PART B. DESCRIPTION OF PROPOSED PROJECT, ALTERNATIVES, AND SCENARIO FOR ANALYSIS OF CUMULATIVE IMPACTS

B.1 INTRODUCTION

Part B of this Environmental Impact Report/Environmental Impact Statement (EIR/S) provides a description of the project as proposed by the Applicant, Sierra Pacific Power Company (SPPCo), referred to as the Proposed Project. Section B.2 presents the general parameters of the Proposed Project and a description of project components.

Based on the requirements of the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), this EIR/S also considers reasonable alternatives to the Proposed Project. Section B.3 describes the screening process that was used to identify the alternatives analyzed fully in this EIR/S. It also identifies the alternatives eliminated from further consideration, and explains the rationale for their elimination. Section B.4 describes in detail each of the alternatives that are analyzed in this document.

Section B.5 presents the scenario used for analysis of cumulative impacts. In presenting this scenario, the various other projects likely to have impacts in combination with the Proposed Project and/or Project Alternatives are identified and described.

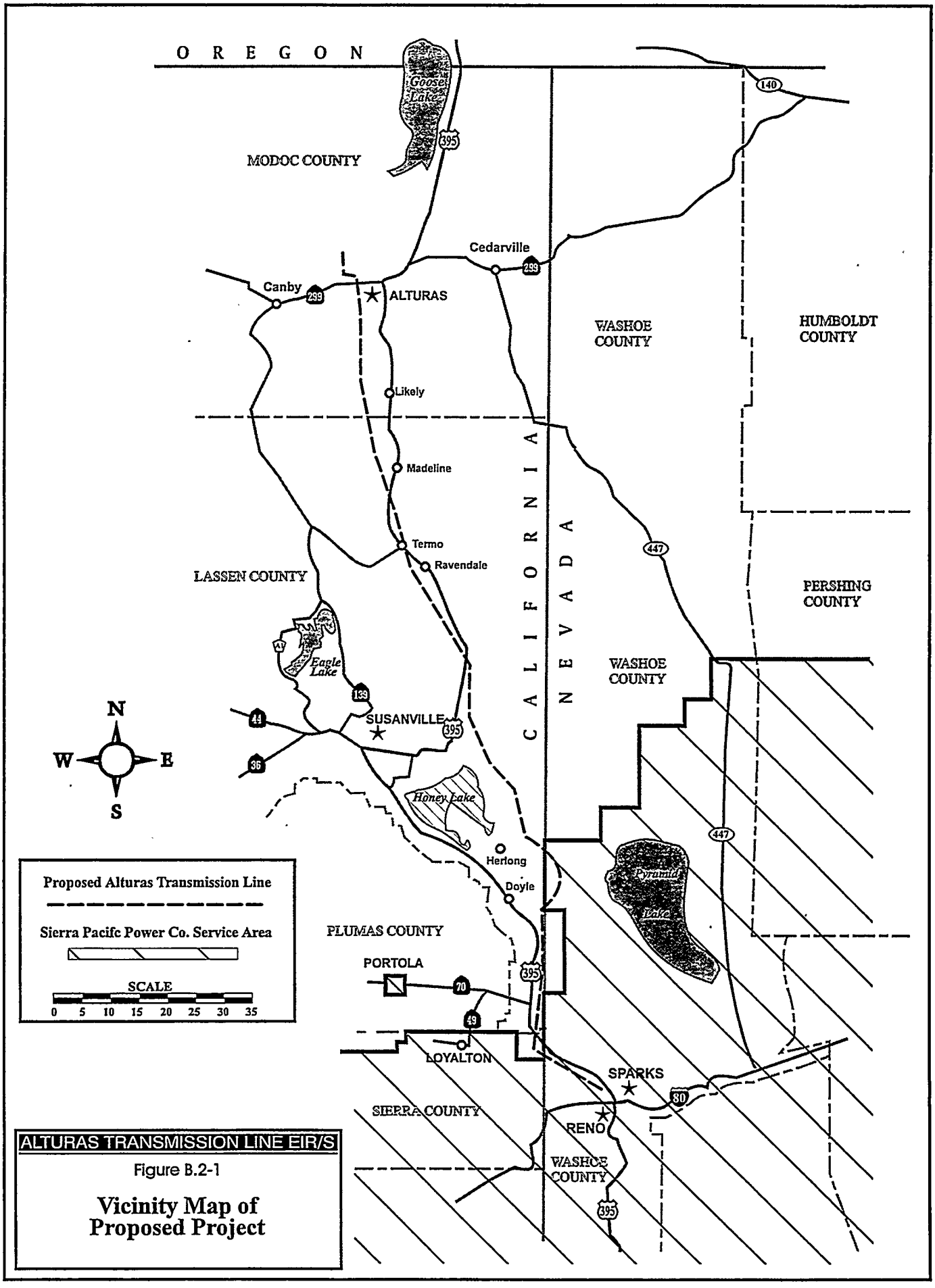
Please note that Part A of the EIR/S addresses the purpose and need for the Proposed Project, the approvals and permits required, and the associated regulatory context.

B.2 PROPOSED PROJECT DESCRIPTION

This Section presents an overview of the Proposed Project (Section B.2.1), describes the components of the Proposed Project (Section B.2.2), provides a description of planned construction (Section B.2.3), describes operation and maintenance procedures (Section B.2.4), and presents potential accident scenarios (Section B.2.5).

B.2.1 OVERVIEW OF THE PROPOSED PROJECT

SPPCo has proposed to construct and operate a 345,000 volt (345 kV) overhead electric power transmission line from the vicinity of Alturas, California to Reno, Nevada. The line would connect SPPCo's electrical system with the Bonneville Power Administration (BPA) and PacifiCorp systems in Oregon and Washington; a two mile, 230 kV segment connecting the Proposed Project to BPA's existing 230 kV line is included as part of the Proposed Project. The proposed transmission line route is approximately 165 miles long; Figure B.2-1 is a map showing the route and vicinity of the Proposed Project, as well as the service area of SPPCo.


O R E G O N
Goose Lake
MODOC COUNTY
Cedarville
Canby
ALTURAS
WASHOE COUNTY
HUMBOLDT COUNTY
Likely
Madeline
Termo
Ravendale
LASSEN COUNTY
PERSHING COUNTY
Eagle Lake
SUSANVILLE
CALIFORNIA
NEVADA
N
W
E
S
Honey Lake
Herlong
Doyle
Pyramid Lake
PLUMAS COUNTY
PORTOLA
LOYALTON
SPARKS
SIERRA COUNTY
RENO
WASHOE COUNTY
140
395
299
447
139
44
36
70
49
80
Proposed Alturas Transmission Line
Sierra Pacifc Power Co. Service Area
SCALE
0 5 10 15 20 25 30 35
ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-1
Vicinity Map of Proposed Project

The majority of the Proposed Project (approximately 140 miles) would travel in a general north-south direction through northeastern California, starting a few miles northwest of the City of Alturas to the California-Nevada state line near Border Town, Nevada. From Border Town, the line would travel in a southeasterly direction until it reaches Reno, Nevada. Within California, the line would traverse Modoc, Lassen, and Sierra Counties; within Nevada, the project would traverse Washoe County. Table B-1 provides a summary of the approximate miles of transmission line within each California and Nevada County.

Table B-1 Project Route Summary

County	Transmission Line Mileage within County
CALIFORNIA	
- Modoc	27.5
- Lassen	106.6
- Sierra	4.5
California Subtotal	138.6
NEVADA	
- Washoe	26.2
Nevada Subtotal	26.2
TOTAL CA & NEVADA	164.8

The proposed 345 kV transmission line would be suspended from 70- to 130-foot structures (depending on terrain), spaced on average, about every 1,200 feet; the two mile, 230 kV portion would use structures about 80-85 feet tall, spaced approximately every 700 feet. Approximately 730 structures would be required. The suspended line would include three pairs of conductor cables and two shield wires, one of which would also contain a fiber-optic cable. The project as proposed would include construction of two new substations in California, one northwest of Alturas and one in Sierra County, California just west of Border Town, Nevada. In addition, SPPCo's existing North Valley Road Substation north of Reno would be expanded. Minor modifications would also be made to substations owned by the BPA and by PacifiCorp in southern Oregon and northeastern California.

The Applicant originally proposed 100- to 130-foot structures for transmission line suspension in the Proponents Environmental Assessment. Subsequently, SPPCo modified the range in structure heights from 100- to 130-feet to 70- to 130-feet to address any possible structure height that may be required for the project. For example, a 70-foot structure may be desirable for ridge-tops with steep canyons on each side of the ridge. Given the required minimum conductor ground clearance of 34 feet, structures must be at least 70 feet in height. SPPCo estimates that 70-foot structures would comprise less than 5% of the total number of structures to be used on the project.

B.2.2 PROPOSED PROJECT COMPONENTS

Table B-2 summarizes the various components of the Proposed Project. These components are discussed in detail in the following sections which address the proposed route, transmission line facilities, substation facilities, and communication facilities.

Table B-2 Summary of Proposed Project Components

Proposed Route and Right-of-Way • Route Length: 165 miles • Tap Point: Bonneville Power Administration 230 kV line, northwest of Alturas, CA • Termination Point: SPPCo North Valley Road Substation, Reno, NV • Right-of-Way (ROW) Width: 160 feet (120 feet from BPA 230 kV line to Alturas Substation, 140 feet from Angle Point X13 to North Valley Road Substation, • Total ROW Acreage: 3,200 acres (not including substations, construction access roads and staging areas)
Transmission Line Facilities (345 kV line) • Voltage: 345 kV (230 kV from BPA 230 kV line interconnect to Alturas Substation) • Conductors: 3 pairs of 1-inch diameter current-carrying wires (stranded aluminum/steel) • Minimum Conductor Distance from Ground: 34 feet at 130°F (SPPCo Design Specification) • Shield Wires: 1 pair of 3/8 - 3/4-inch diameter wires, one containing fiber-optic cable • Structure Types: - Tubular steel H-frame structures for straight sections of route - Guyed 3-pole tubular steel structures for "angle points," where line changes direction - Wood H-frame structures from BPA 230 kV line interconnect to Alturas Substation - Single-pole steel structures from Angle Point X-13 west to North Valley Road Substation. • Structure Heights: 70 - 130 feet • Approximate Average Distance between Structures: 1,200 feet (700 feet in wood H-frame section, 800 feet in single-pole section) • Total Number of Structures: approximately 730
Substation Facilities • Alturas Substation (new), Devils Garden Site, Alturas, CA Area: - Developed acreage: 10.5 acres (approx. 695 x 535 feet fenced, plus access road and 3 feet outside fence) - Functions: voltage transformation and control, switching/circuit protection, communications • Border Town Substation (new), Sierra County, CA, near Border Town, NV: - Developed acreage: 11.8 acres (approx. 790 x 430 feet fenced, plus access road, 3 feet outside fence, and berm area for visual screening) - Functions: power flow control (magnitude, direction), switching/circuit protection, voltage control, communications • North Valley Road Substation (existing), Reno, NV: - Expansion of developed acreage: 1.7 acres (340 x 128 ft. fenced, plus additional earthwork), added to existing 340 x 490 feet (4-acre) site - Functions: voltage transformation and control, switching/circuit protection, communications • Existing Sites of Other Minor Substation Additions: - Bonneville Power Administration Malin and Warner Substations
Communications Facilities • Systems: Optical Ground Wire, Power Line Carrier System, VHF/UHF Radio • Functions: communications for fault detection, line protection, system control and data acquisition SCADA), two-way voice communication • Communication facilities: Five communications sites to house fiber optic communications equipment, one installed at each substation and two communication sites (Herlong & Termo)
Construction Facilities • Access Roads: new access roads (2.5 miles), permanant overland travel routes (3.4 miles), upgrade existing roads (28.6 miles), temporary overland travel routes requiring blading (77.6 miles) • Staging Areas: 7 total (5 used by Tuscarora Pipeline; one adjacent to Border Town Substation; one at Ohm Place-Reno) (approx. 100 acres total)

B.2.2.1 Proposed Route and Right-of-Way Characteristics

This Section provides an overview of the proposed routing of the Alturas Transmission Line Project, a discussion of the Route Refinement Process conducted by SPPCo, and a summary of future easement classifications for the project right-of-way (ROW).

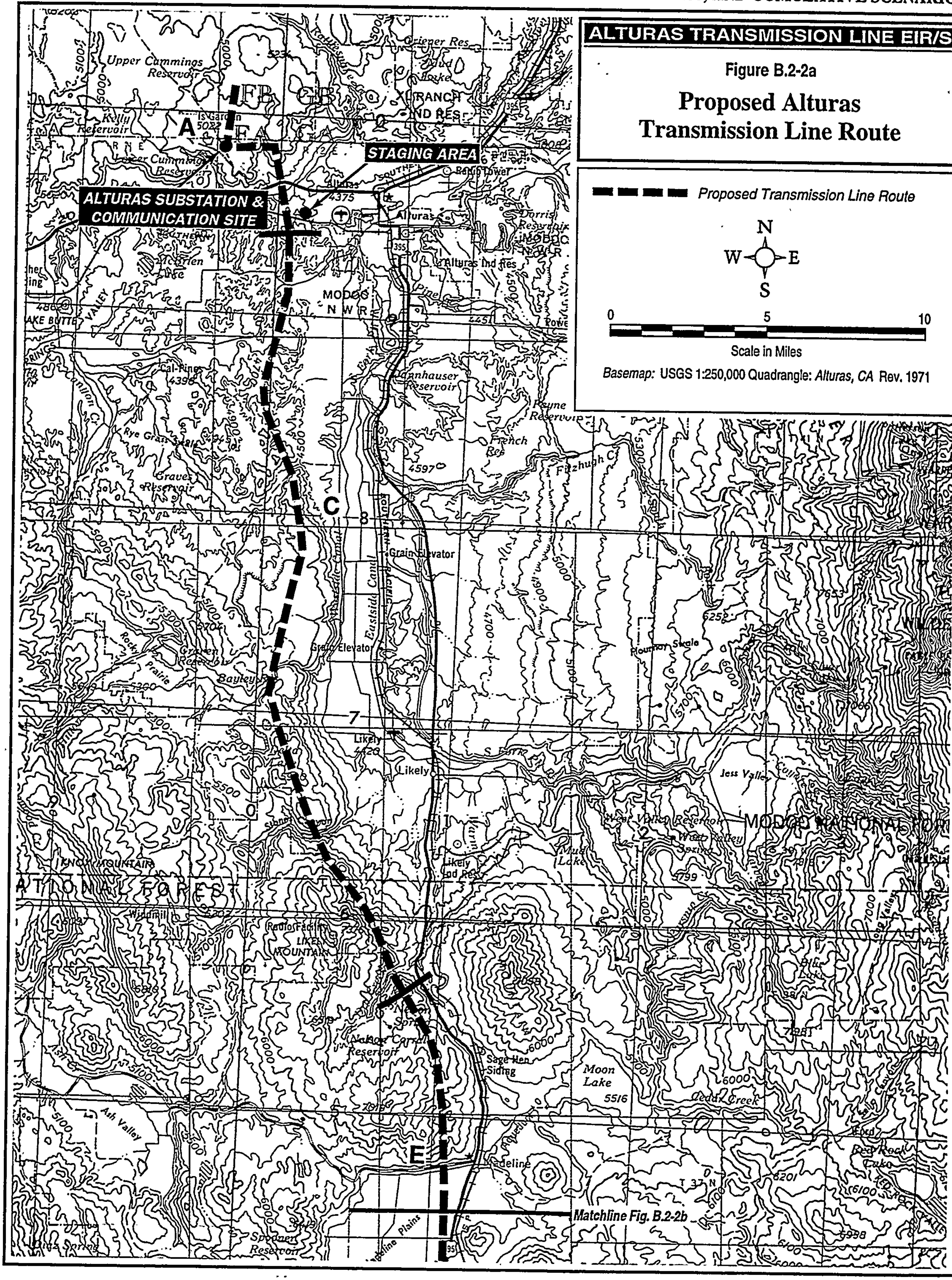
Project Routing Overview. Figure B.2-2(a-d) presents the Applicant's proposed transmission line route from north to south. More detailed base maps are provided at the end of Volume I. In it's application, SPPCo presented the Proposed Project as a linear series of Segments (A, C, E, K, L, N, O, Q, R, T, W, X, Y), where each segment is defined by a series of angle points (the locations where the line changes direction; e.g., CØ1, CØ2, etc.). This nomenclature has been carried forward in this EIR/S.

The proposed 165-mile route originates just northwest of Alturas at a tap point on the existing Bonneville Power Administration 230 kV transmission line. From the tap point, a double circuit 230 kV line would be constructed for connection to the proposed Alturas Substation (Devils Garden site). Traveling south from the substation a 345 kV line would be constructed that crosses Highway 299 west of Alturas, and would run along a plateau well to the west of U.S. 395 until approaching U.S. 395 approximately three miles south of Madeline. Figure B.2-2a illustrates this portion of the proposed route.

The 345 kV line would cross to the east side of U.S. 395, paralleling the route of the proposed Tuscarora Gas Pipeline through the Madeline plains (see base maps, at the end of Volume I, for Tuscarora Gas Pipeline routing). The line route would then cross over well to the west side of U.S. 395 in the vicinity of Ravendale, crossing back over to the east side of U.S. 395 near Saddle Rock. The line would closely parallel U.S. 395 to the vicinity of Smoke Creek Ranch Road, where it would leave U.S. 395 heading south/southeast to the east side of Wendel, then south along the eastern boundary of Sierra Army Depot. Figures B.2-2b and B.2-2c illustrate this portion of the proposed route.

The proposed transmission line route would then go around the east side of the Fort Sage Mountains, then again paralleling U.S. 395 along the western foothills of the Petersen Mountain Range (east of U.S. 395). The route would cross U.S. 395 and connect to the proposed Border Town Substation site located within Sierra County, California, southwest of U.S. 395 near Border Town, Nevada. As shown in Figure B.2-2d, from the substation, the proposed route would follow along the northern and eastern flanks of Peavine Peak where it would turn east, paralleling two existing overhead power lines, and travel to the proposed transmission line's connection with SPPCo's existing North Valley Road Substation in northern Reno.

Between Alturas, California, and Reno, Nevada, the land ownership along the Proposed Project route consists of approximately 44% private land and 56% public land. The public portion includes lands of the Department of Interior, U.S. Bureau of Land Management (BLM), the U.S. Forest Service (USFS), the California Department of Fish and Game (CDFG), California State Lands Commission, and the Sierra Army Depot (U.S. Army). Private lands include open range lands and some residential and agricultural uses, including parcels of land ranging from a few acres to large ranch holdings.


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2a
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
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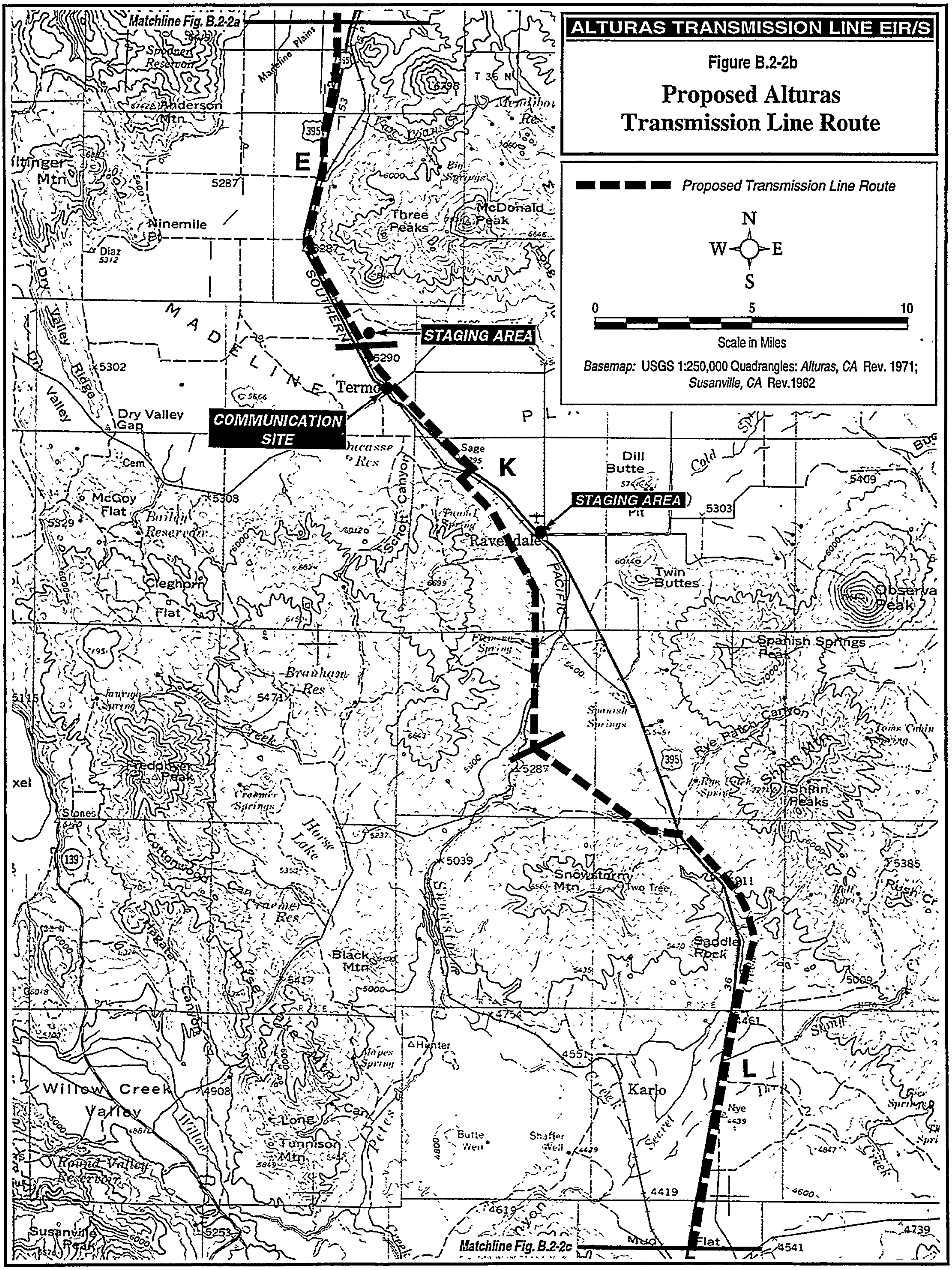
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangle: Alturas, CA Rev. 1971
STAGING AREA
ALTURAS SUBSTATION & COMMUNICATION SITE
A
C
E
Matchline Fig. B.2-2b
Upper Cummings Reservoir
Kelly Reservoir
Alturas
MODOC N W R
Dorris Reservoir
Alturas Ind Res
Cal-Pine
Rye Grass Swale
Graves Reservoir
Grain Elevator
Eastside Canal
Likely
Likely Ind Res
Jess Valley
West Valley Reservoir
West Valley Spring
MODOC NATIONAL FOREST
KNOX MOUNTAIN
Windmill
Radio Facility
LIKELY MOUNTAIN
Nelson Corral Reservoir
Sage Hen Siding
Moon Lake
5516
Cedar Creek
Ash Valley
Madeline
Madeline Plains
Spooner Reservoir
Red Rock Lake
French Res
Fitzhugh C
Payne Reservoir
Dannhauser Reservoir
Mud Lake
Bayley Res


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2b
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
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0
5
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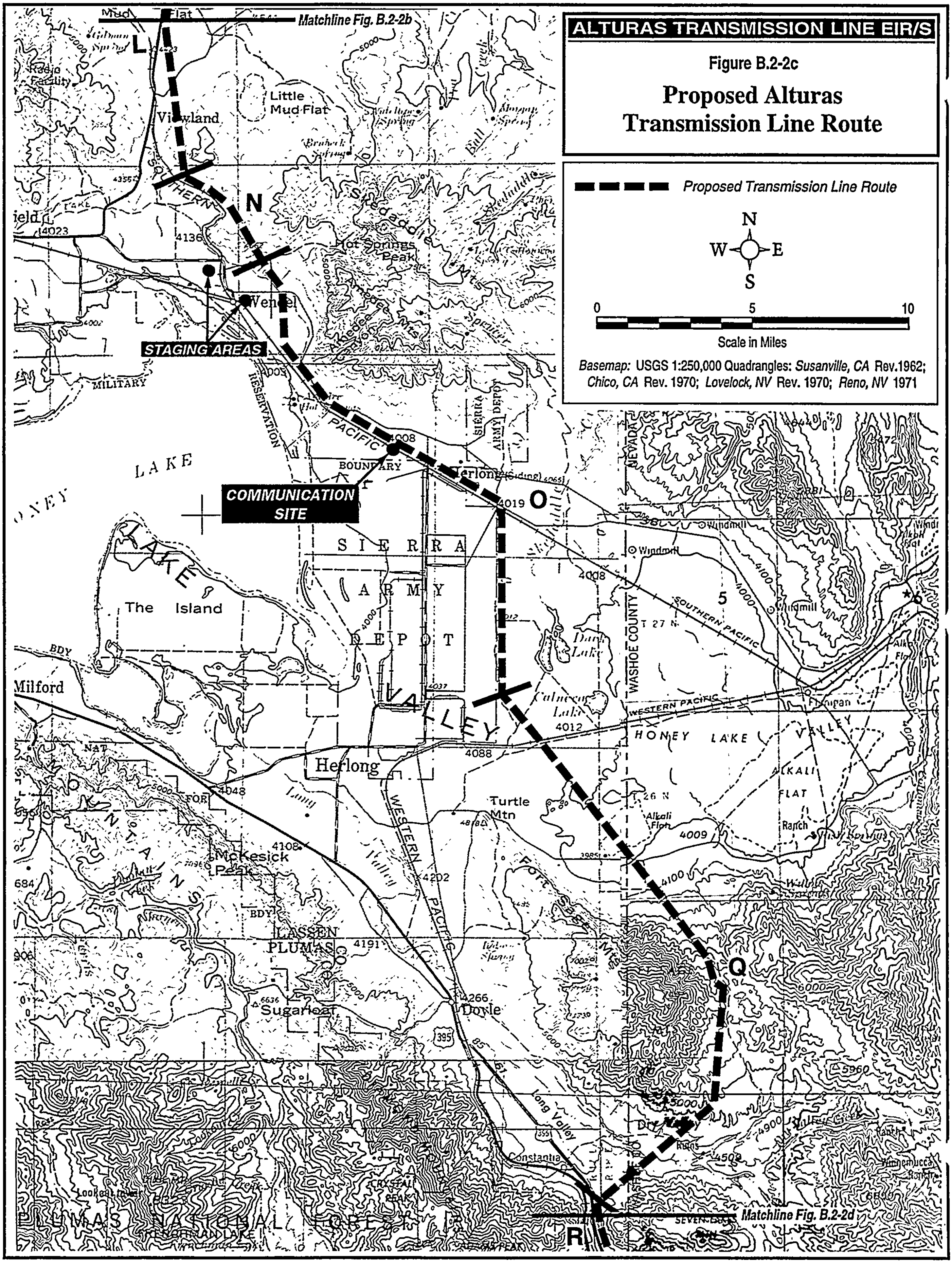
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Alturas, CA Rev. 1971; Susanville, CA Rev.1962
Matchline Fig. B.2-2a
Matchline Fig. B.2-2c
STAGING AREA
COMMUNICATION SITE
STAGING AREA
E
K
L
Termo
Ravendale
Madeline Plains
Dry Valley Gap
Three Peaks
McDonald Peak
Twin Buttes
Observation Peak
Snowstorm Mtn
Saddle Rock
Karlo
Willow Creek Valley
Round Valley Reservoir
Susanville Peak
Horse Lake
Black Mtn
Spanish Springs Peak
Shinn Mtn
Shinn Peaks
Dill Butte
Anderson Mtn
Ninemile
McCoy Flat
Cleghorn Flat
Bailey Reservoir
Mud Flat


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2c
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
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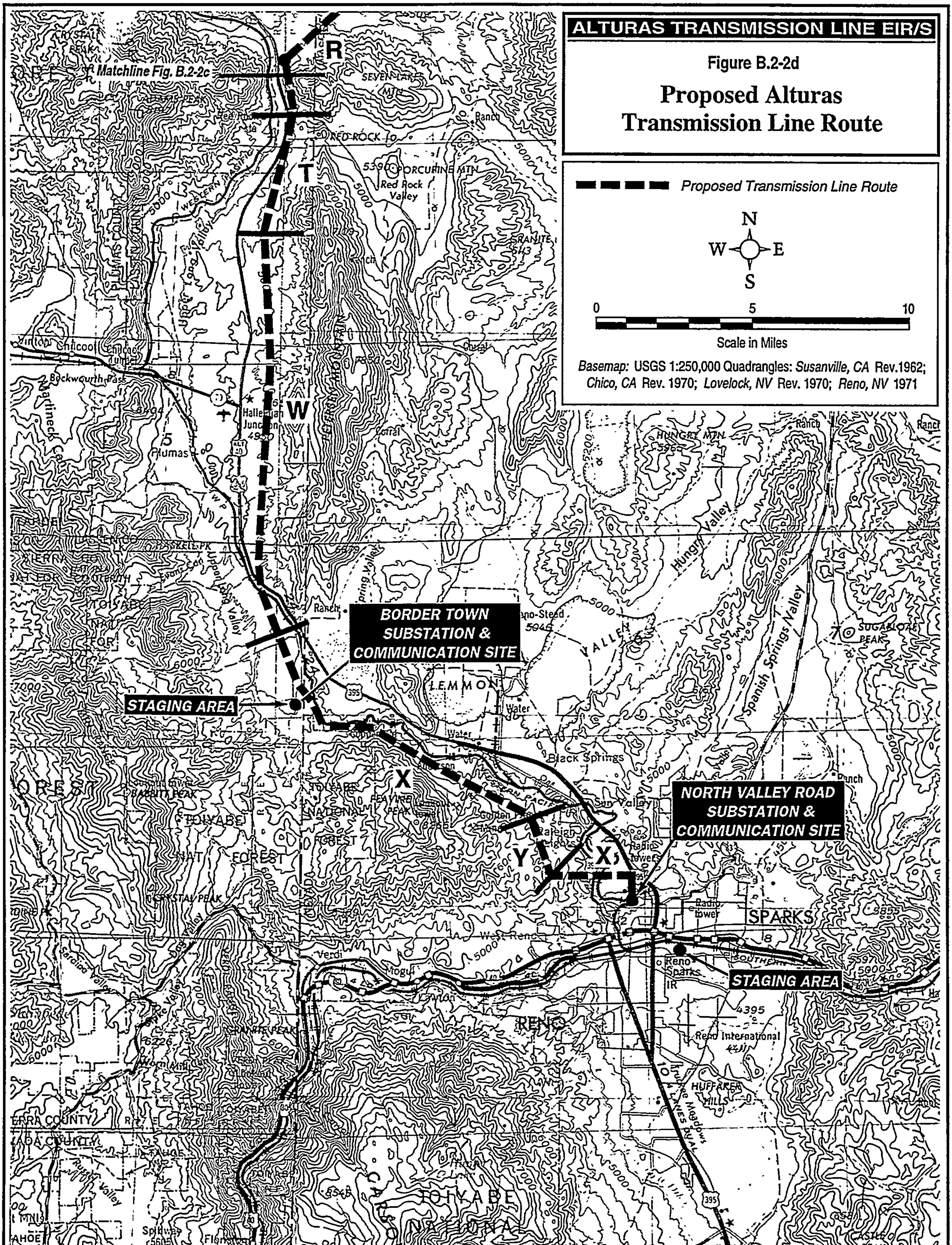
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
Matchline Fig. B.2-2b
Matchline Fig. B.2-2d
STAGING AREAS
COMMUNICATION SITE
L
N
O
Q
R
Viewland
Little Mud Flat
Hot Springs Peak
Wendel
The Island
Milford
Herlong
Turtle Mtn
McKesick Peak
Sugarloaf
Doyle
Constantia
SIERRA ARMY DEPOT
HONEY LAKE VALLEY
WASHOE COUNTY
SOUTHERN PACIFIC
WESTERN PACIFIC
LASSEN
PLUMAS
PLUMAS NATIONAL FOREST
Long Valley


ALTURAS TRANSMISSION LINE EIR/S
Figure B.2-2d
Proposed Alturas Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
Matchline Fig. B.2-2c
R
T
W
X
Y
X
BORDER TOWN SUBSTATION & COMMUNICATION SITE
STAGING AREA
NORTH VALLEY ROAD SUBSTATION & COMMUNICATION SITE
STAGING AREA
SPARKS
RENO
LEMMON
Black Springs
Sun Valley
Hungry Valley
Spanish Springs Valley
Red Rock Valley
Chilcoot
Plumas
Verdi
Reno International
Boca
Spanish Springs Valley

Route Refinement Process. The ROW for the Proposed Project would generally be 160 feet wide. In their applications to the California Public Utilities Commission (CPUC) and BLM, SPPCo proposed a 660-foot wide study corridor for the 165-mile length of the project route with the centerline located at 330-feet, bisecting the corridor. In the preparation of this EIR/S, the 660-foot corridor was studied for each issue area. In addition, a 660-foot corridor was studied for each proposed alternative segment to the project route (see Section B.4). As baseline setting information was generated for the project and alternative study corridors, it was entered into a Geographic Information System (GIS) developed for this EIR/S. The base maps at the end of Volume I, illustrate this baseline setting information.

In July 1994, SPPCo made a request to the CPUC and BLM that the GIS baseline data developed for this EIR/S be provided, with basic interpretive services, to assist SPPCo in refining its proposed centerlines and angle points within the 660-foot survey corridors (referred to as the "Route Refinement Process"). During the week of October 11 through 14, the Aspen Team, under the supervision of the CPUC and BLM, provided displays of GIS-mapped resources relative to SPPCo's proposed route and route segment alternatives. These displays identified the resources mapped and indicated their relative sensitivities per an informal rating system developed by the Aspen Team, in consultation with the CPUC and BLM. Resources mapped included biological resources, wildlife habitat, cultural resources, geologic hazards, hydrologic resources, and sensitive land uses. In addition to providing the GIS displays, the Aspen Team provided limited services in describing the nature of the mapped resources in response to SPPCo questions.

SPPCo utilized the Route Refinement Process for selecting the Proposed Project and alternative segment centerlines and angle points within the 660-foot study corridors based on their weighing of the environmental constraints with respect to their design considerations. The centerline and angle point locations are illustrated on the base maps included at the end of Volume I. Angle point coordinates and segment lengths are summarized on a spreadsheet included as Appendix C.

SPPCo used the Route Refinement Process to identify the mapped resources that could be easily avoided (with appropriate protective flagging in the field) and those that they would commit to avoiding (through establishment of exclusion zones or through routing of construction access). The biological resources to be avoided are summarized on a spreadsheet included as Appendix E.4; no structure zones have been identified for cultural resources, but given the confidential nature of this information, these no structure zones have not been included in this EIR/S. All exclusion zones will be identified and flagged in the field prior to project construction, subject to Lead Agency and designated environmental monitor(s) verification. Construction and related activities would be restricted to specific areas only. Any operation in unspecified areas, including unauthorized access routes, would be prohibited. If during construction additional resources are discovered (e.g. expanded or new plant communities because of varying precipitation patterns, undiscovered subsurface cultural resources, etc.), all applicable mitigation measures presented in this EIR/S will be implemented, in the event the resources can not be avoided.

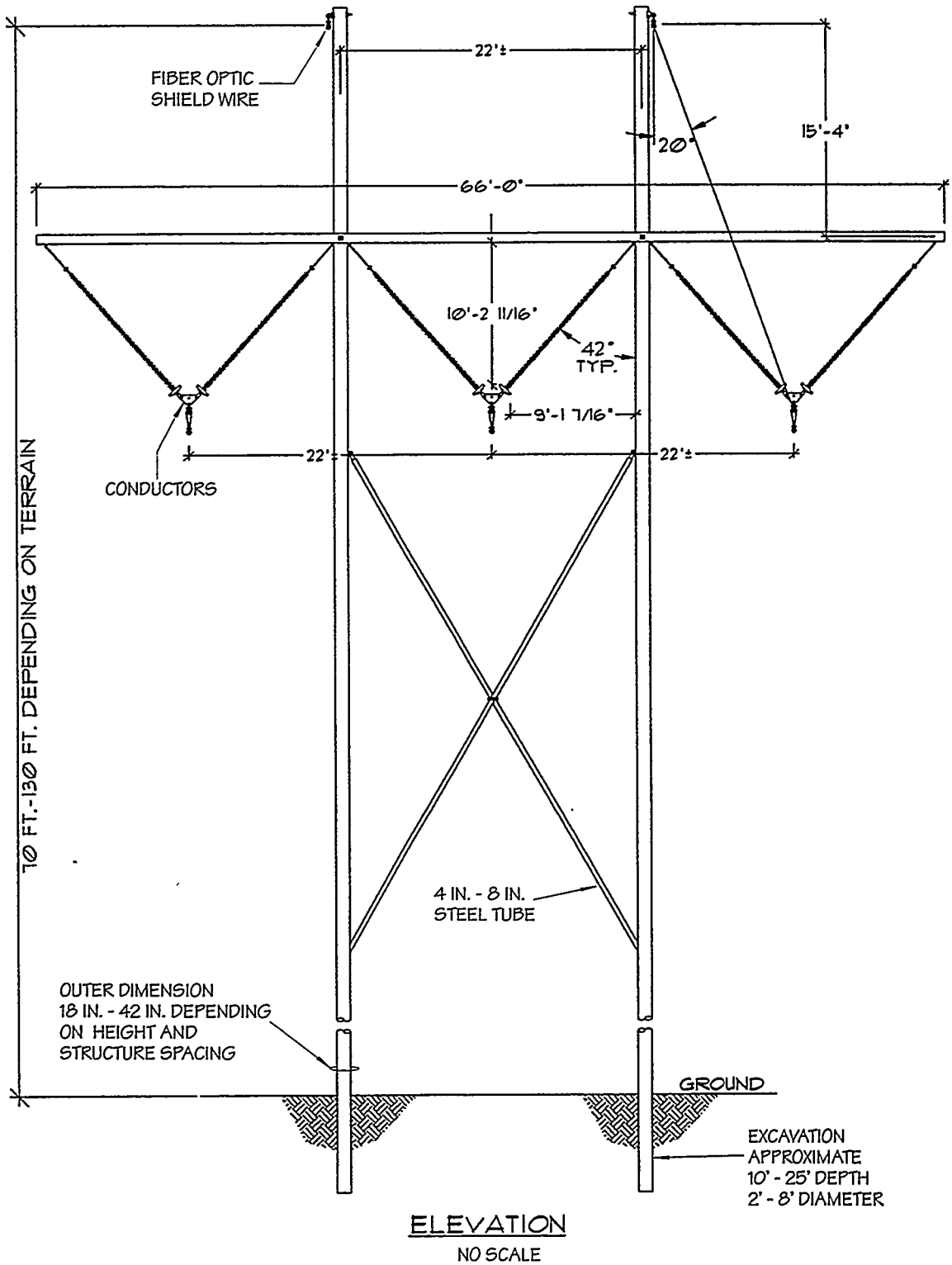
ROW Easement Classifications. For the portion of the Proposed Project to be routed on Federal lands, SPPCo would obtain a non-exclusive grant of ROW from the BLM and a non-exclusive ROW or permit

from the USFS. In addition, the Modoc and Toiyabe National Forests might designate the ROW traversing their respective lands as utility corridors through their plan amendment processes (the growth inducement aspect of designated utility corridors is discussed in Section E.3 of this EIR/S). An easement would also be obtained from the U.S. Army for the portion of the route traversing Sierra Army Depot lands. These Federal agencies would reserve control of the ROW within Federal lands by maintaining the right to permit non-interfering uses within the ROW. For private lands, SPPCo intends to acquire exclusive transmission line easements that would be recorded in the respective counties in California and Nevada. Additional land uses within the 160-foot ROW that do not conflict with the safe operation of the line (e.g., cattle grazing) could be allowed depending upon jurisdictional constraints.

