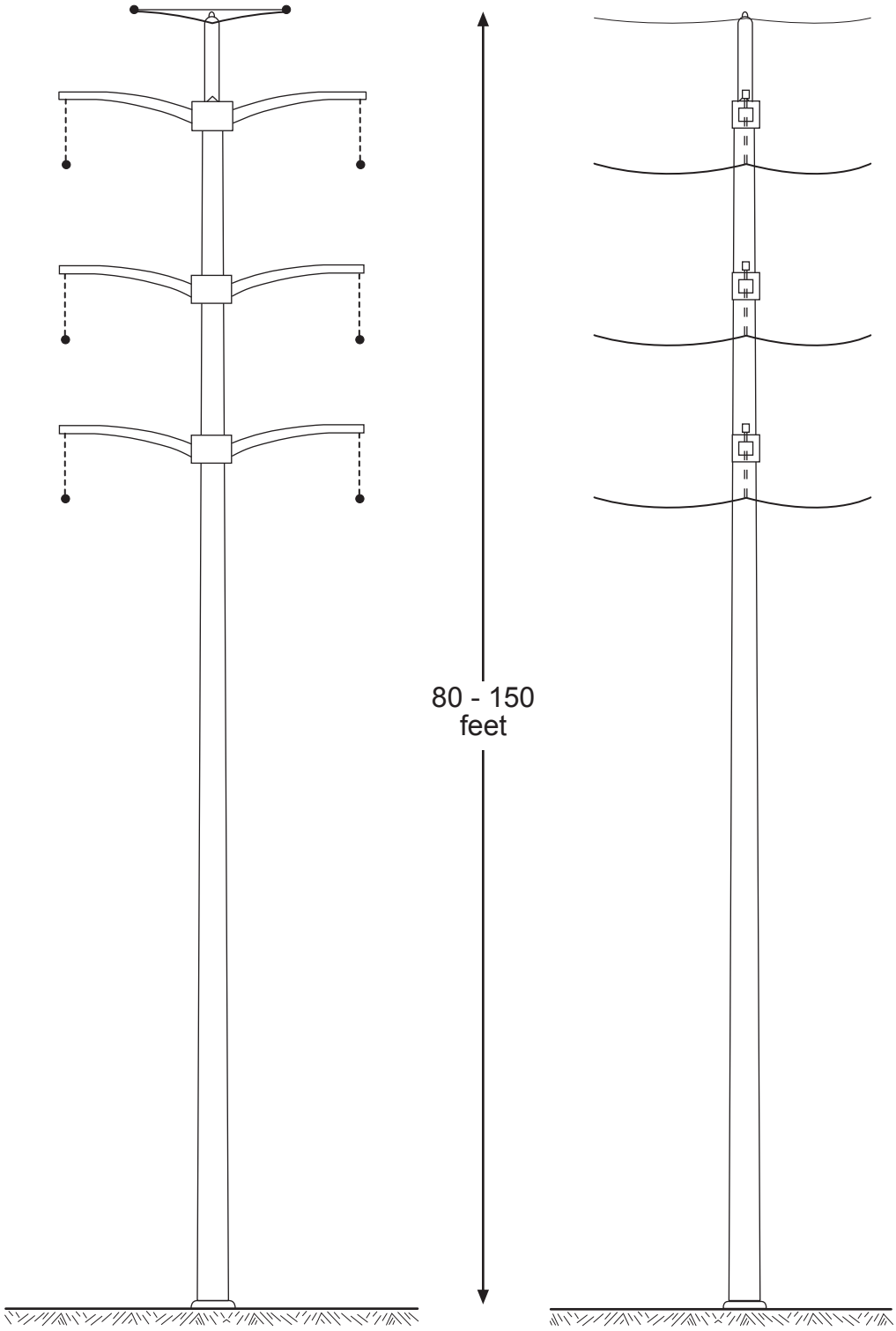
[3] The shield wire could include a fiber-optic cable system.

Figure B-5 **Placeholder**

Plan View of Dublin and North Livermore Substations (Page 1 of 2)

Figure B-5 **Placeholder**

Plan View of Dublin and North Livermore Substations (Page 2 of 2**)**



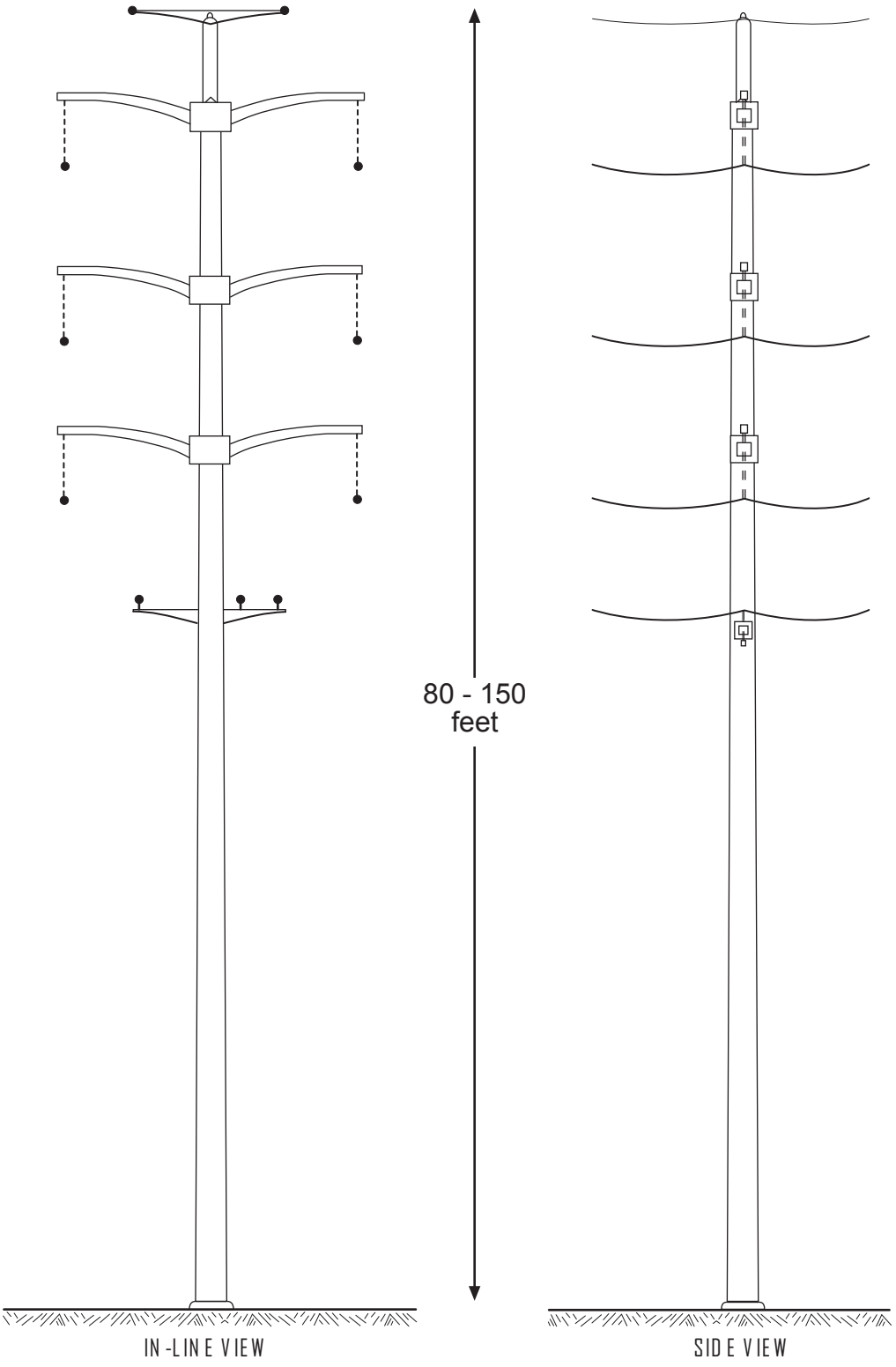
Tri-Valley 2002 Capacity Increase Project EIR

Figure B-6

Typical Tubular Steel Pole

Source: PEA, 1999

Aspen Environmental Group



Tri-Valley 2002 Capacity Increase Project EIR

Figure B-7

Typical Tubular Steel Pole with Underbuild

Aspen Environmental Group

Source: PEA, 1999

B.2.2.4 Phase 2 Project Components

When the transformer loading at the North Livermore and Dublin Substations approaches the current carrying limit of the Contra Costa-Newark 230 kV circuit, it would be necessary to construct approximately 10 miles of double-circuit, looped-configuration transmission line to the Tesla Substation (see Figure B-2). The timing of construction of this project phase is not known, but as discussed in Section A.2.4, PG&E Co. states that it expects Phase 2 to be needed between 2004 and 2007.

This line would be constructed from the present loop location on the Contra Costa-Newark line using PG&E Co.'s vacant easement position through the Altamont Pass to a breaker position at Tesla Substation. Transmission towers would include those shown in Figures B-6 (tubular steel pole) and B-7 (tubular steel pose with distribution underbuild).

The location of this transmission line follows a 75-foot-wide transmission easement acquired by PG&E Co. in the 1960s. The maximum right-of-way needed is 60 feet on each side of the centerline (or 120 feet total). Approximately 45 additional feet of right-of-way would need to be acquired (or about 22 feet on each side of the existing easement). This easement extends from Tesla Substation on Patterson Pass Road in eastern Alameda County to the San Ramon Substation in the City of San Ramon on Alcosta Boulevard. The proposed Phase 2 plan would use the easternmost 10 miles of this easement, from its intersection with the Contra Costa-Newark 230 kV transmission line near Vasco Road to its origin at Tesla Substation. This easement traverses gently to moderately sloped grazing land, mostly encumbered with windfarms through the Altamont Hills. Some relocations of this easement may be necessary at the Browning Ferris Industries (BFI) Landfill at Vasco Road and within some of the windfarm development where there are encroachments on PG&E Co.'s easement.

B.3 PROPOSED PROJECT CONSTRUCTION

B.3.1 CONSTRUCTION WORKFORCE AND EQUIPMENT

The construction work force for the Tri-Valley Project would average approximately 60 to 70 workers over a 12-month period. The work force would vary depending on the activities in progress. During surveying, site preparation, and access road preparation, 10 to 20 workers would be needed. Between 40 and 50 workers would be needed during the most active period when multiple phases of the work are being completed simultaneously. As an example, tower assembly and erection activities could be underway in the North Area while tower foundations are being installed in the South Area. As phases of the work are completed, the work force would gradually decline. A small work force of 10 workers would remain to complete required project clean-up activities. Equipment that would be used during construction of the project is listed in Table B-2.

Table B-2 Equipment Used During Construction

Equipment	Use
Equipment Required for Overhead Construction and Substations	
Crawler tractor	Road construction
Motorized grader	Road construction
Tractor-mounted backhoe	Install drainage
Truck-mounted auger	Install fences and poles
½-ton pickup	Transport personnel
Crew-cab truck	Transport personnel
Air compressor	Drive pneumatic tools
Trucks and trailers (2-60 tons)	Haul materials
Mechanics service trucks	Service vehicles
Crawler-mounted auger	Excavate foundations
Tiltbed trailer	Haul equipment
Backhoe	Excavate foundations
Concrete mixer trucks	Haul concrete
Tool van	Tool storage
Mobile office trailer	Supervision and clerical office
15-, 30-, and 80-ton cranes (mobile)	Erect structures
Tensioners (truck mounted)	Install conductor
Pullers (truck-mounted)	Install conductor
Reel trailers with reel stands (semitrailer type)	Haul conductor
Tractors (semi-type)	Haul conductor
Take-up trailers (sock line)	Install conductor
Reel winders	Install conductor
Line truck	Install clearance structures
Helicopter	Install sock line, haul material
Tractor, D7 Caterpillar	Install conductor
Converter dolly	Install conductor
4x4 SUVs	Transport personnel
Equipment Required for Underground Construction	
Pickup trucks	Transport construction personnel
2-ton flatbed truck	Haul materials
Flatbed boom truck	Haul and unload materials
Rigging truck	Haul tools and equipment
Mechanic truck	Service and repair equipment
Winch truck	Installing and pulling rope into position in conduits
Cable puller truck	Pulling transmission cables through conduits
Cement trucks	Transporting and pouring of back-fill slurry
Shop vans	Store tools
Crawler backhoe	Excavate trenches (excavate around obstructions)
Large backhoe	Excavate trenches (main trencher)
Dump trucks	Hauling of trench and excavation spoils/importing backfill
Large mobile crane	Lifting/loading/setting of 20-ton cable reels and pre-fabricated splice vaults and lifting cable ends on terminating structures
Small mobile cranes (< 12 tons)	Load and unload materials
Transport	Haul structural materials
Cable reel trailers	Transporting cable reels and feeding cables into conduits
Splice trailer (40 ft)	Splicing supplies / air conditioning of manholes
Air compressors	Operate air tools

Equipment	Use
Air tampers	Compact soil
Rollers	Repaving streets over trench and manhole locations
Portable generators	Construction power
Horizontal dry boring equipment	For horizontal bores

B.3.2 TRANSMISSION LINE (OVERHEAD AND UNDERGROUND) AND SUBSTATION CONSTRUCTION

B.3.2.1 Pleasanton Area Construction

Vineyard Substation Modification

New structures in the Vineyard Substation would be developed within the existing fenced area. Reinforced concrete footings and slabs would be constructed to support structures and equipment. PG&E Co. would extend the existing buried conduit installation to cover the expanded area for the electrical control and communication cables. PG&E Co. would extend the existing grounding mat to cover the modified area and install gravel over the new area to match the existing gravel level.