B.2.2.2 Transmission Line Facilities (Lines and Structures)

SPPCo has proposed the use of tubular steel structures to support the power lines along the route. H-frame and single-pole structures would be used for the straight portions of the proposed route. Wood H-frame structures would only be used from BPA's 230 kV line to the Alturas Substation. Single-pole structures would be used from Angle Point X13 west to SPPCo's North Valley Road Substation. Steel H-frame structures would be used along the remainder of the proposed route, except at "angle points" (places where line changes direction). The H-frame structures would consist of two steel or wood poles embedded in the ground and connected by a cross-beam (creating the "H" shape); the single-pole structure would involve the embedment of one steel pole into the ground or concrete footing. The steel H-frame structures would vary in height from 70 to 130 (80-85 feet for wood H-frame structures) feet depending on the terrain being crossed; the height of single-pole structures would range from 110 to 130 feet. The average span between structures along the straight portion of the route would be approximately 1,200 feet (700 feet in wood H-frame section, 800 feet in single-pole section). Guyed three-pole structures would be used at "angle points" (places where the line changes direction). Like the H-frame structures, these structures would also vary from 70 to 130 feet in height. Schematic drawings of the proposed transmission structures appear in Figures B.2-3a and B.2-3b (H-frame structures), B.2-4 (single-pole structures), and B.2-5 (angle point structures).

Structures would support six non-specular (non-reflecting), stranded aluminum/steel conducting wires approximately one inch in diameter and two "shield" wires. Minimum conductor ground clearance would be 34 feet. SPPCo is currently proposing the use of twin 795 aluminum conductors, steel reinforced (ACSR) (one-inch diameter). While detailed design of the Alturas Project might require the use of twin 954 ACSR conductors (approximately 1.2 inch diameter), the use of these larger conductors would require only a minor increase in structure heights (the range in structure heights would not change) and structure wall thicknesses. In addition, as discussed in Section C.10, no appreciable increase in electric and magnetic field (EMF) strengths would be experienced. "Shield wires" are stranded steel wires (3/8 - 3/4 inch diameter located at the tops of the uprights) that protect the line from lightning strikes. One of the shield wires would consist of a stranded steel wire which would contain a fiber optic cable inside it. The line would be designed to meet or exceed the loading requirements of the CPUC's General Order 95 (GO95) and the National Electrical Safety Code (NESC).

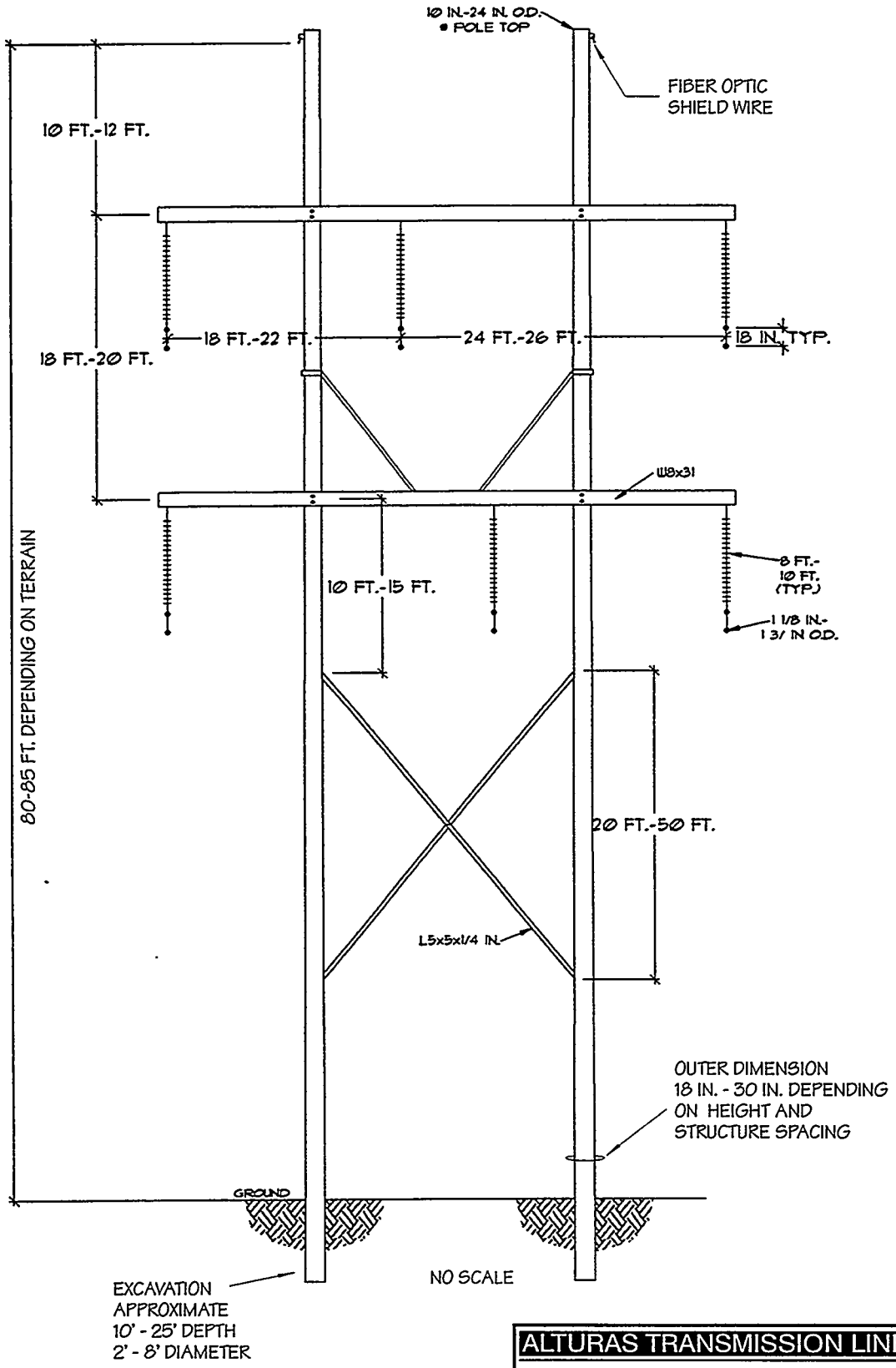


ELEVATION
NO SCALE

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-3a

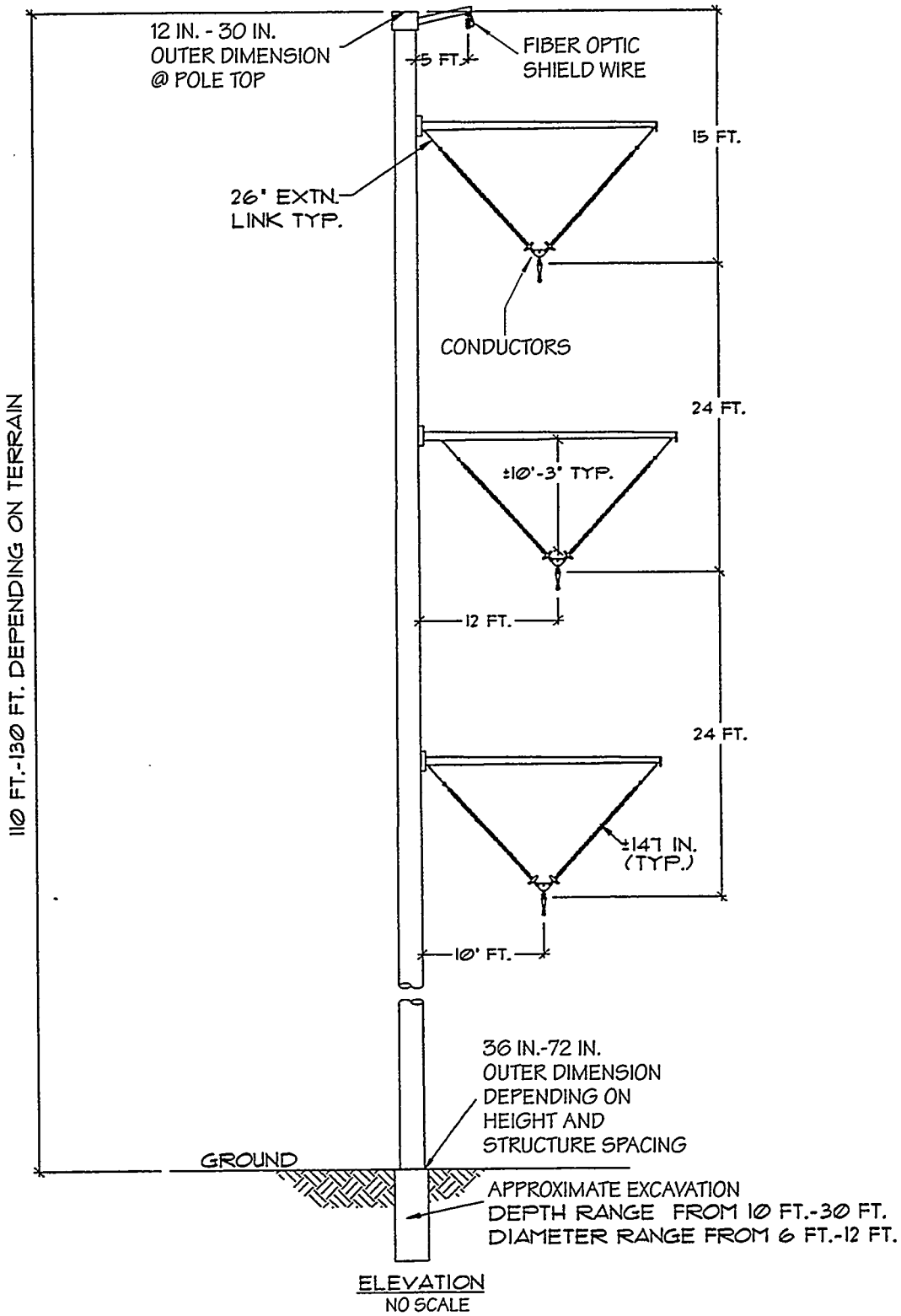
345 kV Steel H-Frame Structure



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-3b

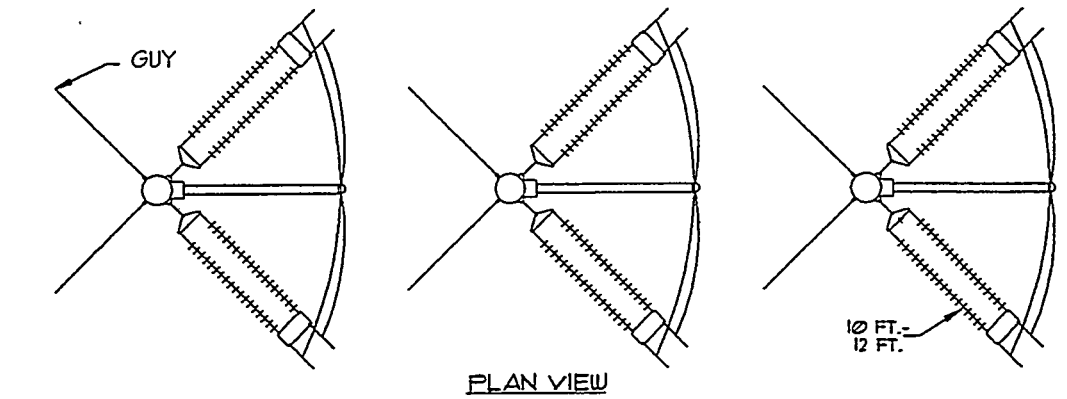
230 kV Double Circuit Wood H-Frame Structure



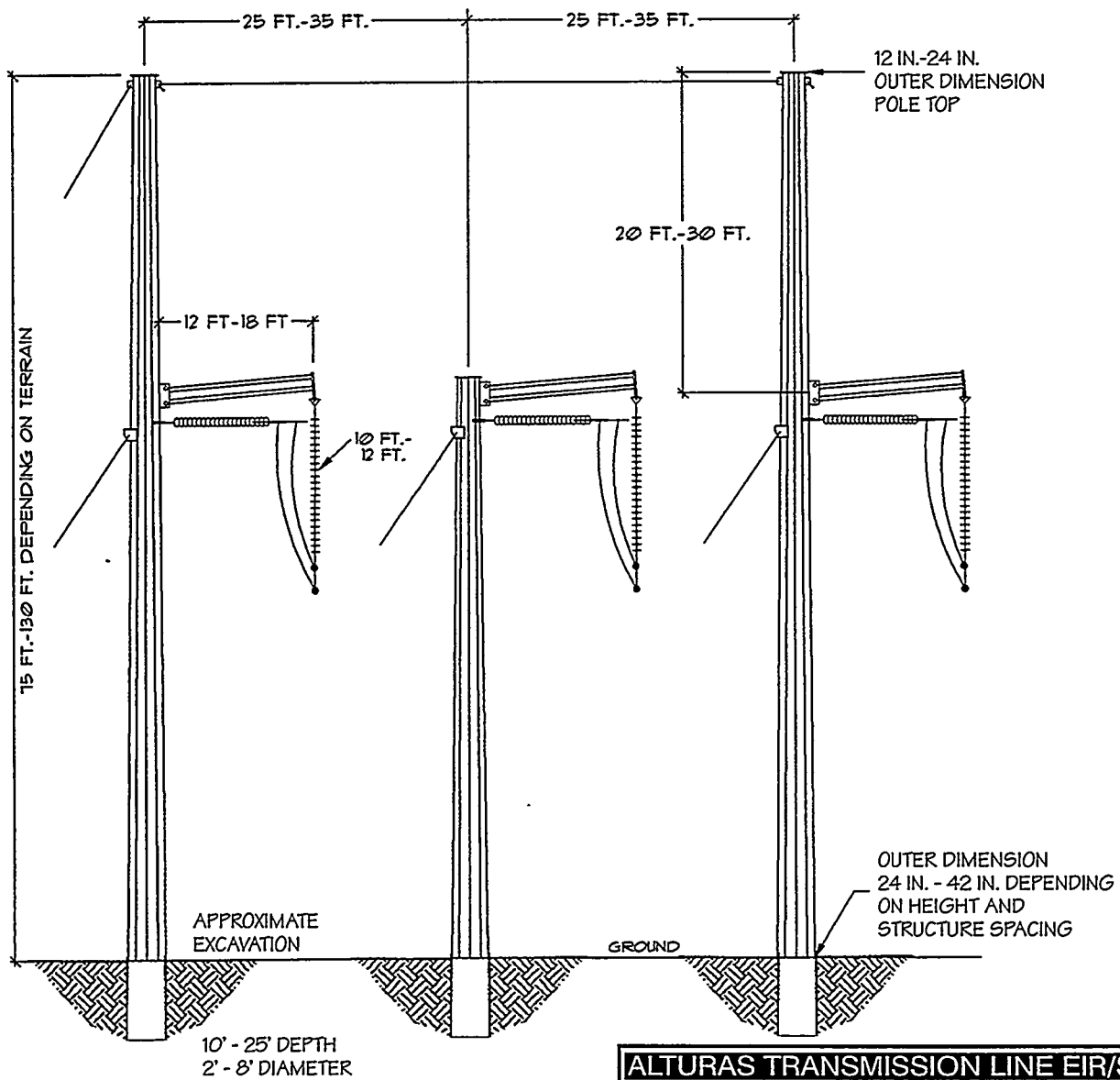
ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-4

345 kV Steel
Single Pole Structure



PLAN VIEW



ELEVATION
NO SCALE

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-5

345 kV Steel
3-Pole Angle Structure

In selecting the type of structure to use for the transmission line, SPPCo considered structural engineering factors, including the structures' ability to support the conductors and shield wires placed on them. SPPCo also considered factors including cost, aesthetics, public safety, ease of assembly and erection, performance, and flexibility/strength. All systems were evaluated based on CPUC GO95 Loading Requirements. Five different structure configurations were evaluated based on their relative cost, aesthetics, maintenance, electrical characteristics, and reliability. The structure types evaluated by SPPCo were:

- Rectangular Laminated Wood H-Frame Structure
- Tubular Steel H-Frame Structure (see Figure B.2-3)
- Guyed Delta Steel Lattice Structure
- Four-legged self supporting Lattice Steel Structure
- Single Shaft Tubular Steel Structure

As a result of this analysis, SPPCo selected the tubular steel H-frame as the preferred structure for the Proposed Project. Further, SPPCo proposes the use of self-weathering, Corten steel (dark, rust-like finish) and non-specular conductors to mitigate the visual impacts of the structures. Since BPA is responsible for the design of the Proposed Project from BPA's 230 kV line to the Alturas Substation, BPA selected the use of wood H-frame structures for this portion of the project alignment.

B.2.2.3 Proposed Substation Facilities

The proposed interconnection of the new transmission line to the BPA system in the north and SPPCo system near Reno would include the design and construction of two new electrical substations, and additions to an existing substation. The first new substation is called Alturas Substation, to be located northwest of Alturas, CA. The second new substation is called Border Town Substation, located in Sierra County, California, approximately 15 miles northwest of Reno. The southern end of the new line would terminate at SPPCo's existing North Valley Road Substation, located north of Reno, Nevada.

The designs for each substation are still preliminary at this time. However, based upon analysis of comparable existing substations, the type and size of equipment and structures can be described. Preliminary drawings have been made to show the proposed layouts and the size of the property that might be required. Upon completion of planning studies, the designs would be finalized and any needed changes could, for instance, change the proposed number of switches and circuit breakers or change the transformer ratings, etc. Figure B.2-6 is a "one-line diagram" illustrating the connection of the proposed transmission line and substations upon completion of construction.

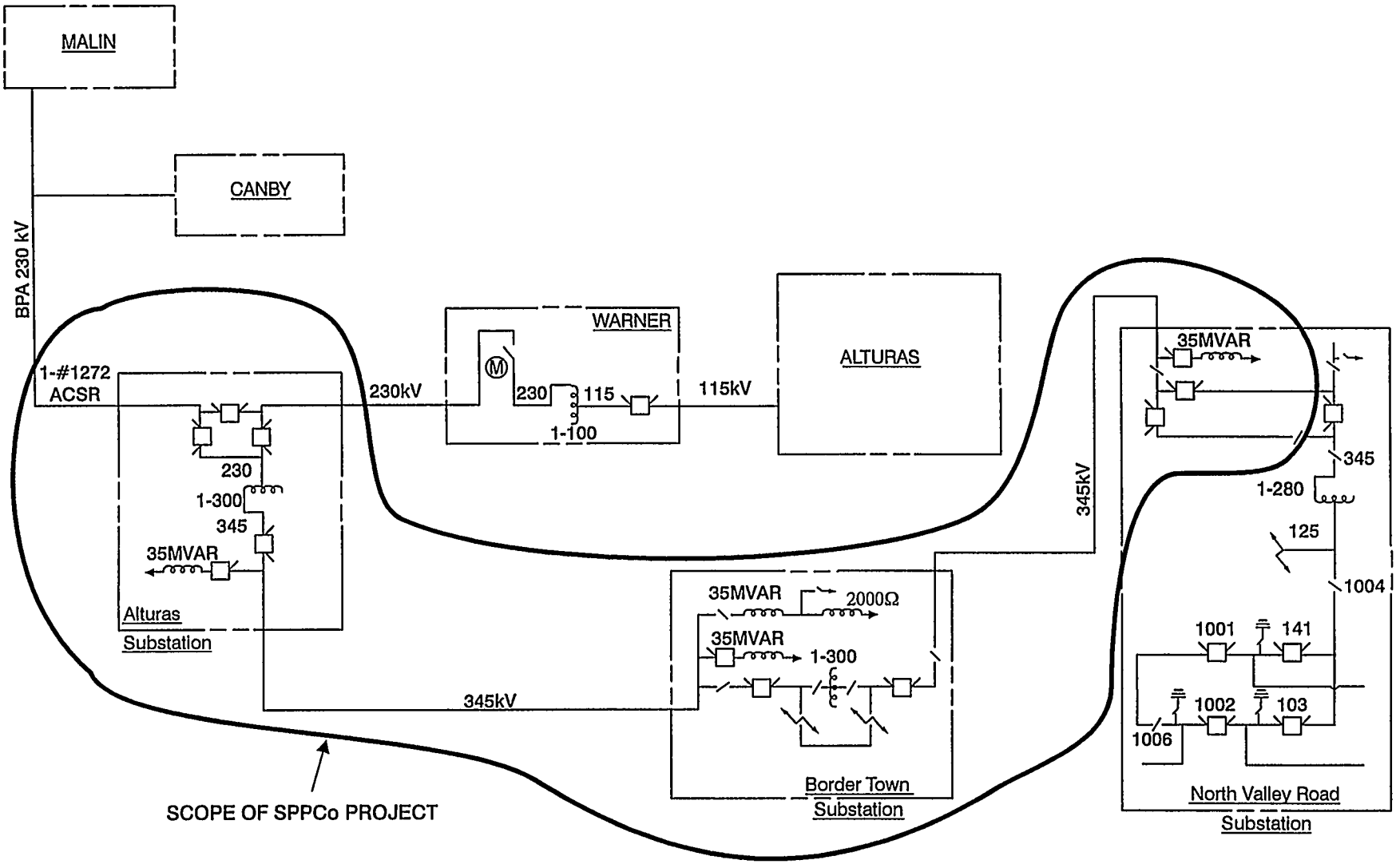
Landscaping around the perimeter of the Border Town Substation is proposed by the Applicant. At the Alturas Substation site, SPPCo proposes to preserve existing vegetation adjacent to the County Road to provide visual screening.

Alturas Substation

The Alturas Substation would be located at the northern end of the Proposed Project, approximately five miles northwest of Alturas. The purpose of the Alturas Substation is to interconnect the north end of the transmission line to the BPA. SPPCo evaluated several possible sites for this substation and has proposed the Devils Garden site shown in Figure B.2-7. This figure also illustrates the study area addressed in selecting the preferred substation location. This northern substation site is located a few miles southwest of BPA's Warner Substation. The Devils Garden site is approximately 16 acres (925 feet by 760 feet). The area of disturbance for the Alturas Substation is estimated to be approximately 10.5 acres. SPPCo proposes to locate the substation and any cut and fill areas that fall outside of the substation fencing within the Devils Garden site boundaries in such a manner that environmental impacts are minimized. BPA's existing Malin to Warner 230 kV line would be folded into the Alturas Substation for connection to the Alturas 345 kV line. This interconnection would require transmission line switching equipment and a transformer to increase voltage from 230 to 345 kV. The transformer size is presently estimated to be 300 mega volt amp (MVA), 230-345 kV. On the 230 kV side of the transformer, line switching equipment would consist of three 230 kV breakers connected in a ring configuration. In this configuration, any of the three breakers can be removed from service for maintenance, repair, or replacement, without interruption of either the BPA or SPPCo lines. Figure B.2-8 presents plan view and elevation schematics of the equipment proposed for this substation.

On the 345 kV side of the transformer, one 345 kV breaker would be required for transmission line switching. In addition, one shunt reactor (inductor) would be required to control voltage at the Alturas Substation. A shunt reactor is an electrical device, similar to a power transformer, used to add inductance to a circuit. The inductance offsets line shunt capacitance and reduces the voltage at the terminal. The shunt reactor is estimated to be 35 mega volt amp reactive (MVAR), 345 kV, and would require one 345 kV breaker for switching.

This new substation would include a control building containing protective relays, communication equipment, and metering equipment. The substation would have a perimeter security fence installed. Three inches of substation gravel would provide electrical isolation of personnel operating and maintaining equipment within the substation. Tubular steel structures would be used to support equipment, conductors, and switches at a safe height to permit personnel, vehicles, and equipment to operate and maintain all substation equipment. These structures would be painted to blend with surrounding features. In addition, a 40 to 50 foot tall microwave structure would be required to communicate with BPA's system at Happy Camp.

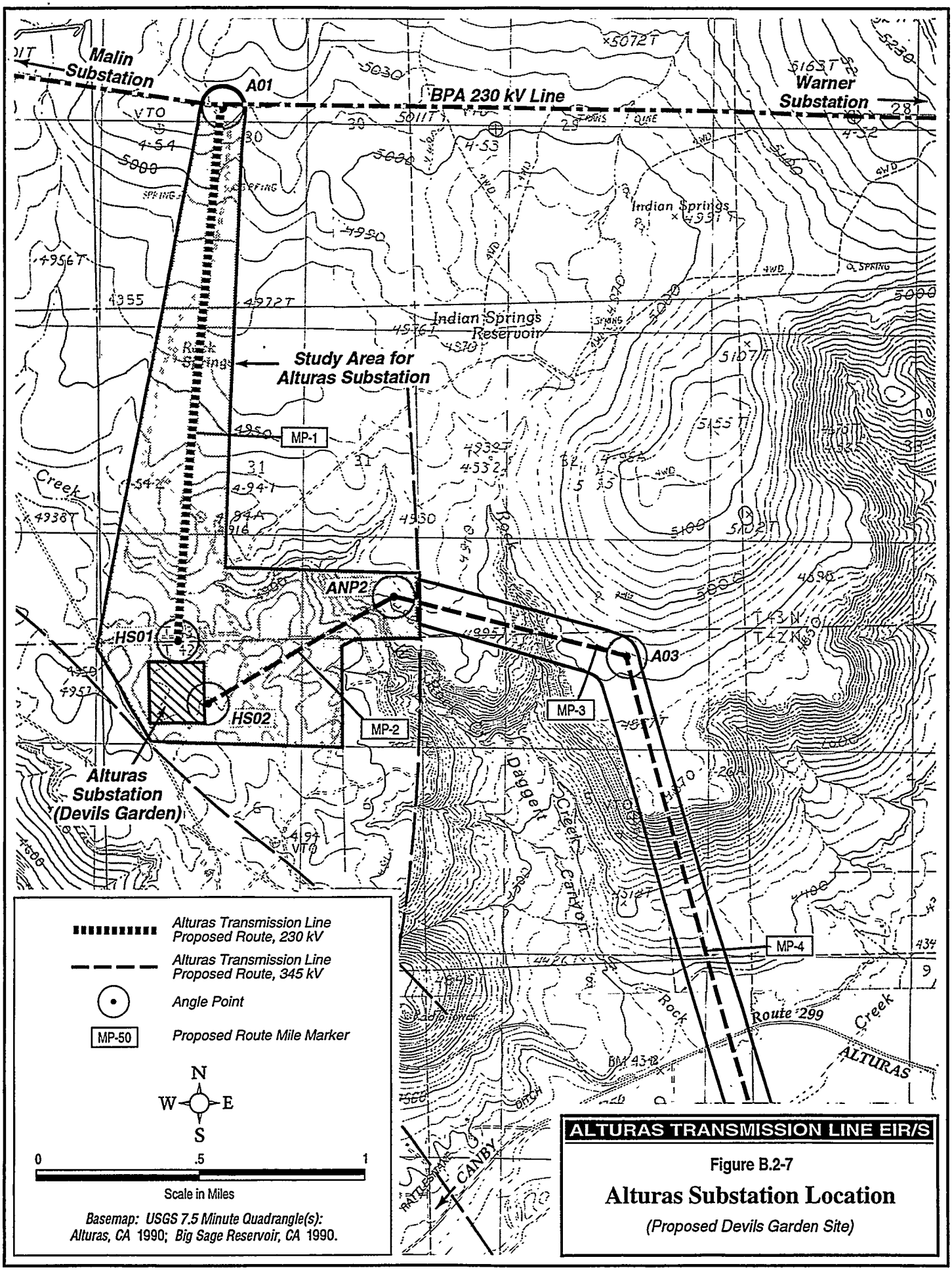


ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-6

One-Line Diagram

Source: SPPCo

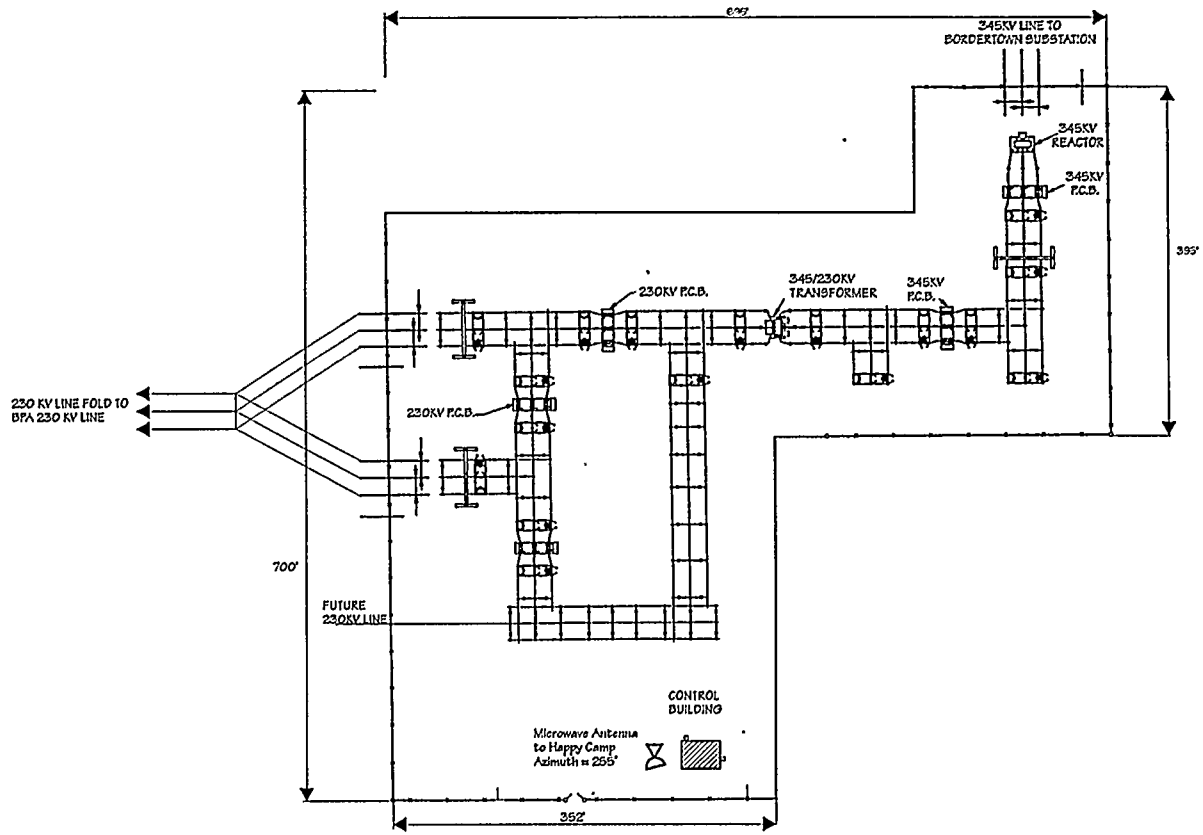


ALTURAS TRANSMISSION LINE EIR/S

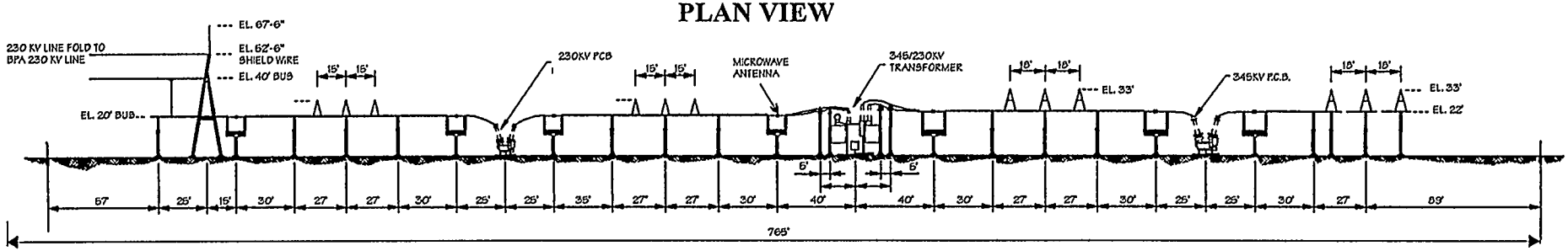
Figure B.2-7

Alturas Substation Location

(Proposed Devils Garden Site)



PLAN VIEW



ELEVATION

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-8

Alturas Substation Plan View and Elevation

Border Town Substation

The Border Town Substation would be the second of the two new substations proposed for the project. This substation would be located in California on property currently owned by the BLM, west of the "Border Town Interchange" on U.S. Highway 395, approximately 15 miles northwest of Reno. Figure B.2-9 shows the location of the substation site and its boundaries (790 feet by 430 feet). In addition the boundary of the study area addressed in selecting the preferred substation location is illustrated on Figure B.2-9.

SPPCo is proposing the construction of the Border Town Substation in lieu of expansion of the North Valley Road Substation, since Border Town is less expensive (an estimated savings of 4 to 10 million dollars) and provides SPPCo the flexibility for future interconnects given the additional area available. SPPCo has incorporated the future installation of a second 345 kV phase shifter into the substation design, to meet future reliability and potential phase angle capacity needs. Section E-3, Growth-Inducing Impacts of the Proposed Project, discusses the potential for future expansions at the Border Town Substation and the growth-inducement implications.

Phase angle regulation would be required at the Border Town Substation to control power flow over the transmission line; to accomplish this, a phase angle regulating transformer (phase shifter) would be required. Phase angle regulating transformers are commonly used to control the flow of electric power over transmission lines. Both the magnitude and direction of power flow can be controlled by varying the phase angle between the input and output voltages on the transformer. Based on preliminary studies, the size of the phase angle regulating transformer is presently estimated to be 300 MVA, 345 kV, allowing for a 300 MW transfer capacity as discussed in Section A.6.3.3.. Figure B.2-10 presents plan view and elevation schematics of the equipment proposed for this substation.

In addition to the phase angle regulating transformer, transmission line switching equipment would be installed. Transmission line switching would be handled by two 345 kV circuit breakers, with disconnect switches. Two shunt reactors (inductors) would be installed at the Border Town Substation to control voltage. Each would be rated 345 kV; each is estimated to be 35 MVAR in size, and one of the reactors would be switched by a 345 kV breaker. Transmission lines would be terminated in A-frame structures to provide the required vertical electrical clearances from equipment and energized buswork (aluminum tubing connecting the transformers inside the substation).

The station would require a control building with protective relays, communications equipment, metering equipment, a perimeter security fence, substation gravel, painted tubular steel structures to blend with surrounding features, and two distribution line extensions useable for station power.

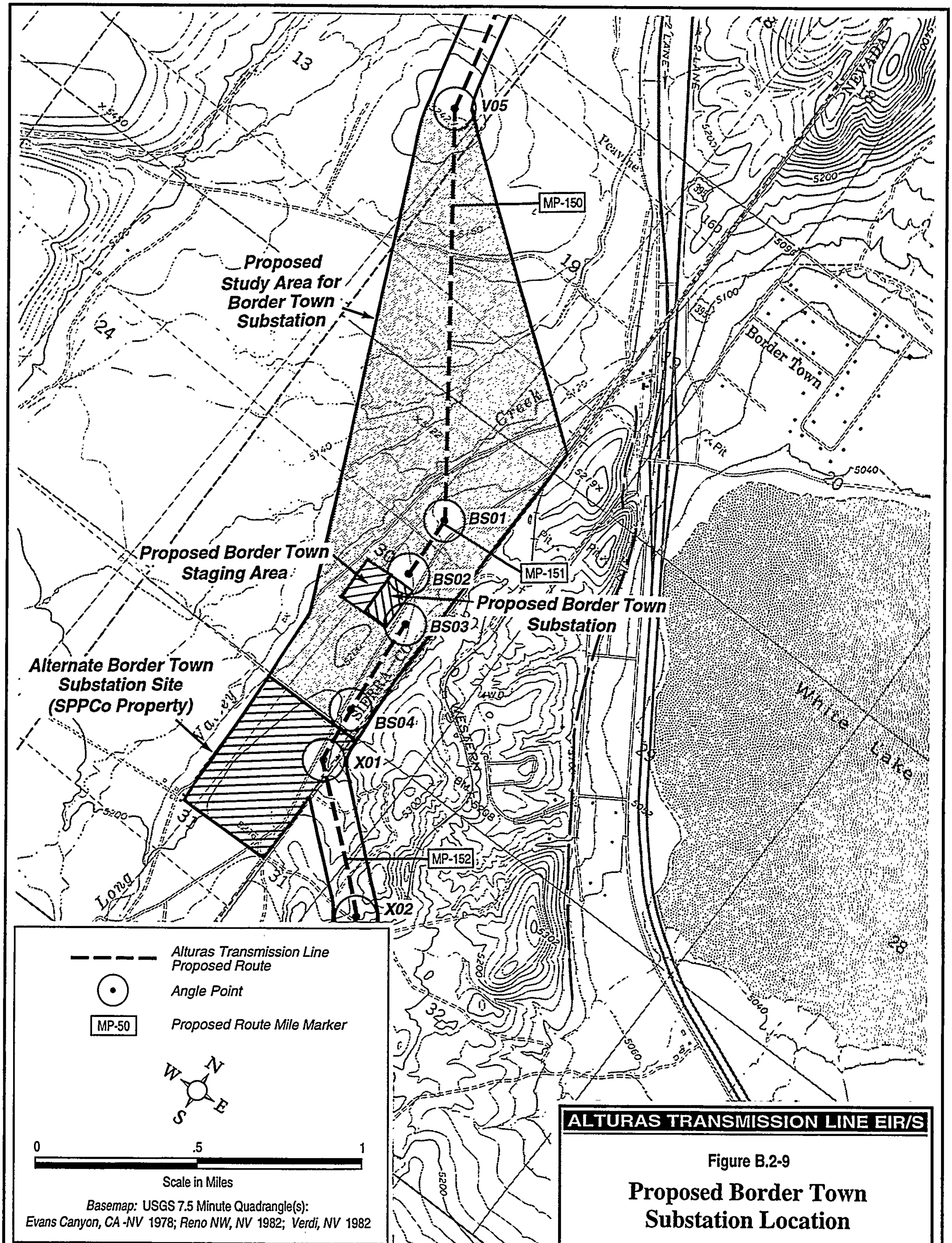
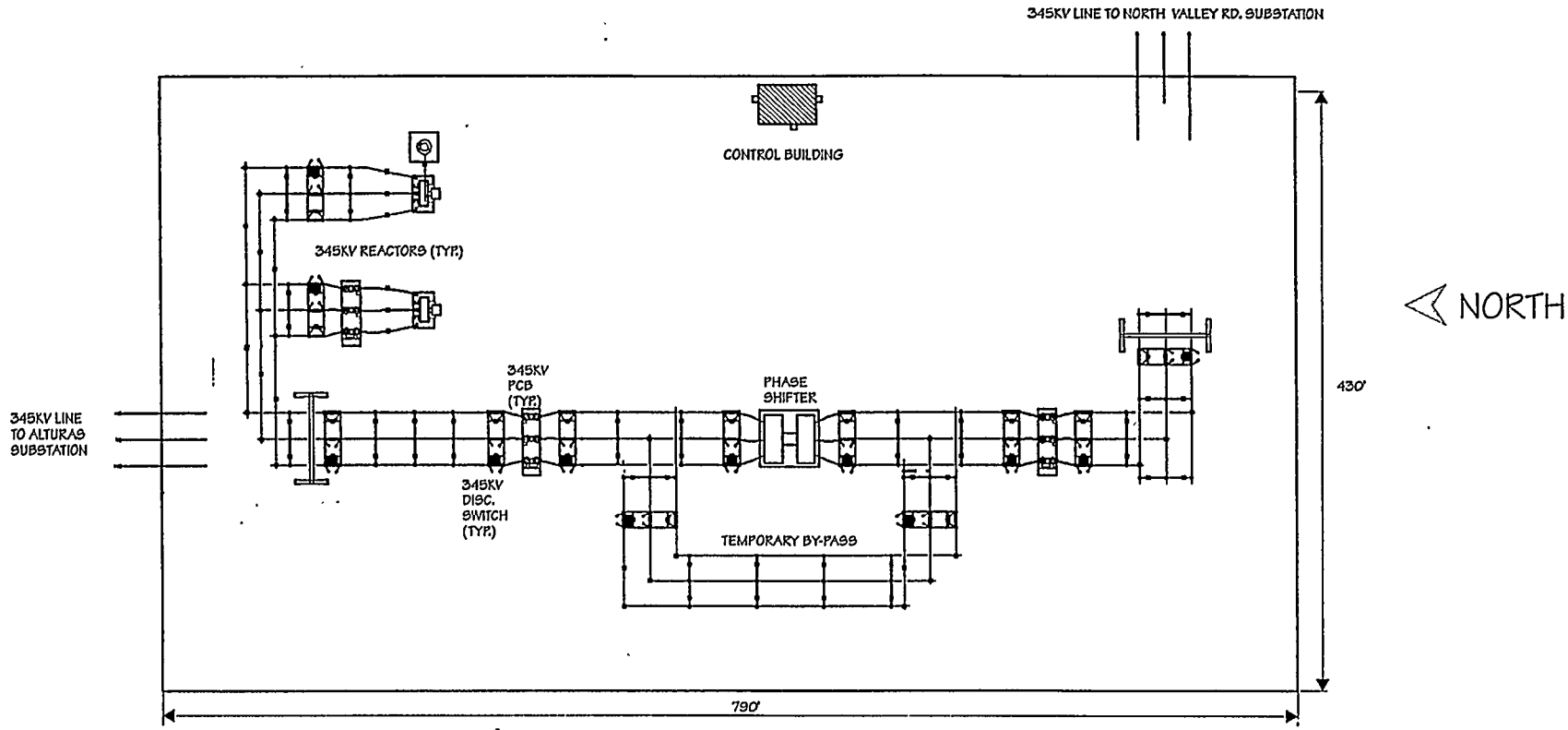
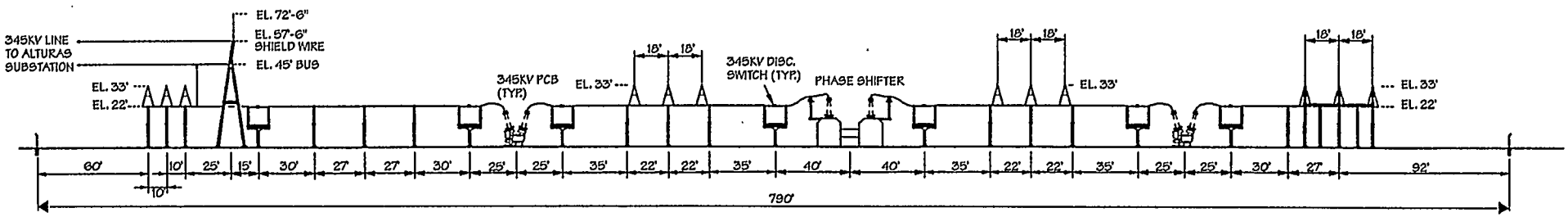


Figure B.2-9

Proposed Border Town Substation Location



PLAN VIEW



ELEVATION

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-10

Border Town Substation Plan View and Elevation

Additions to the North Valley Road Substation

North Valley Road Substation is an existing 345/120 kV substation owned and operated by SPPCo. The termination of the Alturas Transmission line Project at this substation would interconnect the southern end of the Proposed Project to SPPCo's system. Figure B.2-11 shows the parcel and facility boundaries for the expanded North Valley Road Substation. The fenced substation pad would be expanded approximately 128 feet, on property presently owned by SPPCo. The size of North Valley Road Substation, including all required additions, is estimated to be approximately 618 feet by 340 feet. Figure B.2-12 presents plan view and elevation schematics of the existing and proposed new equipment at the North Valley Road Substation.

Transmission line switching equipment consisting of two 345 kV circuit breakers would be added. A shunt reactor would be used to control voltage. A third 345 kV breaker would be used to switch the shunt reactor.

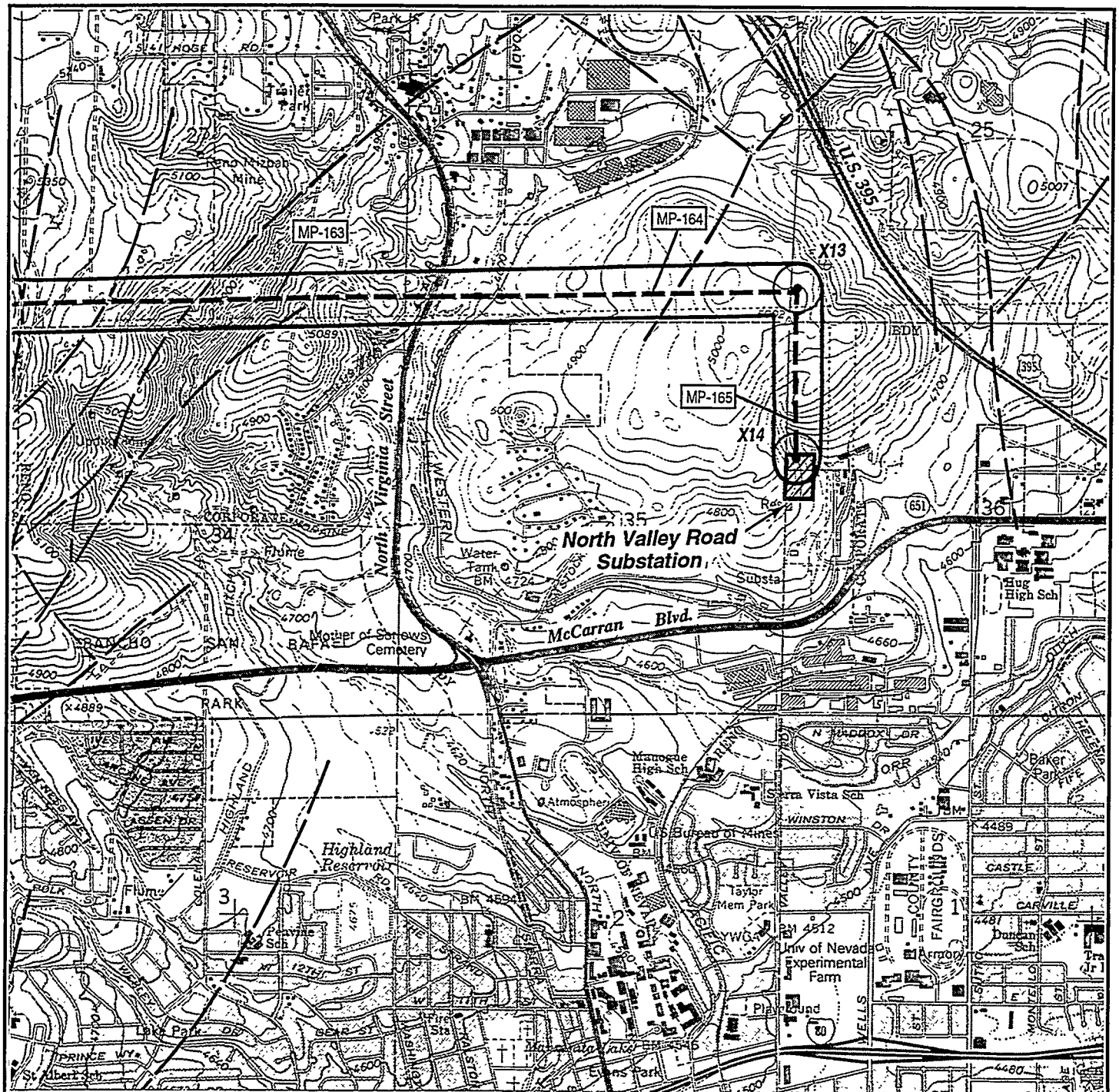
Other Substation Additions

Other substation work includes adjusting or modifying relays and controls to enhance protection schemes as required at the Warner and Malin Substations owned by BPA. These modifications would not require an expansion of the facilities; no earth work would occur, nor would there be any increase in the EMFs associated with these facilities.

B.2.2.4 Communication Facilities

The Applicant is proposing to use a fiber optic system for communications needs, along with a fault detection information system and provisions for communication between construction or maintenance personnel. The three systems provide for communication of direct transfer trip (automatic interruption of power flow) information and protection of the transmission line, monitoring of system operation through a System Control and Data Acquisition (SCADA) process, and for necessary construction and operational communications for maintenance personnel to ensure the safety of the public and SPPCo employees. These functions would be served by the three systems described below:

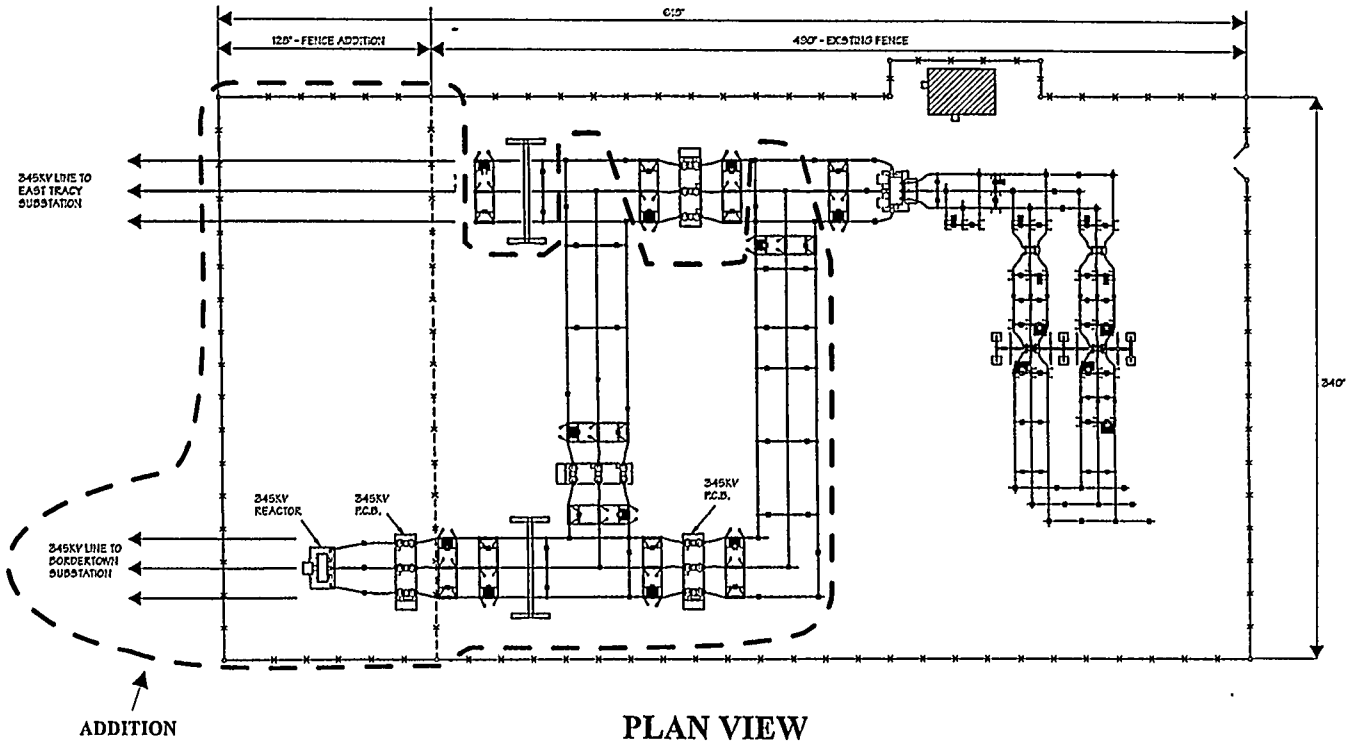
Optical Ground Wire (OPGW) is a relatively new technology, but is becoming widely used throughout the utility industry because of its ability to provide reliable communications. OPGW would be used instead of one of the standard shield wires; the fibers that carry communications information would be located inside of the aluminum/steel cables that are strung along the top of the transmission structures for the purpose of preventing lightning from striking electrical conductors and taking the current from a lightning strike safely into the ground. Therefore, the OPGW serves both as a shield wire and a communication medium. SPPCo's proposed system would include extra fibers for back-up communications (transmitting transfer trip information if other systems fail) and possibly for lease to other



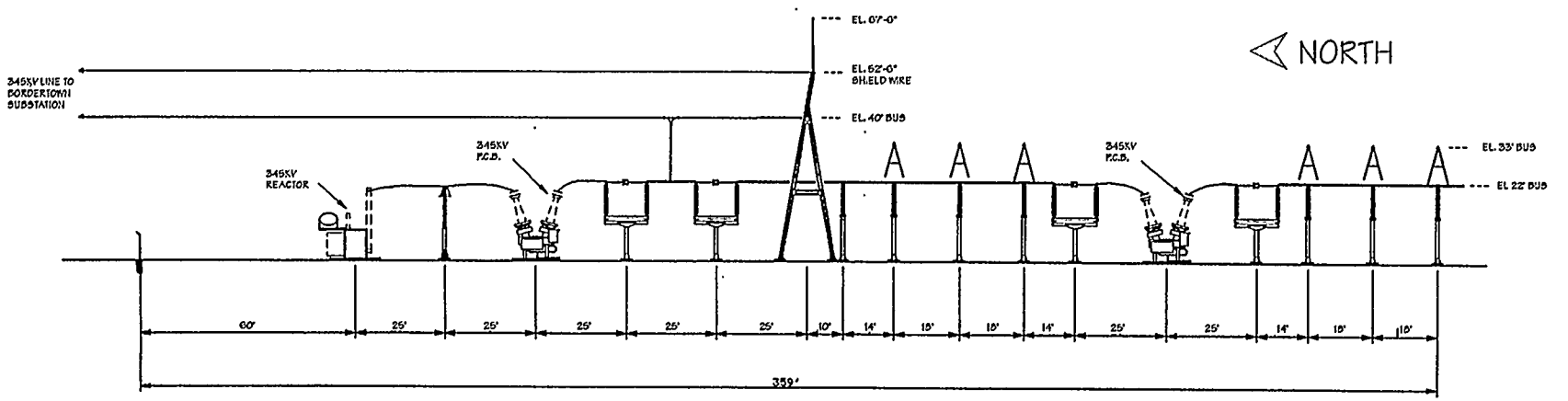
ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-11

North Valley Road Substation Location



PLAN VIEW



ELEVATION

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-12

North Valley Road Substation
Plan View and Elevation

users. SPPCo anticipates that five communication sites would be required to house the fiber optic communications equipment along the Alturas transmission line. As illustrated on Figures B.2-2a-d, the proposed communication sites include: (1) North Valley Road Substation, (2) Border Town Substation, (3) Herlong (approximate), (4) Termo (approximate), and (5) Alturas Substation. The equipment located at the substation sites would be located inside the substation buildings. Communication equipment at the Herlong and Termo locations would be located adjacent to the transmission line within the 160-foot ROW. SPPCo expects that at each of these two locations, a cinder block or prefabricated, bullet-proof fiberglass building would be erected on concrete pads. Each building would be approximately 10'W x 16'L x 8'H, painted tan in color, and centered within a chain-link, fenced area encompassing about 1200 square feet (30 feet by 40 feet). The exact location of the communications sites is highly dependent upon the line length from the Alturas to Border Town Substations (estimated at 148.5 miles) and the proximity to usable distribution power. Current technology dictates the distance between the communication sites which house the fiber optic repeater equipment at an approximate, maximum distance of 50 miles. Until the transmission route is finalized, SPPCo is unable to finalize the exact location of the non-substation, communication sites. In addition, if the overall line distance increases significantly, it may be necessary to relocate the two non-substation sites to include a third intermediate site. All non-substation, communication sites would be located within the 160-foot ROW.

Telecommunications facilities will be required to operate and maintain the interconnection between the Proposed Project and BPA. These facilities will provide communications between the proposed Alturas Substation and the existing BPA substations (Warner & Malin). The existing six circuit radio system is presently "at capacity" and unable to provide for the additional circuit requirements, necessary for this project. SPPCo proposes replacement of this system with one that would provide for current and projected circuit requirements in coordination with BPA. SPPCo has negotiated and received confirmation from existing users at Happy Camp (approximately 25 1/2 miles west of the Alturas Substation site), for shared use of their microwave site. BPA is proposing to collocate with an existing site user, a new narrow band, point to point microwave radio repeater at Happy Camp Radio Station site. The microwave radio would link from the new Alturas Substation via Happy Camp to the existing Captain Jack Substation. The building would be 3.04 m (10ft) x 6.08 m (20 ft) block structure with a new microwave tower and engine generator with propane tank as backup electricity. Access to the site would be 2-3 times a year, plus additional emergency access. BPA would utilize existing microwave radio sites at Captain Jack Substation and Warner Substation. BPA would retain and use the existing UHF radio links from Warner Substation via Happy Camp to Buck Butte. For mobile radio coverage, there is an existing VHF repeater at Happy Camp in the PH&E radio building.

The SCADA system consists of remote computers located at substations. These computers would continuously provide information to SPPCo on the quantities of power transmitted through the line, as well as the control and status indication of circuit breakers and switches in the substations. SCADA communications would be also provided by the fiber optic wires.

In addition to the fiber optic system, SPPCo would employ the **Power Line Carrier System** to provide system fault detection information. Circuit breakers at each end of the transmission line and at the Border Town Substation would be controlled by this equipment in order to protect the line. This system would work by superimposing a very low frequency radio carrier, usually in the 60 KHz range, onto the power line through a coupling capacitor. Transfer trip information (when power flow is interrupted) would be sent to the Reno Control Center from the fault detection/trip initiation equipment. SPPCo would also use the fiber optic system as a backup system to communicate the transfer trip signals from the designated points along the transmission line.

Two-way Communications would be required for construction and maintenance personnel. It would be provided by cellular phones or VHF/UHF two-way radio system. A conventional VHF or UHF two-way radio system could be used, utilizing the following existing mountain-top transmission/repeater sites: (1) Peavine Peak located northwest of Reno, Nevada; (2) Antelope Mountain located northeast of Susanville, California; and (3) Likely Mountain located south of Alturas, California. These sites are existing radio sites for other public services and have been classified as "electronic mountain-top sites" by the appropriate federal and state agencies. SPPCo doesn't anticipate that any physical enhancements to the existing sites would be required since sufficient room exists for SPPCo to rent space from the resident entities. These sites would be in direct line-of-sight to the proposed fiber optic repeater sites allowing for an "uplink" from the valley floor repeater sites to the mountain-top communication sites.

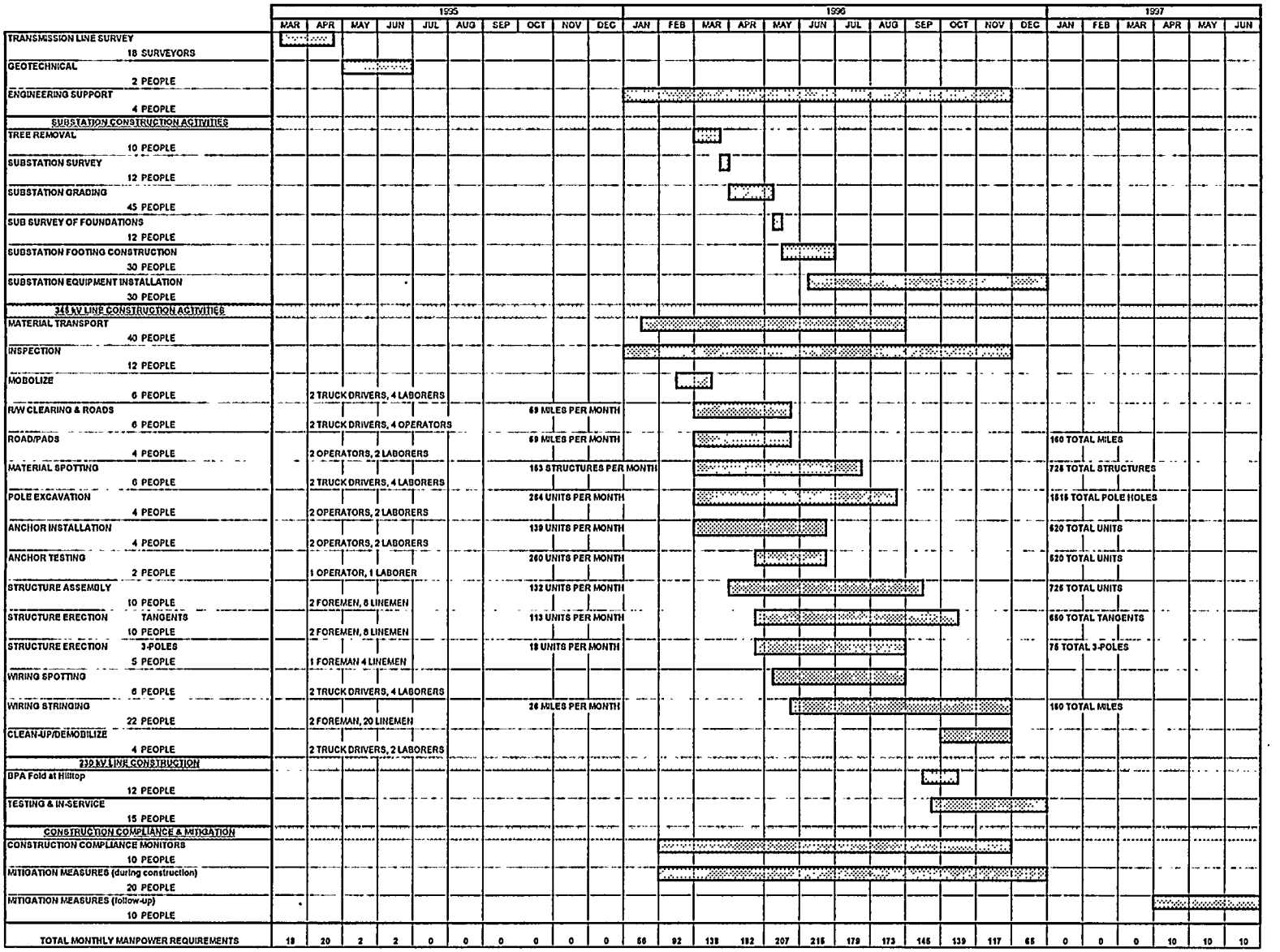
B.2.3 PROPOSED PROJECT CONSTRUCTION

This section includes presentation of an estimated construction schedule, description of transmission line and substation construction processes, discussion of anticipated construction employment, and requirements for construction materials, equipment, and staging areas.

As discussed in this section, Part C (Environmental Analysis), and Part F (Proposed Mitigation Monitoring, Compliance, and Reporting Program), SPPCo would be required to provide various plans that describe the specific techniques and procedures to be utilized in the construction, operation, and maintenance of the Proposed Project.

B.2.3.1 Construction Schedule

SPPCo has prepared a Construction Schedule for the Proposed Project (see Figure B.2-13). Construction activities would occur over an estimated 9-month period. Assuming that the environmental review process and permitting would be finalized in the first quarter of 1996, construction would start in March 1996, with material transport and inspection, and end with system testing, expected to be completed in December, 1996. Substation construction would begin in March 1996, and continue through December, 1996. Transmission line construction would occur from early-March through late-November 1996, including clean-up and demobilization. The fold-in (loop-in) of the Alturas Transmission Line into the



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-13

Project Construction Schedule

Source: SPPCo

BPA system would occur during September/October, 1996. System testing would be done during the fourth quarter of 1996. Mitigation compliance monitors would be present during all aspects of construction, in addition to post-construction mitigation effectiveness reviews.

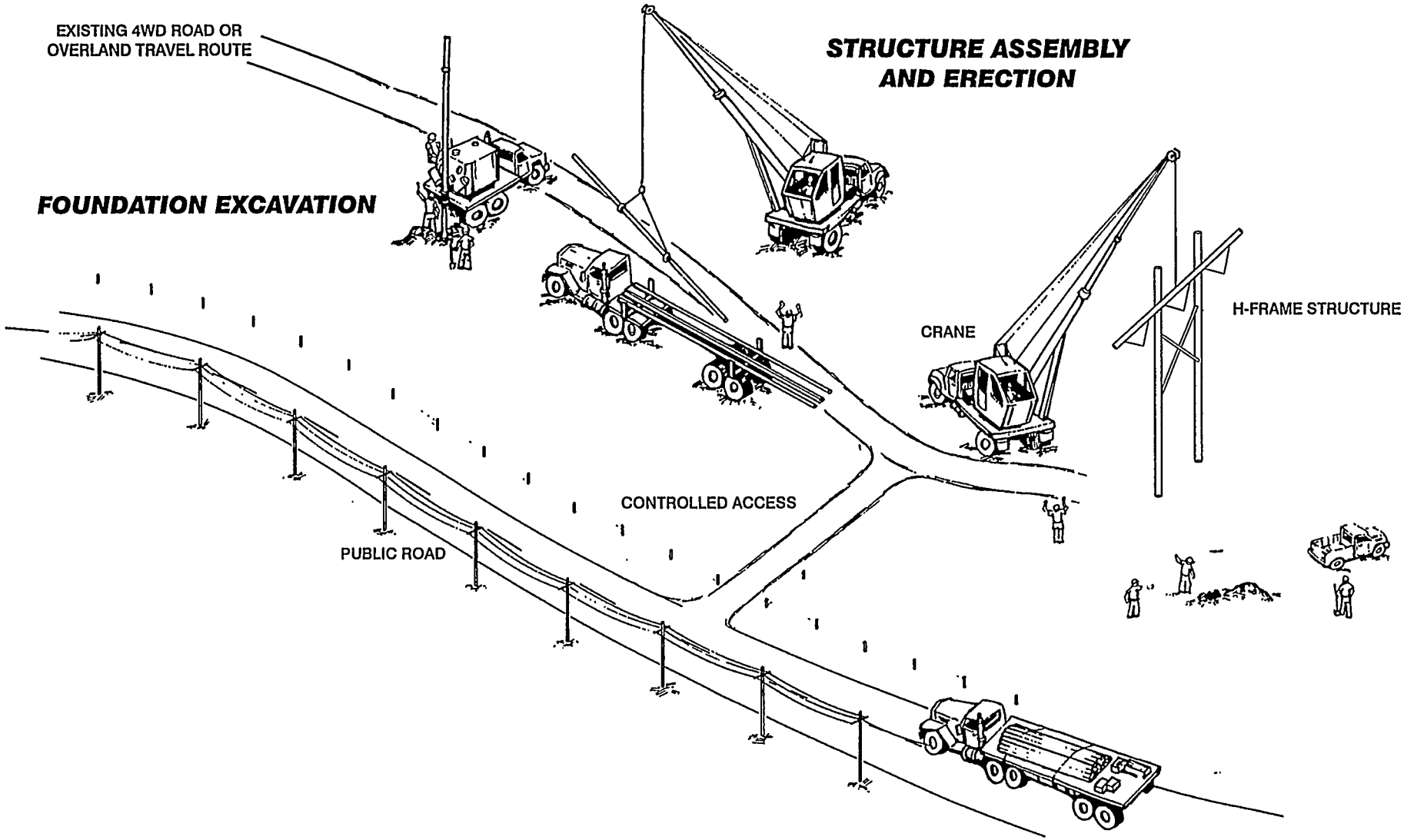
B.2.3.2 Transmission Line Construction

Construction of the proposed 345 kv, 165-mile long transmission line would include the permanent installation of an estimated 730 structures to be spaced approximately every 1,200 feet on average (800 feet apart on single-pole section); the 230 kV segment would include wood H-frame structures approximately 80-85 feet high, spaced about every 700 feet, from the existing BPA 230 kV line to the Alturas Substation. In addition, about 100 temporary sites would be designated about every 9000 feet for wire setup; the wire setup sites would be located within the 160-foot project ROW. Approximately 18,000 square feet of land, on average, would be disturbed at each structure setup site and 7,500 square feet at each wire setup site. Table B-3 summarizes the expected area of disturbance for the various project components (structures, substation, wire setup sites, etc). Figures B.2-14a and B.2-14b depict typical construction procedures for installation of transmission line structures and wires. At the direction of private property owners and land management agencies, SPPCo would install gates and other obstacles to aid in restricting access to the ROW. The phases involved in the construction of transmission lines are described in the following paragraphs.

Right-of-Way (ROW) Preparation. ROW preparation would involve: (1) the identification of exclusion zones; (2) providing designated access roads and overland travel paths for constructing 730 structures and conductor stringing purposes including the identification of turnaround points, and (3) clearance of vegetation to accommodate necessary travel within the specified areas of the 16-foot ROW and line clearance requirements.

SPPCo would be required to conduct pre-construction surveys (all testing and flagging activities) under the direction and supervision of the Lead Agencies and designated construction monitor(s) before commencing construction. Following the preconstruction surveys, exclusion zones would be established through consultation with the Lead Agencies and their designated environmental monitor(s) who would review and approve each exclusion zone on a case by case basis. Construction and related activities would be prohibited within the exclusion zones and restricted to specified areas only. Environmental monitor(s) would be present during all phases of project construction to ensure that the integrity of the exclusion zones is maintained and that all construction-related activities occur in specified areas. In the event exclusion zones can not be avoided by construction activities, the mitigation measures presented in this EIR/S would be implemented.

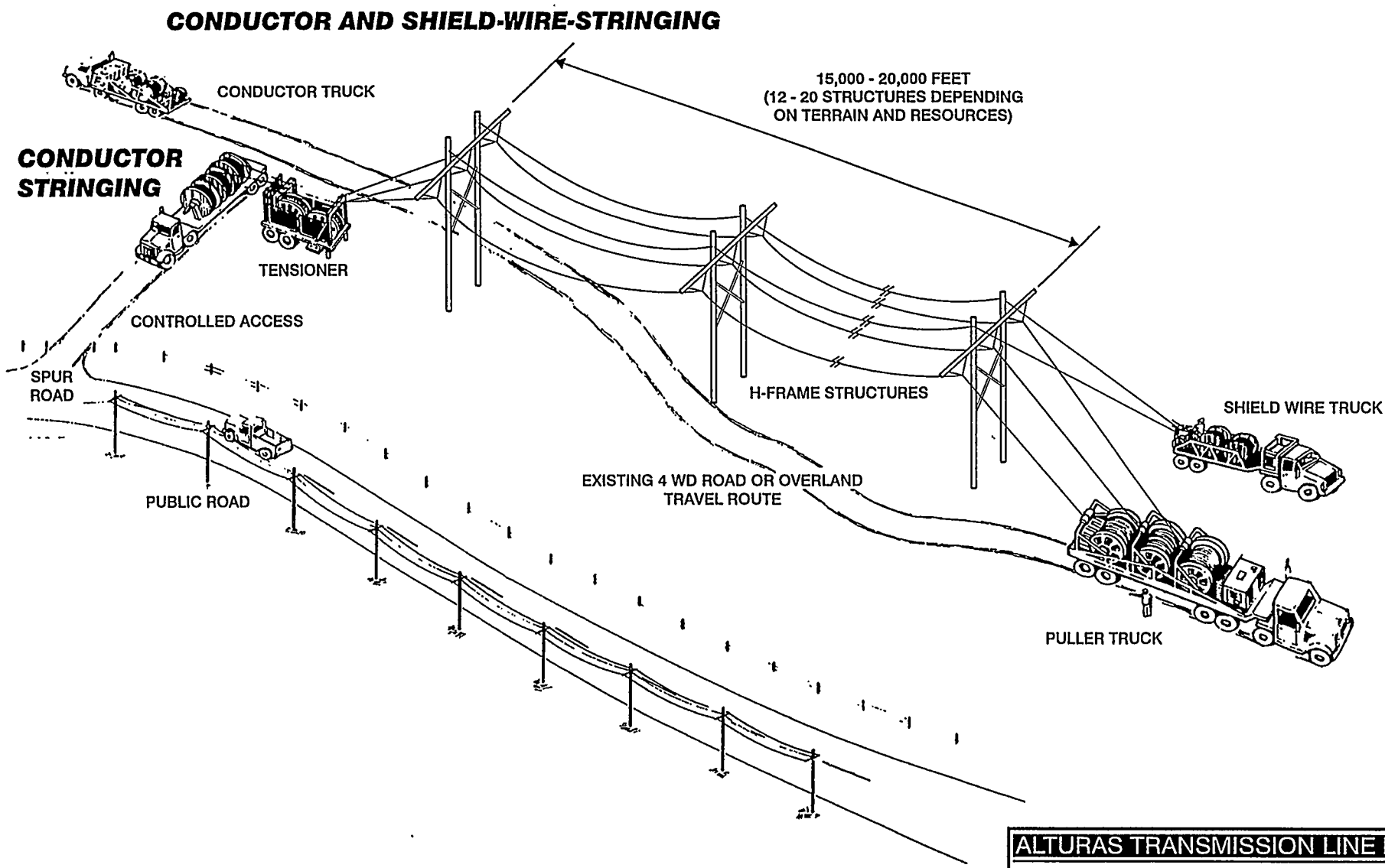
To access and travel within the ROW, SPPCo proposes to utilize existing roads, upgrade existing roads, construct new access roads, and use overland travel. Table B-4 provides a summary of the location of



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-14a

Transmission Line Construction Procedures: Structure Erection



ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-14b

Transmission Line Construction Procedures: Wire Stringing

Table B-3 Construction Activities: Estimated Area of Disturbances

Impact	Permanent (acres)	Temporary (acres)	Non-bladed Overland Travel (acres)
Alturas Substation	10.5	7.5	0
Structure setup (730 X 0.41 acre)[a]	0	299.3	0
Structure footings (730 X 0.0013 acre)[b]	0.9	0	0
Wire setup (100 X 0.17 acre)[c]	0	17.2	0
Communication facilities (2 X 0.03 acre)[d]	0.06	0.02	0
Border Town Substation[e]	11.8	0.0	0
Border Town Staging Area	0.0	8.8	0
Permanent New Roads (29,300 ft X 15 ft)[f]	10.1	0	0
Upgrade existing roads (45,100 ft X 5 ft)[g]	0	5.2	0
Intermittent blading (274,900 ft X 15 ft)[h]	0	094.7	0
Non-bladed overland travel access[i]	0	0	113.4
TOTALS	**33.4**	**432.7**	**113.4**

[a] Based on an estimated total of 730 structures requiring an estimated average of 18,000 square feet for setup at each location. The estimated number of each structure type that would be constructed and the associated area of disturbance required for their construction are summarized below:

Structure Type	No. of Structures	Est. Area of Disturbance (ft^2)
Single Pole	10	15,000
3 Pole Guyed	89	22,000
H-Frame 230kV	18	15,000
H-frame, 345 kV	613	17,500
Avg. Est. Area of Disturbance (weighted by no. of structures)		18,000

[b] Based on a maximum pole radius of 1.75 feet plus an estimated 1.25 feet of additional permanent impact around the base of the pole for a total radius of 3 feet (28 square feet) multiplied by two poles.

[c] Based on the estimated footprint or 7500 sq. ft. as described in Part B (Project Description) of the EIR/S.

[d] Based on description of the proposed construction of two communication sites outside of the substation facilities that will occupy approximately 1,200 square feet (0.03 acre) and involve the temporary disturbance of an estimated 400 square feet around the perimeter of these sites as described in Section B.2.2.4 of Project Description (Part B) of the EIR/S.