Structures would be erected to support busses, circuit breakers, switches, overhead conductors, instrument transformers and other electrical equipment, as well as to terminate incoming transmission lines. PG&E Co. would use fabricated tubular steel structures. Structures within the substation would be grounded to the station grounding grid. Workers would set the equipment on slabs and footings, and would either bolt or weld the equipment securely to meet the applicable seismic requirements. Equipment slated for installation includes high-voltage circuit breakers and air switches, structures and bus work, high-voltage instrument transformers and line traps, control and power cables, metering, relaying, and communication equipment.

230 kV Overhead Transmission Line (Tesla-Newark Corridor to South of Pleasanton)

The procedures for bringing personnel, materials, and equipment to each structure site, constructing the supporting structure foundations, erecting the supporting structure, and stringing the conductors would vary along the route alignment. Transmission line materials would be stockpiled on General Electric property through a land rental agreement. Sufficient paved area exists on this property and no natural ground disturbance would be necessary. To construct the overhead portion of the South Area transmission line (approximately 2.8 miles), PG&E Co. would construct approximately 0.8 miles of new all-weather (gravel) road. Construction vehicles would use 3 miles of an existing farm road and drive cross country over 0.8 miles of grazing land.

Overhead-to-Underground Transition Structure

The construction of the transition station south of Pleasanton will require the excavation of approximately 1,500 cubic yards of material in order to place the station behind and below the ridgeline at the Pleasanton City limits. Some of the excavated material will be used on site to prepare an earthen berm on the north side of the station in order to enhance the visual screening of station equipment. The majority of the excavated material will be deposited on-site per landowners' instructions. The delivery of earthmoving equipment would be unloaded at Benedict Court, a dead-end cul de sac. Approximately 20 trips of ten cubic yard capacity haul trucks will be needed for engineered fill, completed over a three to four day period. Foundation concrete will be delivered directly to the site and is estimated to require 30 trips by five-yard mixers over a two-week period. The transition structure equipment would be delivered by vendor truck on a constant flow basis. Due to the size and weight of the transformers, lane closures and traffic control will be required while the oversized transport vehicles maneuver onto the sites. This is estimated to require less than 20 minutes of lane control at each location for no more than three occurrences during delivery over a one-week period.

230 kV Underground Transmission Line

Construction Methods. The underground transmission line, approximately 2.7 miles long, would be installed from Milepost 2.8 (the overhead-underground transition station) to the Vineyard Substation. The southernmost portion of this route would be through open space, and the northern portions would be through city streets.

The work would be completed using cut and cover construction (open trenching) of the underground power line, conduits, and duct banks. Duct bank containing the solid dielectric cables would be installed in a trench approximately 3 feet wide and 8 feet deep. The duct bank would have a minimum cover of 32 inches. Approximately every 1,500 feet, splice vaults would be incorporated for installing cables and splicing sections of cables together. Each circuit would be capable of carrying 400 MVA per circuit at the normal conductor rating of 90 degrees centigrade. Cables would rise out of the ground at the transition station and at the Vineyard Substation, and they would terminate on support structures.

PG&E Co. would conduct soil sampling and potholing before construction. Soil information would be provided to construction crews to inform them about soil conditions and utility locations. If hazardous materials are encountered in soils from the trench, work would be stopped until the material is properly characterized and appropriate measures are taken to protect human health and the environment. PG&E Co. states that hazardous materials would be handled, transported, and disposed of in accordance with federal, state, and local environmental regulations, including Chapter 6.95 of the California Health and Safety Code and Title 22 of the California Code of Regulations.

With two simultaneous work locations, one on Bernal and one on other streets, PG&E Co. would need three months of five-day work weeks to complete the 2.7 miles of underground construction. This assumes 75 feet per day at each of the two locations to complete trenching/installation of conduit and racks, vaults at 1,500 to 2,000 foot intervals, pouring slurry backfill and concrete cap, and repaving.

No more than 300 feet would be open in either location at any one time, pursuant to the City of Pleasanton's requirements for the Project. The off-road segments and the Arroyo Valle bore are not included in these estimates, but could be done by a third crew at the same time.

Wire pulling in the underground segment of the Project is expected to take approximately 3 additional months. This estimate assumes splicing at two vaults at a time on a five day per week schedule. Each 300-foot segment would be closed within four days and openings would be plated at night.

Standard erosion and dust control measures would be used by PG&E Co. during construction. These methods include installation of sediment and erosion control structures according to best management practices (BMPs) to protect biological resources, roadways, and adjacent properties. Watering for dust control would also be employed.

PG&E Co. would impose temporary lane closures along residential streets during construction of underground segments, in coordination with the City of Pleasanton. PG&E Co. is a member of the California Joint Utility Traffic Control Committee, which in 1996 published the *Work Area Protection and Traffic Control Manual*. The traffic control plans and associated text depicted in this manual conform to the guidelines established by the Federal and State Departments of Transportation. PG&E Co. would follow the recommendations in this manual regarding basic standards for the safe movement of traffic upon highways and streets in accordance with Section 21400 of the California Vehicle Code. These recommendations include provisions for safe access of police, fire, and other rescue vehicles. In addition, PG&E Co. has stated that it would obtain roadway encroachment permits from the City of Pleasanton and would submit a traffic management plan subject to agency review and approval. PG&E Co. estimates that the City of Pleasanton would permit no more than 600 feet of linear activity in any one street segment. Since each 600-foot segment may require up to four weeks to construct, it will be necessary to have simultaneous construction within Bernal Avenue and one other street location in order to have the underground segment completed and wire installed by June 2002. No more than 300 feet of actual trench would be open at any one time and security plating would be placed over all excavations by the conclusion of the permitted work hours.

To construct the transition station, provide year-round maintenance access, and protect the underground cableway from accidental dig-ins, PG&E Co. proposes to construct 0.4 mile of new roadway over the underground cable. This new road would connect the transition station to the existing access road leading to the water tank above Benedict Court. The water tank access road, approximately 0.4 mile long, would be used to install the remaining segment of underground cable before reaching city streets. The remaining length of underground cable would be installed within City of Pleasanton streets per the existing city franchise agreement.

Horizontal Dry Boring. The underground line would cross Arroyo Valle Creek at Bernal Avenue. Open trenching through Arroyo Valle Creek could cause sedimentation within the creek and affect biological resources in the area. Therefore, PG&E Co. proposes to use a crossing method called "horizontal dry boring" for the crossing of Arroyo Valley Creek. This construction technique would

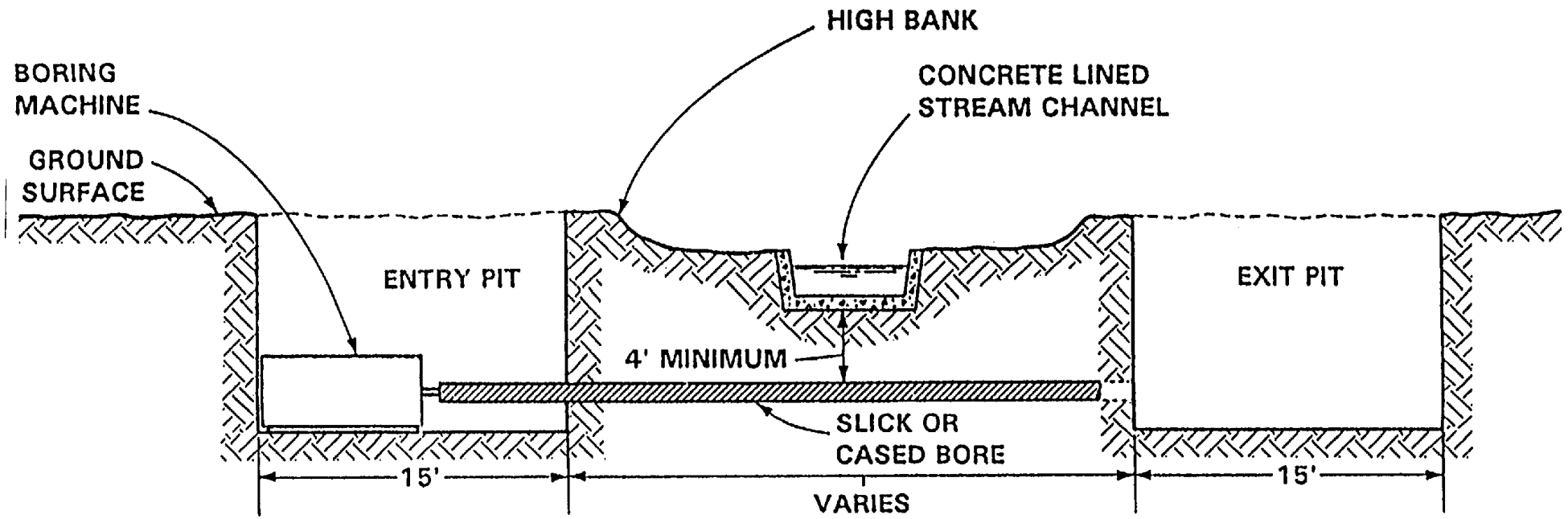
result in up to two steel casings, each between 30 and 42 inches in diameter, to be installed under the creek. The casings would be located at least 5 feet below the creek bed or as required by the permitting agency (Streambed Alteration Permit from the California Department of Fish and Game). The dry boring operation under the creek would begin at the north end of the bridge in an underground easement area leading to the Vineyard Substation. An area approximately 25 feet by 100 feet would be used at this location for laydown and boring. A shored trench of approximately 20 feet deep would be used as a receiving area for the bore casing. The bore would be approximately 5 feet below the creek bed and approximately 15 feet below Bernal Avenue.

Dry boring would begin by digging a bore pit at the sending end and a trench at the receiving end of the bore. The bore pit would be approximately 24 feet by 8 feet wide and would be approximately 20 feet deep. The elevation at the bottom of the bore pit and the receiving trench would be about the same. The horizontal bore equipment would then be installed in the bore pit. The steel casing would be welded in 10- to 15-foot sections and jacked into the bore as the boring operation proceeds.

The actual volume of soil removed from the creek bore is estimated to be approximately 100 cubic yards. All spoils and asphalt would be loaded straight from the bore area onto trucks for removal. At no time would spoils be stored on site. In addition to the boring machinery, a loader, backhoe, and dump truck would be used at both ends of the bore.

The racked PVC conduit bundles would be arranged in a circular pattern. The conduit bundles would be assembled completely before being pulled through the steel casing. Once boring is complete, the trench would be extended to meet the exposed cable at the south end of the bridge where the conduits would be joined together.

The setup for the dry boring operation would require a crew of four, while the operation of the bore would only require two or three crew members. The duct pull would require a crew of four to six. The length of time estimated for completing the bore is three weeks.



Tri-Valley 2002 Capacity Increase Project EIR

Figure B-8

Cross-Section of Typical Bored Crossing

Aspen Environmental Group

Source: Pacific Pipeline Final EIS/EIR.

Construction Activities. As illustrated in Figure B-9, the major construction activities associated with installation of underground cable are as follows:

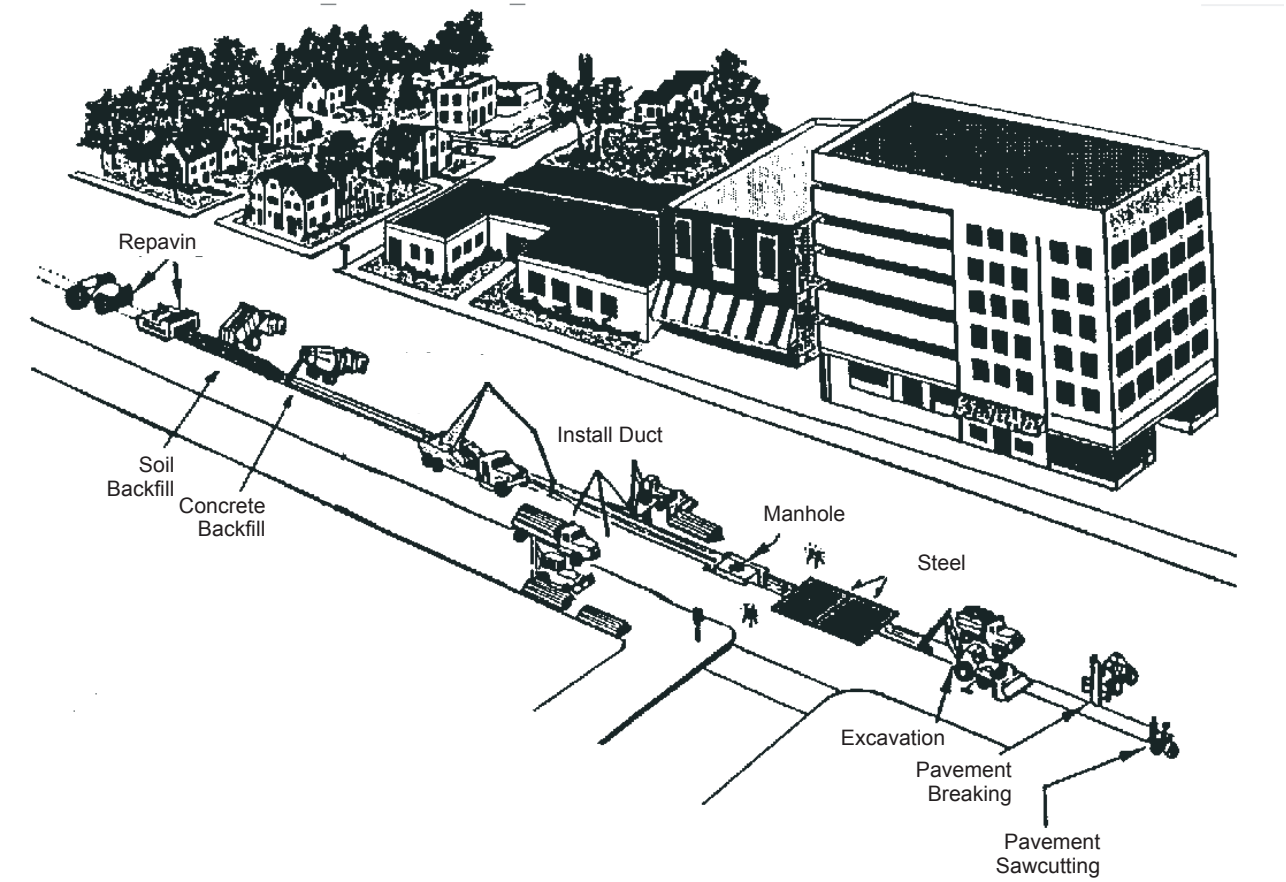
- Saw cut the pavement for the trench and splice vaults
- Excavate a trench for the electrical conduit bank
- Haul away and dispose of trenched and excavated spoils
- Install the cable conduit, reinforcement bar, ground wire, and concrete conduit encasement (duct bank)
- Excavate and place pre-formed concrete splice vaults
- Backfill the trench
- Pull cable into the conduit bank and splice at several predetermined locations (vaults) along the route
- Terminate cables at Vineyard Substation and at transition structures
- Horizontal bore of one or two steel casings under Arroyo Valle Creek near Bernal Avenue
- Restore all paved surfaces, restore landscaping as necessary, and clean up the job site

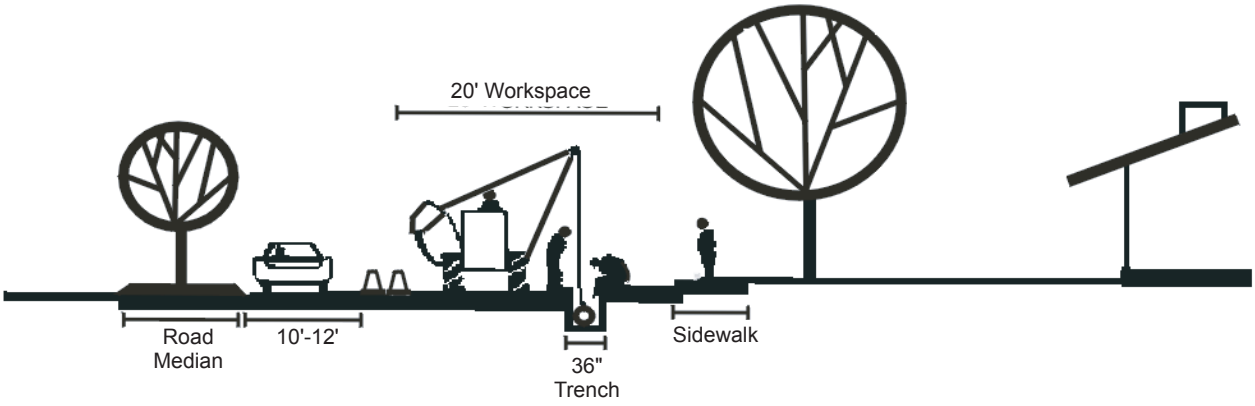
Vehicles and Equipment. A dump truck would be on site during excavation activities. As trucks are filled with spoils, they would leave the site and be replaced by empty trucks. The number of truck trips per day would depend upon the rate of the trenching and the size of vault excavation. Jackhammers would be used sparingly to break up any sections of concrete that cannot be reached with the saw-cutting and pavement-breaking machines. Other miscellaneous equipment would include a concrete saw, a pavement breaker, various paving equipment, and pickup trucks.

Trenching. To construct the underground duct bank, the roadway would be temporarily trenched. The width of the workspace would be as set forth in the encroachment permit to be issued by the City of Pleasanton. The typical trench would be approximately three feet wide, with a depth of six to eight feet.

A maximum open trench length of 600 feet on each street would be typical at any one time, with provisions for emergency vehicle and local access. Additionally, the trench would be wider or shored where needed to meet Cal/OSHA safety requirements. Prior to trenching, PG&E Co. would notify other utility companies (via the Underground Service Alert or USA) to locate existing underground structures along the proposed alignment.

After the trench route is marked and encroachment permits are obtained, work begins with a concrete saw cutting the trench line. The trench pavement would be broken into manageable pieces for removal and the trench dug to a depth of six to eight feet. At about 12 points along the trench, larger excavations would be opened to install splice vaults. Throughout construction, asphalt, concrete, and spoils would be hauled off by truck to an approved Class III disposal site (Class III landfills accept municipal solid waste only, and no designated or hazardous wastes). Approximately 11,000 cubic yards of asphalt and spoil would be removed, resulting in approximately 1,100 truck trips during excavation.





Tri-Valley 2002 Capacity Increase Project EIR

Figure B-9

Typical Underground Construction Process Within Roadways

Aspen Environmental Group

Source: PEA, 1999

Vaults. Approximately 26 underground vaults (13 per circuit) would be installed during trenching for pulling cables and housing cable splices. The vaults would be used initially to pull the cables through the conduits and to splice cables together. During operation, vaults provide access to the underground cables for maintenance inspections and repairs. Vaults would be constructed of steel-reinforced concrete (either prefabricated or cast-in-place), with inside dimensions of approximately 18 feet long, 5 feet wide, and 8 feet deep. The vaults would be designed to withstand the maximum credible earthquake in the area, as well as heavy truck traffic loading.

The vaults would be installed in pairs placed end-to-end and overlapping in order to separate circuits into respective vaults. The circuits are spliced in separate vaults in order for maintenance workers to work safely on a de-energized circuit while the second circuit remains energized. An electrical fault from an energized splice or cable inside of a vault could injure or be fatal to a worker. The total excavation footprint for the pair of vaults would be approximately 40 feet long by 15 feet wide. Installation of each vault would take place over a 3-day period with excavation and shoring of the vault pit being followed by delivery and installation of both vaults, filling and compacting a backfill, and repaving of the excavation area.

Equipment Installation. Following trench excavation, nine 6-inch PVC conduits would be racked in a three-by-three arrangement. As shown in Figure B-10, the underground cables would then be contained within the 6-inch PVC conduit pipes, which themselves would be housed in reinforced concrete duct banks. The 400 MVA load on this circuit would be met using approximately 2500-kcmil copper conductor extruded dielectric (XLPE) cable. To achieve this performance, both circuits would be installed in a common duct bank, with special cross-bonding of cable sheaths to reduce heat generated by sheath losses. When the electrical transmission duct bank crosses or runs parallel to other substructures (which have operating temperatures not exceeding basal earth temperature), a minimum radial clearance of 12 inches is required from these substructures. These types of substructures include electric lines, telephone lines, water mains, storm lines, and sewer lines. In addition, a 5-foot minimum radial clearance is required when the new electrical transmission duct bank crosses another heat-radiating substructure at right angles. A 15-foot minimum radial clearance is required between the electrical transmission duct bank and any paralleling substructure whose operating temperature significantly exceeds the normal earth temperature. Examples of heat radiating facilities are additional underground transmission circuits, primary distribution cables (especially multiple-circuit duct banks), steam lines, or heated oil lines.

The majority of the route would be in the three-by-three duct bank configuration with occasional rolling of ducts into a flat configuration in order to clear substructures in highly congested areas or to fan out to termination structures. The main duct bank would split into two separate duct banks leading into each splice vault.

Backfilling and Paving. Once the duct bank is installed, thermal-select or controlled backfill would be imported, installed, and compacted. A road base back-fill or slurry concrete cap would then be installed, and the road surface would be restored in compliance with the locally issued permits. While

the completed trench line sections are being restored, additional trench line would be opened further down the street. This process would continue until the entire conduit system is in place.

Cable Installation and Splicing. Cable would be pulled through individual ducts at the rate of approximately two pulls per day. After cable installation is completed, the cables would be spliced between all vaults and riser structures. A splice trailer would be located directly above the manhole openings for easy access by workers. A mobile power generator would be located directly behind the trailer. The dryness of the vault must be maintained 24 hours per day to ensure that unfinished splices are not contaminated with water or impurities.

Normal splicing hours would be eight to ten hours per day with some workers remaining after hours to maintain splicing conditions and guard against vandalism and theft. These conditions are essential to maintaining quality control through completion of splicing. As splicing is completed at a vault, the splicing apparatus setup is moved to the next vault location and the splicing is resumed.

Construction Duration

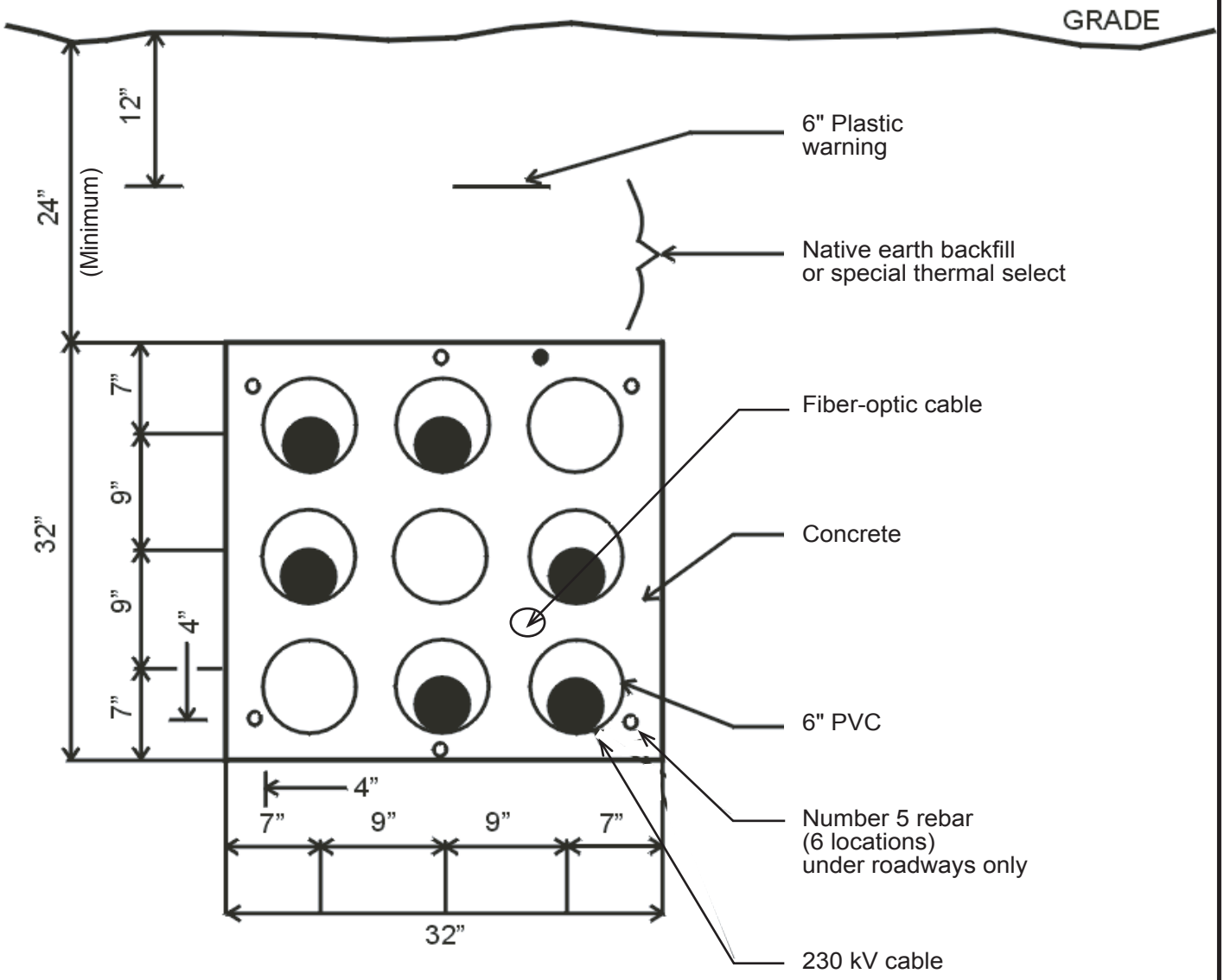
The length of time required for constructing this phase of the project is approximately 13 months. Trenching, installation of the concrete duct bank, and vault installation would be completed within five months, while cable installation, splicing, and terminating would require approximately six months. Underground construction would require approximately 10 to 20 crew members.