[e] Based on the total area specified by the Applicant.

[f] Based on the total length of new roads and permanent overland travel routes proposed for construction outside and inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (10 foot wide vehicle lane plus 5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet).

[g] Based on the total length of existing roads proposed for upgrades outside and inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet).

[h] Based on the maximum potential length of intermittent blading proposed to allow overland travel inside the 660-foot study corridor as described by the Applicant (July 10, 1995). Area of impact is calculated by multiplying the length of the proposed access roads by the average width of the disturbed area (10 foot wide vehicle lane plus 5 additional feet of width for side-cast material) and converted to acres (1 acre/43,560 square feet). Actual intermittent blading impacts will be considerably less because it will only be done as necessary.

[i] Based on the summary of all overland travel presented in Table C.3-9.

the new and upgraded access improvements and the base maps at the end of the Volume I illustrate their alignments. New, permanent single-lane access routes would need to be constructed outside of the 660-foot corridor at three locations to a maximum width of 15-feet (see Table B-4). In addition, SPPCo proposes to construct permanent, overland access routes within the 660-foot study corridor at five locations. These permanent, overland routes would be utilized for construction, maintenance, and emergency access. SPPCo expects the frequency of post-construction access to the project ROW to be approximately once or twice a year. Upgrading of existing access routes would include limited grading and widening of existing, four-wheel drive routes to two-track roads (15-foot maximum width). Improvement of new roads along the 230 kV segment would include placement of gravel/rock. As presented in Table B-4, such upgrading would be required at numerous locations along the Proposed Project route. Finally, temporary overland travel routes would be required for construction purposes at several locations.

Permanent and temporary overland travel would occur within the 160-foot ROW and would involve off-road vehicle travel over existing terrain. In some locations intermittent blading of rough areas would be required to allow for a single-lane overland route of 12 to 15 feet wide. Blading will be accomplished using a D-8 bulldozer or equivalent. Surface material, including rocks, would be bladed and side-cast to allow for passage of rubber-tired vehicles. Rocks that cannot be removed with blading equipment would be avoided. Overland travel would occur on specified routes and work areas only and would be prohibited in all other areas (see above discussion). Access ramps and crane landing pads (50 x 100 feet) would need to be bladed and leveled for all transmission structure sites located on hill-sides. The area of disturbance for crane landing pads is included within the average 18,000 square feet of disturbance for structures (see Table B-3). Table B-5 summaries SPPCo's estimated number of hillside crane landing sites by segment. The exact number and location of landings cannot be determined until pre-construction structure spotting occurs and slopes are verified. Crane landings would be permitted only in specified areas and prohibited everywhere else (including exclusion zones). Bridges, culverts, gates and cattle guards would be installed where necessary.

Tree removal and trimming for required line clearance and overland travel would also be conducted. Tree trimming would be conducted to allow for a ten-year growth envelope as illustrated on Figures B.2-15a,b,c. On non-federal lands, tree removal would be done in accordance with the Timber Harvest Plan to be prepared for the Proposed Project under the authority of the California Division of Forestry, Department of Forestry and Fire Protection. The Timber Harvest Plan will be prepared by a California Registered Professional Forester, subject to the review and approval of the Department, after preliminary staking of the route is completed. The plan would specify the areas requiring tree removal versus tree trimming, the number of trees to be lost to removal, and required trimming practices given the varying growth rates of the tree species encountered along the Proposed Project ROW. On federal lands, tree removal would be conducted consistent with BLM and USFS requirements. When the project ROW crosses a fence, SPPCo would install a gate for access. Cattle guards would be installed where livestock access is controlled. A series of interlinking locks would provide access to all authorized users.

Table B-4 Construction Access Route Improvements

Access Route Improvements	Route Segments Requiring Improvements[1]
Construct new access routes outside 660 foot study corridor area.[2]	• Near AØ3, about one mile from the Devils Garden area, south of Mahogany Ridge • One mile north of Angle Point CØ2, about 8 miles north of Alkali Lake and the Infernal Caverns, extends out southwest from Segment C • Between CØ4 and CØ5 segment points, about 1 mile southwest of Delta Lake
Construct permanent, overland access routes within the 660 foot study corridor	• Along 230 kV portion between BPA 230 kV line and Alturas Substation • Railroad crossing between AØ4 and AØ5 • Short sections from CØ1 to CØ2 and CØ4 to CØ6 • One section between C-10 and EØ2 • Short sections between DØ4 and DØ7
Upgrade existing 4WD roadways with limited grading and selective widening.[2]	• Along 230 kV portion between BPA 230 kV line and Alturas Substation • About .4 miles north of Segment A, near Angle Point AØ3, southwest of Rattlesnake Creek • About 3.5 miles southwest of Modoc National Wildlife Refuge, along Segment C, between AØ6 and CØ1 • Extends out westward from segment point CØ3, about 5 miles north of Alkali Lake an Infernal Caverns • Near and along Segment C, from north of C-6 to north of C-7, southeast of Delta Lake at Modoc County/Lassen County border • Generally, follows segment alignment from north of Dø1 to Dø4 • Along Segment J, between J-7 and JNO7, directly north of Snowstorm Mountain, northeast of Horse Lake • Along Segment L between points J-8 and L-1, north of Snowstorm Mountain, west of Secret Creek • Along Segment L around Angle Point LØ1, directly north of Snowstorm Mountain and on the western side of Secret Creek • Between E-1 and E-2, running southeast of centerline to Highway 395 north of Madeline • Between L-7 and L-8 and between L-8 and N-2, east of Shaffer Mountain • Along Segment J, between J-4 and J-6, south of Termo • Along Segment P, between P-1 and P-5, northeast of Doyle • Along Segment X, near X-7 and between X-7 and X-8, near Anderson Siding
Intermittent blading of rough areas within 660-foot corridor for temporary overland travel routes.[2]	• Extensively on the plateau west of the Likely Valley (Angle Points CØ1 to CØ6) • North and west of the Madeline Plains (C-8 to about E-2 or D-7, and D-8 to G-1) • South of the Madeline Plains (J-4 to near L-5, including the southern portion of K-6 to J-8) • South of Secret Valley (just south of L-7 to L-8, and on the N Segment to M-3) • Along Segment LN (east Secret Valley), between L-1 and LN-3, between LN-5 and LN-6, and between LN-7 and N-2 • West of the Fort Sage Mountains (P-2 to P-5) • Portions of the route east of the Fort Sage Mountains (Q-1 to Q-2, Q-4 to P-9) • West of the Petersens (P-9 to T-2, near S-1 and S-2, route options near W-2) • Scattered locations in the Long Valley area (W-3 to X-1) • A small area on the north flank of Peavine Peak • Much of Segments X-7 to X-9 and Segment Y
Tree removal for line per clearing pattern or overland travel.	• Along Segment A, from A-1 to A-3, near Devils Garden, south of Mahogany Ridge and Big Sage Reservoir • On Segment A, south of A-3, near Devils Garden, south of Mahogany Ridge • Along Segment C, from angle ZØ6 to CØ2, and various locations from C-4 to E-2 • Various locations between C-10 and DØ1, DØ2 and DØ7, DØ7 and GØ1, and DØ8 to FØ1 • Along Segment E from C-10 to Ash Valley Road, west of the town of Madeline • Various locations between JØ7 and LØ2 along the J and L Segments • Along Segment L, at various locations between LØ2 and LØ4 • Along the LN Segment (east Secret Valley) at various locations between highway 395 and LNØ2 • Along Segment Q, south of QØ4 to 1.5 miles south of QØ5 • Along Segment Q, between QØ5 and PØ9 directly north of Seven Lakes Mountain, and south of Long Valley • From TØ2 to WNØ1, east of Long Valley

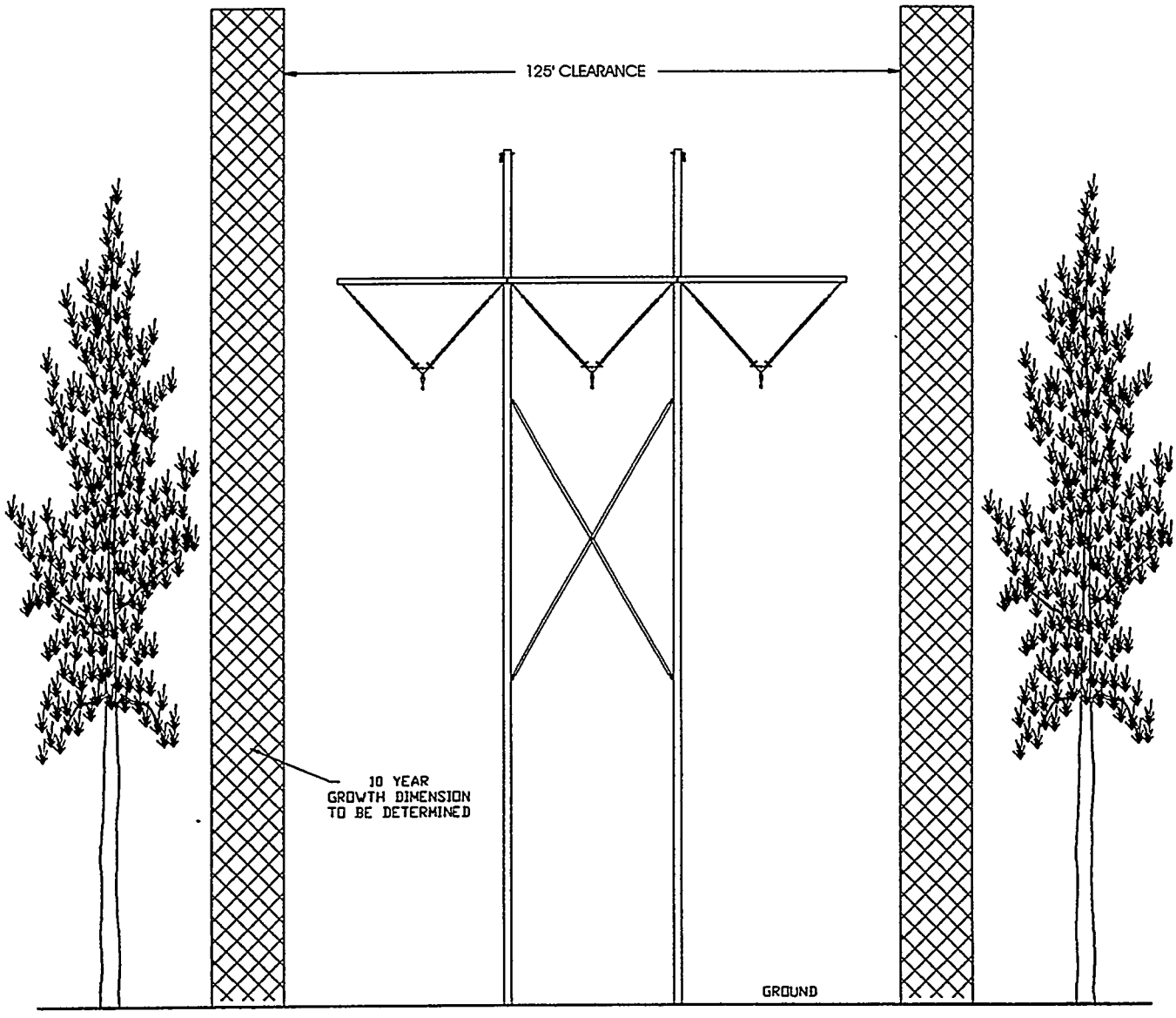
1. Refer to detailed project base maps at the end of Volume I.
2. 15-foot maximum width.

Table B-5 Alturas 345 kV Estimated Number of Hillside Crane Landings[1]

SEGMENT	# PADS
AØ1 - HSØ1	2
HSØ2 - ANPØ2	2
ANPØ2 - AØ3	2
AØ3 - AØ4	3
AØ4 - AØ5	2
AØ5 - AØ6	8
BØ2- BØ3	2
BØØ - BØ4	1
BØ7 - BØ8	7
AØ6 - CØ1	10
CØ1 - CØ2	11
CØ2 - CØ3	4
CØ3 - CØ4	2
CØ4 - CØ5	10
CØ5 - CØ6	9
CØ6 - CØ7	7
CØ7 - CØ8	7
CØ8 - CØ9	5
CØ9 - C10	3
C10 - EØ1	4
EØ1- EØ2	9
EØ2- ENØ1	5
DØØ - DØ1	15
DØ1 - DØ2	2
DØ2 - DØ3	6
DØ3 - DØ4	12
DØ4 - DØ5	2
DØ5 - DØ7	4
DØ7 - DØ8	3
DØ8 - GØ1	4
EØ6 - EØ7	5
EØ7 - EØ8	1
JØ3 - JØ4	2
JØ4 - JØ5	8
JØ5 - JØ6	14
JØ6 - JØ7	10
JØ7 - JNØ7	4
JNØ7 - JNØ8	7
LØØ - LØ1	7
LØ1 - LØ2	1
LØ2 - LØ3	7
LØ3 - LØ4	6
LØ4 - LØ5	5
LNØ9 - LØ8	10
LØ1 - LNØ1	8
LNØ1 - LNØ2	14
LNØ2 - LNØ3	12
LNØ3 - LNØ4	1
LNØ5 - LNØ6	5
LNØ7 - LNØ8	8

SEGMENT	#PADS
LNØ8 - NØ2	10
LØ8 - MØ1	2
MØ1 - MØ2	3
MØ2 - MØ3	2
NØ1 - NØ2	3
NØ2 - NØ3	7
OØ5 - PØ1	2
PØ1 - PØ2	6
PØ2 - PØ3	9
PØ3 - PØ4	7
PØ4 - PØ5	8
PØ5 - PØ6	4
PØ8 - PØ9	1
QØ1 - QØ2	12
QØ2 - QØ3	3
QØ3 - QØ4	2
QØ4 - QØ5	15
QØ5 - PØ9	18
PØ9 - RØ1	1
RØ1 - RØ2	3
RØ2 - SØ1	3
SØ1 - SØ2	9
SØ2 - SNØ1	2
SNØ1 - WNØ1	5
RØ2 - TØ1	4
TØ1 - TØ2	12
WNØ1 - WØ1	2
WØ1 - WNØ2	9
WNØ2 - WNØ3	4
WNØ3 - WNØ4	7
WØ1 - WØ2	10
WØ2 - WNØ4	7
WNØ4 - WNØ5	7
WNØ5 - WNØ6	4
WNØ6 - WNØ7	5
WNØ7 - WNØ8	1
XØ1 - XØ2	3
XØ2 - XØ3	5
XØ3 - XØ4	3
XØ4 - XØ5	2
XØ5 - XØ6	2
XØ6 - XØ7	7
XØ7 - XØ8	17
XØ8 - XØ9	3
XØ9 - X10	3
X10 - X11	4
X11 - X12	6
X12 - X13	1
XØ9 - YØ1	9
YØ1 - X12	1

[1] Exact number and location of landings cannot be determined until structure spotting takes place (pre-construction flagging). Crane landing estimates based on an approximate 4:1 slope (horizontal : vertical).

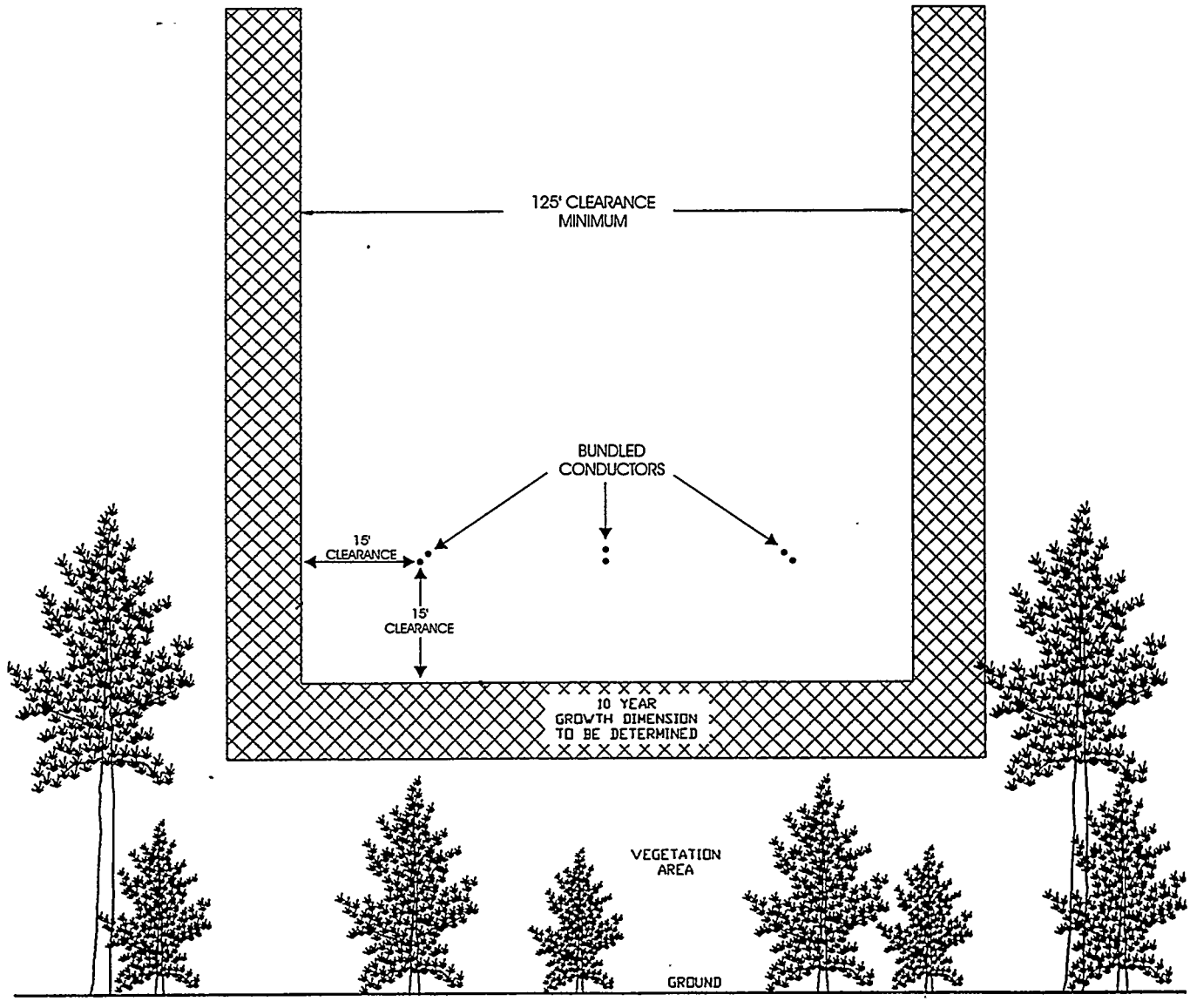


ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-15a

Tree Trimming Clearance at H-Frame Structure

Source: SPPCo

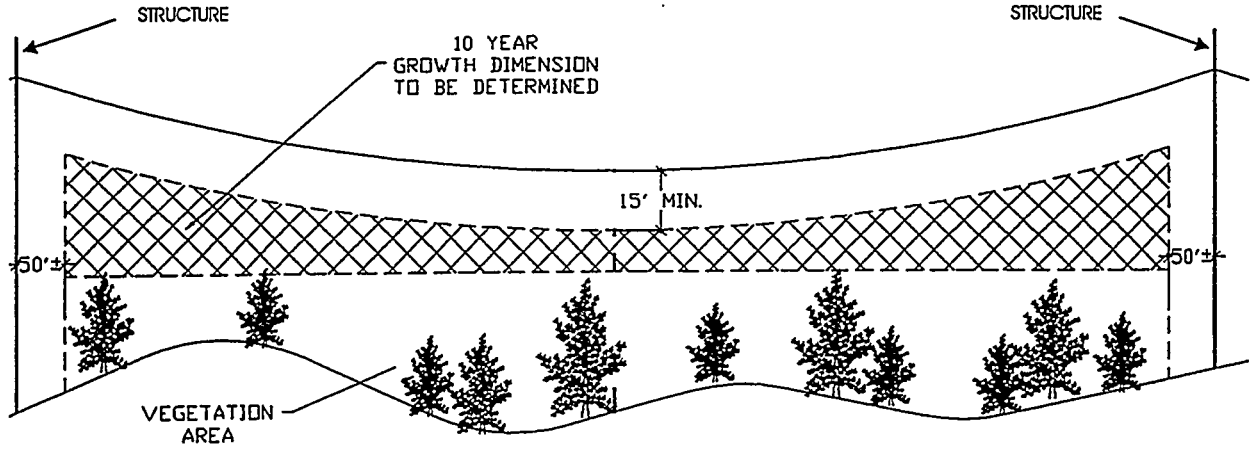


ALTURAS TRANSMISSION LINE EIR/S

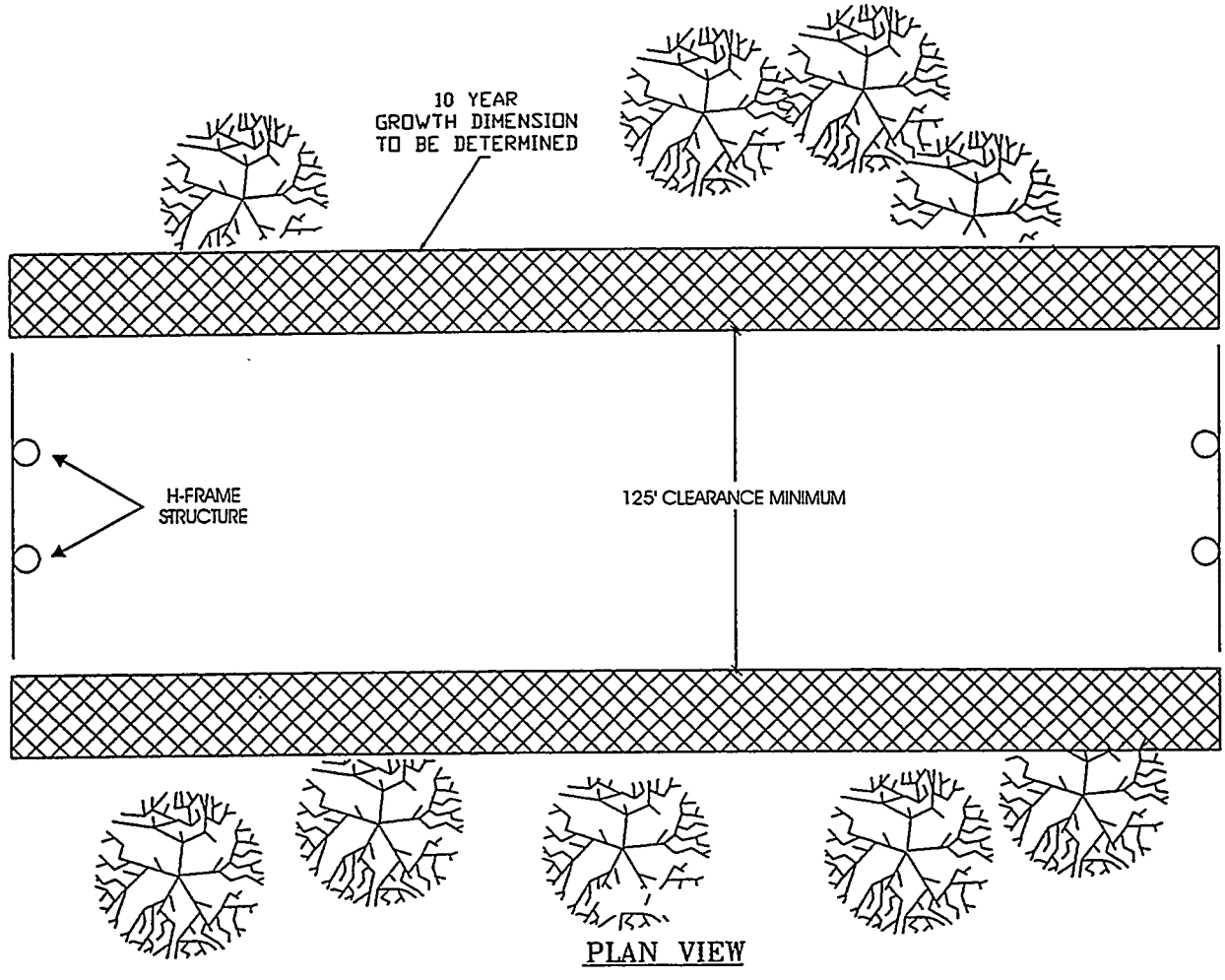
Figure B.15-b

Tree Trimming Clearance at Conductor Midspan

Source: SPPCo



SIDE ELEVATION



PLAN VIEW

ALTURAS TRANSMISSION LINE EIR/S

Figure B.2-15c

Tree Trimming Clearance Side Elevation and Plan View

Source: SPPCo

Structure Foundation Excavation. Two excavations approximately 2 to 8 feet in diameter and 10 to 25 feet in depth would be required for each H-frame tangent structure. One excavation ranging from 6 to 12 feet in diameter and 10 to 30 feet in depth would be required for each single-pole structure. Three excavations approximately 2 to 8 feet in diameter and 10 to 25 feet in depth would be required for the angle structures. Smaller diameter excavations would be required for the 6 to 12 anchors for attachment of the guys on the 3-pole angle structures. Excavations for direct-embedment of the tubular steel poles would be augured when possible. If auger excavation becomes difficult due to subsurface conditions or terrain, a track-type backhoe would be used. Blasting would only be used in areas where conventional excavation techniques are not effective. Blasting is anticipated in lava flow areas which are not sufficiently fractured to excavate conventionally. All blasting would be performed by licensed demolition personnel. The area of disturbance for structure excavations and erection, and construction vehicle movement is estimated by SPPCo to be approximately 18,000 square feet, on average, per structure (see Table B-3). As proposed by SPPCo, no structures would be located within river, stream, or creek beds.

Structure Assembly. The preparation of sub-assemblies and the storage of structure components would occur at the staging areas discussed in Section B.2.3.5. After material crews deliver the structure components and sub-assemblies to the structure sites within the ROW, assembly crews would assemble the structures into complete units and ready them for erection. Assembly crews would follow the delivery crews and would use a boom truck or small mobile crane to assemble the structure in preparation for erection.

Structure Erection. Erection crews would follow the assembly crews and would set the completed structures in the excavations using a large mobile crane (with a 50-100 ton rating). As previously discussed, landings of 50 feet by 100 feet would be utilized for cranes on hillside locations. Native material would be used as backfill and compacted with air tamps to completely fill the space between the pole and the sides of the excavations. Guys would be installed on the 3-pole angle structures. Each guy installation would result in a disturbed area of roughly 10 feet by 20 feet.

Conductor and Shield Wire Installation. The installation of conductors and shield wires to the erected structures would involve a three step process: (1) Installation of pull ropes (sockline), (2) pulling of conductors and shield wires; and (3) sagging and connection of conductors and shield wires to the structures. This three step process would be performed approximately every 9,000 feet, connecting 6 to 10 structures at a time; terrain constraints and environmental sensitivities would determine the actual number of structures to be strung at a time.

Sockline installation would require the use of a puller truck carrying reels of wire rope (9,000 feet each) and a D-6 bulldozer or cat. The puller truck would be located on a designated work pad at the beginning of the run of structures to be strung. At this location, the five lines of sockline would be connected to the bulldozer/cat. Pulleys would also be located on each structure. The bulldozer/cat would travel from

the puller truck to each structure (either side could be accessed) via defined access roads or overland routes; SPPCo may be required to utilize helicopters or manual stringing in areas where steep terrain or sensitive environmental resources make overland travel impossible (including perennial river and stream beds). As discussed in Section C.7, Hydrology, SPPCo expects that they may need to cross the stream located in Crooks Canyon by utilizing a temporary bridge; however, SPPCo states that no other river or stream beds would be crossed with construction equipment. At each structure, the pull ropes would be threaded through the stringing blocks attached to the insulators on each structure.

Once the socklines have been installed, trucks carrying conductor and shield wire and a tensioner truck would be brought on-site. At the terminus of the structures, a tensioner truck would be brought on-site. The sockline would then be connected to one conductor pair and shield wire at a time. The sockline would then be pulled in with the tensioner keeping the wire under enough tension to keep it above the ground to avoid any damage from dragging.

After the conductors and shield wires have been strung, they are sagged to the proper tension and secured to temporary anchors. The wires are then removed from the stringing blocks and permanently attached to the structure insulators using a clipping crew.

Right-of-Way Cleanup. Cleanup crews would follow the clipping crews removing all surplus material, equipment, packing crates and other construction debris daily. Littering will not tolerated. SPPCo proposes that tree trimmings and removed vegetation would be shredded and spread within the ROW at a depth no greater than three inches. All debris cleaned from the ROW will be disposed of in conformance with permit conditions, regulatory requirements, and the restoration plan. Disposal of removed trees on non-federal and federal lands would be conducted in accordance with the Timber Harvest Plan and BLM/USFS requirements, respectively. Rocks excavated during access and site preparation would also be distributed within the ROW; on BLM lands, the agency has the option of requiring that rocks be buried or removed from the site.

Site Restoration. SPPCo crews would restore all access roads and overland travel paths, not required for future maintenance activities. In addition, other disturbed areas (structure erection sites, including crane landings, pulling sites and staging areas) would also be restored. Native seed mixtures and live plant material would be planted in order to revegetate areas disturbed during construction. Section C.3, Biological Resources and Appendix E.3, Community and Habitat Restoration Plan Objectives and Guidelines, present general guidelines for the revegetation of the major plant communities affected by the Proposed Project. The plant communities addressed include big sagebrush, juniper woodland, woodland, silver sagebrush, and low sagebrush. A Community and Habitat Restoration Plan would also be required to address detailed mitigation planning for affected special status plant species, natural plant communities, and wetlands (see Section C.3 and Appendix E.3). Reclamation and revegetation will be completed according to the requirements of the permit conditions, regulatory requirements, and

restoration plan. Site adapted native plant material and locally-collected seeds from native plant materials would be utilized as required by permitting agencies. Mulches and fertilizers would also be applied as specified in the Soil Conservation and Erosion Control Plan. Site restoration efforts are expected to begin as line construction is completed (June through November, 1996), with any necessary follow-up to be conducted during the fourth quarter of 1997.

B.2.3.3 Substation Construction

Construction of all substations would occur from March, 1996 through mid-December, 1996, not including design and acquisition of materials. In the construction sequence, first, the site is cleared and graded, to assure soil compaction and surface drainage. Excess topsoil and organic debris would be removed to an offsite landfill or reserved for use along the ROW and spread similarly to chipped woody debris (maximum three inch depth). Fencing is installed around the perimeter of the substation to provide security for substation equipment, and to keep unauthorized personnel and wildlife at a safe distance from the high voltage equipment when the substation is eventually energized.

Reinforced concrete footings and slabs would be constructed to support structures, equipment, and the control building. Buried conduit would be installed throughout the substation, to be used for electrical control cables. After trenches are dug, conduit would be placed on a bed of sand, covered with sand, and then soil would be back-filled to match the adjacent grade.

A ground mat would then be constructed inside the substation fence, to assure that all equipment and structures are properly grounded. A computer would be used to design the spacing for a grid of conductors to be buried approximately 12" below the substation soil grade. Trenches would be dug in both directions across the station and copper conductors installed in the trenches, creating a mat across the entire substation. The conductors would be thermally welded at intersections, and conductor tails brought up next to the equipment and structure footings for use in grounding equipment and structures. Then soil would be back-filled to match the existing grade.

Gravel would be installed over the substation pad to a depth of approximately 3 inches. The angular, 100% crushed gravel would be screened to be no larger than 1-1/2 inches in size. Gravel is essential for providing electrical isolation for maintenance and operations workers in the station. The gravel would also prevent equipment and vehicles from getting stuck in mud during inclement weather and inhibit weed growth.

The control building would then be erected on a concrete slab. SPPCo normally uses a pre-fabricated steel building, which permits easy erection and provides for later expansion. Equipment installed inside the control building would consist of relay and control panels, AC and DC load centers to provide power to all loads and equipment inside and outside the control building, a battery bank to permit transmission

line switching equipment to operate during loss of AC, a heating/cooling system to prevent protective and control equipment temperature failure, communications equipment to allow remote control and monitoring of essential equipment, and other protection and control equipment.

Next, structures would be erected to support switches, electrical conductors, instrument transformers, lightning arresters, and other electrical equipment, as well as to terminate incoming and outgoing transmission lines. Structures would be fabricated from welded tubular steel and painted a color to blend with the surrounding terrain, such as desert tan or sky gray. Structures would be grounded by thermally welding one or more ground grid tails to each structure.

Electricians would then set all equipment on slabs and footings, and either bolt or weld the equipment securely to meet seismic requirements. Equipment to be installed includes a phase angle regulating transformer, voltage transformer, shunt reactors (inductors), 230 or 345 kV circuit breakers, high voltage air switches, high voltage current and voltage instrument transformers used for relaying or metering, electrical conductors, and buswork.

As mentioned above, panels consisting of protective relays and controls would be installed in the control building. Control cables would be pulled from the panel boards in the control building, through underground conduits, to circuit breakers, transformer and shunt reactor auxiliary loads, and other station equipment.

When all substation and protective and control equipment was installed, and all controls adjusted to the specified settings, systems would be extensively tested. Following testing, switches and circuit breakers would be closed, energizing substation equipment and the transmission line.

After completion of construction, SPPCo proposes to landscape the perimeter of the Border Town Substation. Existing vegetation adjacent to the County road near the Alturas Substation would be preserved for visual screening.

B.2.3.4 Construction Employment

Construction employment on the Proposed Project would include skilled or semi-skilled positions, including line workers, welders, heavy equipment operators, surveyors, engineers, utility equipment workers, truck drivers, warehouse workers, clerical workers and laborers. Table B-6 presents anticipated construction employment totals based on a 16-month construction schedule. The figures provided in Table B-6 do not include any employment that would result from support services such as food, lodging and vehicle maintenance. Figure B.2-13 illustrates the distribution of this labor force over the 9-month construction period.

SPPCo expects that specialized labor (lineman, substation equipment technicians, etc.) would not be hired from the local communities. However, local labor would be used for support activities (material hauling, site grading, etc.) and services (food, lodging, etc.), to every extent possible.

Table B-6 Construction Employment Totals

Project Component	Minimum Quantity of People Required During Task	Maximum Quantity of People Required During Task
Transmission Line & Substation Survey	9	18
345 KV Transmission Line Construction	6	67
230 KV Transmission Line Construction	10	15
Substation site work & Grading (at each sub-site)	6 (18 total)	15 (45 total)
Substation Construction (at each sub-site)	5 (15 total)	15 (45 total)
Engineering Support	3	6
Construction Inspection	6	15
Geotechnical Testing	10	20
Pre-construction resource verification	5	10
Construction compliance monitors	4	12
Right of way (liaison with private property owners)	2	4
Mitigation measures	20	30
Material Transportation (wire, structures, equip., etc.)	30	60
Total	138	287

B.2.3.5 Materials, Equipment, and Staging Areas

SPPCo has identified seven staging areas along the proposed transmission line route. Five of these sites were proposed for use by Tuscarora Pipeline Company for their pipeline construction activities and were included in the Tuscarora Pipeline EIR/S analysis. Figures B.2-2a-d illustrates the locations of the seven staging areas, including: (1) An area west of Alturas near the Alturas Lumber Yard (approximately 50 acres); (2) A location in the Madeline Plains north of Angle Point EØ8 and east of U.S. 395 (APN 043-050-43) (approximately 20 acres); (3) A site east of Ravendale (about 4 acres); (4) A site west of Angle Point M-Ø2 on the Wendel Quad (approximately 16 acres); (5) A site just north of Wendel adjacent to the railway (about 8 acres); (6) A location adjacent to the proposed Border Town Substation site (approximately 8 acres); and (7) Property near SPPCo's material storage yard in Reno at 11 Ohm Place (approximately 10 acres). Sites 1 through 5 are the proposed Tuscarora staging grounds.

Staging areas would be between 4 and 50 acres in size for a total of approximately 100 acres; the designated sites are oversized to allow for some flexibility in siting actual staging area boundaries to avoid sensitive environmental resources. Staging areas may be graded and covered with gravel. These yards would also be used as headquarters for crew and company reporting. Structure components and wire reels would be hauled to the structure locations from storage yards by semi-tractor trailers and unloaded

by a mobile crane, or hauled and set by helicopter. Structure sub-assemblies would be prepared at the staging areas.

Table B-7 lists the type and purpose of the major equipment that would be used during construction of the transmission line.

Table B-7 Major Equipment Used During Construction

Equipment	Use
3/4 ton pickup trucks	Transport construction personnel
1 ton crew trucks	Transport construction personnel
2 ton flat bed trucks	Haul materials
Flat bed boom truck	Haul and unload materials
Rigging truck	Haul tools and equipment
Mechanic truck	Service and repair equipment
Shop vans	Store tools
Office van	House the office
D-8 bulldozer	Blade access roads, platforms
D-6 bulldozer	Pull hardline & rangeland drill
Truck mounted digger	Excavate foundations
Crawler backhoe	Excavate foundations
Small mobile cranes ($\leq$12 tons)	Load and unload materials
Large mobile cranes ($\geq$75 tons)	Erect structures
Transport	Haul structure components
Drill cat	Drill holes for blasting
Puller	Pull conductor and wire
Tensioner	Pull conductor and wire
Wire reel trailer	Haul wire
Semi tractor trailers	Haul structure components
Air compressors	Operate air tools
Air tampers	Compact soil around poles
Small helicopter	Pull hardline
Large helicopter	Erect and haul structures
Rangeland drill	Sow seed

B.2.4 PROPOSED PROJECT OPERATION AND MAINTENANCE

This Section includes discussion of the normal operation of the proposed transmission line, as well as procedures for line maintenance.

B.2.4.1 Transmission Line Operation

Once the transmission line is operational, SPPCo's Electric System Control Center would be responsible for its operation. This department would monitor voltage and power flow along the transmission line from a central control center in Reno. Substations would not be manned on a continual basis, but their operation would be monitored from Reno. Figure B.2-6 presents a "One-Line Diagram" illustrating the components of proposed transmission line as it would be at completion of construction.

With the proper maintenance, SPPCo expects that the operational life of the Proposed Project would be indefinite with proper design, quality materials, an aggressive maintenance program, and the dry climate.