Right-of-Way Requirements

In undeveloped property, the conduit would be placed in the center of a 30-foot easement (to be acquired) that can be placed within a future roadway system. PG&E Co. would restrict any above ground structure or foundation within the easement. Deep-rooted vegetation that could compromise the integrity of the electric system would also be restricted. The easement language would require the property owner to notify PG&E Co. should any change in the overburden depth (i.e., removal of or addition to soil above the conduit) be contemplated. This is necessary to ensure public safety and system integrity. In developed areas, the underground portion of the transmission line would be placed in city streets and would comply with City of Pleasanton franchise agreements.

Laydown Areas

Material for the transmission segment from the Contra Costa-Newark tap point to the Dublin Substation (MP B10.4-B15.7), and the North Livermore loop (MP V0-V1.0), would be stockpiled at the proposed five acre North Livermore Substation site. Substation construction materials would be stockpiled at the respective substation sites. The material for the South Area overhead section (MP M0.0-M2.7) would be stockpiled on an existing paved asphalt pad on the General Electric Vallecitos plant site. The underground segment material would be stockpiled in two locations: the conductor reels would be stored at the Vineyard Substation site with splice vault and conduit materials would be stockpiled at the Kiewit industrial concrete plant north of Stanley Boulevard, through a land rental agreement.



Source: PEA, 1999

Tri-Valley 2002 Capacity Increase Project EIR

Figure B-10

Typical Duct Bank Installation of 230kV Double-Circuit Cable

Aspen Environmental Group

B.3.2.2 North Livermore and Dublin Substation Construction

PG&E Co. would grade the proposed Dublin and North Livermore Substation sites to ensure adequate compaction and surface drainage. PG&E Co. would initially install a 7-foot-high chain-link fence with a one-foot barbed-wire outrigger around the perimeter of both substations to provide security and protect the public from contacting the high-voltage equipment. The delivery of construction equipment to the proposed substation sites would occur over a five to ten day period with approximately 10 pieces of equipment placed at each site. The importation of engineered fill will be done during non-peak commute hours and consist of an estimated 75 trips over ten days at the Dublin Substation site, and 50 trips over ten days at the North Livermore Substation site. Concrete mixer trucks will be used to haul foundation material and will be driven directly to the sites with no interruption of traffic flow.

Reinforced concrete footings and slabs would be constructed to support structures and equipment. PG&E Co. would install buried conduit throughout the substation site for electrical control cables. After the trenches are dug, conduit would be placed on a bed of sand, and then soil would be backfilled and compacted to match the adjacent grade. PG&E Co. would install a grounding mat approximately 18 inches below the substation soil grade to protect workers from electrical shock in the event of a ground fault. Trenches would be dug in both directions across the station, and copper conductors would be installed, creating a grounding mat across the entire substation. Soil would be backfilled and compacted to match the adjacent grade. Gravel or crushed rock would be installed over the substation to a depth of approximately 4 inches to provide electrical isolation for workers in the substation. The North Livermore and Dublin Substations would be accessed by the public thoroughfares North Livermore Avenue and Tassajara Road, respectively. Off-roadway parking would be prepared to limit impact to local circulation during the site grading and preparation phase.

Structures would be erected to support switches, electrical conductors, instrument transformers, and other electrical equipment, as well as to terminate incoming and outgoing power lines. PG&E Co. would use fabricated tubular steel structures. Structures within the substation would be grounded to the station grounding grid. Workers would set all equipment on slabs and footings, and would either bolt or weld the equipment securely to meet seismic requirements.

230 kV Transmission Line

Right-of-Way Requirements. An easement of between 100 to 120 feet wide is required for 230 kV double-circuit transmission lines. The width depends on the lateral distance between the conductors, swing of the conductors caused by wind, and the distance specified by the CPUC's General Order 95 related to safe conductor clearances.

Construction Methods. The procedures for bringing personnel, materials, and equipment to each structure site, constructing the supporting structure foundations, erecting the supporting structure, and stringing the conductors would vary along the route alignment. PG&E Co. would construct the transmission line in the following four steps:

Step 1—Site Access Preparation

PG&E Co. needs temporary laydown areas approximately two acres in size for constructing the proposed 230 kV transmission line. The North Livermore and Dublin Substation sites (each five acres in size) would be used as transmission line material laydown areas, which eliminates the need to impact any additional areas along the route.

PG&E Co. would construct approximately 7.9 miles of overhead transmission line in the North Area. The area to be traversed is primarily used for cattle grazing, and although it is somewhat remote, there is a developed (primarily unpaved) road network used by property owners for managing their cattle operations. Construction equipment would be able to travel on approximately 4.8 miles of existing farm road, but may need to use cross-country routes (over grassland) in the dry season (when these roads are usable) for approximately 4 miles. Some existing roads may need to be improved and/or widened to allow equipment access. All material removed for this purpose would be compacted in the existing roadway. Grades in excess of 15 percent would be evaluated to determine whether aggregate base (gravel) would be required to improve vehicle traction (with the landowner's approval).

Less than one mile of new all-weather (gravel) road, approximately 12 feet wide, would need to be constructed to provide access to some sites. Most of the new road construction is a half-mile segment necessary to connect the proposed Dublin Substation site to an existing county road. Proposed access road locations are shown in Figure B-11.

Access roads would be maintained when required for operation and/or maintenance of the transmission facilities; otherwise, the land would be restored to its original condition. In accordance with proposed mitigation measures to protect biological resources, PG&E Co. would flag and avoid areas determined to be environmentally sensitive.

Step 2—Installing the Supporting Structure Foundations

- PG&E Co. would install drilled pier foundations at each structure site in the North Area. Material removed during the process would be placed in a location specified by the landowner and/or disposed of according to all applicable laws. Temporary disturbance around each structure site would be limited to a 100-foot radius around the foundation. Disturbance would consist of soil compaction from placement of crane outrigger pads and from vehicle tracks. If necessary, restoration of the area would include reseeding according to landowner instructions. However, most of the area would return to pre-existing conditions after the first spring rain season.
- **Lattice Steel Towers**. Placement of lattice steel towers would require boring four holes, one for each structure leg. Each hole would be about 4 feet in diameter and 11 to 15 feet deep. Workers would place reinforcing steel in each hole along with stub angles, which formulate part of the tower leg itself. Concrete forms that reach up to 2 or 3 feet above natural ground level would be placed over each hole, and concrete would be placed around the reinforcing steel and stub angles up to the top of the form.
- **Tubular Steel Poles**. Placement of tubular steel pole structures would require the use of a large auger to dig the foundation hole. The foundation hole would be between approximately 5 feet and 7 feet in diameter and from 15 to 30 feet deep. A rebar cage with anchor bolts would be installed and concrete would be placed in the hole. During the concrete curing period of 1 month, workers would remove the concrete forms and place backfill around the foundations.

Figure B-11 **Place holder**

Access Roads and pull/tension sites (page 1 of 2**)**

Figure B-11 **Placeholder Access Roads, Pull and Tension Sites (Page 2 of 2)**

Step 3—Erecting the Supporting Structures

- **Lattice Steel Towers.** The double-circuit lattice steel towers would have three cross arms, each supporting two phases consisting of a single conductor on each side. Figure B-3 illustrates a typical double-circuit lattice steel tower configuration. Steel tower components, packaged in bundles by tower type, would be dispatched to each tower site. Individual towers would be assembled immediately adjacent to the tower foundations and raised into place using a large crane. A smaller crane would also be used to assemble tower sections and to lift heavy steel members into place during assembly. After the structure is set on the foundation, crews would tighten all bolts to specified torques, attach insulators to the crossarms, and prepare the towers for the conductor stringing operation.
- **Tubular Steel Poles**. The double-circuit tubular steel pole structures would also have three cross arms, each supporting a phase conductor on each side of the cross arm. Figure B-6 illustrates a typical tubular steel pole structure. The pole shafts would be delivered to the site in two or more sections. For safety and ease of construction, the poles would be assembled on the ground. The sections would be pulled together with a winch and the cross arms bolted to the pole. Insulators would be attached to the cross arms and secured. A large crane would erect the poles and set them on the anchor bolts embedded in the concrete foundation. Finally, the securing nuts on the foundation would be tightened.

Step 4—Conductor StringingBefore conductor installation begins, temporary clearance structures would be installed at road crossings and other locations where the new conductors may accidentally come in contact with electrical or communication facilities and/or vehicular traffic during installation. PG&E Co. would use a set of temporary clearance structures at all roads and railroad crossings, and at all other power lines. These structures would be placed at the edge of the roadway and would not require grading. Conductor installation preparation activities require locating pull and tension sites at 2- to 3-mile intervals as shown in Figure B-11. These sites would be approximately one acre in size.

The conductor stringing operation begins with installation of insulators and sheaves or stringing blocks. The sheaves are rollers attached to the lower end of the insulators that are, in turn, attached to the ends of each supporting structure cross arm. The sheaves allow the individual conductors to be pulled through each structure until the conductors are ready to be pulled up to the final tension position.

When the pull and tension equipment is set in place, a sock line (a small cable used to pull in the conductor) is pulled from tower to tower using helicopters to place the sock line into the sheaves. After the sock line is installed, the conductors are attached to the sock line and pulled in or "strung" using the tension stringing method. This involves pulling the conductor through each tower under a controlled tension to keep the conductors elevated above crossing structures, roads, and other facilities.

After the conductors are pulled into place, wire or conductor sags are adjusted to a pre-calculated level. The conductors are then clamped to the end of each insulator as the sheaves are removed. The final step of the conductor installation is to install vibration dampers and other accessories. The temporary crossing structures would be removed at this time.

Packing crates, loose bolts, and construction debris would be picked up and hauled away for recycling or disposal during construction. PG&E Co. would conduct a final survey to ensure that cleanup activities have been successfully completed as required.

Distribution System

21 kV Wood Pole Installation. Placement of wood poles for the 21 kV distribution lines from North Livermore and Dublin Substations would require the use of an auger to dig the hole for the pole. The hole would be approximately 3 feet in diameter by 9 feet deep. The wood poles would be delivered to the site and the insulators and cross arms bolted to the poles. The poles would be assembled on the ground both for ease of construction and safety. The assembled poles would be lifted into the air with a line truck, set in the hole, and then backfilled.

21 kV Circuit Underground Installation. The 21 kV distribution system consists of underground electrical cables, conduits, substructures, subsurface equipment, and pad-mounted equipment. Underground electric facilities would be installed within the road easements as needed to serve existing and future customers. The conduits (duct) would be installed in a trench approximately 3 feet wide and 8 feet deep. The conduit would have a minimum cover of 36 inches.

Conductor Installation. For overhead conductor installation, a steel cable is fed through stringing sheaves at the end of each insulator. The cable is then attached to the conductor and the conductor is pulled off the reels through a tensioner and strung to the other end.

B.3.2.3 Phase 2 Construction (North Livermore to Tesla Substation)

Construction of the 10-mile transmission line from North Livermore to Tesla would be done with the same procedures described above for tubular steel tower construction.

Laydown Areas. Material for the line segment from the Tesla Substation to Highway 580 (MP C0.0-3.6) would be stockpiled at the Tesla Substation on the asphalt surface of the existing station. The material for the line segment from Highway 580 to the Old Altamont Highway (MP C3.9 -C5.4) would be stockpiled on a one acre site near MP C4.7. The line segment from MP C5.8 to C6.7, would be stockpiled at the entrance road to Altamont Power, LLC off of Dyer Road, on a one acre existing laydown site adjacent to Dyer Road. From MP C7.1 to the Contra Costa-Newark tap at MP B10.4, the material would be stockpiled at the Browning-Ferris Industries Vasco Road landfill on an improved paved site.

B.3.3 Service Interruption During Construction

PG&E Co. states that it would take the following actions during construction to avoid service interruptions:

- Customers would receive electricity from alternative sources where feasible
- Temporary distribution connections and construction may be implemented to maintain service during construction.

B.4 PROPOSED PROJECT OPERATION AND MAINTENANCE PROCEDURES

B.4.1 GENERAL SYSTEM MONITORING AND CONTROL

Substation monitoring and control functions would be connected to PG&E Co.'s Newark Switching Center and the Hayward Distribution Operations computer system by a telecommunication circuit. Protective relay communication would be through a power line carrier system.

B.4.2 FACILITY INSPECTION

The regular inspection of transmission lines, instrumentation and control, and support systems is critical for safe, efficient, and economical operation. Early identification of items needing maintenance, repair, or replacement would ensure continued safe operation of the project. PG&E Co. would inspect all of the structures from the surface annually for corrosion, misalignment, and excavations. Ground inspection would occur on selected lines to check the condition of hardware, insulators, and conductors. This inspection would include checking conductors and fixtures for corrosion, breaks, broken insulators, and failing splices.

B.5 ALTERNATIVES OVERVIEW AND SCREENING

B.5.1 CEQA REQUIREMENTS FOR ALTERNATIVES

One of the most important aspects 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.

An alternative cannot be eliminated simply because it is more costly or could impede the attainment of all project objectives to some degree. However, CEQA Guidelines declare that an EIR need not consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote or speculative.

Unlike the National Environmental Policy Act (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.

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are feasible) since the CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may impede to some degree the attainment of project objectives or would be more costly.

B.5.2 ALTERNATIVES SCREENING METHODOLOGY

In an EIR, alternatives are evaluated in a screening process for two overall purposes: (1) to eliminate alternatives that do not conform to CEQA requirements (as defined in Section B.5.1 above); and (2) to distinguish alternatives to the project from other EIR elements (such as suggested mitigation measures).

Alternatives to the Proposed Project were selected based on the input from the public, local jurisdictions, and other agencies during the EIR period, as well as technical input from the EIR Team specialists on the potential significant impacts of the Proposed Project. The alternatives screening process consisted of three steps:

Step 1: Define the Proposed Project and the alternatives to allow comparative evaluation

Step 2: Evaluate each alternative using the following criteria:

- Potential for reduction of significant adverse impacts of the Proposed Project
- Technical and regulatory feasibility
- Consistency with PG&E Co.'s basic objectives

Step 3: Determine suitability of the proposed alternative for analysis in the EIR. If the alternative is unsuitable, eliminate it from further consideration

Feasible alternatives that did not clearly offer the potential to reduce significant environmental impacts, and infeasible alternatives were removed from further analysis. In addition, because CEQA requires consideration of a "reasonable range of alternatives," [G.L.15126.6 (a)] not all alternatives suggested by the public and agencies could be considered in this EIR. If a selected alternative was believed to be likely to eliminate specific impacts, additional similar alternatives were eliminated.

In the final phase of the screening analysis (Step 3), the environmental advantages and disadvantages of the remaining alternatives were carefully weighed with respect to potential for overall environmental advantage, technical feasibility, and consistency with project and public objectives. These criteria are discussed in the following sub-sections.

This screening analysis does not focus on relative costs of the alternatives (as long as they are economically feasible) since the CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly." [G.L.15126.6 (b)]

B.5.2.1 Project Objectives

CEQA requires that alternatives meet most of the project objectives. Therefore, project objectives must be defined. As discussed in Section A.2, PG&E Co. in its Proponent's Environmental Assessment states that its objectives for the Tri-Valley Project are to:

- **Meet Electric Demand**—Relieve the electric system deficiency that will occur in the Tri-Valley area by the year 2002, and ensure the ability of the system to safely and reliably serve the area before any interruptions in service or emergency conditions result from this deficiency.
- Comply with **Planning Criteria**—Ensure that the Tri-Valley area transmission system will continue to meet the California Independent System Operator (ISO) Grid Planning Criteria for safety and reliability, as well as meet the Planning Standards and Guidelines of the North American Electric Reliability Council (NERC).

B.5.2.2 Significant Environmental Effects of the Proposed Project

If an alternative clearly does not provide any environmental advantages as compared to the Proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate potential impacts of the alternatives or the Proposed Project with absolute certainty. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them to general conditions of the subject area. In this alternatives analysis, a preliminary assessment of potential significant effects of the Proposed Project was completed, resulting in identification of the following impacts:

- Visual impacts of the transmission line or new substations in scenic areas
- Potential impacts to biological resources, including threatened and endangered species along the transmission line routes
- Construction impacts and operational disturbances impacts to adjacent property owners

One of the most effective ways of reducing these effects is to use existing, disturbed corridors rather that creating new transmission corridors. For that reason, one focus of the search for alternatives was evaluating existing corridors, which include roadways and existing transmission line corridors. Within these corridors, an evaluation of visibility was made to determine whether portions of the alternatives should be installed underground to reduce visual impacts in scenic areas.

B.5.2.3 Feasibility

For the screening analysis, the technical and regulatory feasibility of various potential alternatives was assessed at a general level. Specific feasibility analyses are not needed for this purpose. The assessment of feasibility was directed toward reverse reason, that is, an attempt was made to identify anything about the alternative that would be infeasible on technical or regulatory grounds. According to CEQA case law (*Citizens of Goleta Valley, et al. v. Board of Supervisors of the County of Santa Barbara, et al.*,) 52 Cal.3d 553, 801 P.2d 1161, 276 Cal. Rptr. 410 (1990)), the Court stated that a feasible alternative "…is one which can be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors."

For the proposed Tri-Valley 2002 Capacity Increase Project, feasibility issues relate to:

- Availability of adequate right-of-way for the transmission line and land for the substation in a rapidly developing area, and appropriateness of installing overhead lines in designated scenic areas
- Ability to provide the reliable electric service by the summer of the year 2002 due to the current demand and projected growth in demand in the Tri-Valley area
- Reliability of alternatives in combination with other alternative routes. Use of an underground transmission cable limits the voltage that can be transmitted, and certain alternatives require different configurations for connection to the 230 kV source.

As previously noted, under CEQA, an alternative being more expensive than the Proposed Project is not sufficient to eliminate it from consideration. The additional cost must be sufficiently severe as to render it impractical (i.e., infeasible) to proceed with the project.

B.5.3 SUMMARY OF SCREENING RESULTS

Alternatives identified by PG&E Co., local jurisdictions, and the public are listed in Table B.5-1 according to the determination made for analysis. Those listed in the first column have been eliminated from further consideration (see rationale in Section B.5.4), and those in the second column are evaluated within each issue area of Section C of this EIR and described in Section B.6.

Alternatives considered included alternative transmission line route alignments and substation sites, local generation supply, alternative transmission connections, and the No Project Alternative.

Table B.5-1 Summary of Alternative Screening Results

Alternatives Eliminated From Consideration (see Section B.5.4)	Alternatives Fully Evaluated in this EIR (see Section B.6)
Pleasanton Area	
• West from Water Tank off Proposed route • PG&E Co.'s PEA Alternative 1 • Upgrade PG&E Co.'s Existing 60 kV System and Install new 60kV Substation • Install 115 kV System and New Substation • Quarry Route Alternatives • Distribution from proposed Dublin Substation • Consolidate and underground lines along Stanley Blvd. • Underground along Isabel Avenue	$ S1: Vineyard-Isabel-Stanley $ S2: Vineyard Avenue $ S4: Eastern Open Space $ LG: Local Generation
Dublin / San Ramon Area	
$ Dublin Substation at PG&E Co.'s DS3 Location $ PG&E Co.'s PEA Alternative 2	D1: South Dublin Substation (fed from Vineyard Substation) D2: Dublin-San Ramon (fed from San Ramon Substation)
North Livermore Area	
$ Substation At Manning Road and North Livermore Avenue $ Dagnino Road Substation $ East Hartford Road Route $ Las Colinas Road Route	$ P1-P2: Variants on Proposed Project $ L1: Raymond Road $ L2: Hartman Road
Tesla Connection/Phase 2	
$ Tiger Creek Reconductoring	• Brushy Peak Alternative Segment • Stanislaus Corridor • Switching Station

B.5.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

As discussed in Section B.5.2, a large number of potential alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives listed in the first column of Table B.5-1 (above) were eliminated from detailed EIR consideration. The rationale for elimination of each of those alternatives is described in the following sections, which are presented by area.

B.5.4.1 Pleasanton Area Alternatives Eliminated

B.5.4.1.1 *West from Water Tank off Proposed Route*

Description: This route would diverge from the proposed route at the water tank south of the residential development of Kottinger Ranch. The line could be installed overhead or underground between the water tank and Bernal Avenue, in a west/northwest direction through open space along a ridge for about 1.8 miles. It would then be installed underground along Bernal Avenue into Vineyard substation.

Rationale for Elimination: This alternative would not eliminate any of the potential environmental impacts of the Proposed Project. It would eliminate impacts in Kottinger Ranch, but those same impacts would be shifted to Bernal Avenue, which is 0.5 miles longer. Bernal is a larger street than the streets of the Kottinger Ranch, and still primarily residential in nature. The S4 Alternative evaluated in this EIR also avoids the small residential streets of the Kottinger neighborhood and shares the overhead portion of the route.

B.5.4.1.2 *PG&E Co.'s PEA Alternative 1*

Description: This alternative would be the same as PG&E Co.'s Proposed Project (including Phase 2), but it would add the reconductoring of the vacant Tiger Creek towers from the tap point to a location near the Lawrence Livermore National Laboratory Substation.

Rationale for Elimination: This alternative was originally eliminated because it would have slightly increased impacts over the Proposed Project associated with reconductoring the Tiger Creek towers and offers no environmental benefit. However, as discussed in B.5.4.4.1, this alternative is no longer available, in any event.

B.5.4.1.3 *Upgrade PG&E Co.'s Existing 60 kV System and Install new 230 kV - 60kV (Arroyo) Substation*

Description: This alternative would require installation of a new substation adjacent to the Tesla-Newark Corridor (with a 230 kV to 60 kV transformer) and reconductoring of the existing 60 kV wood poles between the Tesla-Newark Corridor and the Vineyard Substation to provide increased electrical service to that substation.

This new substation could also include 230 kV to 21 kV transformers to allow direct electrical distribution service from the new substation. The distribution circuits from this substation could serve growth in the south Pleasanton area (Ruby Hill and Vineyard area) and growth in south Livermore. This could reduce the area served by the Vineyard Substation. The reconductored 60 kV lines could be relocated from their existing locations within residential neighborhoods north of Vineyard Avenue.

Rationale for Elimination: This alternative would require construction and operation of an additional substation in the South Area (not required under the Proposed Project). Analysis of electricity demand in the Tri-Valley area (see Section A.2) supports the need for a 230 kV system in this area. An upgrade to the 60 kV system would provide adequate power to serve the needs at the Vineyard Substation for a short time, but a 230 kV system would ultimately be required.

Supporting power flow modeling data provided by PG&E Co. indicated that in the year studied, 2002, some 60 kV facilities would be overloaded by 1% during normal peak conditions and by as much as 12% during contingency conditions. Additionally, the modeling indicated that the 60kV bus voltages at area substations were low under normal peak and contingency conditions. While it may be possible to ignore the slight overload during normal conditions in 2002, this problem will only increase in magnitude with time, eventually requiring construction of additional transmission lines. Also, the overloads noted during contingency conditions do not appear to meet the NERC and CAISO planning criteria. The development of the proposed facility is considered to be a short-term stopgap solution and not a viable long-term solution to the problems at Vineyard Substation.

B.5.4.1.4 *Install 115 kV System and New (Arroyo) Substation*

Description: This alternative is identical to the 60 kV upgrade scenario described in Section B.4.1.3, but it would include 230 kV to 115 kV transformers at the new substation, thus providing 115 kV service to the Vineyard Substation. Only 60 kV lines currently feed the Vineyard Substation and these would need to be reconductored (possibly with new poles) to 115 kV.

Rationale for Elimination: Same as in Section B.5.4.1.3. The introduction of a new voltage level into the area would further complicate the maintenance of the system and would require the construction of new transmission lines similar to the 230kV facilities being proposed. A new 115 kV system would not provide adequate power to serve the long-term needs in the area and a 230 kV system could then be required.

B.5.4.1.5 *Quarry Route Alternatives*

Description: Two routes through the Gravel Preserve were suggested during and after the EIR scoping period. One route would diverge from Vineyard Avenue by following the existing 60 kV line serving PG&E Co.'s Iuka Substation (which serves quarry operations) and then continuing due north to Stanley Boulevard, where the new line would turn west along Stanley Boulevard. The second route would cross the Gravel Preserve between a few hundred and 2,000 feet west of Isabel Avenue and would minimize visual impacts of the transmission line from surrounding land uses.

Rationale for Elimination: These routes would affect ongoing and future gravel quarry operations, limiting the availability of gravel resources and posing potential safety hazards to quarry personnel. The route north from the Iuka Substation would be highly visible to users of Shadow Cliffs Regional Park because it would parallel the park's eastern boundary. In addition, the eastern boundary of the park includes an unstable cliff that has failed in the recent past (adjacent to Stanley Boulevard at the northeast corner of the park).

B.5.4.1.6 *Serve Pleasanton Via Distribution Lines From the San Ramon Substation or Proposed Dublin Substation*

Description: The San Ramon or proposed Dublin Substations could serve Pleasanton customers via 21 kV distribution lines running south through the Dublin Ranch area and through the gravel preserve to Pleasanton.

Rationale for Elimination: PG&E Co. has already expanded distribution line service to the Pleasanton area over the past few years by installing additional distribution lines from the San Ramon Substation. With the large anticipated growth in the Cities of Dublin and San Ramon, all available electric capacity in this area is expected to be required for service to the Dublin and San Ramon areas. In addition, while this alternative reduces impacts of the Proposed Project in Pleasanton, it would shift the impacts to the San Ramon or Dublin areas, with no net decrease in environmental impacts in the Tri-Valley area.

B.5.4.1.7 *Consolidate And Underground Lines Along Stanley Blvd.*

Description: This alternative would be similar to the S2 Alternative (see Section B.6.1.2) but the 230 kV lines along Stanley Boulevard would be installed underground. In addition, it was also suggested that the existing 60 kV line along Stanley Boulevard could be relocated underground.