B.2.4.2 Maintenance of Project Facilities

Maintenance activities for the transmission line would include patrol of the lines, climbing inspections, pole testing, anchor testing, right-of-way maintenance, construction activities, and repair of transmission lines. SPPCo anticipates using one foreman, five linemen, and one heavy equipment operator for maintenance along the entire transmission system. This team could be assisted by another four-person crew on an as-needed basis.

Since 1987, SPPCo has been a member of the Northwest/Southwest Transmission Reliability Committee (NSTRC), whose Charter includes the description below:

> ...formed to maintain and promote practices and procedures to enhance the reliability of the interconnected transmission system of the western utilities. The aim of this organization is to establish appropriate minimum maintenance and operating standards such that reliability is maintained at reasonable cost.

This group has established "Transmission Line Inspection and Repair Practices, Agreement for 230 kV and Above." The transmission line maintenance procedures developed by SPPCo and the NSTRC are described in Table B-8.

Emergency maintenance would involve prompt movement of repair crews to repair or replace any damaged components. Crews would be instructed to protect crops, plants, wildlife, and other resources of significance, as defined by the various mitigation plans to be prepared for project construction, including the Community and Habitat Restoration Plan and the Soil Conservation and Erosion Control Plan. Restoration procedures following completion of repair work would be similar to those prescribed

Table B-8 Line Maintenance

Maintenance Function	Description
Overall line integrity	Two patrols per year: one ground patrol (vehicle[1] and foot) and one air patrol (helicopter). More frequent patrols if required by storms or system disturbances.
Structures	Climbing inspection; approximately 10% of structures per year. Check for corrosion, misalignment, excavations.
Lines	Climbing inspection on selected lines to inspect structure, hardware, insulator keys, etc. Check conductors and fixtures (including spacers, shoes, dampeners, insulators, splices, jumpers). Check for sag.
Poles	As needed, based on age and problems noted. Check structure poles for integrity of anchor rods, down guys, footings.
Anchors	As needed, depending on age and soil conditions.
Right-of-way maintenance	Continuous, while other inspections are done along the route. Tree-trimming and removal as needed.[2] Check for encroachments (buildings, excavations, wells, fences, flora, flammable material).

1. Ground patrol vehicles would travel on roadways that exist upon completion of the project.
2. Tree trimming to be conducted to allow for a 10-year growth envelope (see Section C.3). Dead trees to be removed that may fall into conductors or structures. To determine tree trimming and removal needs, site reconnaissance of the ROW would be conducted every three to five years.

for normal construction. The comfort and safety of local residents would be provided for by limiting noise, dust, and any danger caused by maintenance vehicle traffic. Routine and emergency maintenance procedures would be provided in the Construction, Operation and Maintenance Plan to be prepared and approved for the project prior to issuance of permits for the project by the Lead Agencies.

SPPCo is not proposing any maintenance of access roads and overland travel routes to be utilized for maintenance activities. If roadways become unusable due to deterioration, SPPCo proposes to make them passable after the proper approvals have been obtained.

B.2.5 POTENTIAL PROJECT ACCIDENT SCENARIOS

The Proposed Project includes both manual and automatic systems that would result in de-energizing of the transmission line if an accident were to occur. SPPCo's Electric System Control Center in Reno, Nevada would have the capability to manually open breakers located at the substations along the transmission line in order to immediately de-energize the line if an accident were detected.

The Proposed Project would include fault-sensing equipment at the substations that would detect a problem in transmission of power along the line. Fault sensors would be activated when they detect a break in power transmission for any reason. When fault-sensors are activated, they would automatically cause a circuit breaker to open (breakers react in a fraction of a second), causing electrical transmission to stop. The breakers would then automatically close, and if the fault is detected again they would re-

open and be locked out. The System Control Center would then send a field crew out via truck or helicopter, depending on the fault location, to identify and correct the problem.

Under certain circumstances (e.g., a forest/range fire approaching the transmission line), the System Control Center could manually open the breakers at the substations (North Valley Road and Alturas) of terminals and cause the de-energizing of the line. Table B-9 lists potential transmission line accidents, their causes and effects, and SPPCo's proposed response and prevention mechanisms.

Table B-9 Potential Transmission Line Accidents

Accident Scenario	Cause of Accident	Effect	Response	Prevention
Forest/range fire burns through transmission line ROW	Lightning, human error, ash contaminates insulators and causes arcing	Danger to fire-fighters if water is used; Reduced structural integrity	Breakers open and de-energize line if proximity threatens safety of fire-fighters	N/A
Raptors, vegetation (or other objects) come into contact with energized lines	Transmission line high voltage	Forest/range fire; Reduced structural integrity	Breakers open to cut off power flow; repair crew sent out	Vegetation removal Raptor diverters
Aircraft collision with energized lines	Low visibility of lines or pilot not observing markers	Lines broken; structures could be damaged	Breakers open to cut off power flow; repair crew sent out	Follow FAA marking requirements for aircraft warning
Flooding, heavy rains, landslide or earthquake	Natural causes; improper structure location	Lines broken; Structure damage or collapse	Breakers open to cut off power flow; repair crew sent out	Select structure sites for maximum stability
Severe weather (ice or snow)	Weight of ice on lines and/or structures	Lines broken; Structure damage or collapse	Breakers open to cut off power flow; repair crew sent out	N/A

B.3 PROJECT ALTERNATIVES OVERVIEW AND SCREENING

B.3.1 CEQA/NEPA 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, both CEQA Guidelines (Section 15126(d)) and NEPA Regulations (Section 1502.14) 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. CEQA Guidelines state that the discussion of alternatives shall focus on alternatives capable of eliminating or reducing significant adverse environmental effects of a proposed project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. 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. Finally, NEPA Regulations (Section 1502.14(c)) provide for the inclusion of reasonable alternatives not within the jurisdiction of the lead agency.

B.3.2 ALTERNATIVES SCREENING METHODOLOGY

The alternatives screening process serves two overall purposes: (1) to eliminate alternatives that do not conform to CEQA and NEPA requirements; and (2) to distinguish project alternatives from other EIR/S elements (such as suggested mitigation measures). Many alternatives were proposed during the EIR/S scoping process for consideration in establishing a reasonable range of alternatives. The alternatives screening process consisted of three steps:

Step 1: Clarify the descriptions of the alternatives to allow comparative evaluation

Step 2: Evaluate each alternative using the following criteria:
- Potential for provision of clear environmental advantages over the Proposed Project
- Technical and regulatory feasibility
- Consistency with the project applicant's objectives and public policy objectives

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

Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further analysis. In the final phase of the screening analysis, the 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.

B.3.2.1 Potential to Eliminate Significant Environmental Effects

If an alternative clearly does not provide potential overall environmental advantage as compared to the Proposed Project, it is eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

B.3.2.2 Feasibility

For the screening analysis, the technical and regulatory feasibility of potential alternatives was assessed at a general level. Infeasibility was defined more by kind than by degree. The assessment was directed toward reverse reason, that is, was anything about the alternative infeasible on technical or regulatory grounds. According to recent 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."

B.3.2.3 Consistency with Objectives

The objectives of the Proposed Project are listed and discussed in Section A.6 (Purpose and Need) and summarized as follows:

1. Increase SPPCo system import capacity from 360 to 660 MW:
   - Fulfill existing inadequate transmission service requirements
   - Allow purchases from neighboring utilities
   - Respond to long-term emergencies

2. Improve service reliability to the Reno/Lake Tahoe area
   - Improve reliability from the east
   - Improve voltage control (support during peak periods)

3. Provide direct access to the Pacific Northwest power market

4. Secondary Objectives/Benefits: transmission service, exports benefits, PG&E upgrade deferrals, communication benefits, and future LMUD intertie, provide transmission facilities for North Valley growth.

This screening analysis does not focus on relative economic factors of the alternatives (as long as they are economically feasible) since CEQA Guidelines require considerations 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.3.3 SUMMARY OF SCREENING RESULTS

Proposed alternatives identified by the Applicant, agencies, and the public are listed below according to the determination made for analysis. Alternatives considered included alternative route alignments and substation sites, alternatives that could replace the Proposed Project as a whole, and the No Project Alternative.

B.3.3.1 Alternative Route Alignments and Substation Sites Analyzed in the EIR/S

An Alternative Route Alignment is defined as a re-alignment of a portion of the proposed Alturas Transmission Line Project route. Such alignments are not complete alternatives to the project as a whole, but rather could replace specific segments of the Proposed Project. Alternative route alignments and substation sites would not affect the ability of the Proposed Project to achieve the desired project objectives. Therefore, these alternatives were considered in context of their ability to reduce the significant environmental impacts of the Proposed Project and their technical and regulatory feasibility.

The following alternative route alignments and substation sites have been chosen for detailed analysis in this EIR/S through the alternative screening process. These alternatives are described in Section B.4 and are illustrated on Figures B.4-1 through B.4-5 in Section B.4. Each alternative route alignment is evaluated within each environmental issue area of Part C of this EIR/S. The alternative route alignments and substation sites eliminated from further consideration are listed in Section B.3.3.3 and described in Section B.3.4.

Alternative Route Alignments (Section B.4.1)

- Alturas Area Alternative Alignment (Segment B)
- Madeline Plains Alternatives (Segments D, F, G, H, I)
- Ravendale Alternative Alignment (Segment J, I)
- East Secret Valley Alignment (Segment ESVA)
- Wendel Alternative Alignment (Segment M)
- West Side of Fort Sage Mountains Alignment (Segment P)
- Long Valley Alignments (Segments S, U, Z, and WCFG)
- Peavine Peak Alternative Alignment (Segment X-East).

Substation Alternatives (Section B.4.2)

- Alturas Substation Alternative (Mill Site)
- Border Town Substation Alternative (SPPCo Site).

B.3.3.2 Project Alternatives Analyzed in the EIR/S

Numerous project alternatives were evaluated in the screening process that could replace the Proposed Project as a whole. Project alternatives considered included Transmission Alternatives, Generation Alternatives, System Enhancement Alternatives, and Alternative Transmission Technologies. In addition, as required by CEQA, the No Project Alternative was evaluated. The alternatives that could replace the Proposed Project as a whole were assessed for their ability to reasonably achieve the project objectives, both individually and collectively. Since CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives," for an alternative to reasonably achieve a project objective, 100 percent satisfaction was not required. Several of these project alternatives would involve partial use of existing facilities.

As discussed in Sections B.3.4.3 through B.3.4.6, Transmission Alternatives were the only type of project alternatives that could reasonably satisfy at least one project objective. Those Transmission Alternatives that could reasonably satisfy at least one of the three primary project objectives were evaluated individually and collectively for their potential to provide clear environmental advantages over the Proposed Project (see Section B.3.4.6.2). The No Project Alternative is described in Section B.4.3 and is evaluated within each environmental issue area of Part C of this EIR/S. Project alternatives eliminated from further consideration are listed in Section B.3.3.3 and described in Section B.3.4.

B.3.3.3 Alternatives Eliminated from Full Consideration in the EIR/S

The alternatives listed below were eliminated from full consideration in the EIR/S; they are described and the reasons for their elimination are presented in Section B.3.4.

Alternative Route Alignments (Section B.3.4.1)

- USFS Alturas Alignment
- Alturas Ridge Routes
- Knoch Re-Alignment and Barager Variation
- Eastern Madeline Plains Alternative Alignment
- Western Madeline Plains Alternative Alignment
- Leonard Re-Alignment
- McCourt West Secret Valley Re-Alignment
- Re-Alignment East of Ravendale
- Re-Alignment North of Honey Lake
- Sierra Army Depot Alternative Alignment
- Herman Re-Alignment
- East Side of Petersen Mountain Range Routes
- Route Segment V
- Tuscarora Gas Pipeline Alignment.

Substation Alternatives (Section B.3.4.2)

- Alternative Border Town Substation Sites
- Expansion of North Valley Road Substation
- Termination of Project on East Side of System.

Generation Alternatives (Section B.3.4.3)

- Piñon Pine Power Plant
- Fort Churchill Combustion Turbine
- Wind Technology
- Solar Technology
- Geothermal Energy.

System Enhancement Alternatives (Section B.3.4.4)

- Demand Side Measures
- Static Var Compensator
- Capacitor Banks.

Alternative Transmission Technologies (Section B.3.4.5)

- Lower/Higher Voltages
- Direct Current Transmission
- Underground Construction
- Other Transmission Technologies.

Transmission Alternatives (Section B.3.4.6)

Transmission Alternatives That Do Not Satisfy Project Objectives

- Enhancement of 230 kV Utah Intertie Alternatives
- Intertie Alternatives to Nevada Power Company.

Transmission Alternatives That Satisfy Project Objectives

- Los Angeles Department of Water and Power (LADWP) Corridor Alternatives
  - Nevada Route Alternative
  - Summer Lake-Valley Road Alternative
- Midpoint-Valmy Alternatives
- Burns-Oreana Alternative
- Pacific DC Intertie Tap Alternative
- Frenchman Tap Alternative
- Tracy-Silver Lake Alternatives.

B.3.4 ALTERNATIVES ELIMINATED FROM FURTHER CONSIDERATION

As discussed in Section B.3, 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 following alternatives were eliminated from further consideration.

B.3.4.1 Alternative Route Alignments

This section discusses the alternative route alignments eliminated from further consideration. Alternative route alignments are presented from north to south.

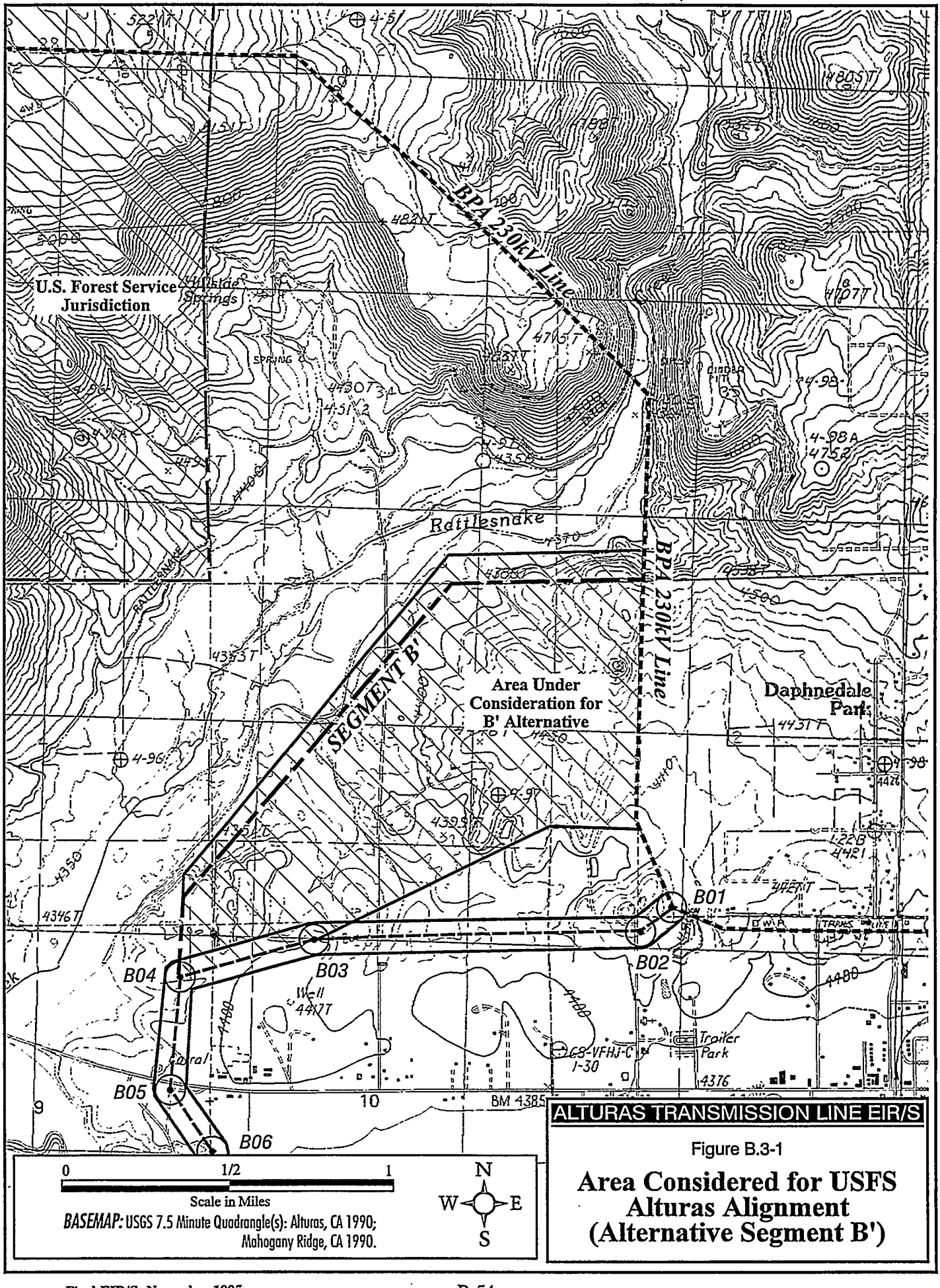
USFS Alturas Alignment

Description. The USFS (USFS, Modoc National Forest, February 10, 1995) recommended evaluation of a route that would replace Segment A of the Proposed Project. The USFS Alturas Alignment (represented as Segment B') would originate on private lands at a BPA line tap point east of the USFS and between the Alturas City golf course on the south and the riparian zone of Rattlesnake Creek on the north. This route would proceed to the southwest to join up with the already-defined route of Alternative Segment B (described in Section B.4.1.1), near angle points B03 and B04, as shown schematically on Figure B.3-1. Since the USFS Alturas Alignment would connect to Alternative Segment B, the Alternative Alturas Substation (Mill Site, between angle points B06 and B07 - see Section B.4.2.1) would be utilized under this alternative. A study area for the USFS Alturas Alignment was originally suggested and an environmentally preferable route within the study area was identified.

This alternative route was suggested to avoid placing the line on USFS land, since proposed Segment A does not follow an existing utility corridor. The USFS indicates that the Forest Land Management Plan directs the placement of new utility facilities within or contiguous to existing corridors and encourages the use of private lands for new corridors. The Forest Land Management Plan also states that construction of new corridors will be considered only if technology, safety, national and state practices, engineering, or environmental quality preclude co-existing uses.

The examination of this alternative is based on the following:

- Analyses of Proposed Segment A, Alternative Segment B, the Proposed Alternative Substation (Devils Garden Site), and the alternative Mill Site location for the substation in the Draft EIR/S
- Alternatives comparison analyses between Segments A and B and the alternative substation sites
- The detailed issue-by-issue responses to comment GP.41-7 from our Team's disciplinary specialists
- Examination of aerial photography for the area in question (flown 10-8-94)
- Site reconnaissance and photography on June 29, 1995
- Subsequent informational letters received from Modoc NF (Henderson, 7/10/95, regarding Forest Service policy pertaining to consideration of private lands use and Forest Plan amendment policy) and from Sierra Pacific (Owens, 7/18/95, regarding SPPCo's original selection of Segment A and the Devils Garden substation site as alternative to Segment B and other substation site alternatives)
- Specific comments received from Modoc NF (dated August 16, 1995).



ALTURAS TRANSMISSION LINE EIR/S

Figure B.3-1

Area Considered for USFS Alturas Alignment (Alternative Segment B')

Based on this analysis, this alternative is compared with proposed and alternative routes in the matrix presented as Table B-10.

Rationale for Elimination. This alternative route is similar to Alternative Segment B which is fully analyzed in Part C of this EIR/S. Alternative Segment B avoids USFS land and appears to comply with the objectives of the USFS regarding use of private land; it would achieve the same purpose as the USFS recommended alternative. The environmental impacts of the USFS Alturas Alignment (study area and identified alignment) are presented in Table B-10 and compared to Proposed Segment A and Alternative Segment B. As presented in Table B-10, in comparison with Proposed Segment A, the USFS Alturas Alignment (Segment B') has no environmental issue areas of clear environmental advantage. Other comparison issue area impacts are summarized as follows:

- Segment B', in comparison to Proposed Segment A, has minor advantages in the issue areas of air quality (less construction emissions), biological resources (possible with increasing distance from the Rattlesnake Creek bottomlands), cultural resources (probably fewer sites to avoid/mitigate), and geology/soils/paleontology (fewer structure sites and postulated blasting requirements).

- Segment B', in comparison to Proposed Segment A, has clear disadvantages in the issue areas of land use (substantially greater conflicts with residential and agricultural uses), transportation (adverse impacts on Alturas Municipal Airport), and visual resources (double-circuit 230 kV line with structures every 700-800 feet would conflict with the open Rattlesnake Creek drainage area and the City golf course, would cross Route 299 one mile closer to central Alturas, and the Mill Site substation would be visually prominent from Route 299).

- Segment B', in comparison to Proposed Segment A, has minor disadvantages in the issue areas of energy and utilities (greater number of crossed utility lines), hydrology (due to the greater impacts associated with the Mill Site), noise (more receptors affected), and public health and safety concerns (more nearby residential development).

In comparison with Alternative Segment B, the USFS Alturas Alignment (Segment B') has no environmental issue areas of absolutely clear environmental advantage. Other comparison issue area impacts are summarized as follows:

- Segment B', in comparison to Alternative Segment B, has a probable minor advantages in the issue areas of land use (where there would be substantially reduced immediate effects on nearby residents, which are counterbalanced to some extent by adverse effects on irrigated cropland and pasture and more generalized effects over the wide-open Rattlesnake Creek drainage area on residents and users of the area - see Table B-10); and visual resources (with the immediate foreground effects on more residents north of Route 299 substantially reduced, which would be counterbalanced somewhat by the more generalized effects on the entire Rattlesnake Creek drainage area where the line would be prominent in the middle ground for many residents and users of the area due to the gently sloping topography of the area - less than 100 feet of relief over the major portion of the area considered).

- Segment B', in comparison to Alternative Segment B, has minor advantages in the issue areas of energy and utilities (slightly fewer utilities line crossed), noise (fewer receptors affected), and public health and safety (less nearby residential development, at least over the near term).

- Segment B', in comparison to Alternative Segment B, has similar levels of impact in the issue areas of cultural resources (possibly a minor disadvantage, depending on exact routing) and transportation (no appreciable difference in effects).

Table B-10 Comparison Matrix for USFS Alturas Alignment

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
GENERAL SEGMENT INFORMATION				
General Descriptive Parameters	Connection to BPA on Modoc NF	BPA connection SE of golf course	BPA connection somewhere north of golf course (see map)	BPA connection approx. 4000 feet north of golf course (see map)
	Crosses about 2.5 miles of Modoc NF	Crosses no Modoc NF	Crosses no Modoc NF	Crosses no Modoc NF
	Substation on BLM land	Mill site (west of Alturas and just south of Route 299) for substation	Mill site for substation would be preferred; no suitable location north of Hwy 299	Mill site for substation would be preferred; no suitable location north of Hwy 299
	7.1 miles total segment length	4.6 miles total segment length	4.9 up to approx. 5.5 miles total segment length, depending on BPA connection point and routing	5.1 miles total segment length
IMPACT ANALYSIS ++: Clear Environmental Advantage - - : Clear Environmental Disadvantage +: Minor Environmental Advantage - : Minor Environmental Disadvantage N: No Discernible Environmental Difference				
Air Quality	Construction emissions greatest due to longest length	(+) Construction emissions would be about 35% lower than for Segment A due to shorter length	[+ vs. A, - vs. B] Construction emissions would be about 20-30% lower than for Segment A due to shorter length, but slightly greater than for Segment B due to slightly greater length	[+ vs. A, - vs. B] Construction emissions would be about 28% lower than for Segment A due to shorter length, but slightly greater than for Segment B (by approx. 12%) due to slightly greater length

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Biological Resources	Disturbance to 21 acres of juniper woodland, 7 acres of big sagebrush scrub, 0.8 acre of montane meadow, 0.7 acre of volcanic gravels, and 1.6 acres of low sagebrush.	(++) Reduced impacts on juniper woodland (impacts eliminated), big sagebrush scrub (5 acres), montane meadow (.4 acre), volcanic gravels (.2 acre), and low sagebrush (impacts eliminated); reduced raptor predation enhancement potential.	[+ or N vs A, - or - - vs.B] Similar impacts on plant communities as for Segment B; slightly greater raptor predation enhancement potential than for Segment B due to location closer to Rattlesnake Creek drainage bottomlands.	[N or + vs A, - - vs.B] Slightly greater impacts on plant communities than for Segment B due to crossing of undeveloped land at the northeastern and southwestern portions of the segment (1.5 miles); substantially greater raptor predation enhancement potential than for Segment B due to location closer to Rattlesnake Creek drainage bottomlands.
	Potential disturbance to 9 occurrences of 3 special status plant species.	Potential disturbance to one occurrence of a special status plant species.	Probably similar impacts to Segment B because little or no additional natural habitat would be directly disturbed; however, impacts could be greater than for Segment B if the undeveloped central or northeast portions of the area being considered were crossed (see aerial photo).	Slightly greater potential for impacts on special status species than for Segment B due to crossing of natural habitat at the northeastern and southwestern portions of the segment (1.5 miles; see aerial photo).
	Greater potential for impacts on wildlife associated with construction disturbance or indirect impacts of increased access (e.g., Swainson's hawk, prairie falcon, bald eagle, golden eagle, sandhill crane) due to greater length, less developed character, and proximity to prime habitat areas of Pit River and Warm Springs Valley.	Slightly reduced potential for impacts due to shorter line length and avoidance of Devils Garden plateau and rimfaces.	As with Segment B, impacts would probably be lower relative to Segment A, but this alternative, depending on routing relative to Segment B, could place the transmission line closer to open water habitat in the Rattlesnake Creek bottomland area, thereby increasing impacts on waterfowl and on the sandhill cranes (highest collision potentials among these 3 alternatives, with double-circuit 230kV line, 6 double-wire transmission line, passing from the BPA line to the substation) and antelope which use this area.	This alternative, relative to Segment B, would place the transmission line much closer to open water habitat in the Rattlesnake Creek bottomland area (parallel and directly adjacent for about 1.5 miles), thereby increasing impacts on waterfowl and on the sandhill cranes (highest collision potentials among these alternatives, with double-circuit 230kV line, 6 double-wire transmission line, passing from the BPA line to the substation) and antelope which use this area.
Cultural Resources	Potentially significant impacts on 17 + sites.	(+) Potentially significant impacts on 5 sites.	[+ vs. A, - or N vs. B] Not surveyed. Probably similar to Segment B, however, impacts could be greater than for Segment B if the undeveloped central, northeast, or southwest portions of the area being considered were crossed (see aerial photo).	[+ vs. A, - vs. B] Not surveyed. Impacts could be greater than for Segment B due to crossing of the undeveloped northeast and southwest portions of the segment (1.5 miles; see aerial photo).

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Energy and Utilities	(+) Least potential for impacts; see Segment B.	Potential for disruption of utility service during construction would be higher than for Segment A because of a greater number of crossed overhead electrical lines.	[- vs. A, + or N vs. B] Impacts similar or slightly less than for Segment B, but greater than for Segment A.	[- vs. A, + vs. B] Impacts slightly less than for Segment B, but greater than for Segment A.
Geology/Soils/ Paleontology	Crosses potentially active fault	(+) No active or potentially active faults crossed	[+ vs. A, - vs. B] Crosses potentially active fault	[+ vs. A, - vs. B] Crosses potentially active fault
	May require greater amount of blasting due to portion on basaltic Devils Garden	Less blasting potentially required	Probable similar blasting requirements as for Segment B	Probable similar blasting requirements as for Segment B, but potentially greater depending on characteristics of undeveloped northeast and southwest portions of the segment.
	Potentially greater grading and erosion due to greater length and access requirements	Less grading and potential for erosion	Potentially greater grading and erosion than for Segment B, but less than for Segment A, depending on greater length and access requirements per specific route that could be chosen.	Potentially greater grading and erosion than for Segment B due to greater length and access requirements (but less than for Segment A).
Hydrology	(N) Crosses 2400 feet of Pit River floodplain (one or 2 structures within)	(N) Crosses 1600 feet of Pit River floodplain (one structure within)	[- vs. A and B] Same or similar Pit River crossing conditions as for Segment B	[- vs. A and B] Same or similar Pit River crossing conditions as for Segment B
	Potentially greater grading and potential for erosion and sedimentation impacts due to greater length and access requirements	Less grading and potential for erosion and sedimentation impacts along shorter transmission line route	Potentially greater grading and erosion and sedimentation impacts than for Segment B, but less than for Segment A, depending on greater length and access requirements per specific route that could be chosen - also depends on proximity of route to bottomlands of Rattlesnake Creek	Substantially greater grading and erosion and sedimentation impacts than for Segment B (but only slightly less than for Segment A) due to greater length and access requirements and proximity of route to bottomlands of Rattlesnake Creek
	Substation would result in less impacts due to location on a relatively flat highland plateau (Devils Garden)	Substation would result in greater impacts due to location in lowlands where construction has a greater chance of affecting the important Pit River hydrologic regime.	Same substation impacts as for Segment B	Same substation impacts as for Segment B

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Land Use	(++) Only 2 residences within 2000 feet (both at approx. 2000 feet from centerline) that would be affected.	Greater impacts associated with degradation of quality of residential uses - more residences at shorter distances - 33 residences (30 between B01 and B04) and a trailer park within 2000 feet. Of the 30 between B01 and B04, 3 are less than 1000 feet away, and about 17 are in the 1000-1500 range.	[- - vs. A, N or + vs. B] Impacts would be less than for Segment B since the line would be farther for most of the residences that would be affected by B (and only 3 or 4 residences before B04, and 6-7 total, would be within 2000 feet); however, the line would be in an open area visible to most of them (mostly in the 2500-5000 foot range) and the line would result in greater impacts to 3 (and possibly 4) residences along or east of Spicer Lane north of Segment B.	[- - vs. A, N or + vs. B] Impacts would be less than for Segment B since the line would be farther for most of the residences that would be affected by B (and only 2 residences before B04 - at distances of approx. 1700 and 1,800 feet - and 5 total, would be within 2000 feet); an additional previously unaffected residence complex at the end of Spicer Lane would also now be at a distance of approx. 2,400 feet; however, the line would be in an open area visible to many of the residences along Segment B (mostly in the 3000-6000 foot range). The line would result in greater impacts to 3 residences along or east of Spicer Lane north of Segment B.
	Minor adverse effects on recreational uses of Modoc NF (bike trail, woodcutting, hunting, wildlife viewing, recreational users of roads above head of Daggert Canyon and in vicinity of Indian Springs Reservoir)	Minor adverse effects on City golf course	Minor adverse effects on City golf course - less substantial than for Segment B due to greater average distance (unless northern border is used), but still prominent visually due to the openness of the terrain in the area north and to the west of the golf course.	Very minor adverse effects on City golf course - less substantial than for Segment B due to greater average distance (approx. 4,300 feet), but still somewhat prominent visually due to the openness and minimal relief of the terrain in the area north and to the west of the golf course.
	Crossing of Modoc NF is expected to require a Forest Plan amendment for permit	No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area	No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area	No Modoc NF requirements (e.g., plan amendment) required for permitting in Alturas area

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Land Use (continued)	Temporary adverse effects on grazing during project construction.	Reduced effects on grazing as compared with Segment A due to crossing of less grazing land.	Greater impacts on grazing, as well as impacts on irrigated cropland and pasture (including wheeled irrigation systems) which is the primary land use north of Segment B; parcels are large and use of parcel boundaries is not practical in the area north of Route 299.	Greater impacts on grazing, as well as impacts on irrigated cropland and pasture (including wheeled irrigation systems) which is the primary land use north of Segment B (1.6 miles of the 3.1 miles crossed north of Angle Point B04); parcels are large and use of parcel boundaries is not practical in the area north of Route 299, except for approx. .6 mile at the northernmost portion of Segment B'.
	Substation would introduce industrial use to an area of minimal development and minor recreational usage	Substation would be in an industrial area but would intrude on some nearby residential (2 residences within 2000 feet) and commercial (along Route 299 (1200-2000 feet away) uses. Also, see visual resources.	Substation effects same as for Segment B.	Substation effects same as for Segment B.
Noise	(+) No receptors subject to severe short-term construction noise impacts	10 receptors near Segment B subject to severe short-term construction noise impacts	[- vs. A, + vs. B] 4 receptors probably subject to severe short-term construction noise impacts	[- vs. A, + vs. B] 4 receptors probably subject to severe short-term construction noise impacts
Public Health and Safety	(+) Little potential for significant EMF exposure concerns	Segment B has most nearby residences and most likely to attract future nearby residential development	[- vs. A, +/N vs. B] Similar long-term impact concerns as for Segment B, but currently less nearby residential development	[- vs. A, + vs. B] Similar long-term impact concerns as for Segment B, but currently less nearby residential development
	General safety concerns similar for all alternatives	General safety concerns similar for all alternatives	General safety concerns similar for all alternatives	General safety concerns similar for all alternatives
Socioeconomics / Public Services	Impacts similar for all alternatives	Impacts similar for all alternatives	Impacts similar for all alternatives	Impacts similar for all alternatives
Transportation/ Traffic	(++) Impacts on Route 299 similar for all alternatives	Impacts on Route 299 similar for all alternatives	[- - vs A, N vs B] Impacts on Route 299 similar for all alternatives	[- - vs A, N vs B] Impacts on Route 299 similar for all alternatives
	Construction potentially impacts 3 roadways	Construction potentially impacts 5 roadways	Construction potentially impacts 4 roadways	Construction potentially impacts 4 roadways
	Lesser degree of interference with navigable airspace and associated safety reduction at Alturas Municipal Airport (line 7000 feet from runway).	Greater degree of interference with navigable airspace and associated safety reduction at Alturas Municipal Airport (line 3700 feet from runway).	Impacts with respect to airport same as for Segment B (line 3700 feet from runway).	Impacts with respect to airport same as for Segment B (line 3700 feet from runway).

	Segment A (Proposed)	Alternative Segment B	Segment B' (Study Area)	Segment B' (Specific Route)
Visual Resources	(++) Line (345kV, 3-pair transmission line, with 1200-foot structure spacing, structures 70-130 feet in height, after substation) would be a prominent foreground feature in the area west of Alturas, particularly between the south edge of Devils Garden and just north of Centerville Road (including a prominent crossing of Route 299), creating moderate to strong visual contrast and moderate landscape change; structure skylining, diminished scenic quality - unavoidable impacts. Portion on Modoc NF would be consistent with USFS VQOs of Partial Retention and Modification.	Line (230kV, double-circuit, 6 double transmission lines, with 700-800 foot structure spacing, structures approximately 110-130 feet in height, before substation) would be a prominent foreground feature in the area at the northwest edges of Alturas, immediately adjacent to residential areas, and including a crossing of Route 299 about 1 mile closer to the City. After substation 345kV south to just north of Centerville Road, with impacts similar to Segment A, except closer to the urban area. No ridge skylining to the north of Route 299. As viewed from Route 299, Fourth Street, and the various nearby residences, the line's visual prominence, moderate to strong visual contrast, and impairment of scenic views creates unavoidable impacts.	[- - vs. A, N or + vs. B] Impacts would be similar in general to those of Segment B, except that the direct visual prominence of the line to immediately adjacent Alturas residences north of Route 299 would be replaced to some extent by more generalized disruption of views across the wide-open drainage of Rattlesnake Creek, which consists of flat to gently rolling terrain of mostly pasture and irrigated cropland set within the surrounding highlands dominated by juniper woodland; the route, depending on its specific location, would be prominent from the City golf course (to the north and west), Spicer Lane, and the residences along Spicer Lane. The crossing of Route 299 and impacts south from there (including the visually prominent and significant substation) would be the same as or similar to those of Segment B.	[- - vs. A, N or + vs. B] The direct visual prominence of the 230kV, double-circuit line to immediately adjacent Alturas residences north of Route 299 would be reduced substantially for most residences affected by Segment B (the line would still be very prominent to 4 residences north of Route 299). This would be replaced to some extent by more generalized disruption of views across the wide-open drainage of Rattlesnake Creek, which consists of flat to gently rolling terrain of mostly pasture and irrigated cropland set within the surrounding highlands dominated by juniper woodland; the route would be prominent from Spicer Lane and the residences along Spicer Lane. The crossing of Route 299 and impacts south from there (including the visually prominent and significant substation) would be the same as or similar to those of Segment B.
	Minor visual impacts of substation (Devils Garden site), provided that construction road clearance does not provide visual access to substation.	The Mill Site substation alternative would result in unavoidable impacts due to visual prominence, moderate visual contrast, and impairment of scenic views for motorists on Route 299 and nearby residents (2 within 2000 feet).	Mill Site substation impacts same as for Segment B.	Mill Site substation impacts same as for Segment B.

++: Clear environmental advantage. +: Minor environmental advantage. N: No discernible advantage.
- - : Clear environmental disadvantage. - : Minor environmental disadvantage.

- Segment B', in comparison to Alternative Segment B, has clear disadvantages relative to Segment B in the area of biological resources (additional disturbance and increased bird collision potential due to double-circuit lines in the Rattlesnake Creek drainage area, depending on specific location - worse with increasing proximity to the Rattlesnake Creek riparian area).

- Segment B', in comparison to Alternative Segment B, has a minor disadvantage in the issue areas of air quality (greater length) and minor-to-clear disadvantages in geology/soils and hydrology (more ground disturbance, erosion, and sedimentation potential - worse with increasing proximity to Rattlesnake Creek).

In conclusion, based on the analysis summarized above and presented in Table B-10, the USFS Alturas Alignment (represented by Segment B') does not offer the potential for environmental advantage, but rather is inferior to Proposed Segment A from an environmental perspective; it also appears to be (at best) even with or even inferior to Alternative Segment B (which is also judged to be inferior to Segment A). Therefore, the USFS Alturas Alignment as been eliminated from further consideration as an alternative route segment for the Proposed Project.

Alturas Ridge Routes

Description. Several alternative route alignments were suggested by the CDFG to replace proposed route Segment C which is located southwest of Alturas. These alternative alignments would move the route further west into the hills and along the Rocky Prairie area, then south on the west side of Likely Mountain to join the alternative alignment D at the northwest corner of the Madeline Plains (see Figures B.4-2 and B.4-3 in Section B.4). These routes were identified by CDFG to reduce impacts to wildlife and wildlife habitat and to reduce interference with aircraft use related to antelope and deer census activities.