Rationale for Elimination: The 230 kV route along Stanley Boulevard is not presented as an underground route because underground alternatives are only used for areas with the most sensitivity to visual resources. The Stanley Boulevard corridor includes multiple railroad lines, transmission (at 60 kV) and distribution lines, railroad communications lines, and many gravel processing facilities. It is not a visually sensitive corridor and the expense of undergrounding the 230 kV line is not warranted. With respect to undergrounding other existing lines, those lines are not incidental to PG&E Co.'s Proposed Project.

B.5.4.1.8 *Underground Along Isabel Avenue*

Description: This transmission line route would be the same as Alternative S1, except instead of overhead lines west of Isabel, the line would be placed underground immediately adjacent to the road.

Rationale for Elimination: This alternative could conflict with Caltrans' Highway 84 Extension Project. Caltrans does not generally allow installation of underground facilities within their ROW. Immediately west of Isabel, there are gravel pits and access roads. In some places, the pits are close to

the west side of the road so there would be stability concerns related to the underground duct bank. This would not be a concern with the overhead lines because the towers would be located between the pits and the conductors could hang over the pits between towers.

B.5.4.2 Dublin/San Ramon Alternatives Eliminated

B.5.4.2.1 *Southern Dublin Substation 1*

Description: This substation site would be located mid-way between PG&E Co.'s proposed Dublin Substation site and the D1 South Dublin Alternative described in Section B.6. It would be closer to the Dublin Ranch residential area and the commercial growth along Interstate 580, and farther from the residential developments being constructed west and north of the proposed Dublin Substation.

Rationale for Elimination: This site is in an undeveloped and scenic valley just east of Tassajara Road and north of the extension of Fallon Road. It does not eliminate any of the potential environmental impacts of the proposed Dublin Substation.

B.5.4.2.2 *Southern Dublin Substation 2*

Description: This substation location is just south of existing residences and west of the future Fallon Road extension. This alternative site is approximately one mile north of Interstate 580.

Rationale for Elimination: This substation site is located in an area planned for residential development under City of Dublin and Dublin Ranch plans. It would also be immediately adjacent to existing residences.

B.5.4.2.3 *PG&E Co.'s PEA Alternative 2*

Description: The location of the Dublin Substation would be the same as that proposed by PG&E Co. However, the substation would receive its electrical feed from the south (from Vineyard Substation) rather than from the east along PG&E Co.'s vacant easement.

Rationale for Elimination: This alternative would eliminate the need for the new transmission line between the North Livermore Substation and the proposed new Dublin Substation in PG&E Co.'s vacant easement. However, that same result would be obtained from the D1 alternative evaluated in this EIR, which would provide for a southern feed for this substation and also relocate the Dublin Substation to the south, closer to the electrical demand and with reduced impacts.

B.5.4.2.4 *PG&E Co.'s PEA Alternative 3*

Description: This alternative, proposed as Alternative 3 in PG&E Co.'s PEA, would serve the Vineyard Substation from two directions with single circuit 230 kV lines (rather than the double circuit line included in the Proposed Project). One single circuit 230 kV line would come from the San Ramon Substation via the existing 60 kV line route along the railroad corridor (also the route of the Iron Horse

Trail). The second single circuit 230 kV line would follow the route of the 60 kV line along Vineyard Avenue and southeast into Sycamore Grove Regional Park.

Rationale for Elimination: This alternative would eliminate some impacts associated with the Proposed Project (the overhead line south of Pleasanton and the underground line through Kottinger Ranch and along Bernal Avenue). However, it would create many more impacts, including visual and recreational impacts along many miles of transmission corridor (through San Ramon, Dublin, and Pleasanton). The new line would also add impacts to the existing San Ramon Substation, associated with additional incoming transmission lines and substation upgrades.

B.5.4.3 North Livermore Area Alternatives Eliminated

B.5.4.3.1 *North Livermore Substation At Manning Road and North Livermore Avenue*

Description: The North Livermore Substation could be installed approximately one mile north of its proposed location. This alternative location would be at the corner of Manning Road and North Livermore Avenue.

Rationale for Elimination: This alternative would move the visual impacts from one highly visible and scenic location to another. While the 230 kV transmission line down North Livermore Avenue would be eliminated, this alternative would require that all distribution lines from the substation go along North Livermore Avenue to the south (where the demand is centered).

B.5.4.3.2 *Dagnino Road Substation*

Description: This substation site, at the northeast corner of Dagnino Road and May School Road, was suggested during EIR scoping as a means of eliminating the potential visual impact of the proposed North Livermore Substation. The substation would have a 230 kV transmission line running due east to the Contra Costa-Newark 230 kV line.

Rationale for Elimination: First, this location would move the North Livermore Substation further away from load that is developing near the I-580 corridor. Second, the transmission line connecting this substation site to the Contra Costa-Newark line would be located within the exclusion area of the Federal Communications Commission Monitoring Station located west of Lorraine Road in the North Livermore area, which restricts the presence of aboveground structures within a certain distance of the facility to prevent interference with facility operation. Note that Alternative P3 (see Section C.13.3.1.1) would be underground partly to address FCC regulations.

B.5.4.3.3 *East Hartford Road Route*

Description: In this alternative, an overhead/underground transition station would be located immediately adjacent to the Contra Costa-Newark line at a location due east of the end of Hartford Road (at the north end of the Springtown area of Livermore). From this point, the 230 kV transmission line would be installed underground for 1.2 miles due west along an existing small asphalt road (bicycle trail), the short span of Hartford Road at the north end of Springtown, and the gravel road west of

Springtown. The North Livermore Substation would be located east of North Livermore Avenue, south of the existing FCC facility.

Rationale for Elimination: The underground transmission line would pass through the center of an area protected because of the presence of an endangered plant (bird's beak). The plant is very sensitive to hydrologic conditions and the flow of shallow groundwater into the area could be disturbed by the underground duct banks.

B.5.4.3.4 *Las Colinas Road Route*

Description: This alternative would start at PG&E Co.'s existing 230 kV Las Positas Substation which is located just south of I-580 and about three blocks east of First Street. The transmission line would be installed underground due to the scenic corridor of the I-580, and follow existing roadways south of the I-580 to Las Colinas Road, where the line would cross the I-580 freeway (most likely via a bored crossing under the freeway). The substation would be located within a mile north of the I-580 freeway near areas shown as "Resource Management" on the North Livermore Specific Plan documents.

Rationale for Elimination: Sensitive land uses (hills that would likely remain undeveloped to protect the scenic and biological resources of the area) surround the area of unincorporated Alameda County located north of the I-580 Freeway, so a substation located here would shift but not eliminate the visual impacts of the proposed substation location. In addition, there is no roadway network in this area and it appears that development may be many years in the future. Installation of the line through open space would not be prudent because future roadway, utility corridor, or other development could require relocation of the line.

B.5.4.3.5 *Los Vaqueros Watershed Route*

This route would be located north of PG&E Co.'s vacant easement within the Los Vaqueros Watershed.

Rationale for Elimination: This route is several miles north of the area that would be served by the transmission line, so it would not be an efficient method of transmitting electricity. The EIR evaluates other alternatives that address potential impacts associated with the Proposed North Livermore area.

B.5.4.3.6 *Highland Road*

Description: Move the proposed North Livermore Substation to the site located west of Highland Road, across from US Sprint's property. Install the transmission lines underground.

Rationale for Elimination: This location south of I-580 and about a mile east of North Livermore Avenue is not well suited to serving the growth north of the I-580, which is developing from west to east (starting west of N. Livermore Avenue). Having to run distribution lines across I-580 to serve customer load to the north of I-580 would not be prudent.

B.5.4.3.7 *Dalton/Ames Roads*

Description: The North Livermore substation could be located at the Contra Costa-Newark line near the existing City of Livermore Water Storage Tank in the area of Dalton and Ames Roads.

Rationale for Elimination: This alternative is very similar to the Raymond Road Alternative, which is evaluated in the EIR; see Section B.6.3.2. Raymond Road, because it is an existing disturbed crossing of the bird's beak habitat area, is considered to provide a better access to development to the west. This EIR considers several other alternative sites in the North Livermore area.

B.5.4.4 Tesla Connection/Phase 2 Alternatives Eliminated

The purpose of PG&E Co.'s Proposed Phase 2 is to provide connection of the Tri-Valley 230 kV system with the Tesla Substation in eastern Alameda County. This connection could be needed between 2004 and 2007 (according to the PEA), at the time when the Contra Costa-Newark 230 kV line became overloaded or otherwise could not reliably handle the growth in demand.

B.5.4.4.1 *Tiger Creek Reconductoring*

Description: This alternative was developed by the EIR team to create a more efficient connection to the Tesla Substation than that proposed by PG&E Co. Rather than constructing a new line through a currently-undisturbed corridor (even though the corridor includes an easement is owned by PG&E Co.), this alternative would require reconductoring of a currently vacant set of towers in the Tesla-Newark Corridor. This set of towers was used by PG&E Co. for a 230 kV line for 30 years, but was abandoned when the newer Tesla-Newark line was constructed. The alternative would have involved installation of double circuit 230 kV conductors between the Tesla Substation and the point at which the proposed route (or the selected alternative) was connected to the Contra Costa-Newark line south of Pleasanton. In addition, this alternative would have required the relocation of the single-circuit 115 kV line between Lawrence Livermore Laboratories and the Tesla Substation (which was occupying one position on the Tiger Creek towers).

Rationale for Elimination: During the summer of 2000, in response to documented inadequate electrical service to the south San Francisco Bay area and the Newark Substation, the California ISO ordered PG&E Co. to reconductor the Tiger Creek line between Tesla and Newark Substations. This line is being upgraded to provide an especially high level of electrical service, which would require expansion of the Pleasanton area 230 kV system to enable connection. Also, the high levels of power flow expected on this line combined with the addition of the Tri Valley loads can not be handled by the line as presently planned by PG&E Co. and the CAISO. However, similar results may be obtained by connecting to the existing Tesla – Newark 230kV line via the construction of a switching station at the point where the lines intersect.

B.5.4.4.2 *Wind Power*

Description: Expand the wind resource area in the Altamont Hills.

Rationale for Elimination: Still need transmission lines to carry power to customer load, so this would not eliminate need for the project. The amount of additional power that could feasibly be generated by the wind farm is in question, since no such expansion is planned or proposed.

B.5.4.4.3 *Reconductor Contra Costa-Newark 230kV*

Description: Reconductoring the line between Contra Costa and Newark would increase its ability to serve the Tri-Valley area and potentially eliminate Phase 2.

Rationale for Elimination: Several alternatives that are analyzed in this EIR change the electrical configuration of the Dublin and North Livermore Substation, to accomplish similar objectives (see Sections B.6.2 and B.6.3).

B.5.4.4.4 *Reroutes Around Landfill*

Description: Reroutes in the area of the Vasco Road Landfill could avoid potential hazards and viewshed impacts.

Rationale for Elimination: The EIR identifies alternatives (i.e., Stanislaus Corridor and switching stations) that would eliminate the potential impacts associated with the Proposed Phase 2 route.

B.6 DESCRIPTION OF PROJECT ALTERNATIVES ANALYZED IN THIS EIR

Because of the geographic spread of this project, alternatives are divided into categories. Table B.6-1 below lists each category, the alternatives considered in that area, and the section in which that alternative is addressed. Each alternative listed for each area can be combined with an alternative for another area, with a few exceptions (described in text below). Figure B-12 shows all alternatives evaluated in this EIR; subsequent figures illustrate these figures in more detail.

Table B.6-1 Characteristics of Alternatives Evaluated (by Area)

Alternative Name	EIR Section	Total Length of Transmission Line	Length of Overhead Line	Length of Underground Line
Pleasanton Area				
Proposed South Area Transmission Line	B.3 – B.4	5.5	2.8	2.7
S1: Vineyard-Isabel-Stanley	B.6.1.1	6.7	5.6	1.1
S2: Vineyard Avenue	B.6.1.2	5.8	1.1	4.7
S4: Eastern Open Space	B.6.1.3	6.6	3.4	3.2
LG: Local Generation	B.6.1.4	<0.1	0.1	0
Dublin/San Ramon Area				
Proposed Dublin Substation and Transmission Line	B.2.2.2	4.9	4.9	0
D1: South Dublin	B.6.2.1	2.8	2.3	0.5

Alternative Name		EIR Section	Total Length of Transmission Line	Length of Overhead Line	Length of Underground Line
D2: Dublin-San Ramon		B.6.2.2	4.6	4.0	0.6
North Livermore Area					
Proposed North Livermore Substation and Transmission Line		B.3 – B.4	3.1	3.1	0
P1: Proposed Project with 1 Mile Underground		B.6.3.1	3.1	2.1	1.0
P2: Proposed Project with 3.8 Miles Underground		B.6.3.1	3.8	0	3.8
L1: Raymond Road		B.6.3.2	1.0	0	1.0
L2: Hartman Road		B.6.3.3	7.3	3.7	3.6
Tesla Connection/Phase 2					
Proposed Phase 2 Transmission Line		B.3 – B.4	10.0	10.0	0
BP: Brushy Peak Alternative Segment		B.6.4.1	10.3	10.3	0
T1: Stanislaus Corridor	to S1/S2/L1	B.6.4.2	14.2	14.2	0
	to Proposed/S4	B.6.4.3	17.3	173	0
T2: Switching Station		B.6.4.3	---	---	---

B.6.1 PLEASANTON AREA ALTERNATIVES

These alternatives would replace the 5.5-mile portion of the Proposed Project between the Contra Costa-Newark tap in the Tesla-Newark corridor and the Vineyard Substation. The Proposed Project in this area would include 2.8 miles of overhead and 2.7 miles of underground transmission line. Figure B-13 illustrates the location of the Proposed Project and the EIR alternatives in the Pleasanton area.

B.6.1.1 Alternative S1: Vineyard-Isabel-Stanley

In this alternative, the Contra Costa-Newark (CC-N) line would be tapped in the Tesla-Newark Corridor in Sycamore Grove Park, where the existing 60 kV wood pole line joins the Tesla-Newark Corridor (see Figure B-13). The transmission line would be installed overhead from the tap point in the Tesla-Newark corridor to the southwest corner of Highway 84 and Vineyard Avenue. The southernmost 2,000 feet of the line would be in the Sycamore Grove Regional Park, and north of that point the line would be outside of the park boundary.

The new 230kV line would follow the existing 60kV route (except for the portion of the 60kV line that turns into the park), on the same side of the road as the existing line and as close as possible to that line. The overhead/underground transition point would be located about 100 feet southwest of the corner of Highway 84, and the underground line would be bored under the highway and installed underground along the property line west of the property on the northwest corner of Vineyard and Hwy 84, continuing straight north to the point where it meets Vineyard Avenue. The underground line would continue in the firebreak road on the south side of Vineyard to Isabel. It would be installed overhead along the west side of Isabel Avenue (about 40 feet west of the roadway) to Stanley Blvd., where the line would turn west and be installed overhead along north side of Stanley Boulevard. Along Stanley Boulevard, the overhead line would be installed south of the mainline railroad tracks but north of the spur line. It would cross Stanley Boulevard into Vineyard Substation, just before Bernal

Avenue. This alternative would be about 6.7 miles long with 1.1 miles underground and the remainder aboveground.

B.6.1.2 Alternative S2: Vineyard Avenue

This alternative is essentially the route that the CPUC approved in 1988 as an all-underground alternative (although this alternative would have the southernmost 1.1 miles aboveground). The first 2.2 miles of this alternative would be the same as for the S1 Alternative (see Figure B-13), and would tap the CC-N in Sycamore Grove Regional Park. It would be installed as an overhead 230kV line to Highway 84, then underground along Vineyard to Bernal, as described for S1 above. After passing Isabel, the underground line along Vineyard would remain south of the road under the firebreak road to the western boundary of the Ruby Hill development. From that point west, the line would be installed south of the roadway in the adjacent private property frontage, at the base of the slope. Where Vineyard becomes a divided road, the underground line would move into the roadway (because there is more room for underground utilities in a divided highway and less likelihood of future road improvements in the newer portion of the road). Where Vineyard meets Bernal Avenue, the line would turn north on Bernal (still underground) as it would in the proposed route, and into the Vineyard Substation. This alternative would be about 5.8 miles long; the first 1.1 miles would be installed overhead and the remainder underground.

The potential advantages of this route over the Proposed Project are that it would utilize an existing (60kV) transmission corridor, rather than creating a new corridor for 5.5 miles south of Pleasanton. This route would also avoid the small residential streets of the proposed route and utilize larger streets (Vineyard, Isabel, and Stanley) where construction and operational impacts are more appropriately located.

B.6.1.3 ALTERNATIVE S4: EASTERN OPEN SPACE

This alternative would follow the proposed route's overhead transmission line from the tap in the Tesla-Newark Corridor, for 2.2 miles to a point where S4 Alternative would turn northeasterly away from the proposed route. As illustrated in Figure B-13, the route would continue northeasterly and overhead for 1.2 miles, then transition to underground for the last 0.7 miles across country north to Vineyard Avenue. At this point, the S4 Alternative route would turn west on Vineyard, still underground, and follow the S2 Alternative route described in Section B.6.1.2 along the south side of Vineyard Avenue and Bernal into the Vineyard Substation. The total length of this alternative (from the Tesla-Newark tap to the Vineyard Substation) would be about 6.6 miles with 3.2 miles underground.

Figure B-12 **Placeholder**

Proposed Project and all EIR alternatives (page 1 of 2)

Figure B-12 Placeholder Proposed Project and all EIR Alternatives (page 2 of 2)

Placeholder: Figure B-13 Pleasanton Area Alternatives

B.6.1.4 Local Generation

The construction of power generation in the Tri-Valley area could delay or reduce the need for the portions of Proposed Project. Three generation facilities (providing a possible 50 MW of power each at peak use) have been proposed or are expected to be proposed in the Tri-Valley area: two in the City of Pleasanton and one in Livermore. All would be under-50 MW natural gas turbine power plants. These facilities are undergoing environmental review by the City's Planning Department. Due to the time required by the local jurisdictions for CEQA review of the proposed facilities, none of the three are expected to be operational in the summer of 2001, but it is possible that they could be operational for the summer of 2002.

As detailed in Section A.2.6, the Planning Commission of the City of Pleasanton recently adopted a resolution requesting that the City Council initiate a study of electrical power facilities and adopt a local energy policy/strategy. The resolution also called for deferring action on any CEQA process for any pending power plant application until the study is completed. As also addressed in Section A.2.6, implementation of local generation projects would not necessarily result in reduced need for proposed Tri-Valley 2002 Capacity Increase Project, but could defer the need for the transmission project for one or two years.

The City of Pleasanton recently prepared a Draft Negative Declaration on the first of these local generators, proposed by Enron on a site north of the Vineyard Substation; subsequently, the Pleasanton Planning Commission decided that an Environmental Impact Report would be required for that project. The impact analysis following is primarily based on that Draft Negative Declaration, the impact assessments included in Sections C.2 through C.12, as well. The impacts of the other two potential facilities (one in Pleasanton west of the Vineyard Substation, and one in Livermore near the Las Positas Substation) would be similar, except that the proximity of sensitive land uses and receptors would vary with each specific site.

B.6.1.4.1 *Enron Facility*

The proposed facility is a 45-megawatt (MW) electrical generation facility located on an approximately one-acre site leased from the Kiewit Company. As proposed, the facility would utilize a natural gas-fired combustion turbine engine to generate electricity. The facility would be unstaffed, would operate from 6:00 a.m. to 10:00 p.m., and would operate on most days of the year. The plans call for an employee to visit the site 3-4 times per week to conduct routine maintenance and equipment checks, and for 19.5% aqueous ammonia solution to be delivered to the site every two weeks (for injection into the air pollution control system). The electricity generated would connect, via proposed overhead lines, into the existing 60 kilovolt (kV) transmission system located south of the site.

Unlike the other transmission route and switching station alternatives, the CPUC does not have jurisdiction over this alternative project to implement measures to reduce significant impacts. Mitigation authority for this project is with the City of Pleasanton as the Lead Agency of the project, and any other permitting authorities. The City of Pleasanton released a Draft Negative Declaration for

the project on October 6, 2000. However, at the November 8, 2000, Planning Commission hearing on this document, the Planning Commission directed staff to prepare an EIR for the project. The following analysis presents impact discussions only; no mitigation measures are presented. The discussions are not in any way a substitute for the analysis that the City is performing, but are preliminary analyses based on limited available information about the project.

B.6.2 DUBLIN AREA ALTERNATIVES

The following alternatives would replace the transmission line that connects the proposed Dublin substation site with the North Livermore Area (and also the connection to the CC-N line east of North Livermore Road). Figure B-14 illustrates the two Dublin area alternatives evaluated in the EIR.

B.6.2.1 Alternative D1: South Dublin

The South Dublin Substation would be located between Fallon and Tassajara Roads, north of the I-580, as illustrated in Figure B-14. It would be about 2600 feet west of Fallon Road, and about 1000 feet north of the I-580 and immediately south of (and adjacent to) the future extension of Dublin Boulevard. This location was selected because it is in the only commercially-zoned portion of the Dublin Ranch development; all the property to the north will be residential. The commercial and industrial growth in Dublin is concentrated along the I-580 freeway corridor, and the high-tech companies locating in this area have very high demands for electric power.

The 230kV double circuit transmission line connection would be from the Vineyard Substation in the south. This route would follows part of the north-south route of PG&E Co.'s PEA Alternative 2, through the gravel quarries between Stanley Boulevard and I-580 along El Charro Road. Starting at the Vineyard Substation, the transmission line would go north across Stanley until it reached the north side of the paved east-west roadway into the gravel area. Then it turns east for 0.25 miles to the corner, then it turns north, following the west side of the roadway, for 0.35 miles. At this point, it would cross to the east side of the road, continuing north for 0.8 miles to MP I5.2 where it would cross back to the west side and continue to the south side of the I-580 interchange. The line would transition to underground, turning west to follow the south side of the Caltrans ROW, turning north and crossing the freeway (in a bored crossing) one-half mile west of Fallon Road. The route would continue north for 1,000 feet north of the freeway; the five-acre substation would be located just south of (future) Dublin Boulevard. The total length of this alternative (from the existing Vineyard Substation to the D1 Substation Site) would be about 2.8 miles with about 0.5 mile underground.

B.6.2.2 Alternative D2: Dublin - San Ramon

In this alternative, PG&E Co.'s proposed Dublin Substation would be retained at the site where it is proposed. The substation would be fed from the west (from PG&E Co.'s existing San Ramon Substation). The 230kV line from Dublin to San Ramon would follow PG&E Co.'s vacant ROW, as shown in Figure B-14. The transmission line route between the Dublin site and San Ramon Substation would utilize PG&E Co.'s vacant easement, which PG&E Co. has modified since the PEA to add two angled variants, which accommodate the requests of area landowners. In this alternative, the

westernmost approximately one mile of the route would be installed underground (starting east of the ridgeline east of San Ramon and continuing into PG&E Co.'s existing San Ramon Substation) to minimize visual impacts in San Ramon.

Under this alternative, no 230kV line would be constructed west of North Livermore Road. This alternative would also require some (relatively minor) upgrades to San Ramon substation. Based on information provided by PG&E Co., this alternative was originally designed to include the need for reconductoring of 20 miles of a single circuit 230 kV transmission line between the San Ramon Substation and Pittsburg (see Figure B-15). PG&E Co. stated that this would be required in order to increase power into San Ramon to allow this substation to power the Dublin Substation. The EIR analysis includes consideration of the impacts of this reconductoring effort. However, PG&E Co. is in the process of reconductoring the northernmost five miles of this line, and as a result, power flow modeling completed by the California ISO in October of 2000 (with participation of PG&E Co. and EIR team transmission planners), indicated that the San Ramon Substation is likely to be able to provide adequate power to the Dublin Substation without the reconductoring effort. The total length of this alternative (from San Ramon Substation to the Proposed Dublin Substation) is about 4.6 miles, with 0.6 mile underground.

Placeholder: Figure B-14 Dublin/San Ramon Area Alternatives

Page 1 of 2

Placeholder: Figure B-14 **Dublin/San Ramon Area Alternatives (page 2 of 2)**

B.6.3 NORTH LIVERMORE AREA ALTERNATIVES

In this area, the Proposed Project starts at a connection with PG&E Co.'s existing CC-N 230 kV line, and runs west across the north end of the valley. The proposed North Livermore Substation would be located at the south end of a one-mile overhead transmission line that would be located just west of North Livermore Road. The Proposed Project would result in dramatic visual changes to the valley as a result of both the east-west and north-south transmission lines. Alternatives to this portion of the project are illustrated in Figure B-16 and need to include a 230 kV substation and a connection to a 230 kV transmission line.

B.6.3.1 Underground Alternatives to the Proposed Project in North Livermore Area

B.6.3.1.1 *Alternative P-1: Proposed Project with Underground Along North Livermore Road*

This alternative is identical to the Proposed Project, except that the one mile of north-south 230 kV transmission line along North Livermore Road would be installed underground. Two overhead/underground transition stations (one for each circuit) would be located just southwest of the corner of North Livermore Road and Manning Road**.** The underground line would be installed at the center of the vacant easement (marked with PG&E Co. signs, south of Manning Road), but PG&E Co. notes that they would need to re-negotiate the easement for this purpose since it is specific to overhead steel towers.

B.6.3.1.2 *Alternative P-2: Proposed Project with Underground Along Manning Road and North Livermore Road*

This alternative follows the route of the Proposed Project, but would require underground installation of two components:

- The 230 kV transmission line between the CC-N line (at its tap near Milepost B10.4) and approximately Milepost B13.2 (about 2.8 miles across north valley, or only to North Livermore Road if the proposed Dublin Substation were not constructed), and
- As for Alternative P-1, the north-south 230 kV transmission line just west of North Livermore Road (about 1 mile).

For the east-west portion, the underground line would be installed at the center of the vacant easement (marked with PG&E Co. signs, south of Manning Road), but PG&E Co. notes that they would need to re-negotiate the easement for this purpose since it is specific to overhead steel towers. For the north-south portion, the underground line would be installed 50 feet west of the fence on the west side of North Livermore Avenue.