Rationale for Elimination. The primary environmental advantage of these route alignments would be avoidance of lower-lying areas used by waterfowl, other birds, deer and antelope. However, portions of these alternative route segments pass very close to Graven Reservoir, Bayley Reservoir, and Delta Lake and would have the potential to impact birds (e.g., line collisions) using these water bodies. Other biological disadvantages include potentially greater impacts on sensitive plant species because sensitive plants in this area tend to be concentrated in the foothill areas. Also, greater line lengths would result from these alignments that in turn would cause more habitat disturbance from ground clearing and greater energy use. Land use impacts would be greater than for the proposed route due to conflicts with recreational uses at the reservoirs, and visual impacts on greater numbers of people using these areas would probably be more adverse than for the proposed route.

These alternative alignments would result in minor disadvantages in the geology and hydrology issue areas due to steeper terrain and number of stream crossings associated with these routes. Conflicts with USFS plans and policies is another disadvantage because the southern portion of this alternative alignment crosses or is adjacent to USFS lands that are designated as "Partial Retention" by the USFS Visual Quality Objectives (VQO). This designation does not prohibit transmission lines, but the USFS would require a detailed analysis to determine whether or not the project would be compatible with this partial retention area. On balance, these alternative alignments do not offer the potential to reduce overall

significant impacts of the Proposed Project. This is due to the fact that they may reduce impacts in a few areas, but increase or create new impacts in other resource or geographic areas.

Knoch Re-Alignment and Barager Variation

Description. A citizen request (by Wauneta Jo Knoch, April 20, 1994) was made to re-route a portion of the proposed route in Modoc County (Segment C, on the ridge southwest of Alturas, between Angle Points CØ1 and CØ3) to the west on the basis of potential impacts to a BLM viewshed and associated impacts to a private residence. Subsequently, Ronald and Nanette Barager suggested consideration of a similar alternative starting at Angle Point AØ6 proceeding slightly to the west of the proposed route (by about 1000 feet) to an angle point about 4000 feet south-southwest of Angle Point CØ1, and from there down to an angle point about 2000 feet south-southwest of Angle Point CØ3, with this latter portion being about 3000 feet west of the proposed route (comment on DEIR/S, dated April 10, 1995, see Comment/ Response to Comment TA.1-1). This Barager variation was proposed to replace physical encroachment and visual impacts on various residences and residential parcels.

Rationale for Elimination. Review of the portion of the proposed route that would be replaced by these alternatives indicates that, for the most part, the transmission line would not be visible or would not create a significant visual impact on the residential properties of concern due to distance generally greater than 2000 ft (and generally well in excess of 3000 feet for the Wildlife Estates properties) and topography. Further, movement of the line to the west would have greater effects on the California Pines area, and would get into areas of more sensitive topography and associated habitat conditions, including being closer to Graves Reservoir. Therefore, there appears to be no environmental advantages for these alignments.

Eastern Madeline Plains Alternative Alignment

Description. This alignment represents relocation of a portion of Proposed Segment E (Angle Points EØ2 to EØ5) to the eastern edge of the Madeline Plains rather than paralleling the Tuscarora Pipeline corridor on the west side of U.S. 395. This route was suggested by CDFG to reduce greater sandhill crane, migratory birds, and sage grouse impacts from line collisions and habitat loss and to avoid conflicts with low-flying antelope census aircraft activities. A specific alignment was not identified by CDFG.

Rationale for Elimination. This alternative alignment would have the potential to reduce bird collisions due to the fact that it would be moved from the central waterfowl habitat area to the edge of the hills and edge of sensitive bird habitat. However, it would have the potential to interfere with bird flights between a small seasonal lake northeast of Madeline and the main valley area or Moon Lake. There would be no environmental benefit to sensitive plant species because the foothills in the region crossed by this alternative route generally maintain more sensitive plant communities. By removing the line from the Tuscarora Pipeline corridor, this alignment may result in greater construction disturbance to habitats, although habitat value at the edge of the plains may be of less value. Finally, this route may pass through or adjacent to the Tule Mountain Wilderness Study area north of Madeline and would conflict with BLM

land use policies for Wilderness Study Areas. A more southern route would have the potential to impact the community of Madeline. Therefore, on balance, this route does not appear to offer the potential for overall environmental advantage.

Western Madeline Plains Alternative Alignment

Description. This alignment would generally re-locate the Madeline Plains portion of the proposed route (Segments E and K, between Angle Points DØ8 and FØ3) westward to the western edge of the Madeline Plains. This route was suggested by CDFG to possibly reduce impacts to birds from line collisions and habitat loss and improve antelope census aircraft flight safety conditions.

Rationale for Elimination. This route was considered by SPPCo and dismissed during the project planning process due to potential land use conflicts with farmlands and ranches, including the bisection of cultivated lands. The alignment would provide potential benefits to wildlife but no advantages to botanical resources because sensitive plant species are more concentrated in the foothills in this region. The proposed alternative segment would also add more distance to the transmission line thus creating potentially more habitat disturbance and more area subject to bird collision impacts, although it would be in a potentially less sensitive area for bird habitat. Therefore, on balance, this alternative does not appear to offer the potential for environmental advantages.

Leonard Re-Alignment

Description. A member of the public requested consideration of an alternative alignment in the vicinity of Madeline (near Angle Point EØ2) to move the transmission line to an access road 3/4 mile west of the proposed route (scoping comment letter of May 1, 1994 by Robert Leonard).

Rationale for Elimination. An alternative that moves this portion of the proposed route to the far west is already included in the EIR/S analysis (Alternative Segment D). The route recommended by Leonard would cross steep topography at its southern end that would render project implementation difficult, if not infeasible, and would increase the chance of erosion and associated vegetation loss. Therefore this alternative does not appear to offer the potential for overall environmental advantage.

McCourt West Secret Valley Re-Alignment

Description. This route would traverse lands west of Snowstorm Mountain. It was recommended by a member of the public (Michael McCourt) during the scoping process.

Rationale for Elimination. Compared to the proposed route, this alternative would result in potentially greater environmental impacts. It would cross several miles of the Biscar State Wildlife Area and would be in close proximity to Biscar Reservoir, resulting in a higher potential for bird collision impacts. Cultural resources may also be impacted, as the vicinity of Snowstorm Mountain is a sensitive area. For these reasons, this alternative is not further considered in this EIR/S.

Re-Alignment East of Ravendale

Description. For a portion of the Proposed Project route in the Ravendale - Spanish Springs area (Segments K and L, between angle points KØ3 and LØ2), CDFG (Scoping Comment letter dated May 27, 1994) has requested study of a route to the east side of U.S. 395, in order to reduce possible sandhill crane impacts from line collisions and habitat loss, migratory bird collisions, and sage grouse impacts primarily from line collisions and habitat loss, and to improve antelope census aircraft flight safety conditions.

Rationale for Elimination. This suggested alignment has been eliminated from further consideration based on the following key constraint factors that preclude the development of a feasible route on the east side of U.S. 395 that offers a reasonable likelihood of potential environmental advantage:

- Location relative to the BLM Ravendale Fire Station - The BLM Ravendale Fire Station is located along U.S. 395 (west side) in the Spanish Springs area, about 5 miles southeast of the town of Ravendale. As documented in a letter from BLM to SPPCo (Peter Humm to Carl Barnett, dated February 25, 1994), this fire station serves as a fire fighting helicopter base during the fire season, with a contract helicopter stationed there full time and other helicopters flying in and out whenever a major wildland fire occurs in the area. Based on concerns regarding helicopter flight safety, as expressed by BLM's Eagle Lake Resource Area Manager and referencing the concerns of the Helitack Foreman at the station (letter dated December 15, 1993) and by Pete Gillies, Chief Pilot of Western Helicopters (letter dated September 15, 1993), it was recommended that "the least desirable location for the powerline, from a helicopter flight safety standpoint, would be east of and uphill from the fire station, between Highway 395 and the Spanish Springs dude ranch . . . With respect to safety for helicopter operations, the western alignment would be the preferred route. Ideally, the line should be at least three miles west of the fire station." As stated by Mr. Gillies, "because of normal prevailing winds, most approaches made to the heliport(s) begin east of the fire station, and the rising terrain of the mountain to the east creates enough of a problem in itself, let alone running a large power line across it from north to south." Furthermore, the rugged slopes of Spanish Springs Peak and Shinn Mountain to the east of the highway would have more limited access for construction and maintenance and they feature numerous springs and ephemeral watercourses that give rise to significant additional impact concerns.

- Impacts on Ravendale Airport - Immediately to the northeast of the town of Ravendale (and northeast of U.S. 395) is the Ravendale Airport, which features a north-south runway extending approximately 3,000 feet north from the highway. Concerns have been expressed by Lassen County regarding impacts on the airport (SPPCo Proponent's Environmental Assessment, Volume 2, Appendix H - meeting memorandum recorded by S. Younkin, August 13, 1993), also noting that most of the land east of Ravendale is in a FEMA 100-year flood zone. As discussed in Section C.12 (Transportation and Traffic), significant height restrictions would be applicable to the project within approximately 4,000 feet of the airport (80 feet at 4,000 feet, based on a 50 to 1 slope). This would effectively necessitate a possible route distance of at least 7,000 north from Ravendale and place the line out in the middle of the open plain area about 6,000 to 7,000 feet or more from the highway. This would involve many more parcels of private land and significantly greater visual disruption than the Proposed Project route west and southwest of the highway (Segment K) and the other alternative route in the area (Segment J, still further west and southwest).

Note that the above-referenced fire station and airport are discussed in Section C.12 and mapped in Figure C.12-1b.

Re-Alignment North of Honey Lake

Description. The CDFG has requested that the portion of the proposed route in the vicinity of Honey Lake (Segment L, near angle point LØ8) be re-routed to more closely follow U.S. 395. Therefore the route in this area would be re-located about one mile to the west and generally adjacent to the proposed Tuscarora Pipeline. The basis for this recommendation is potential reduction of sage grouse impacts from line collisions and habitat loss and improvement of aircraft flight safety conditions for antelope census and deer herd composition counts.

Rationale for Elimination. There are sensitive biological resources throughout this area, along both the proposed route and along U.S. 395, and moving the line closer to U.S. 395 would increase visual impacts. Therefore this re-alignment does not appear to offer overall environmental advantage. However, this slight re-alignment would be considered as potential mitigation if the biological and transportation impacts of the proposed route are determined to be significant.

Sierra Army Depot Alternative Alignment

Description. The portion of the proposed route to the east of Sierra Army Depot (Segment O, near angle point OØ4) would be moved southeast four miles to the California/Nevada border on the east side of Duck Lake and Calneva Lake. This alternative alignment was proposed by SPPCo.

Rationale for Elimination. This alternative alignment appears to offer no overall environmental advantage over the Proposed Project route because the portion of the proposed route that would be replaced by this alignment passes along an existing dirt road on the eastern border of the highly disturbed Sierra Army Depot property. Construction along this road would result in less biological and cultural resources impacts than constructing the project on an undeveloped stretch of land in eastern California at the Nevada border.

Herman Re-Alignment

Description. A scoping comment (by Paul Herman) requested inclusion of previously eliminated PEA route segments in the vicinity of Doyle. No further definition of this alternative was provided.

Rationale for Elimination. Alternative routes in and around Doyle (PEA Segments 48 and 49) were eliminated by the applicant during the project planning process due to land use conflicts with small ranches in the Doyle community and biological/agency conflicts in the Doyle Wildlife Area. Because of these conflicts, these routes do not provide environmental advantages over the portion of the proposed route that they would replace.

East Side of Petersen Mountain Range Routes

Description. CDFG (1994) and Toiyabe National Forest (1994) requested review of alternative routes that would avoid the Hallelujah Junction Wildlife area and the Forest. Potential alternative routes could replace proposed route Segments R, T, W, X, Y, and portions of Segment Q as shown in Figure B.3-2. The Applicant initially identified several routes on the east side of Petersen Mountain, but dismissed these routes early in the planning process due to land use, line length, and biological resource considerations (SPPCo, 1994a, Response to Item I.4). There are basically two potential routes considered here:

- **Eastside Route 1** - A route that departs from proposed route Segment Q just north of Seven Lakes Mountain, circumvents Seven Lakes Mountain to the east, progresses either on the east side of Red Rock Valley or to the east of the Sand Hills through the Bedell Flat area and then progresses south through the canyon to the east side of Petersen Mountain, passes through the west side of Cold Springs Valley, crosses U.S. 395, and ties into the proposed Border Town substation site on the west side of U.S. 395. This route was suggested by CDFG. This route does not satisfy concerns of Toiyabe National Forest, because it would not replace segments of the proposed route (Segments X and Y) that traverse Toiyabe National Forest lands.

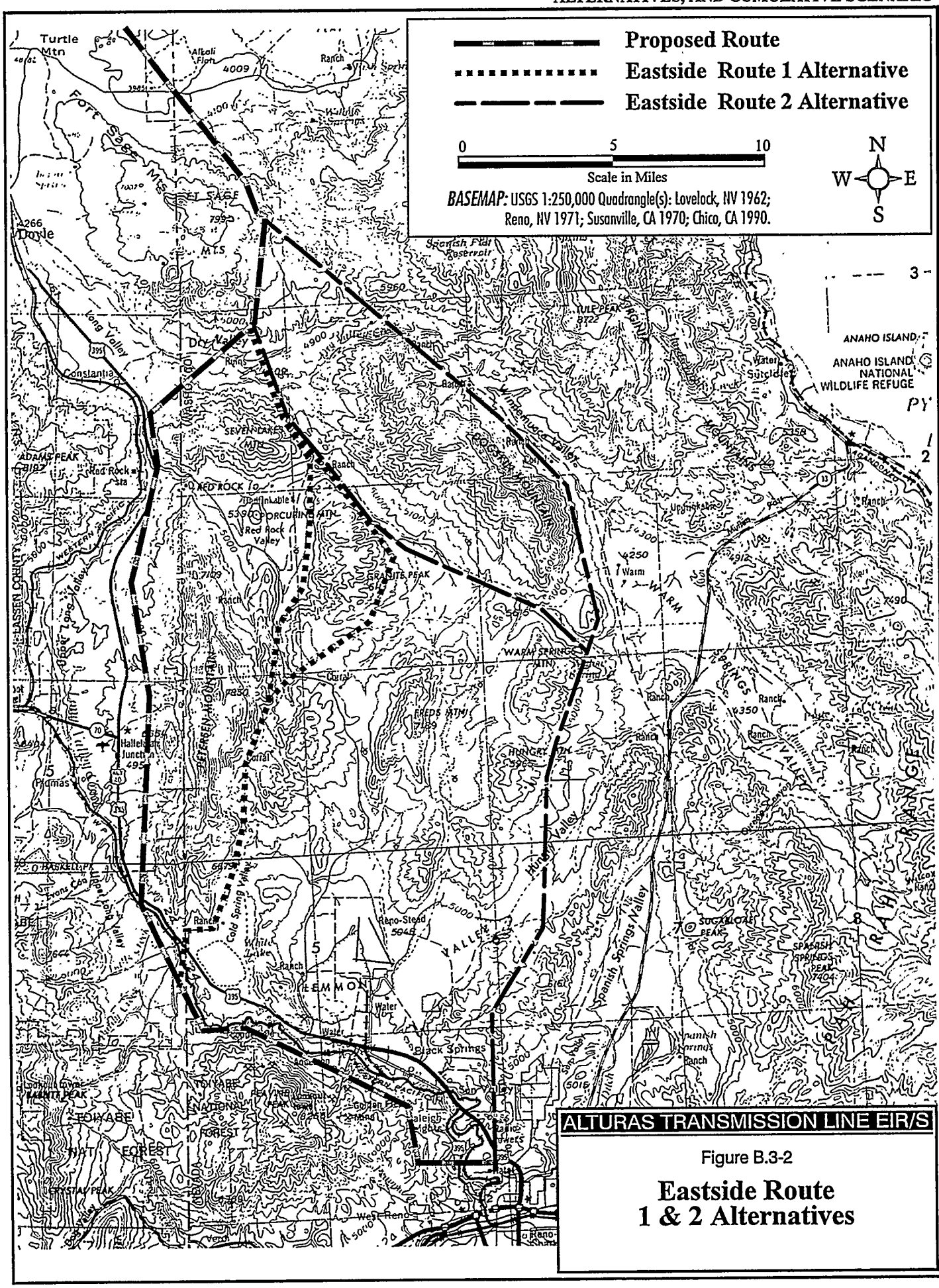
- **Eastside Route 2** - A route that proceeds from proposed route Segment Q southeast of the Fort Sage Mountains through Winnemucca Valley or the Bedell Flat area, east of Warm Springs Mountain and Hungry Mountain, and then south through Hungry Valley to the North Valley Road substation. This second route was suggested by Toiyabe National Forest because it would avoid crossing any USFS land. This route would necessitate development of a substation in place of the proposed Border Town substation, since the route would no longer pass near Border Town. This means that either the existing North Valley Road substation would be substantially expanded (see Section B.3.4.2 on this alternative) or a new site along Eastside Route 2 would need to be selected for substation development.

The examination of these alternatives is based on the following:

- Consideration of SPPCo's analysis and rejection of similar routing options (SPPCo, 1993c, 1994a)
- Analysis of similar routes through Bedell Flat and the Winnemucca Valley for the Tuscarora Natural Gas Pipeline Project (FERC, 1995)
- Consideration of BLM planning and land status mapping for the area, including a May 31, 1994 memorandum from the BLM's Lahontan Resource Area regarding alternative routing in the area of concern
- Review of spring 1994 aerial photography of the southern portions of these alternatives
- Field reconnaissance and photography on July 18 and 19, 1994 and July 27 and 28, 1995.

Based on this analysis, these alternatives are compared with proposed and alternative routes west of Petersen Mountain in the matrix presented as Table B-11.

Rationale for Elimination. The main advantage of a route to the east of Petersen Mountain would be the avoidance of a State of California-designated wildlife area and/or Toiyabe National Forest (and the foothills of Peavine Peak), but this advantage is offset by impacts on residential land uses, and impacts on biological, cultural, and earth resources the east side of Petersen Mountain and by other environmental disadvantages. Even from a wildlife perspective, an Eastside alternative would not provide a distinct environmental advantage over the proposed route. While issues of the CDFG and USFS would be resolved by Eastside routes, both BLM and the Nevada Department of Wildlife have expressed concerns



ALTURAS TRANSMISSION LINE EIR/S

Figure B.3-2

Eastside Route 1 & 2 Alternatives

regarding impacts on wildlife around Petersen Mountain and the Sand Hills east of Petersen Mountain. Much of the area on the east side of Petersen Mountain is relatively undisturbed and undeveloped except primarily for pockets of low-density residential use.

- **Eastside Route 1** - Eastside Route 1 would encounter substantial land use conflicts in the Red Rock Valley/Rancho Haven area and in the Cold Spring Valley where extensive development of residential uses has occurred, is continuing, and where small parcels slated for future residential development would need to be crossed. The BLM indicates that the northern portion of Route 1 would be inconsistent with BLM land use plans. Approval of the project in this area would require a plan amendment to allow overhead transmission lines. Overhead lines are not authorized on public land in the Dry Valley or Bedell Flat areas due to the BLM's limitation on developments that alter the undeveloped character of the landscape.

  Deer and antelope crucial habitat has been identified for Route 1, along with prairie falcon and red-tailed hawk nest sites. Also, this route would have the potential to cross sage grouse strutting grounds and wintering areas. Access limitations and rougher terrain associated with this route would result in potentially greater earth resources, cultural resources, and wildlife habitat impacts due to more extensive construction activities. Route 1 would result in more severe botanical impacts due to the amount of undisturbed land to be crossed. Proposed route Segment W (that would be replaced by this alignment) was subjected to a fire in the past and was replanted with an invasive grass that has displaced sensitive native plant species. Therefore proposed route Segment W would result in very low level botanical impacts relative to this alternative alignment. On balance, Route 1 does not appear to offer the potential for overall environmental advantage.

- **Eastside Route 2** - The primary environmental disadvantages of Eastside Route 2 are related to land use, geology, and cultural resources. Eastside Route 2 would result in significant land use conflicts in areas immediately north of the North Valley Road Substation site where residential development is prevalent in the Panther Valley and Golden Valley/Sun Valley areas). Potential conflicts with BLM land use planning, ranching and agricultural, and future residential development in the Golden Valley/Sun Valley and Lemmon Valley/Hungry Valley areas are additional land use disadvantages, relative to the proposed route, particularly where a substation may need to be developed. A route through Hungry Valley could also be of concern to the residents of the Reno-Sparks Indian Colony, recently established by Congress in the southeastern part of Hungry Valley.

  Portions of this route cross rugged terrain with limited access, necessitating development of access roads and substantial construction disturbance on steep slopes. Construction-related impacts due to land disturbance would be considerably greater than for the proposed route. Cultural resources impacts may be more severe because of increased construction activities and because this area is less disturbed relative to the U.S. 395 corridor.

  Minor environmental advantages to biological resources resulting from Eastside Route 2 would be primarily related to avoidance of habitats outside of USFS boundaries. Wildlife habitat value may be higher along portions of the proposed route (Long Valley area) replaced by Route 2. There are several communities of sensitive plants along proposed route Segment X that could be avoided by Route 2, but it is expected that other sensitive plant species would be found along this mainly undeveloped eastern route. Numerous threatened and endangered plant species have been identified from Warm Springs Mountain to Hungry Valley.

  In summary, Route 2 would offer a benefit in that it would avoid the CDFG Wildlife Area, Toiyabe National Forest, and the lower slopes of Peavine Peak, but would encounter other significant land use and agency conflicts, as well as other environmental disadvantages, which on balance, do not appear to offer the potential for overall environmental advantage, particularly if a substation were to be developed somewhere along the route north from North Valley Road (see also Section B.3.4.2 regarding potential expansion of North Valley Road Substation as an alternative to development of the proposed Border Town Substation).

Table B-11 Comparison Matrix for Routes to the East Side of Petersen Mountain

Issue Area	Eastside Route 1 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)	Eastside Route 2 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)
IMPACT ANALYSIS ++: Clear environmental advantage. +: Minor environmental advantage N: No discernible advantage. - - : Clear environmental disadvantage. - : Minor environmental disadvantage.		
Air Quality	(N) Similar air quality impacts would be expected.	(N) Similar air quality impacts would be expected.
Biological Resources	(+ or N) Potential minor advantages by virtue of avoidance of Long Valley riparian corridor and Hallelujah Junction Wildlife Area, counterbalanced to some extent by greater overall disturbance to undeveloped land and impacts on the Dry Valley Creek watershed and impacts on deer, antelope, and sage grouse habitat in the Dry Valley Creek watershed, the canyon east of Petersen Mountain, and in the Sand Hills and Bedell Flats areas.	(+ or N) Potential minor advantages by virtue of avoidance of Long Valley riparian corridor and Hallelujah Junction Wildlife Area, counterbalanced to some extent by greater overall disturbance to undeveloped land and impacts on the Dry Valley Creek watershed and impacts on deer, antelope, and sage grouse habitat in the Dry Valley Creek watershed, the upper Winnemucca Valley (which includes numerous springs and several small reservoirs, with an introduced herd of bighorn sheep in the Virginia Mountains to the northeast), and the Bedell Flats area.
Cultural Resources	(-) Higher potential for disturbance to sites due to the more undeveloped nature of the potential route; higher densities of sites found in the Bedell Flat area on Tuscarora project surveys (30 sites found along a 22 mile, 200 foot wide survey corridor).	(-) Higher potential for disturbance to sites due to the more undeveloped nature of the potential route; higher densities and complexities of sites found in the Winnemucca Valley area on Tuscarora project surveys (16 sites found along a 21 mile, 200 foot wide survey corridor); historic Winnemucca Ranch along route through upper Winnemucca Valley. Also, higher densities of sites found in the Bedell Flat area on Tuscarora project surveys (30 sites found along a 22 mile, 200 foot wide survey corridor).
Energy and Utilities	(N) Similar impacts would be expected.	(N) Similar impacts would be expected.
Geology/Soils/ Paleontology	(-) Impacts would probably be greater due to more rough topography to be encountered and greater difficulty of access, particularly in the upper Dry Valley Creek drainage and in the canyon to the east of Petersen Mountain.	(-) Impacts would probably be greater due to more rough topography to be encountered and greater difficulty of access, particularly in the upper Dry Valley Creek drainage, upper Winnemucca Valley/northeast flanks of Dogskin Mountain, east of Warm Springs and Hungry Mountains, and in the hills directly to the north from North Valley Road Substation.
Hydrology	(N) Similar levels of impact would be expected with the drier conditions and limited resources counterbalanced by greater potential for erosion and sedimentation due to topographic and access considerations.	(N) Similar levels of impact would be expected with the drier conditions and limited resources counterbalanced by greater potential for erosion and sedimentation due to topographic and access considerations.
Land Use	(–) Substantially greater impacts on residential uses would be expected, due to the introduction of the line adjacent to residential areas without such intrusive industrial facilities (the Red Rock Valley/Rancho Haven area, which consists of 13.6 square miles of contiguous private land, approximately 3 miles wide by 4 miles long, all of which is designated in the Washoe County Land Use Plan as low-density residential and much of which is already developed as residential; and the Cold Spring Valley area, which features substantial pockets of residential development northwest, north, and northeast of White Lake that are designated Washoe County as low, medium, and high density suburban). The residential areas northwest of White Lake approach within 1,000 feet of rugged topography of the southmost extension of Petersen Mountain. BLM has indicated that a route through Dry Valley or Bedell Flat (that would avoid the Red Rock Valley/Rancho Haven area) would seriously conflict with planning for that area.	(N) Reductions of impacts on residential uses in the Border Town to North Valley Road area and impacts on recreational use of the foothills of Peavine Peak would be counterbalanced by impacts on residential uses in the Panther Valley (where the line would need to pass within 1,000-2,000 feet of 30-50 residences; 15 residences here would have only open, undeveloped land between them and the line) and north from Panther Valley where the line would pass between the Washoe County-designated low density suburban areas of eastern Golden Valley and western Sun Valley in the area of O'Brien Pass (Golden Valley Road /West 7th Avenue) - here approximately 15 residences in western Sun Valley and 5-8 residences in eastern Golden Valley would be expected to be within 2,000 feet of the line. The line would also degrade the recreational use of Hungry Valley and intrude on the Winnemucca Ranch complex. BLM has indicated that a route through Dry Valley and Bedell Flat would seriously conflict with planning for that area.

Issue Area	Eastside Route 1 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)	Eastside Route 2 (in comparison with Proposed and Alternative Routes West of Petersen Mountain)
Noise	(-) Somewhat greater impacts due to more nearby residences.	(N) Similar levels of impact would be expected.
Public Health and Safety	(-) Somewhat greater levels of public concern would be expected due to residential uses.	(N) Similar levels of impact would be expected.
Socioeconomics/Public Services	(-) Somewhat greater impacts due to more nearby residential uses.	(N) Similar levels of impact would be expected.
Transportation/ Traffic	(+) Slightly reduced impacts on important transportation corrdors.	(+) Slightly reduced impacts on important transportation corrdors.
Visual Resources	(N or +) Reduced impacts on heavily travelled U.S. 395 corridor, counterbalanced somewhat by introduction of a major, intrusive industrial feature into undeveloped and residential areas.	(N or +) Reduced impacts on heavily travelled U.S. 395 corridor and on Peavine Mountain foothills, counterbalanced somewhat by introduction of a major, intrusive industrial feature into undeveloped, agricultural, and residential areas.

Alternative Segment V

Description. This alternative segment would replace proposed Segment W in the vicinity of Hallelujah Junction and Long Valley. Alternative Segment V would be located on the west side of U.S. 395, whereas proposed Segment W would be sited on the east side of the highway. Alternative Segment V could also include the construction of a substation on assessor parcel number 021-020-02 (BLM owned), instead of the proposed Border Town Substation site.

Rationale for Elimination. Sensitive wildlife and plant species are located in substantially greater numbers along this alternative segment than along the proposed route. In addition, Lassen County has expressed concerns over this alternative segment due to potential general plan and land use conflicts with residential and agricultural development. Therefore, it appears that, on balance, the impacts of this alternative would be at least equal to and probably greater than those of the proposed route segment.

Tuscarora Natural Gas Pipeline Alignment

Description. This alternative would involve relocating the majority of the Proposed Project alignment within or adjacent to the proposed Tuscarora Natural Gas Pipeline Project ROW. As currently proposed, the Tuscarora Natural Gas Pipeline Project would run adjacent to the proposed Alturas Transmission Line Project for approximately 37 miles at four separate locations (see Section B.5, Scenario for Analysis of Cumulative Impacts, for a complete description). In addition, the two projects would cross at four locations. The Base Maps in Appendix C illustrate the areas of common alignment for the two projects as currently proposed. This alternative assumes that both project alignments would follow the Tuscarora corridor from Alturas to northern Reno area.

The Tuscarora Natural Gas Pipeline Project involves the construction of approximately 250 miles of new natural gas pipeline, both mainline and laterals, between Malin, Oregon and Tracy, Nevada, as well as ancillary facilities. From Alturas, the pipeline parallels U.S. 395 in a north-south direction for approximately 75 miles, where, northeast of Wendel, the direction of the pipeline alignment would change to a southeast orientation. About ten miles southeast of Honey Lake, the gas pipeline would enter Nevada as it continues south to its termination point near Tracy, Nevada.

The proponent of the pipeline, Tuscarora Gas Transmission Line Company, consists of a partnership between Tuscarora Gas Pipeline Company (a wholly owned affiliate of Sierra Pacific Resources [a parent company to Sierra Pacific Power Company]) and TCPL Tuscarora, Ltd. (a wholly owned affiliate of TransCanada Pipelines Ltd.).

Rationale for Elimination. The main advantage of relocating the majority of the Proposed Project alignment within or adjacent to the Tuscarora Natural Gas Pipeline Project ROW would be the minimization of impacts related to construction activities. Construction of the gas pipeline involves the excavation of a trench varying in width from three to five feet, depending on soil/rock conditions. The trench depth would be sufficient to allow for 36 inches of cover over the top of the installed pipeline (24 inches minimum in areas of solid rock). Since the transmission line structures would require excavations 10 to 30 feet in depth, the structures could not be placed directly over the pipeline alignment. Therefore, impacts associated with soil removal (biology and cultural resources) could not be avoided by relocating the Alturas Transmission Line Project within the Tuscarora Pipeline alignment. However, soil disturbance impacts related to construction vehicle movement could be minimized by utilizing a joint construction ROW.

If the Proposed Project were to be located within or adjacent to the Tuscarora Natural Gas Pipeline ROW, the transmission line would parallel U.S. 395 for approximately 75 continuous miles (within 100 to 1,000 feet of the highway); as proposed, the Alturas Transmission Line Project parallels U.S. 395 for 27 miles at two separate locations (14 miles starting three miles south of Madeline and 13 miles through Secret Valley starting one mile northeast of Tule Patch Spring). By increasing the length of the transmission line along U.S. 395 to 75 continuous miles, visual impacts would be significantly intensified. The gas pipeline project does not impose the same visual impacts since it is located below ground and areas of surface disturbance could be mitigated with proper revegetation and recontouring. In addition, traffic interference impacts resulting from construction activities along U.S. 395, a major regional roadway, would be exacerbated if the two projects were constructed consecutively. Further, impacts related to restricted emergency vehicle and property owner access would increase.

By placing the Alturas Transmission Line Project and Tuscarora Natural Gas Pipeline within the same ROW, system safety issues such as induced and fault currents must be considered. Induced current could cause hazardous electric shock and becomes a compatibility concern when electric transmission lines are to be located near metal pipelines. Metal components may act as conductors and can acquire an electrical potential from an electric transmission line, causing an electric current along the pipeline. Such currents can cause corrosion of the pipeline and could deliver a shock to a person upon contact. Fault current is

produced when the current being transported by a high voltage transmission line flows into the ground because lightning comes into contact with a transmission line structure, broken energized conductors come into contact with the ground, or flashover occurs from conductors to towers due to dust or ash accumulation on the insulators. Depending on its magnitude, a fault current can cause damage to metal structures, puncture the coating of an underground pipeline (or even the pipeline itself if sufficient heat is generated) and can travel along the pipeline. To minimize the effect of induced and fault currents, several measures may be necessary to protect the pipeline. These measures include using thicker coatings for the sections of pipe near transmission line structure foundations, installing shielding and corrosion protection systems, or placing ground shields underneath structures. The effectiveness and the required frequency of replacement of such measures depends on the area's ground resistance (earth resistivity) and frequency of ground faulting occurrences. To replace these subsurface devices, soil excavation would be required.

For the reasons stated above, no net environmental advantage is expected from relocating the majority of the Proposed Project alignment within or adjacent to the Tuscarora Natural Gas Pipeline Project ROW. Therefore, this alternative has been eliminated from further consideration.

B.3.4.2 Substation Alternatives

Alternative Border Town Substation Sites

Description. During the scoping process, numerous sites were identified in the Border Town area as potential alternative sites for the proposed Border Town substation. Table B-12 presents general information for each of these alternative sites, including assessor parcel numbers, ownership, and locality (one of the alternative sites is located in Lassen County, California; four are in Sierra County, California; and one is in Stead [City of Reno], Nevada). The specific locations of these alternative sites are illustrated on Base Maps 29, 30, 31, and WCFG, which are included at the end of Volume I.

Rationale for Elimination. The environmental impacts of the alternative substation sites and a comparison of their impacts to the proposed Border Town Substation impacts are presented in Table B-12 for the following issue areas: Biological Resources, Visual Resources, Cultural Resources, Land Use/Recreation, Earth Resources, and Transportation/Traffic. Since no significant difference is expected for the subject alternative sites (in comparison with the proposed Border Town Substation site) for the issue areas of Air Quality, Energy and Utilities, Noise, Public Health and Safety, and Socioeconomics and Public Services, no parcel specific analysis was conducted for the noted issue areas.

As presented in Table B-12, no environmental advantage was identified (regardless of issue area), in comparison to the proposed Border Town Substation site, for each alternative parcel. The main environmental disadvantages associated with the alternative substation parcels are summarized as follows:

Table B-12 Alternative Border Town Substation Site Screening

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
GENERAL SITE INFORMATION							
Owner	BLM	CDFG	CDFG	BLM	CDFG	USFS	Private
General Location (See Base Maps at the end of Volume I)	Western Border Town	Approximately three miles northwest of Border Town, adjacent to the east side of U.S. 395; Lassen County, California. (See Base Maps 29 & WCFG.)	Approximately two miles northwest of Border Town, adjacent to the east side of U.S. 395; Sierra County, California. (See Base Maps 29 & WCFG.)	Approximately one-half mile northwest of Border Town, with frontage on the east side of U.S. 395; Sierra County, California. (See Base Maps 30 & WCFG.)	Approximately one-half mile northwest of Border Town, adjacent to the east side of U.S. 395; Sierra County, California. (See Base Maps 30 & WCFG.)	Approximately six miles southeast of Border Town, and one mile south of U.S. 395; Sierra County, California. (See Base Map 31.)	Approximately six miles southeast of Border Town, and one mile north of U.S. 395; vicinity of Lear and Moya Boulevards, Stead (City of Reno), Nevada.
Project & Alternative Segments Traversing Alternative Substation Sites		Proposed Segment W; approx 1 mile Alternative Segment WCFG; approx 2000 ft	Proposed Segment W; approx 1 mile Alternative Segment WCFG; approx 1 mile	Alternative Segment WCFG (near WN06); approx 1500 ft Alternative Segment WCFG (near WN07); approx 1500 ft	Alternative Segment WCFG; approx 3000 ft	None; Rerouting of Proposed Project would be required	None; Rerouting of Proposed Project would be required
IMPACT ANALYSIS[2] ++: Clear Environmental Advantage --: Clear Environmental Disadvantage +: Minor Environmental Advantage -: Minor Environmental Disadvantage N: No Discernible Environmental Difference							
BIOLOGICAL RESOURCES	Low Sagebrush Scrub; no sensitive species or habitat Access to biological communities already exists because of improved access to area	[--] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within W and WCFG alignments) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[--] Sagebrush/Bitterbrush Scrub & Rabbitbrush/ Montane Meadow; no sensitive species or habitat (within W and WCFG alignments) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[-] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within WCFG alignment) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts	[--] Sagebrush/Bitterbrush Scrub; no sensitive species or habitat (within WCFG alignment) Permanent substation access would increase access to natural communities resulting in habitat degradation and wildlife disturbance impacts Located within Hallelujah Junction Wildlife Area	[N to --][3] Area comprised of Big Sagebrush Scrub; presence of sensitive species or habitat unknown Existing 4WD access to site	[N to --][4] No biological resources expected in area of proposed alternative substation site (Lear & Moya Blvds); however, rerouting of transmission line through Stead could require traversing the Peavine Mtn drainage area and its associated potential wetlands and water bodies

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
VISUAL RESOURCES	Distant middle-ground to back-ground feature to southbound motorists on US 395	[N] Prominent middle-ground feature to US 395 motorists	[N] Prominent foreground to middleground feature to motorist on US 395 motorists (depending on location of substation)	[-] Prominent fore-ground feature to motorists on US 395	[-] Prominent fore-ground feature to motorists on US 395	[N] Distant middle-ground to back-ground feature to motorists on US 395	[N to - -][4] Alternative substation site would not likely be visible from US 395 because of buildout of area
	Distant middleground to background feature to one dozen western Border Town residences	Limited, if any, residential visibility	Limited, if any, residential visibility	Distant middleground to background feature to residences in eastern Border Town	Distant middleground to background feature to residences in eastern Border Town	Distant middle-ground to back-ground feature to Anderson Acres residences	Rerouting of transmission line through Stead could require traversing residential areas with densities up to 7 dwelling units per acre
CULTURAL RESOURCES	One cultural resource site recorded; does not appear to be significant under NRHP eligibility criteria	[N] No cultural resource sites recorded at this location (within W and WCFG alignments)	[-] One cultural resource site recorded on W alignment. No sites recorded on WCFG alignment. Site on W alignment appears to be significant under NRHP eligibility criteria. Impacts to site mitigable through data recovery.	[N] Two cultural resource sites recorded on WCFG alignment. Neither site appears to be significant under NRHP eligibility criteria	[N] No cultural resource sites recorded at this location (within WCFG alignment)	[N] No cultural resource sites recorded within subject lands. Two recorded sites (one historic, one prehistoric) located within 1/4 mile	[N] No cultural resources retaining integrity expected in area of alternative substation site (Lear & Moya) since area is developed and industrial in nature
LAND USE/ RECREATION	No residences within 2000 feet	[-] No residences within 2000 feet	[-] No residences within 2000 feet	[N] No residences within 2000 feet	[- -] Up to 15 residences within 2000 feet, depending on substation location	[-] No residences within 2000 feet	[N to - -][4] Substation would likely be consistent with industrial nature of alternative area (Lear & Moya), depending on Land Use designations and planning policies; however, routing of transmission line through Stead could result in residential and commercial land use conflicts and planning policy inconsistencies
	Degradation of existing access to recreational uses	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of limited recreational use (recreation is limited because of no available vehicular access)	Degradation of recreational use (existing 4WD access)	
	Consistent with Lahontan RMP	Inconsistent with Wildlife Area Management Plans	Inconsistent with Wildlife Area Management Plans	Consistant with Lahontan RMP	Inconsistent with Wildlife Area Management Plans	Inconsistant with Toiyabe NF land and RMP	
	Inconsistent with Sierra County General Plan	Inconsistent with Lassen County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	Inconsistent with Sierra County General Plan	

	Proposed Border Town Substation	Alternative Substation Sites					
		APN 147-090-10	APN 021-020-26	APN 021-080-01	APN 021-080-12	APN 082-083-09	Stead Ind. Park[1]
EARTH RESOURCES	Site relatively flat with no unique geologic features No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[-] Additional grading and higher potential for erosion because of topography No unique hydrological features	[- -] Additional grading and higher potential for erosion because of topography No unique hydrological features Site traversed by a fault	[N to - -][4] Substation would not likely result in significant impacts to earth resources; however, routing of transmission line through Stead could require the crossing of potential flood hazard and wetland areas, and water bodies
TRANS./ TRAFFIC	Access via US 395 interchange and improved surface streets	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[-] Greater potential for traffic disruptions because direct access off of US 395 would be required	[N] Access available via improved surface streets and existing 4WD road	[-] Access available via improved surface streets. Rerouting of transmission line could not occur to the north because of the Reno-Stead Airport
SUMMARY		[- -] 1 [-] 3 [N] 2 [+] 0 [++] 0	[- -] 1 [-] 4 [N] 1 [+] 0 [++] 0	[- -] 0 [-] 4 [N] 2 [+] 0 [++] 0	[- -] 2 [-] 3 [N] 1 [+] 0 [++] 0	[- -] 1 [-] 1 [N] 3 [N to - -][3] 1 [+] 0 [++] 0	[- -] 0 [-] 1 [N] 1 [N to - -][4] 4 [+] 0 [++] 0

1. No specific parcel identified during scoping.
2. Environmental issue areas for which no significant differences could be expected for the subject alternative sites (in comparison with the proposed Border Town Substation site) including air quality, energy and utilities, noise, public health and safety, and socioeconomics and public services.
3. Depending on presence of sensitive species or habitat.
4. Depending on transmission line rerouting alignment.