B.6.3.2 Alternative L1: Raymond Road

This alternative would be located along the northern border of most of the bird's beak protected area. It would start at a tap to the CC-N line at the northeast corner of Ames Street and Raymond Road. A transition structure would take the line underground at that corner, and the line would run underground to the west for 1 mile to the corner of Raymond Road and Lorraine Road. The substation would be

located just northeast of this corner, immediately east of the farm/barn property that is just north of the Raymond/Lorraine corner.

B.6.3.3 Alternative L2: Hartman Road

The 230 kV transmission line route would be the same as for the Pleasanton Area Alternative S1 (beginning in Sycamore Grove Regional Park, then underground to Vineyard Avenue and overhead north on Isabel Avenue). Alternative L2 would diverge from Alternative S1 at the corner of Stanley Boulevard and Isabel: rather than turning west on Stanley Boulevard, the line would continue north for an additional 1.7 miles along the Highway 84 corridor to the I-580 junction**.** Between Stanley Boulevard and Jack London Boulevard, the line would be installed overhead and about 40 feet west of edge of the (soon-to-be-expanded) highway. At Jack London Boulevard, the line would turn west to a location just west of the Water Reclamation Plant and east of the end of the airport runways. It would continue north and cross Airway Boulevard at an angle to the northeast, then turn north again along Kitty Hawk. The line would be bored under the I-580 at the point where Kitty Hawk would run into the freeway if it continued due north (Kitty Hawk turns to the west south of the I-580). Across the freeway, the line would be installed underground within the new street network (currently under construction) in the future Isabel Avenue extension and Hartman Road southeast of Las Positas College.

Because Alternative L2 would pass the east end of the Livermore Municipal Airport, the route would have to be installed underground from Jack London Drive north (about one mile immediately south of I-580). It would continue underground approximately 1 to 1.3 miles north of 580 to a substation site study zone in the southwest corner of the North Livermore development area, near Las Positas College. The total length of this alternative (from the Tesla-Newark Corridor the L2 Substation Site) is about 7.3 miles, with 3.6 mile underground.

Due to the topography (relatively steep hillside) of the substation site area, this EIR evaluates a substation "study zone" that includes the hillside and the flatter area to the north. The southern portion of the study zone is within the City of Livermore, and the northern portion is in unincorporated Alameda County. The whole study zone is adjacent to and immediately southeast of the future Hartman Road. All of the resources in this study zone are identified for each issue area in Section C of this EIR.

This alternative would be served electrically by connecting to the CC-N line in the Tesla-Newark Corridor to the south (rather than connecting to the CC-N line in the east, as would be the case for the proposed North Livermore Substation).

Placeholder: Figure B-15 **D2 Reconductoring (page** 1 of 2**)**

Placeholder: Figure B-15 **D2 Reconductoring (page** 2 of 2**)**

Placeholder: Figure B-16 North Livermore Area Alternatives

B.6.4 PHASE 2: TESLA CONNECTION

Phase 2 of PG&E Co.'s Proposed Project would provide a connection between the Proposed Project North Livermore and Dublin Substations and PG&E Co.'s Tesla Substation (located in the western San Joaquin Valley at the eastern base of the Altamont Hills). PG&E Co.'s Proposed Phase 2 and the following alternatives would not be constructed concurrent with Phase 1. Rather, the timing of this phase would be dependent on the actual rate of growth in the region. This phase will be required when the CC-N line (from which the Proposed Project will be served in Phase 1) can no longer support the area's electrical demand (see also discussion of project need in Section A.2). Phase 2 alternatives are illustrated in Figure B-12.

B.6.4.1 Brushy Peak Alternative Segment

Based on input from the East Bay Regional Parks District, an alternative to a portion of the proposed Phase 2 route south of Brushy Peak Preserve is evaluated. The EBRPD believes that relocating this segment would reduce visual impacts at the entrance of the park. This segment would move a portion of the Phase 2 transmission line south to a point near the future entrance to the Brushy Peak Preserve, so the line would not obstruct views north to the Peak. This alternative is approximately 0.3 mile longer than the proposed route.

B.6.4.2 Stanislaus Corridor

In this alternative to PG&E Co.'s Proposed Phase 2, a new 230 kV double circuit line would be constructed between the Tesla Substation and the tap point of the selected alternative (either at about Milepost V17 for the proposed route or S4 alternative or near Milepost V14 for the S1 or S2 alternatives). This route would be about 14.2 miles long (if combined with Alternatives S1 or S2) or 17.0 miles long (if combined with the proposed route or Alternative S4).

This alternative would require between 4.2 and 7.0 more miles of new construction than PG&E Co.'s Phase 2. However, the new construction would be entirely within an established transmission corridor that has been occupied since about 1910. The Stanislaus Corridor is currently occupied by two sets of lattice tower lines that were constructed in the early 1900's. These two sets of towers (which are located at much closer spacing than the taller towers of the 230 kV alternative) would be removed along the portion of this corridor used for this project, if this alternative were selected. Therefore, the landowners whose land is currently crossed by this route would have taller, but more widely spaced, towers crossing their land, and there would be only one set of new towers where there are currently two sets of lattice towers.

Starting at the Tesla-Newark tap at the western end of the Stanislaus Corridor that would be utilized, tubular steel towers would be installed and the old lattice towers would be removed. The new line would be installed at the center of the existing ROW. At Tesla Junction, where the Stanislaus towers continue east across the San Joaquin Valley (to the hydroelectric generation facility on the western slope of the Sierra Nevada for which this line was constructed), the new line would leave the Stanislaus

corridor and turn northerly, for 2.1 miles into the Tesla Substation, paralleling an existing 115kV lattice tower line.

B.6.5 SWITCHING STATION

This alternative would involve construction of a switching station to allow direct connection of the new 230 kV transmission lines (proposed or alternative routes) that originate in the South Area, adjacent to the existing Tesla-Newark Corridor to the existing Tesla-Newark 230 kV transmission line. The existing Tesla-Newark line, while also a 230 kV line, is rated at approximately 1000 MVA[4], which is much higher than the Proposed Project's rating. This existing line has bundled 2300Al conductors with ratings of 988 MVA in normal conditions and 1216 MVA in emergencies. Power flow modeling has been completed by the California ISO to ensure that this line is capable of supplying two of the three substations involved in the Proposed Project (Vineyard, Dublin, North Livermore) without overloading during contingencies.

A switching station would allow the Tesla Newark line to reliably feed the Tri-Valley area without requiring all of the power flowing into the Bay Area to be initially routed through the Tri-Valley area. Because the switching station would allow use of an existing direct connection to the Tesla Substation, this connection would replace PG&E Co.'s proposed Phase 2 and the Stanislaus Corridor Alternative (both of which would require construction of new lines between the Tri-Valley area and the Tesla Substation).

A switching station would require an approximately one-acre fenced site, and would be an unstaffed facility. Figure B-17 illustrates the equipment layout of the switching station. Three locations for possible installation of a switching station are evaluated in Section C.13 of this EIR, and are illustrated on Figure B-18. The locations are:

- In the Sycamore Grove Regional Park, just southwest of the location where the S1/S2/L2 Alternatives would connect with the Tesla-Newark Corridor
- Adjacent to the Del Valle Water Treatment Plant, about one-half mile southwest of the first location. This location would require installation of an underground 230 kV transmission line to the north (in or adjacent to the existing paved roadway) to meet the S1/S2 routes, or installation of an overhead 230 kV line in the Stanislaus Corridor, west to the Proposed/S4 route tap or east to the S1/S2 tap
- At the southern terminus of the proposed overhead line that serves the Vineyard Substation, just south of Highway 84.

[4] MVA: megavoltamperes, is defined as the apparent power of the line. MVA is composed of both real power (measured in megawatts or MW) and reactive power (measured in megavoltamperes reactive or MVAR). The cable circuit rating (expressed in MVA) is the apparent power rating. In comparison, the proposed 230 kV line that would be part of this project could carry 400 MVA per circuit in underground segments.

B.7 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.7.1 and B.7.2 below.

B.7.1 NO ACTION TAKEN BY PG&E CO.

In this scenario, PG&E Co. 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, as a result of rapidly growing demand for electricity in the Tri-Valley area, the electric transmission system will not be able to reliably serve customers in the Tri-Valley area if no new facilities are in place by the summer of 2002. Interruption of electric service to customers could be necessary to relieve equipment overload in peak demand periods. During peak load conditions, the system will not be able to serve the additional demand from new electric customers or the additional electric demands of existing customers in the area, even with all power system facilities in service.

PG&E Co. states that without the Proposed Project (or an equivalent alternative), severe and widespread overloading of the existing electric transmission system may occur starting in 2002, leading initially to equipment overheating, and eventually to electrical and/or mechanical failures. Such failures would result in electric service interruptions and may pose safety hazards in some circumstances.[5] To prevent this from happening, 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 would result in interruption of electric service (rotating blackouts) to customers. As customer demand continues to grow in the Tri-Valley area, electric service interruption would become more frequent and widespread due to worsening electric transmission system overload.

B.7.2 REASONABLY FORESEEABLE ACTIONS BY PG&E CO.

If neither the Proposed Project nor any alternative were approved by the CPUC, PG&E Co. would be forced to evaluate alternative courses of action that could be implemented to solve the near-term electricity shortages in the Tri-Valley area. The following paragraphs address possible courses of action.

Reconductoring of Existing Lines

Reconductoring of existing lines, in locations where this has not already been completed to maximize power flow, is the most likely scenario under the No Project Alternative. Most reconductoring can be completed without CPUC permits or CEQA compliance, because the CPUC's General Order 131-D

[5] This could occur, for example, when overheated conductors anneal, elongate, or sag too close to the ground, in violation of the safety requirements specified in CPUC General Order 95.

Placeholder: Figure B-17 **Typical** Switching **S**tation **L**ayout

page 1 of 2

Placeholder: Figure B-17 **Typical Switching Station Layout (**page 2 of 2**)**

Placeholder: Figure B-18 Switching Station Sites

specifically exempts reconductoring of existing towers from its permitting process. Reconductoring may also require installation of some new structures, since the older structures may not be able to support the heavier conductors; this issue would require evaluation by PG&E Co. Lines that could benefit from reconductoring, thus providing increased electrical service to the Tri-Valley area, are:

- Newark-Vineyard 60 kV line
- Los Positas-Vineyard 60 kV line
- San Ramon-Vineyard 60 kV line

In addition to the reconductoring, many of the existing 60 kV-21 kV and 60 kV-12 kV transformers at area substations would have to be replaced with larger units which in some cases could require significant substation renovation. Also, it may be necessary to upgrade the 230-60kV transformation at the Los Positas and San Ramon Substations as well. This option would only allow PG&E to modify existing substations so the areas that would be served by the proposed Dublin and North Livermore Substations would not receive benefit from these actions.

Curtailment of Electric Service

During June of 2000, when exceptionally high demand due to a Statewide heat wave coincided with the shut-down of units at local power plants, PG&E Co. was forced to institute rolling blackouts (for periods of one to three hours) at various locations in and around the City of San Francisco. This type of scenario may have to be implemented in the Tri-Valley area at times of peak demand if additional transmission and associated substation infrastructure is not provided. PG&E Co's load curtailment plans are structured so as to avoid curtailment of critical loads such as hospitals.

Demand-Side Management (Conservation)

PG&E Co. uses a program of voluntary reduction in electricity use known as Customer Energy Efficiency (CEE). PG&E Co. has had an active CEE program over the past two decades. Its cumulative reduction of use has been substantial. For any given planning area, the historical CEE energy and peak demand impacts have been subsumed within the peak load demands experienced year by year and thus their impacts are included in the forecast of peak growth. Such is the case within the Tri-Valley area. As for future potential CEE impacts, PG&E Co.'s Local Integrated Resource Plan (LIRP) study indicates that only 4 MW per year could be obtained through aggressive locally focused CEE. This falls well short of the capacity needs in the project area, and therefore can only be viewed as an augmentation to other non-traditional wires solution options.

Interruptible Load Program

As an alternative to constructing various components of the project, selective load-dropping[6] during peak load periods was considered. During this past summer, the CAISO solicited bids for

6 Load dropping can be at the discretion of the CAISO and/or utility, or voluntarily at the discretion of the consumer.

"interruptible load". This process took the form of two distinct but similar programs in which various loads (customers) would be paid to interrupt or curtail load during peak load conditions. The CAISO had targeted approximately 2,800 MW of statewide load for these programs. Initially, the CAISO received bids totaling about 580 MW and currently actual statewide participation amounts to 55 MW. While there are many and varied reasons for the small amount of capacity that is participating in these CAISO programs, the results point to the fact that there are relatively small levels of load that can contribute in a manner that will effectively and reliably reduce peak loads. The failure to interrupt one's load at the times required is much the same as a local generator not being available or the occurrence of some other contingency. Given the level of constraints with the current PG&E Co. system serving the Tri-Valley area, it is doubtful that interruptible load sufficient to solve these problems could be placed under contract.

Local Peaking Power Plants

Local power plants that can produce about 50 MW of power each can be installed in the Tri-Valley area to generate power at the times of highest demand. Two such plants are currently proposed in the City of Pleasanton and one in the City of Livermore. While these facilities are evaluated as alternatives to the proposed transmission line and substation project, they are likely to be installed whether or not the Proposed Project is approved. Therefore, they are also part of the No Project Scenario.