- Because of the need to construct permanent access to the future substation, four of the alternative parcels identified would increase access to biological communities, resulting in habitat degradation and wildlife disturbance impacts. Further, three of these parcels are located within the Hallelujah Junction Wildlife Area. Access to biological communities surrounding the proposed Border Town Substation site already exists because of existing, improved access to the area.

- Given the proximity of four of the alternative parcels to U.S. 395, a substation on any of these parcels would be a "prominent" foreground to middleground feature (depending on parcel) to motorists, whereas the proposed Border Town Substation would be a "distant" middleground to background feature to southbound motorists only.

- Existing, limited recreational uses would be degraded on four of the alternative sites. The Border Town Substation would be passed by persons destined to recreational areas to the west.

- Five of the alternative parcels would require additional grading and have a higher potential for erosion because of topography. One alternative site is traversed by a fault. The Border Town site is relatively flat with no unique geologic features.

- Greater potential for traffic disruptions for four of the alternative parcels because direct access off of U.S. 395 would be required. The Border Town site can be accessed via a U.S. 395 interchange and improved surface streets.

- The Stead Industrial Park alternative would require a rerouting of the transmission line. While a substation within an existing industrialized area is not expected to result in any significant impacts, the rerouting of the transmission line could likely require that existing and/or planned residential (density up to 7 dwelling units per acre) and commercial areas be traversed, resulting in significant land use and visual impacts. Further, the Peavine Mountain drainage area, with its associated potential flood plains and wetlands, and water bodies might need to be crossed, resulting in biological and hydrological impacts. Access to the Stead area from the north is not likely because of the Reno-Stead Airport.

Because of the reasons summarized above and presented in Table B-12, the subject alternatives are not considered to offer environmental advantage to that of the proposed Border Town Substation site and have been eliminated from further consideration.

Expansion of North Valley Road Substation

Description. During the scoping process, several requests were made to investigate the possibility of expanding the existing North Valley Road Substation on the north side of Reno to accommodate equipment planned for the proposed Border Town Substation. The North Valley Road Substation is the proposed terminus for the proposed transmission line. This alternative would replace the Border Town Substation.

To accommodate the equipment planned for the proposed Border Town substation, the North Valley Substation pad would need to be expanded to accommodate the phase shifter bus, reactors, and circuit breakers. The size of the pad expansion consider by SPPCo was approximately 500' by 340' (the Border Town Substation pad is 790' by 430') and would be in addition to the 128 foot expansion required to terminate the project at the North Valley Substation (see Figure B.2-12) For purposes of this analysis, expansion of the North Valley Substation pad to accommodate the Border Town Substation equipment is assumed to occur to the north, lengthwise, for the following reasons:

- Expansion to the west would require rerouting the transmission line through and expanding the substation onto property zoned for Single Family Residential, in which the portion of the property which would be directly affected by substation expansion has been designated as Public Open Space in the Draft City of Reno Master Plan.

- Expansion to the due-east is not feasible because of existing gas distribution facilities.

- Expansion to the northeast would require that the Alturas Transmission Line cross existing 345 kV and 120 kV transmission lines that enter the North Valley Substation or traverse the area to the east of the substation, respectively, imposing reliability concerns and requiring taller structures to provide appropriate clearances. Expansion to the northeast would also impose similar topographic constraints as expanding to the north.

- Expansion to the south would require that the Alturas Transmission Line pass the existing North Valley Road Substation, terminate at the southern site, and then return to the North Valley Road Substation in order to tie into the North Valley Road bus. Insufficient area exists to the south to accommodate this line configuration, especially given existing warehouse/manufacturing facilities on the southern parcel.

- The parcel to the north is zoned industrial and is owned by SPPCo.

For optimum performance of the Proposed Project, the reactors should be distributed along the transmission line from one end to another; therefore, by expanding the North Valley Substation, line performance would be degraded because one reactor distribution point (Border Town) would be lost. As discussed in Section A.6.3.3, from a utility planning standpoint, placing the phase shifter toward the edge of the service area would be desirable, since any future customers served by SPPCo (e.g., 120 kV expansion into North Valleys area) should be on the same side as existing customers (Section E.3 discusses the growth-inducement impacts of the project). From an operation and maintenance viewpoint, the closer the phase shifter is to crews to the south, the better.

Expansion of the North Valley Substation site to accommodate the proposed Border Town Substation equipment could require relocation of the existing 345 kV transmission line that enters the North Valley Substation from the north.

Rationale for Elimination. The parcel to the north of the existing North Valley Road Substation contains steeply sloping terrain throughout the site, with an average slope of over 20 percent in the area of expansion. For this reason a two-tiered substation design scenario would minimize cut and fill to approximately 200,000 cubic yards (cy) of cut and 200,000 cy of fill (the lower tier being the 128 foot expansion of the North Valley Substation, and the upper tier being a 500' by 340' pad located further up the slope to the north). If a two-tiered approach were not used (the 128' expansion and new 500' by 340' pad were constructed directly adjacent and due north), the construction of a 500 by 340 foot pad in such terrain would require about 635,000 cy of cut and 16,000 cy of fill (the area of the 128' expansion is relatively level). These volumes of substantial cut and fill, regardless if the two-tiered approach is used or not, could result in the following impacts:

- Significant erosion impacts could be expected with the exposure of soils around the expansion pad (which would be paved), because of the recontouring of the area that would be required. Recontouring of the expansion area could also affect the adjacent parcel to the west (zoned Single Family Residential), since the actual expansion pad would likely run directly adjacent or very close to the western property boundary because of existing transmission facilities to the east, as described above.

- Cut and fill activities would require substantial construction vehicle operation to excavate, move, and recompact substantial amounts of soil. Spoils (rocks, debris, etc.) would also have to be removed from the site for disposal. This intensification of construction vehicle usage would significantly impact local transportation and air quality; a non-attainment classified air basin for both State and Federal ambient air quality standards.

- Construction into areas of over 20 percent is discouraged by the City of Reno zoning regulations which require a density reduction factor for development on slopes of over 10 percent.

- Cut and fill scars would be visible from the Reno/Sparks metropolitan area and U.S. 395.

The placement of facilities planned for the Border Town site at North Valley Road Substation would result in a net additional cost of 4 to 10 million dollars because of required site work; approximately 1 million dollars in equipment savings would occur due to the elimination of one circuit breaker and associated equipment.

For the reasons cited above, the expansion of the North Valley Substation has been eliminated from further consideration.

Termination of Project on East Side of System

Description. Comments on the Draft EIR/S requested that the possibility of terminating the Proposed Project on the east side of SPPCo's system be investigated. The Tracy and Fort Churchill Substations were suggested as possible termination points. The North Valley Road Substation, located in the northwestern portion of SPPCo's system, is the proposed terminus for the proposed transmission line.

Rationale for Elimination. As discussed in Section A.6.5, if the Proposed Project were to be terminated at the Tracy Substation, the project objective of improved service reliability and system security for the portion of SPPCo's service area west of Tracy, would not be realized. In addition, a Tracy Substation termination would not prevent the projected failure of the 120 kV line extending from Tracy Substation to Spanish Springs Substation. Termination of the Proposed Project at the Fort Churchill Substation would require extensive modification of substation facilities and upgrade of existing transmission facilities servicing the Reno/Sparks metropolitan area or construction of new lines. The upgrade or construction of new transmission facilities through an urban environment would impose significant property owner and land use constraints, and associated visual and air quality impacts. For these reasons, termination of the Proposed Project on the east side of the system has been eliminated from further consideration.

B.3.4.3 Generation Alternatives

Increasing generation is one technology available for serving the increasing needs of utility customers. While generation additions at the proper locations could provide improved service reliability to the Reno area, they would not directly improve import capacity or provide direct access to the Pacific Northwest power market (project objectives).

SPPCo states that the addition of new generation sources does not displace their need for additional transmission capacity. SPPCo's 1993 Electric Resource Plan (ERP) included discussion of two potential

new generation resources: plans for construction of the Piñon Pine Power Plant and siting studies for the Fort Churchill Combustion Turbine.

Piñon Pine Power Plant

Description. The Piñon Pine Power Plant would use an Integrated Gasification/Combined Cycle technology that converts coal into a clean gas, virtually free of sulfur and particulates, and then burns the gas in a combustion turbine and captures the exhaust heat to drive a steam turbine. This project would be a part of the U.S. Department of Energy's Clean Coal Technology Program, paid for with 50% federal matching funds for construction and the first four years of operation. The plant would generate approximately 89 MW of summer-rated capacity, and would be located approximately 20 miles east of Reno, Nevada at the existing Tracy generating station. The Final EIS for the power plant was released in September, 1994, and a Record of Decision was issued in November, 1994. Construction ground breaking occurred early-1995. Estimated operation start-up is 1997-98.

Rationale for Elimination. As noted above and discussed in Section A.6, Purpose and Need, generation alternatives cannot provide direct access to the Pacific Northwest or improve import capability, except for providing improved response to long-term emergencies. SPPCo must improve its transmission system import capability to meet the needs of other utilities within the Control Area (see Section A.6). Further, since the Piñon Pine Power Plant would be located at the existing SPPCo Tracy facilities, it would place more supply on the Valmy-Tracy-North Valley corridor. As a result, this generation project would not improve service reliability to the Reno/Lake Tahoe area. In addition, ground breaking for construction of the Piñon Pine Power Plant has commenced; since SPPCo has received all necessary permits for the project, this project would exist whether or not the Alturas Transmission Line Project is approved. For these reasons, the Piñon Pine Power Plant has been eliminated from further consideration as an alternative to the Proposed Project.

Fort Churchill Combustion Turbine

Description. SPPCo has recently installed two combustion turbines (70 MW each) at its Tracy facilities. As part of this system generation upgrade, SPPCo is also studying the feasibility of adding a third combustion turbine near its Fort Churchill Power Plant. Generation siting studies are being prepared to evaluate possible sites near the Fort Churchill plant for the collection of air quality and meteorological information so that SPPCo can proceed with the permitting of at least one gas combustion turbine at Fort Churchill in the future.

Rationale for Elimination. The Fort Churchill Combustion Turbine would provide no improvement in import capability, except for improved response to long-term emergencies. In addition, the combustion turbine alternative would not provide additional access to the Pacific Northwest power market. Since the Fort Churchill Combustion Turbine would be located to the south of Reno, avoiding the Valmy-Tracy-North Valley corridor, it is expected to provide limited improvement in Reno/Lake Tahoe service reliability. For these reasons, this generation alternative has been eliminated from further consideration.

Wind Technology

Description. The perception of wind as an emerging energy source reached a peak in the early 1980s, when wind turbine generators to convert wind power into electricity were being installed in California at a rate of nearly 2,000 per year. Progress slowed a few years later, however, as start-up tax subsidies disappeared and experience demonstrated some deficiencies in design. At the present time, technological progress again has caught up, contributing lower cost, greater reliability, and reason for genuine optimism for the future (Lamarre, 1992). A major factor has been the inclusion of environmental externalities by electric utilities in their resource planning programs. The more penetrating analysis, which has included these potential costs, has shown wind power to be substantially more economically attractive than was previously thought.

There are now more than 16,000 wind turbines installed in the U.S., with almost all located in California. Their aggregate power rating is about 1,500 MW, and they generated some 2.7 billion kilowatt-hours (kWh) of electricity in 1991. It has been estimated that with fully commercial development, 20 percent of the nation's electricity needs could be supplied by wind power. And while California has seen much more than its share of this resource, there still are opportunities for substantial growth.

Rationale for Elimination. Wind energy is a method of generating, not transmitting, electric power. Therefore this form of power generation has the same limitations in satisfying the project objectives as the other generation alternatives considered. In particular, if wind generation facilities were sited appropriately, avoiding the Valmy-Tracy-North Valley corridor, they could provide partial improvement in service reliability for the Reno/Lake Tahoe area, assuming naturally windy sites were available for development (e.g., mountain passes or high ridges). Wind energy generation would provide no improvement in import capacity, but could serve as a back-up to long-term emergencies. Wind energy would also not provide any additional access to the Pacific Northwest power market. Therefore, this alternative was eliminated from further consideration.

Solar Technology

Description. Solar energy always has held promise as an environmentally preferred resource. However, it suffers from serious limitations in that the quantity of energy striking a unit area of the earth's surface, and so available for capture, is quite small, even in the characteristically sunny southwest. Its availability only during daytime hours also limits its usefulness as an alternative source. If electricity is the type of energy most needed, then solar energy needs to be converted to electricity before it can be used. Recent advances make almost certain dramatic, near-future improvements in conversion efficiency, now expected to reach the goal of 26 percent in routine use with commercial devices (Moore, 1992).

A key to this improvement lies in the use of high-concentration photovoltaic technology; solar cells capable of functioning at a high conversion efficiency and extended lifetimes, even when subjected to sunlight concentrated more than 100 times. Research sponsored by the Electrical Power Research Institute has overcome some early technical problems. Current product development is proceeding, with

planned initial commercialization expected by 1995. Photovoltaic panels would incorporate numerous cells in an array. A goal now believed to be fully achievable would be systems with overall efficiencies near 20 percent, at capital costs of less than $2 per watt of peak-rated power; this is a high capital cost, but with no fuel cost to pay, it is at the acceptable range.

Rationale for Elimination. Solar energy, like wind energy, has the same limitations with respect to satisfying the project objectives as the other generation alternatives considered. Therefore, this alternative was eliminated from further consideration.

Geothermal Energy

Description. In California and the western states, geothermal energy is relatively well developed and contributes to the electricity supply.

Rationale for Elimination. Geothermal energy, like wind and solar energy, has the same limitations with respect to satisfying the project objectives as the other generation alternatives considered. Further, since geothermal energy is a subsurface resource, the capture, conversion, and transmission of this resource could impose significant adverse impacts. In addition, since it is the marginal resources that have remained untapped, the costs for utilizing this resource would be relatively high. Therefore, this alternative was eliminated from further consideration.

B.3.4.4 System Enhancement Alternatives

Demand Side Measure Alternative

Description. Demand side management programs are designed to reduce customer energy consumption. Regulatory requirements dictate that supply-side and demand side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. SPPCo has developed numerous existing and proposed demand side programs to improve customer energy efficiency through its Electric Resource Planning process; these programs were considered by SPPCo as being in place in their demand projections. Existing programs include residential and commercial "Good Cents" certification, residential and commercial lighting rebates, electric water heater wrapping, large commercial and industrial Peak Performance/Shared Savings conservation programs, peak shaving through the interruption of customer loads, etc. Programs proposed for the future include solar water heating, refrigerator recycling, and customer power factor correction. The five-year goals for the SPPCo demand side programs is a savings of approximately 11 MW during peak winter and summer demand.

Rationale for Elimination. While reductions in demand are considered an essential part of SPPCo's future operation, the savings from these programs (11 MW) are insufficient to improve the service reliability to the Reno/Lake Tahoe area to the level desired (a strong second source); the 11 MW savings offered by the conservation programs represents an approximate 1% reduction in winter and summer peak demands (1099 MW and 1130 MW, respectively, in 1994 - see Table A-3). Further, the noted

conservation programs would do little to increase the simultaneous import capacity rating of the SPPCo system, nor would they provide additional access to the Pacific Northwest power market. For these reasons, this alternative has been eliminated from further consideration.

Static Var Compensator

Description. The Static Var Compensator (SVC) is an active device which injects or absorbs reactive power into the transmission network to control system voltages and to dampen electrical oscillations caused by major transmission disturbances. This device utilizes system components (thyristors, shunt reactors and capacitors, harmonic filters, and microprocessor controls) that have been in use by the utility industry for two decades. This SVC mechanism would extend SPPCo's export capabilities and increase the operational flexibility of the system.

Rationale for Elimination. While the SVC would increase export capabilities and the operational flexibility of the SPPCo system, it would not improve SPPCo's capability to import additional power appreciably, improve service reliability to the Reno/Lake Tahoe area by providing a strong second source, nor provide additional access to the Pacific Northwest power market. Therefore, this alternative has been eliminated from further consideration.

Capacitor Banks

Description. The installation of capacitors helps maintain system voltages at prescribed levels by allowing reactive power to be altered as demand fluctuates. Reactive power is a component of power production that is not sold, but is critical to the operation of an electrical system. By increasing the reactive power supply to an area, voltage levels can be bolstered or supported. Conversely, by decreasing the reactive supply, voltage levels can be reduced. Capacitors can be installed closer to the loads and supply needed support in areas where reactive power is deficient.

Rational for Elimination. As with the other system enhancement alternatives discussed, the installation of capacitor banks would not increase import capacity beyond an insignificant increment, improve service reliability to the Reno/Lake Tahoe area (except for improving voltage control during peak periods), or provide additional access to the Pacific Northwest power market. Therefore, this alternative has been eliminated from further consideration.

B.3.4.5 Alternative Transmission Technologies

Lower/Higher Voltages

Description. SPPCo sized the Alturas Transmission Line at 345 kV to meet existing and projected native, transmission and wheeling customer needs (see Section A.6.2.2). Other standard transmission line voltages include 115 kV, 230 kV and 500 kV.

Rationale for Elimination. The use of a lower voltage, such as 115 kV or 230 kV, would not provide SPPCo with the system performance desired given the length of the Proposed Project (performance is a function of voltage and length), while imposing essentially the same environmental impacts; structure erection and conductor stringing would be similar to the Proposed Project. Building the Alturas Transmission Line at 500 kV instead of 345 kV was rejected because SPPCo's needs are met by the capacity of the 345 kV line and the higher costs of a 500 kV project cannot be justified unless significant participation by other utilities occurs. Although interest in using the Proposed Project for wheeling through SPPCo's system has been shown by at least two utilities, no firm commitments have been established. Furthermore, construction of a 500 kV project would delay the in-service date past the early-1997 time frame that is critical for SPPCo. For these reasons, these alternatives have been eliminated from further consideration.

Direct Current Transmission

Description. SPPCo considered the construction and operation of a direct current (DC) as opposed to an alternating current (AC) transmission line. Given the need to connect to existing AC transmission lines in Alturas and Reno, a DC transmission line would require DC/AC conversion terminals at both ends of the line. A 345 kV DC transmission line would offer much greater power transfer capacity.

Rationale for Elimination. SPPCo rejected a DC transmission line on the basis of costs: 1) DC/AC conversion terminals are approximately $50 million each, thereby nearly doubling the costs of the project and 2) tapping the DC line at a future date to provide transmission service to other utilities between Alturas and Border Town, would be more complicated and considerably more expensive. In addition, while a 345 kV DC project would offer greater power transfer capacity, SPPCO has not identified a need for that much additional capacity. Finally, the construction of a DC transmission line would impose essentially the same environmental impacts as constructing an AC line (structure erection and conductor stringing). Therefore, this alternative has been eliminated from further consideration.

Underground Construction

Description. There has been underground construction of transmission systems in the United States since the late 1920s. Underground construction of transmission lines is commonly used for lower voltage distribution lines in urban areas. Most high voltage (115 kV or above) underground installations have been constructed under constraining circumstances for short distances where overhead lines were impractical or unsafe (e.g., in the vicinity of airports, urban centers, long water crossings, etc.). Underground transmission lines offer the principal environmental advantage of reduction of adverse visual impacts and reduction in electric and magnetic field exposure.

Rationale for Elimination. There are two types of undergrounding technologies available for 345 kV transmission lines:

- **High-Pressure Fluid Filled (HPFF).** The majority of underground 345 kV transmission lines utilize the HPFF system technology. This system is comprised of a steel pipe (typically 10-3/4 inch diameter for a 345 kV line),

into which three dielectric fluid (oil) impregnated paper-insulated cables are drawn. For cooling purposes, the pipe is filled with dielectric fluid (oil) and is pressurized to about 200 pounds per square inch (psi). In order to maintain oil pressure and accommodate oil contraction and expansion in the system, storage tanks (500 to 1000 gallon capacity) and oil-pressure control units, with pumps and relief valves, would need to be installed about every five miles.

- **Self-Contained Fluid Filled (SCFF).** The SCFF system is rarely used for 345 kV systems. This system is comprised of copper conductors (one for each phase) with hollow cores that contain dielectric fluid (oil), pressurized to 15 to 40 psig or higher, for cooling purposes. The conductors are insulated and wrapped in a lead or aluminum sheath to prevent moisture ingress and to withstand the internal fluid pressure. Conductors are spaced approximately 15 inches apart below ground. Oil reservoirs (10 to 40 gallon capacity, no pumping facilities) are installed every two to four thousand feet to accommodate fluid expansion and contraction.

To underground shorter, individual segments of an above ground transmission line, converting from an overhead to underground system would be required. Such conversions would be needed at each end of the underground segment and would require installation of conversion facilities. These facilities would require an approximate 120 square feet, fenced, and graveled site. Within the fenced area would be located a three-pole structure of same or larger magnitude as used on the overhead line to convert the line conductors. On these structures surge arrestors, insulators, and overhead to underground transformation terminators would be installed. The terminators sit atop the riser pipes that house the underground cable and lead to the underground system. Similar facilities would be required to convert the underground conductors to an overhead system. Also located on site would be fluid handling equipment such as storage tanks and pressurizing equipment.

Both the HPFF and SCFF system installation costs are approximately 12 times higher than that of an overhead system. In addition, maintenance costs are estimated to be up to 200 times higher than for an overhead line because of the routine (weekly, monthly, semiannual, and annual) monitoring required for a pressurized oil system. The identification and repair of cable failures is also more difficult and time consuming for both systems.

A third underground technology, Extruded Dielectric Cables, has proven reliable at 69 kV and 138 kV, has limited applications at 230 kV, and has not been installed in the U.S. at 345 kV (the Electric Power Research Institute is currently conducting research at 345 kV). For this reason, Extruded Dielectric Cables have been eliminated from further consideration because of technological constraints.

During construction, the environmental impacts of an underground transmission line would be similar to those for major pipeline construction. Construction of an underground transmission line would require a continuous trench, whereas overhead transmission line construction would result in disturbances to individual structure sites, located approximately every 1,200 feet, and the impacts associated with conductor stringing (overland travel).

Operation of a HPFF or SCFF system presents the possibility of an oil spill. With the HPFF system, if the pipe enclosure, storage tank, or pressurization system were to fail or be damaged a spill could occur. Likewise, failure or damage to the SCFF conductors or reservoirs could result in a spill. Damage to these facilities could occur due to rupture during an earthquake (both systems would be rigid, subject

to breakage during seismic activity). Failure of system facilities could also occur because of corrosion, faulty seals, poor maintenance; human error; or vandalism. An oil spill and cleanup activities could result in the following significant impacts: plant and wildlife mortality, contamination of water bodies, disturbance of cultural resources, degradation of land use and recreational activities, and visual blight. Dielectric fluid filled systems also impose an added system safety risk of fire or explosion since the fluid is volatile. Line losses would also greater for underground systems than overhead transmission lines. If repair activities necessitate the replacement of underground conductors, excavation would be required, resulting in impacts similar to constructing an underground transmission line.

Although visual impacts would be mitigated and electric and magnetic field impacts would be partially mitigated with an underground system, potentially greater adverse environmental impacts could be expected because the majority of the right-of-way would be disturbed during construction and the environmental consequences of system failure during operation. Because of the technical complications and costs, and the potential adverse effects of undergrounding, an underground project was not considered a viable alternative and was eliminated from further consideration.

Other Transmission Technologies

Description. Other technologies that might be considered as an alternative for economical bulk-power transmission of electric energy from a generating source to load centers are microwave, laser, and superconductors.

Rationale for Elimination. Current research and development shows some promising indications that the above noted technologies may eventually be available for overhead transmission systems. However, none of these technologies are currently available for commercial use. Therefore, new technologies were eliminated from further consideration.

B.3.4.6 Transmission Alternatives

In accordance with the alternative screening criteria discussed in Section B.3.2, Transmission Alternatives were evaluated for their ability to satisfy the project objectives. Those Transmission Alternatives that could not satisfy the project objectives have been eliminated from further consideration and are described in Section B.3.4.6.1. For those transmission alternatives that could satisfy the project objectives, an assessment of the potential of these alternatives to provide clear environmental advantage in comparison to the Proposed Project was conducted (see Section B.3.4.6.2).

B.3.4.6.1 *Transmission Alternatives That Do Not Satisfy Project Objectives*

Enhancement of 230 kV Utah Intertie Alternatives

Description. SPPCo has an existing 230 kilovolt (kV) intertie east of the Fort Churchill Generating Plant near Yerington, Nevada, which connects to PacifiCorp's Pavant Substation in Utah and the LADWP's

Intermountain Generating Plant in Utah. SPPCo has studied several enhancements to this transmission line, including installing series capacitors in one or more locations, paralleling the existing line with another 230 kV transmission line, and building new interconnections between the 230 kV line and existing 120 kV or 345 kV facilities in the Winnemucca/Battle Mountain area. As illustrated on Table A.6-5 in Section A.6, Purpose and Need, these alternatives would offer 20-50 megawatts (MW) of additional import capacity (depending upon the alternative implemented), partial improvement to the service reliability in the Reno/Lake Tahoe area and limited additional, but indirect access to the Pacific Northwest power market.

Rationale for Elimination. SPPCo does not believe that the Utah Intertie Enhancement Alternatives offer enough import capability and access to the Pacific Northwest power market to meet its near-term needs. In addition, these alternatives would not provide a sufficient improvement in reliability needed for the Reno/Lake Tahoe area to remedy existing system limitations. Finally, SPPCo's assessment of the costs versus additional import capacity to be gained by the alternatives concluded that the Utah Intertie Enhancement Alternatives were less cost effective than other comparable alternatives considered (e.g. Frenchman Tap Project - see Section B.4.4.5). Therefore, these alternatives were eliminated from further consideration.

Intertie Alternatives to Nevada Power Company

Description. Several possible tielines with Nevada Power Company in Las Vegas, Nevada, have been considered by SPPCo, including various 230 kV and 345 kV lines from the Yerington, Tonopah, or Ely areas, south to Las Vegas. The Nevada Power Company interties would offer 66-153 MW of additional import capacity, depending on the alternative implemented, and a comparable increase in indirect access to the Pacific Northwest power market (see Section A.6).

Rationale for Elimination. The Nevada Power Company interties would provide only partial relief to existing transmission system import limitations. The interties would not provide cost-effective, direct access to the Pacific Northwest power market. Further, SPPCo asserts that most of these alternatives would not improve service reliability to the Reno/Lake Tahoe area. Therefore, these alternatives were eliminated from further consideration.

B.3.4.6.2 *Transmission Alternatives That Reasonably Satisfy Project Objectives*

The following alternatives, either individually or collectively, could satisfy the Proposed Project objectives. These alternatives are described below and are assessed for their ability to provide environmental advantage over the Proposed Project. Since these projects have only been preliminarily studied by SPPCo for their technical feasibility and estimated cost, no site specific routing information is available. Therefore, the environmental analysis of these alternatives is limited to a qualitative assessment. The approximate routes for these transmission alternatives are shown on Figure B.3-3. Table B-13 summarizes the ability of the transmission alternatives to satisfy the project objectives,

individually and collectively (see Section A.6 and Table A-8 for a complete description of project objectives and the ability of the transmission alternatives to satisfy them, respectively).

As presented in Table B-13, the Nevada Route, Summer Lake-Valley Road, and the Pacific DC Intertie Tap alternatives are each capable of reasonably achieving all of the primary project objectives, but would not achieve the secondary project objectives of a future intertie to Lassen Municipal Utility District (LMUD) and the provision of transmission facilities to future North Valley customers. These alternatives are analyzed below for their potential to eliminate or reduce the environmental impacts of the Proposed Project. Further, a feasible alternative is one that can be "accomplished within a reasonable period of time, taking into account economic, legal, social and technological factors" (*Citizens of Goleta Valley, et al.)*. These factors are also taken into consideration in the assessment of all the Transmission Alternatives discussed in this section.

The Midpoint-Toano-Carlin-Valmy, Midpoint-Carlin-Valmy, and Burns-Oreana Alternatives are each capable of reasonably satisfying the project objective of increased import capacity. In addition, these alternatives would provide SPPCo with indirect access to the Pacific Northwest power market via Idaho Power Company (IPC). However, to fully realize the potential economic benefits of this project objective, "direct" versus "indirect" access is preferred by SPPCo because direct access would save IPC wheeling charges, although other wheeling charges may be incurred depending upon whether purchases are from BPA or other utilities wheeling through BPA's system. Since CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives," this objective is considered to be reasonably satisfied by the subject alternatives. None of these alternatives would improve the service reliability to the Reno/Lake Tahoe area or provide for future interconnection to LMUD. Since the Tracy-Silver Lake Alternatives would improve service reliability to the Reno/Lake Tahoe area (see Table B-13), these alternatives are considered collectively with the Midpoint-Toano-Carlin-Valmy, Midpoint-Carlin-Valmy, and Burns-Oreana Alternatives in this Section. These alternatives, when considered collectively, could reasonably satisfy all of the project objectives with the exception of future interconnection to LMUD.

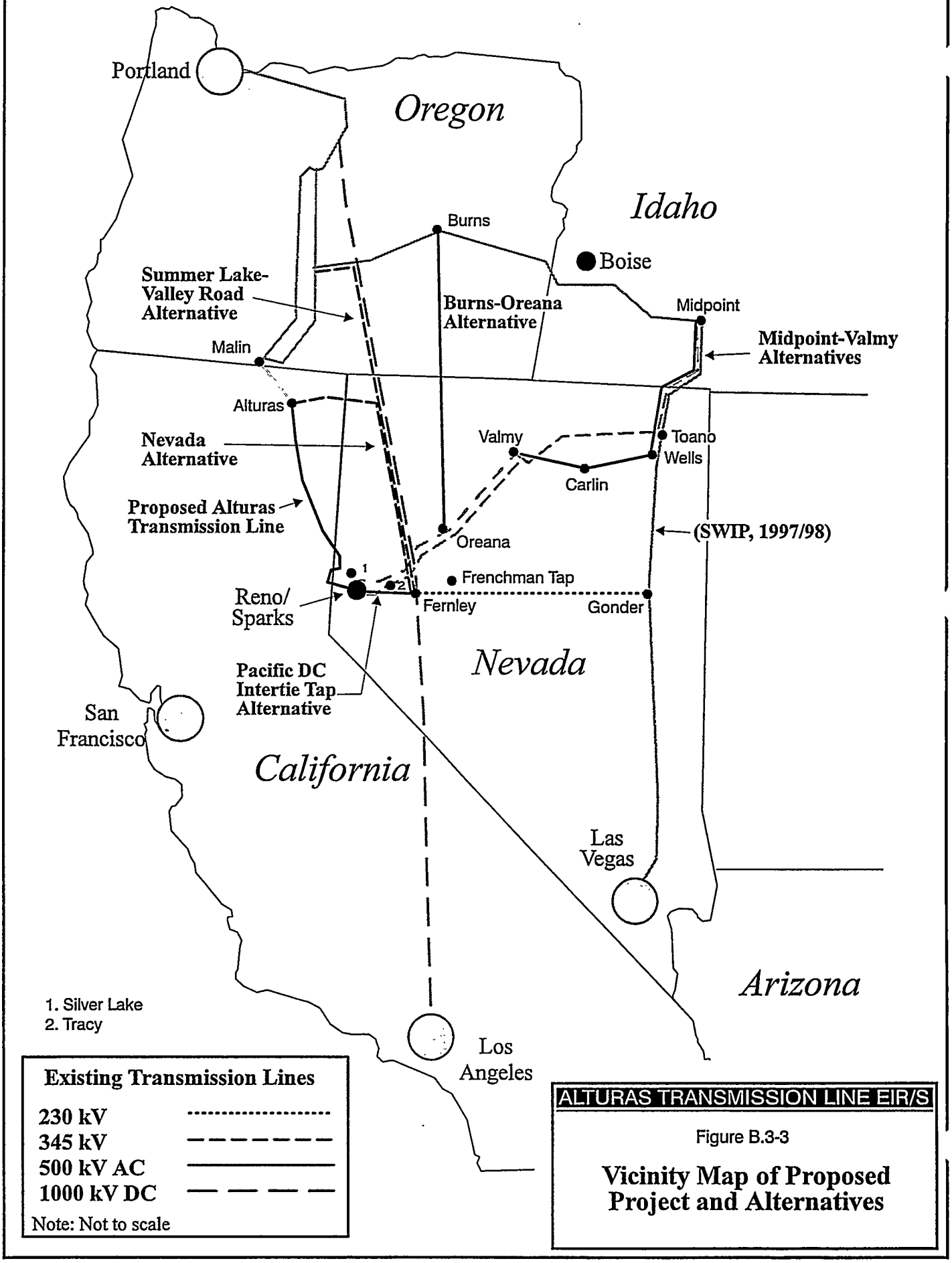
The Frenchman Tap Alternative is considered to be capable of reasonably satisfying the project objective of increased import capacity, even though the alternative would not be able to completely remedy existing system limitations. This alterative would not be able to satisfy, even partially, any of the other project objectives. When assessing this alternative in conjunction with the other Transmission Alternatives presented in Table B-13, the Frenchman Tap Alternative does not provide any complementary benefits.

Table B-13 Transmission Alternatives vs. Project Objectives Summary

Transmission Alternatives	Primary Project Objectives[1]			Secondary Objectives and Benefits[2] (LMUD, Exports, Pg&e Deferral, Comm. Benefits)
	Increase Import Capacity from 360 MW to 600 MW	Improve System Security and Reliability West of Tracy	Access to Pacific Northwest Power Market	
LADWP CORRIDOR ALTERNATIVES				
Nevada Route Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
Summer Lake-Valley Road Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
MIDPOINT-VALMY ALTERNATIVES				
Midpoint-Toano-Carlin-Valmy Alternative	Y	N, except for partial improvement in voltage control	Y, indirect access only	Y. except LMUD intertie
Midpoint-Carlin-Valmy Alternative	Y	N, except for partial improvement in voltage control	Y, indirect access only	Y, except LMUD intertie
TRACY-SILVER LAKE ALTERNATIVES				
120 kV from East Tracy to Silver Lake Substation	N	Y	N	N
345 kV from East Tracy to Silver Lake Substation	N	Y	N	N
OTHER				
Burns-Oreana Alternative	Y	N	Y, indirect access only	Y, except LMUD intertie
Pacific DC Intertie Tap Alternative	Y	Y, except for providing transmission service to North Valley	Y	Y, except LMUD intertie
Frenchman Tap Alternative	Y, but ability to fulfill existing inadequate system requirements is only partially fulfilled.	N	N	N

Y = Yes, expected to reasonably satisfy objective or provided stated benefit.
N = Not expected to satisfy objective or provide stated benefit beyond an insignificant increment.

1 The primary objectives of the Proposed Project are those considered critically necessary for SPPCo to operate within prudent utility practices.
2 The secondary objectives and benefits are considered indirect benefits of the Proposed Project and are not considered principal to the Proposed Project justification by satisfying critical needs.


Portland
Oregon
Idaho
Burns
Boise
Summer Lake-
Valley Road
Alternative
Burns-Oreana
Alternative
Midpoint
Midpoint-Valmy
Alternatives
Malin
Alturas
Nevada
Alternative
Valmy
Toano
Wells
Carlin
Proposed Alturas
Transmission Line
(SWIP, 1997/98)
Oreana
1
2
Frenchman Tap
Reno/
Sparks
Fernley
Gonder
Nevada
Pacific DC
Intertie Tap
Alternative
San
Francisco
California
Las
Vegas
Arizona
1. Silver Lake
2. Tracy
Los
Angeles
Existing Transmission Lines
230 kV
345 kV
500 kV AC
1000 kV DC
Note: Not to scale
ALTURAS TRANSMISSION LINE EIR/S
Figure B.3-3
Vicinity Map of Proposed
Project and Alternatives

LADWP Corridor Alternatives

Two alternatives were considered that would travel within the LADWP 1000 kV DC transmission line corridor. These alternatives included the Nevada Route Alternative and the Summer Lake-Valley Road Alternative. The main advantage of the LADWP Corridor Alternatives would be the avoidance of adverse impacts along the Proposed Project route while still achieving the project objectives. However, this advantage would be offset by comparable impacts imposed by the alternative routes, including impacts to biology, land use, soils, hydrology, visual, and historic resources. The alternative routes would also present technological and economic constraints.

Nevada Route Alternative

Description. The Nevada Route Alternative offers a route alternative that travels mostly adjacent to existing powerline routes, particularly the LADWP 1000 kV DC transmission line, which runs in a north-south direction through the northwest part of Nevada. The basis for this recommendation was the potential environmental advantages of paralleling an existing utility corridor and passing through areas that may be less sensitive than the Proposed Project. This alternative would originate in the eastern portion of Alturas, California, and proceed east into Nevada and then south to the Fernley (Nevada) area, where it would proceed west to the Reno area as shown on Figure B.3-3 and described below. It would be approximately 230 miles in total length and travel as follows:

- **Alturas to LADWP Corridor (47 miles).** The Nevada Route Alternative would probably originate on the east side of Alturas near the BPA Warner Substation. The route would proceed eastward across the Warner Mountains, through the Cedarville area, and across Surprise Valley and the California-Nevada border. It would cross the Hays Canyon Range, joining the LADWP corridor on the east side of Long Valley, near Fortynine Lake.

- **LADWP Corridor (150 miles).** The route of the LADWP DC transmission line would be picked up on the east side of Long Valley at a point about four miles northeast of Fortynine Lake. This route segment would parallel the LADWP line all the way south to the vicinity of Fernley, Nevada, which is located along Interstate 80, about 30 miles east of Reno.

  The LADWP line proceeds south through Long Valley, west of Fox Mountain and the Granite Range, through Squaw Valley and the very northeastern edge of the Smoke Creek Desert, to just west of the town of Gerlach. From there the line skirts the southwest edge of the Black Rock Desert, proceeding south through the northeastern portion of the San Emidio Desert, crossing the low northern end of the Lake Range and Poito Valley (between the northern end of Winnemucca Lake and the Selenite Range, which includes Kumiva Peak). The line passes in a southeasterly direction through the saddle between the Selenite Range and the Nightingale Mountains and then proceeds south along the eastern foothills of the Nightingale Mountains. It continues south through the Truckee Range and eventually crosses Interstate 80 about three miles east of Fernley. However, the Nevada Route Alternative, as suggested herein, would turn west toward Reno in the area where the LADWP line crosses the east-west transmission line corridor located less than one mile north of Interstate 80.

- **Fernley-Reno Corridor (30-34 miles).** This portion of the route would parallel existing power lines along the north side of Interstate 80 from the LADWP line intersection point (about four miles northeast of Fernley) to the Reno area.

The Nevada Route Alternative would probably involve a new Alturas Substation site (on the east side of Alturas) and a different substation site in the Reno area to replace the proposed Border Town Substation. System tie-in would need to occur at the North Valley Road Substation site. This alternative would achieve the project objectives of increasing import capacity, improving service reliability to the Reno/Lake Tahoe area and providing direct access to the Pacific Northwest power market. However, as discussed below, the feasibility of this alternative is subject to existing land use constraints within the City of Sparks and northern Reno area, as well as eastern Alturas and the Cedarville area.

Rationale for Elimination. The analysis of the Nevada Route Alternative involved the solicitation of comments from various resource management and planning agencies, including the U.S. Bureau of Land Management (BLM), California Department of Fish and Game (CDFG), U.S. Forest Service (USFS), U.S. Fish and Wildlife Service, Modoc County, Lassen County, LMUD, Nevada Division of Wildlife, Nevada Air National Guard, Public Service Commission of Nevada, LADWP, Pyramid Lake Paiute Tribe, Truckee Meadows Regional Planning Agency, and the City of Sparks. The merits of the Nevada Route as an alternative to the Proposed Project are summarized below.

Potential environmental impacts of the Nevada Route Alternative include the following:

Land Use and Wildlife Impacts in the Eastern Alturas Area. Development of a substation and the initial portion of the Nevada Route Alternative in the eastern Alturas area would likely traverse many more private properties and place more residences in close proximity to the line as compared with the Proposed Project. In addition, the desire to avoid the XL Ranch Indian Reservation leaves few, if any, options for traversing the highly sensitive wildlife corridor between the north fork of the Pit River and Dorris Reservoir.

Soil and Hydrology Impacts in the Warner Mountains (Cedar Pass). The Nevada Route Alternative would need to cross the Warner Mountains (east of Alturas) in the area of Cedar Pass. Steep topography and highly erodible soils in the Warner Mountains would likely present significant erosion and sedimentation impacts, requiring special structure design and construction techniques.

Land Use Impacts East Warner Mountains. If the Nevada Route Alternative crossed the Warner Mountains in the area of Cedar Pass, it could travel within an existing Modoc National Forest designated utility corridor. Following this corridor east of the Warner Mountains, the alternative would traverse the Town of Cedarville, traversing additional private properties and placing additional residences in close proximity to the line.

Biological and Hydrological Impacts in Surprise Valley. The biological resource value and sensitivity of the Surprise Valley area is significant. Of particular concern in this area are sandhill cranes, wintering bald eagles, wetlands, rare shrimp species, and antelope kidding areas near the Nevada border. In addition, the Nevada Route Alternative would need to cross Middle Alkali Lake located within Surprise Valley. Given the periodic flooding of the lake, special structure foundations would be required (California State Route 299 crosses this area by means of a causeway).

Scenic and Historical Impacts East of Surprise Valley. From the California-Nevada border to the point the Nevada Route Alternative intersects the LADWP corridor near Fortynine Lake, the alternative route would be close to or within the one-mile wide Applegate-Lassen Emigrant Trail corridor. The Nevada portion of the Trail is on the National Register of Historic Places. In association with this historical resource designation, the BLM has also designated the corridor of Nevada State Route 8A (eastward extension of California State Route 299) as a Scenic Byway.

Environmental Impacts in Nevada. As discussed in Section B.4.4.1.1, approximately 150 miles of the Nevada Route Alternative would travel parallel to the existing Los Angeles Department of Water and Power (LADWP) 1000 kV transmission line. The 200-foot wide right-of-way for this transmission line was granted by the BLM in 1967. Since the LADWP right-of-way was granted prior to the adoption of the National Environmental Policy Act (NEPA) (adopted in 1969), no environmental review was conducted prior to the granting of the right-of-way and therefore, limited information is currently available on the environmental resources along the proposed alternative route within Nevada.

When consulted, the Nevada Division of Wildlife expressed specific concerns regarding the extensive sage grouse, antelope, and mule deer resources that could be affected along much of the alternative route. In addition, the southern end of the route could affect wintering bald eagles and waterfowl in the Truckee River corridor. The Division also noted that limited information is available on the effectiveness of revegetation in areas of drier ecology and the significance of limited water resources. In addition, the BLM (Winnemucca District) and Pyramid Lake Paiute Tribe noted that the Winnemucca Lake and San Emidio Desert areas, two areas the LADWP right-of-way traverses, are highly sensitive for cultural resources.

Impacts in the Northern Sparks and Reno Area. As discussed in Section A.6, in order for the Proposed Project, or any transmission or generation alternative, to improve service reliability to the Reno/Lake Tahoe area, connection to SPPCo's North Valley Road Substation would be required. This need is based on existing limitations of the Tracy-to-North Valley connections and projected load increases in the Reno/Lake Tahoe area. For the Nevada Route Alternative to access the North Valley Road Substation, the route would likely need to cross a severely constrained and rapidly growing area of the City of Sparks (to the north) and the northern Reno area. These growing areas are also located within the Truckee Meadows Air Basin, a non-attainment classified air basin for both State and Federal ambient air quality standards, resulting in possible significant air quality impacts. This routing could also result in significant property ownership constraints and potentially significant land use and visual impacts. For example, in the area of northern Sparks, the Nevada Alternative would need to traverse lands designated as Low Density Residential allowing 3 to 7 dwelling units per acre. When traversing northern Reno, the alternative would cross Low Density Residential (3 to 7 dwelling units per acre) and Medium Density Residential (7 to 21 dwelling units per acre) lands. In addition, given that the alternative would be traversing an urban area, electric and magnetic field (EMF) concerns would be significant, because separation distances from sensitive resources would be restricted due to limited available space (see discussion below on utility corridor requirements).

Public comments were received on the Draft EIR/S suggesting that the transmission line be placed underground when traversing the urbanized Sparks and northern Reno areas. As discussed in Section B.3.4.6, in addition to construction impacts (land use, air quality, traffic, etc.), an underground transmission line imposes the risk of oil spill, and fire and explosion during operation. Line losses would also be greater. Although visual and electric and magnetic field impacts would be mitigated with an underground system, potentially greater adverse environmental impacts (especially air quality and transportation) could be expected because the majority of the right-of-way would be disturbed during construction, and because of the potential environmental consequences of system failure during operation.

Public comments were also received on the Draft EIR/S suggesting that a system of smaller, 120 kV and 230 kV transmission lines be used when traversing the urbanized northern Sparks and Reno areas, in lieu of one 345 kV line. While this option provides some relief to visual impacts along a single right-of-way, since shorter structures would be required, a system of multiple transmission lines (whether directly parallel or separated) would result in cumulative visual impacts, because multiple right-of-ways would be required. Multiple right-of-ways would exacerbate property owner and land use concerns. In addition, construction impacts (air quality, transportation, etc.) would be more significant since several projects would need to be constructed.

Additional Considerations. The Nevada Route Alternative would travel primarily within the LADWP transmission line corridor, designated by the BLM as a "utility corridor." Both the BLM and USFS designate corridors to concentrate facilities into a specific area or concentrated linear area. Through the consolidation of corridors, agencies can minimize the number of separate right-of-ways, identify preferred locations for future right-of-ways, and establish joint-use planning corridors, thereby, minimizing the environmental impacts of the utilities (Western Regional Corridor Study, 1992).

The Western System Coordinating Council (WSCC) has established reliability and operating criteria for their member utilities located in the fourteen western states (see Section A.2.1.2). Although the WSCC does not define specific separation distances, without adequate separation of transmission systems, WSCC criteria considers the simultaneous outage of parallel transmission facilities as a credible event, or an event that has a significant likelihood of occurring.

In order to mitigate reliability concerns with respect to an accident affecting both the Nevada Route Alternative and the LADWP line, a separation distance between the two lines of at least the distance of the spans between the structures (1200 feet or more, depending on LADWP span lengths) is recommended by LADWP.

The Nevada Route Alternative would require the construction of about 30 miles of 345 kV line from the Fernley area to SPPCo's North Valley Road Substation. From Fernley to Tracy, (approximately 15 miles east of Reno), no existing transmission corridors are available in which the alternative could travel. From Tracy to the North Valley Road Substation however, an existing SPPCo transmission line corridor could be utilized by the Nevada Route Alternative. This corridor contains a 345 kV and 120 kV transmission line, with 140 feet and 105 feet $\pm$ wide right-of-ways, respectively (or a 255 $\pm$ foot wide corridor). The

separation distance between these two transmission lines is 200 feet. In many areas, urban development in the northern Sparks and Reno area, usually in the form of residential development, has encroached up to edge of the right-of-ways for these existing 345 kV and 120 kV transmission lines. Adding a third transmission line to this corridor would require expansion of the corridor into existing urbanized areas resulting in significant land use impacts; the City of Sparks estimates that up to 64 homes could be lost.

As previously noted, SPPCo has only conducted preliminary technical feasibility analyses and cost-estimates for the alternatives included in Table B-13 (except the Nevada Route Alternative, since this route was identified during the scoping process). Given the time required to permit, design, and construct projects of this magnitude, SPPCo estimates that these alternative facilities would not be available for operation until the year 2000. As discussed in Section A.6, given SPPCo's existing system limitations, SPPCo is currently unable to operate within prudent, WSCC operating criteria. This existing system shortcoming will only be exacerbated as loads continue to grow. As early as the summer of 1997, a 120 kV line that services the Reno area is projected to exceed its design power carrying capability. This condition could, if uncorrected, cause damage to the line, or to avoid line damage, result in an interruption of service to the Reno/Lake Tahoe area. Because SPPCo is a WSCC member utility, failure of the SPPCo system could also have ramifications on the service provided by other WSCC utilities. Interruptions of service in the Reno/Lake Tahoe area would impose economic impacts on all affected commercial and industrial activities. In addition, such interruptions could affect the responsiveness of emergency services. However, the responsibility in planning for the length of permitting processes is the Applicant's, and as such, has been given only minor consideration in the evaluation of alternatives.

For all of the reasons discussed above, the Nevada Route Alternative is not considered to offer environmental advantage in comparison to the Proposed Project.

Summer Lake-Valley Road Alternative

Description. The Summer Lake-Valley Road Alternative would involve the construction of a transmission line starting at PacifiCorp's existing 500 kV Summer Lake Substation (where BPA's 1000 kV DC line crosses it). The alternative would then follow the corridor of the LADWP line from northwestern Nevada to just east of Reno (see Figure B.3-3). This route would follow existing corridors from Summer Lake east to the LADWP 1000 kV DC line, then south to a point east of Reno where the line would turn west to Reno along existing SPPCo corridors and would terminate at the North Valley Road Substation. This route would be longer than the Nevada Route Alternative and the Proposed Project. This alternative would achieve the project objectives of increasing import capacity, improving service reliability to the Reno/Lake Tahoe area and providing direct access to the Pacific Northwest power market. However, as discussed in this section, the feasibility of this alternative is subject to existing land use constraints within the City of Sparks and northern Reno area.

Rationale for Elimination. As illustrated on Figure B.3-3, the alignment of the Summer Lake-Valley Road Alternative is the same as the Nevada Route Alternative with the exception of the northern segment (the Nevada Route Alternative turns west toward Alturas near Fortynine Lake, while the Summer Lake-Valley Road Alternative continues north to Summer Lake, Oregon). The Summer Lake-Valley Road Alternative is approximately 150 miles longer than the Nevada Route Alternative (approximately 25 additional miles within Nevada and 125 miles in Oregon). Since the Summer Lake-Valley Road Alternative introduces 25 additional miles of transmission line in Nevada, the environmental and economic effects of the Summer Lake-Valley Road Alternative in Nevada are expected to be more severe than the Nevada Route Alternative. In addition, the Summer Lake-Valley Road Alternative could impose biological and visual impacts in Oregon as it travels to Summer Lake. These impacts could be encountered as the alternative skirts the eastern end of the Abert Rim Wilderness Area and the northern boundary of the Summer Lake Wilderness Study Area. In addition, the alternative would cross U.S. 395 and Highway 140. The feasibility of this alternative is subject to the same delay ramifications as the Nevada Route Alternative, given required permitting, design, and construction timelines. For these reasons, the Summer-Lake Valley Road Alternative is not considered to be preferable to the Proposed Project.

Pacific DC Intertie Alternative

Description. The LADWP 1000 kV DC transmission line is also known as the Pacific DC Intertie. Under the Pacific DC Intertie Tap Alternative, SPPCo would connect directly into the LADWP line at its crosspoint with SPPCo's 230 kV lines (about 30 miles east of Reno). This alternative would require construction of only about 30 miles of 345 kV line from a new converter station near Fernley to the existing North Valley Road Substation.

The Pacific DC Intertie Tap Alternative would provide 400 MW in increased import capability and improve the service reliability for the Reno/Lake Tahoe area. While this alternative could provide direct access to the Pacific Northwest power market, this access is severely restricted since there is little, if any, available capacity on the 1000 kV DC transmission line. Further, as stated by SPPCo, the service reliability and import capability provided by a DC transmission interconnection is inferior to an AC interconnection such as the Proposed Project.

Rationale for Elimination. As discussed in relation to the LADWP Corridor Alternatives, in order for the Proposed Project or any transmission or generation alternative to improve the service reliability to the Reno/Lake Tahoe area, connection to the North Valley Road Substation would be required. The Pacific DC Intertie Tap Alternative would travel a path similar to the southern, east-west segment of the LADWP Corridor Alternatives (Fernley area to North Valley Road Substation), likely crossing a severely constrained and rapidly growing area of the City of Sparks. This would result in significant property ownership and EMF constraints in routing the line, as well as potentially significant land use, visual, and air quality impacts. In addition, the alternative would most likely travel within close proximity to the Truckee River and Interstate 80, imposing potential biological and water quality concerns, and adding to potential visual impacts.

The following utility corridor restrictions could occur with the Pacific DC Intertie Alternative:

As with the southern, east-west segment of the Nevada Route Alternative, the Pacific DC Intertie Tap Alternative would also require the construction of about 30 miles of 345 kV line from the Fernley area to SPPCo's North Valley Road Substation. Given that the Pacific DC Intertie Tap Alternative could be sharing an existing SPPCo corridor with a 345 kV and 120 kV line that traverses northern Sparks and Reno, significant land use impacts are expected when expanding the corridor width because of the encroachment of urban development to the edges of the existing corridor.

Other issues that are presented by the Pacific DC Intertie Alternative include:

Capacity of the LADWP Line. The LADWP 1000 kV DC transmission line is a major transmission line connecting the Pacific Northwest and the Pacific Southwest. The line is owned by southern California utilities (primarily LADWP and Southern California Edison). In addition, several Pacific Northwest utilities (Bonneville Power Administration [BPA], IPC and PacifiCorp) have access to the DC line through existing, contractual ownership agreements. While the LADWP 1000 kV DC transmission line has a total capacity of 3100 MW, bi-directional, the line is currently operating at near capacity during the peak transmission periods. As discussed in Section A.6.9.1, the Pacific Northwest has a large amount of hydroelectric generation capacity which peaks in output from water run-off from the snow melt during the spring and summer. One of SPPCo's primary objectives is to gain direct access to the Pacific Northwest power market, in particular the economical, hydroelectric generation in the spring and summer. Since little, if any, surplus capacity is available on the 1000 kV DC line during these periods, the Pacific DC Intertie does not appear to be able to satisfy this objective.

Permitting, Design, and Construction Timing. The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

Alternative Costs. Despite the significantly shorter line construction requirements (30 miles versus 165 miles for the Proposed Project), SPPCo and BPA estimate that total construction costs for this alternative would be comparable to those of the Proposed Project (about $100 million). The major expense would be construction of the DC converter station near Fernley ($50 million).

For the reasons discussed above, the Pacific DC Intertie Tap Alternative is not considered to be preferable to the Proposed Project.

Midpoint-Valmy, Burns-Oreana, and Tracy-North Valley Alternatives

The Midpoint-Valmy (Midpoint-Toano-Carlin-Valmy and Midpoint-Carlin-Valmy), and Burns-Oreana Alternatives are major alternative transmission line projects in which SPPCo has been involved in preliminary feasibility studies. As summarized on Table A-8, these alternatives would increase the import capacity of the SPPCo system and provide indirect access to the Pacific Northwest power market (access

would be less cost effective); reasonably satisfying these project objectives. These alternatives would not improve the service reliability to the Reno/Lake Tahoe area since they terminate at Valmy, thus increasing the supply on the Valmy-Tracy-North Valley corridor. Therefore, these alternatives are being considered in conjunction with the Tracy-Silver Lake Alternatives which offer the ability to improve the service reliability to the Reno/Lake Tahoe area. These combined alternatives would satisfy the primary project objectives.

Midpoint-Toano-Carlin-Valmy Alternative + Tracy-North Valley Alternatives

Description. The Midpoint-Toano-Carlin-Valmy Alternative proposes use of the northern 130-mile portion of the SWIP (500 kV transmission line) from the Midpoint Substation to a new substation at Toano. The SWIP is a 500 kV AC transmission line project proposed by Idaho Power Company. The north-to-south portion of SWIP would be approximately 520 miles long and extend from the Midpoint Substation in southern Idaho to a new substation in Ely Nevada area and then connect to a new substation just northeast of Las Vegas, Nevada. The east-to-west SWIP crosstie is a 500 kV transmission line to be constructed from the Intermountain Generating Station near Delta, Utah, to the new substation in the Ely, Nevada area. The project's north-to-south capacity rating is tentatively set at 1200 MW. A Final Environmental Impact Statement/Draft Plan Amendment has been prepared for SWIP and a Record of Decision and ROW grants were issued by the BLM in December, 1994. The anticipated in-service date for the SWIP is 1997/98.

At the Midpoint Substation two 500 kV breakers, a 500/345 kV tie bank and two 115 MVAR lines reactors would be installed. From Toano, a 112-mile 345 kV transmission line to Carlin would be built where a 345 kV to 120 kV tap and two reactors would be installed. From Carlin, the 345 kV transmission line would travel to Valmy, a distance of 63 miles. At Valmy, the alternative would require one 35 MVAR switched reactor, two 345 kV breakers and a new 345 kV cross bus. This alternative would improve the simultaneous import capacity of SPPCo's system by approximately 350 MW.

The Tracy-Silver Lake Alternatives considered by SPPCo include the construction of either a 120 kV or 345 kV transmission line from SPPCo's East Tracy Substation to Silver Lake Substation. The East Tracy Substation is located approximately 15 miles east of Reno and the Silver Lake Substation is located in the North Valley area. The 120 kV alternative would be able to satisfy existing and projected short-term limitations to the Reno/Lake Tahoe area, while the 345 kV alternative would be able to accommodate long-term needs. While these alternatives would improve the service reliability to the Reno/Lake Tahoe area, they would not improve system import capability or provide additional access to the Pacific Northwest power market. For this reason, these alternatives are considered in conjunction with the other transmission alternatives discussed in this Section.

Rationale for Elimination. Because the Midpoint-Toano-Carlin-Valmy Alternative utilizes the northern 130-mile segment of the SWIP line (approved December, 1994) from Midpoint to Toano, this discussion is confined to the potential environmental impacts of the alternative from Toano to Valmy. The 175-mile

Toano to Valmy portion of the alternative would travel west from Toano, crossing U.S. 93 and passing near the northern boundary of the Humbolt National Forest, East Humbolt Range Wilderness Area. The alternative would then continue west following Interstate 80 and the Humbolt River, imposing potential visual, biological and surface water quality impacts. From Carlin, the alternative would cross the Tuscarora Mountains and Sheep Creek Range as it continues west to Valmy. The extent to which resources in proximity to the designated utility corridor could be impacted by the alternative is contingent upon required separation distances and terrain constraints. With the exception of the East Humbolt Range Wilderness Area, the Western Regional Corridor Study does not identify any other designated resource areas (e.g., wilderness areas, Indian lands, wildlife refuges, etc.) within proximity to the alternative utility corridor. However, this does not preclude the avoidance of sensitive resources within the area.

Either Tracy-Silver Lake Alternative would involve the construction of 26 miles of transmission line in existing SPPCo utility corridors. These transmission line corridors travel into the northern Reno area from the east, traversing the northern area of Sparks. As a result, the impacts associated with either of these alternatives would be similar to those discussed above for the southern, east-west segment of the Nevada Route Alternative.

The following utility corridor restrictions could occur with the Midpoint-Toano-Carlin-Valmy Alternative and Tracy-North Valley Alternatives:

The entire 305-mile Midpoint-Toano-Carlin-Valmy Alternative could travel within existing BLM and USFS designated utility corridors. To comply with WSCC Operating Criteria, the northern 130 miles of the alternative (the SWIP line) would be separated from adjacent high capacity lines by 2000 feet in most areas (SWIP DEIS, June 1992). Smaller separations would be required for the remaining 175 miles of the Midpoint-Toano-Carlin-Valmy Alternative, since the utility corridor in which the alternative would travel does not currently contain major transmission facilities (230 kV or greater).

Existing SPPCo transmission line corridors could be utilized by the Tracy-Silver Lake Alternatives. These corridors include a joint 345 kV and 120 kV corridor from SPPCo's East Tracy Substation to the North Valley Road Substation, and a 120 kV corridor from the North Valley Road Substation to the Silver Lake Substation. To comply with WSCC Operating Criteria, adequate separation distances between the transmission lines would be required to avoid a simultaneous failure. The ability of the existing corridor widths to satisfy necessary separation distances is dependent upon the size of the alternative line (120 kV or 345 kV), the terrain, environmental resources, and existing land uses.
The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

For the reasons discussed above, these combined alternatives are not considered preferable to the Proposed Project.

Midpoint-Carlin-Valmy Alternative + Tracy-North Valley Alternatives

Description. The Midpoint-Carlin-Valmy Alternative proposes the construction of a 242-mile 345 kV transmission line from Midpoint Substation to a new substation at Carlin. At the Midpoint Substation two 345 kV 50 MVAR switched reactors and a 345 kV PCB line terminal would be required. From Carlin, the 345 kV transmission line would travel to Valmy, a distance of 63-miles. At Valmy, the alternative would require a 35 MVAR switched reactor and two 345 kV PCB line terminals. This alternative would improve the simultaneous import capacity of SPPCo's system by approximately 300 MW and is considered in conjunction with the Tracy-North Valley Alternatives, as previously described.

Rationale for Elimination. The 305-mile Midpoint-Carlin-Valmy Alternative would follow a path similar to the Midpoint-Toano-Carlin-Valmy Alternative. However, the Midpoint-Carlin-Valmy Alternative is expected to have additional impacts to those of the Midpoint-Toano-Carlin-Valmy Alternative since the northern segment of the alternative would not utilize the approved SWIP line. This would involve the construction of approximately 130 additional miles of transmission line. In addition, the Midpoint-Carlin-Valmy Alternative would most likely not be available for operation until the year 2000, imposing the same feasibility constraints as the LADWP Corridor Alternatives. For these reasons, these combined alternatives are not considered preferable to the Proposed Project.

Burns-Oreana Alternative + Tracy-North Valley Alternatives

Description. The 250-mile Burns-Oreana Alternative would involve the construction of a transmission line to connect the PacifiCorp Burns 500 kV substation in eastern Oregon to SPPCo's Valmy-Tracy double circuit 345 kV transmission system at Oreana (approximately halfway between Tracy and Valmy, northeast of Reno, Nevada). This line would follow all or part of the existing corridor for SPPCo's 120 kV line from Burns, Oregon to Oreana, Nevada. Similar to the SWIP/Midpoint-Valmy Alternatives, the Burns-Oreana Alternative would provide 350 MW in increased import capability and indirect access to the Pacific Northwest power market. No improvement in service reliability for the Reno/Lake Tahoe area would be achieved with this alternative; therefore, it is considered in conjunction with the Tracy-North Valley alternatives, as previously described.

Rationale for Elimination. 250-mile Burns-Oreana Alternative would travel approximately 120 miles from Burns, Oregon in a southerly direction to the Oregon-Nevada border. Once in Nevada, the alternative would proceed south to Oreana. Within Oregon, the alternative would travel between the Harney Lake and Malheur Lake Wildlife Refuge areas, traversing the western and eastern boundaries of each refuge, respectively. As the line continues south, it would travel along the western boundary of the Donner and Blitzen River Wildlife Refuge and Wilderness Study Area. To the south of the Donner and Blitzen River Wilderness Study Area, the alternative could travel in either of two designated utility corridors; both running north-south. The western utility corridor would have the alternative skirting the eastern boundary of the Charles Sheldon Antelope Range Wilderness Study Area as it leaves Oregon and enters Nevada. The western utility corridor option then travels south for 40 miles at which point it crosses the Fort McDermitt Indian Reservation at Quinn River Lakes. If the eastern utility corridor is

chosen, the alternative would travel east 20 miles, and then turn south, traversing the eastern boundary of the Trout Creek Wilderness Study Area. At the Oregon-Nevada border, this eastern utility corridor would travel just west of the Fort McDermitt Indian Reservation, northwest of McConnell Peak, and then continue south for approximately 40 miles where it would rejoin the western utility corridor option. From this point, the Burns-Oreana Alternative would continue south passing through the Winnemucca area (an area of sensitive cultural resources) and traversing the eastern boundary of the Rye Patch State Recreation Area before it enters the Oreana area. The extent that resources within proximity to the designated utility corridor could be impacted by the alternative is contingent upon required separation distances and terrain constraints.

The Burns-Oreana Alternative would also parallel State Highway 205 in Oregon for approximately 60 miles. In Nevada, if the western corridor option is selected, the alternative would parallel State Highway 140 for about 40 miles. From Winnemucca to Oreana, the alternative would be adjacent to Interstate 80. The proximity of the alternative to these major roadways could impose significant visual impacts.

As previously discussed, since the Tracy-Silver Lake Alternatives would need to travel into the northern Reno area from the east, they would most likely need to traverse the northern area of Sparks. As a result, the impacts associated with either of these alternatives would be similar to those discussed for the southern, east-west segment of the Nevada Route Alternative and Pacific DC Intertie Tap Alternative.

The following utility corridor restrictions could occur with the Burns-Oreana Alternative and Tracy-North Valley Alternatives:

The entire 250-mile Burns-Oreana Alternative could travel within existing BLM and USFS designated utility corridors. These corridors contain existing SPPCo 120 kV lines. Unlike the other joint utility alternatives discussed, the Burns-Oreana Alternative would require smaller separations between lines because of the capacity of existing lines (120 kV versus 345 kV or greater). However, if terrain or environmental resources prohibit adequate separation, rerouting of the alternative outside of the designated utility corridor could still be required. Other factors such as harmonic interference, impulse voltage, and ground resistivity would also need to be taken into consideration.

As previously discussed, existing SPPCo transmission line corridors could be utilized by the Tracy-Silver Lake Alternatives. The ability of the existing corridor widths to satisfy necessary separation distances is dependent upon the size of the alternative line (120 kV or 345 kV), terrain, environmental resources, and existing land uses.

The feasibility of this alternative is subject to the same delay ramifications as the LADWP Corridor Alternatives, given required permitting, design, and construction timelines.

For the reasons discussed above, these combined alternatives are not considered preferable to the Proposed Project.

Frenchman Tap Project

Description. Oxbow Power, Inc. owns and operates a 230 kV line constructed to deliver geothermal power generated in Dixie Valley (north-central Nevada) to the Southern California Edison (SCE) Company at Bishop, California. This line crosses SPPCo's 230 kV system near Sand Springs Pass, Nevada. This alternative would feature a 230 kV interconnection point between the Oxbow line and SPPCo's system including a 230 kV phase shifter to control power flow. This alternative would provide some import capacity to SPPCo (25-135 MW depending upon extent of modifications), but the major benefits would be added transmission service potential, increased reliability, operating flexibility and voltage regulation. In addition it would provide additional markets for power sales and purchases.

SPPCo's April 1, 1993 Electric Resource Plan, prepared for the Public Service Commission of Nevada, states that

> ... continued development of the Frenchman Tap project is warranted as it would provide future purchase power alternatives ... and a purchase power path if a large industrial customer project is accelerated. The system benefits offered by the Frenchman Tap interconnection and the potential for SPPCo to make short term (up to 10 years) purchases from SCE make it likely that SPPCo would bring this project to the Public Service Commission of Nevada for approval at a later date, possibly in conjunction with a purchase power contract.

While SPPCo may continue its evaluation of this project, it states that this project could not replace the Proposed Project because it would provide less power. In addition, it would not provide the import capability needed for Reno/Tahoe area, or import capability to meet northern Nevada resource requirements. For this reason, this alternative is considered in combination with other alternatives identified in this Section which, when considered together, may meet the Proposed Project objectives.

Rationale for Elimination. As previously discussed, this alternative would only be able to reasonably satisfy the project objective of increased import capacity. However, when considering the benefits of this alternative in conjunction with the objective benefits of the other transmission alternatives, the Frenchman Tap Alternative does not provide any complementary benefits. Therefore, this alternative has been eliminated from further consideration.

B.4 DESCRIPTION OF PROJECT ALTERNATIVES ANALYZED IN THIS EIR/S

As discussed in Section B.3, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Based on this screening criteria, the following alternatives were selected for further consideration within this EIR/S.

B.4.1 ALTERNATIVE ROUTE ALIGNMENTS

As described in Section B.3.3, alternative route alignments would replace one or more segments of the proposed Alturas Transmission Line route. Figures B.4-1 through B.4-5 show all of the following alternative route segments. In addition, the alternative routes are illustrated on the base maps at the end of Volume I. These alternatives are described below and are evaluated within each environmental issue area of Part C.

B.4.1.1 Alturas Area Alternative Alignment (Segment B)

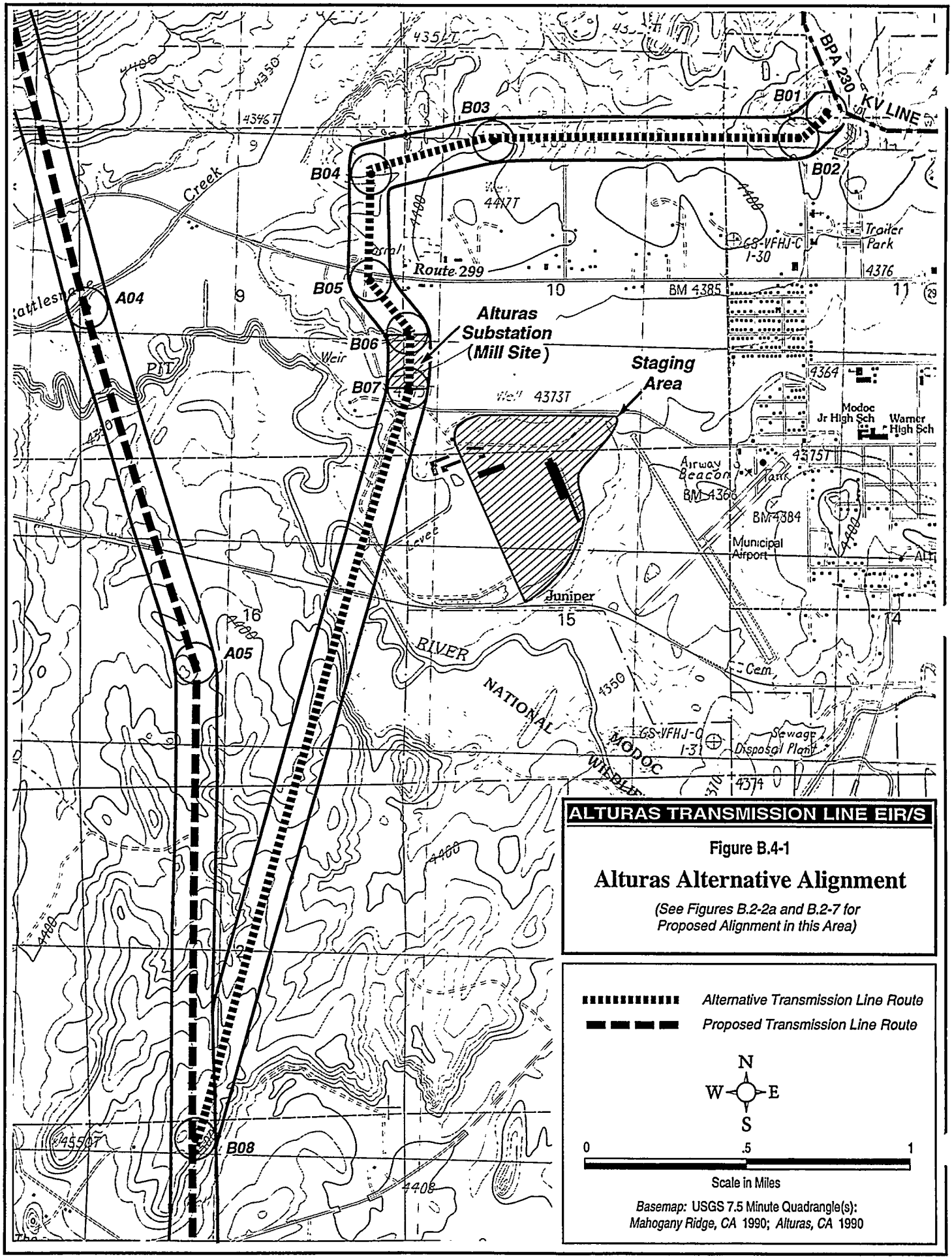
Alternative Segment B would replace the majority of Proposed Segment A and would initiate at a location on the west side of Alturas, north of Highway 299 where it would tie-in to the BPA 230 kV transmission line. From Angle Points BØ1 to BØ2 the alternative extends in a southwesterly direction for about 1.2 miles from the BPA tap point, across agricultural lands, adjacent to the northern terminus of Warner Avenue. From Angle Point BØ2, Alternative Segment B turns west and crosses open, grass fields, to Angle Point BØ4. From Angle Point BØ2 to BØ4, the alternative passes approximately 500 feet south of the Alturas golf course, and north of a few rural residences that form the southern boundary of the grass field. Between Angle Points BØ1 and BØ4, Alternative Segment B crosses several powerlines and a telecommunications line. At Angle Point BØ4, the alternative turns due south, crossing Highway 299 to Angle Point BØ5, and then southeast to Angle Point BØ6 and the Alturas Substation Mill Site Alternative, located in an open field south of Highway 299. From Angle Point BØ6, south to the convergence with Proposed Segment A, Alternative Segment B turns south and then southwest, crossing the Pit River and its associated wetlands, the Modoc National Wildlife Refuge, a telecommunications line, a power line and a railroad. The terrain is relatively flat and primarily contains shrub vegetation, wetland vegetation, and some agricultural and grazing lands. Before reaching the convergence point with Proposed Segment A, Alternative Segment B crosses low plateaus with exposed volcanic rims, as well as County Road 54 (Centerville Road), just east of its intersection with County Road 76.

Alternative Segment B: 4.6 miles Proposed Segment A: 7.1 miles

B.4.1.2 Madeline Plains Alternatives (Segments D, F, G, H, I)

Numerous alternative route alignments have been identified by the applicant for the western area of the Madeline Plains. These alternative segments, in combination, would replace Proposed Segment E. These alternatives were developed to reduce impacts to wetlands areas and to minimize land use conflicts along the proposed route.

Alternative segment D,F,G,H,I: 25 miles (approx.) Proposed Segment E: 18.1 miles

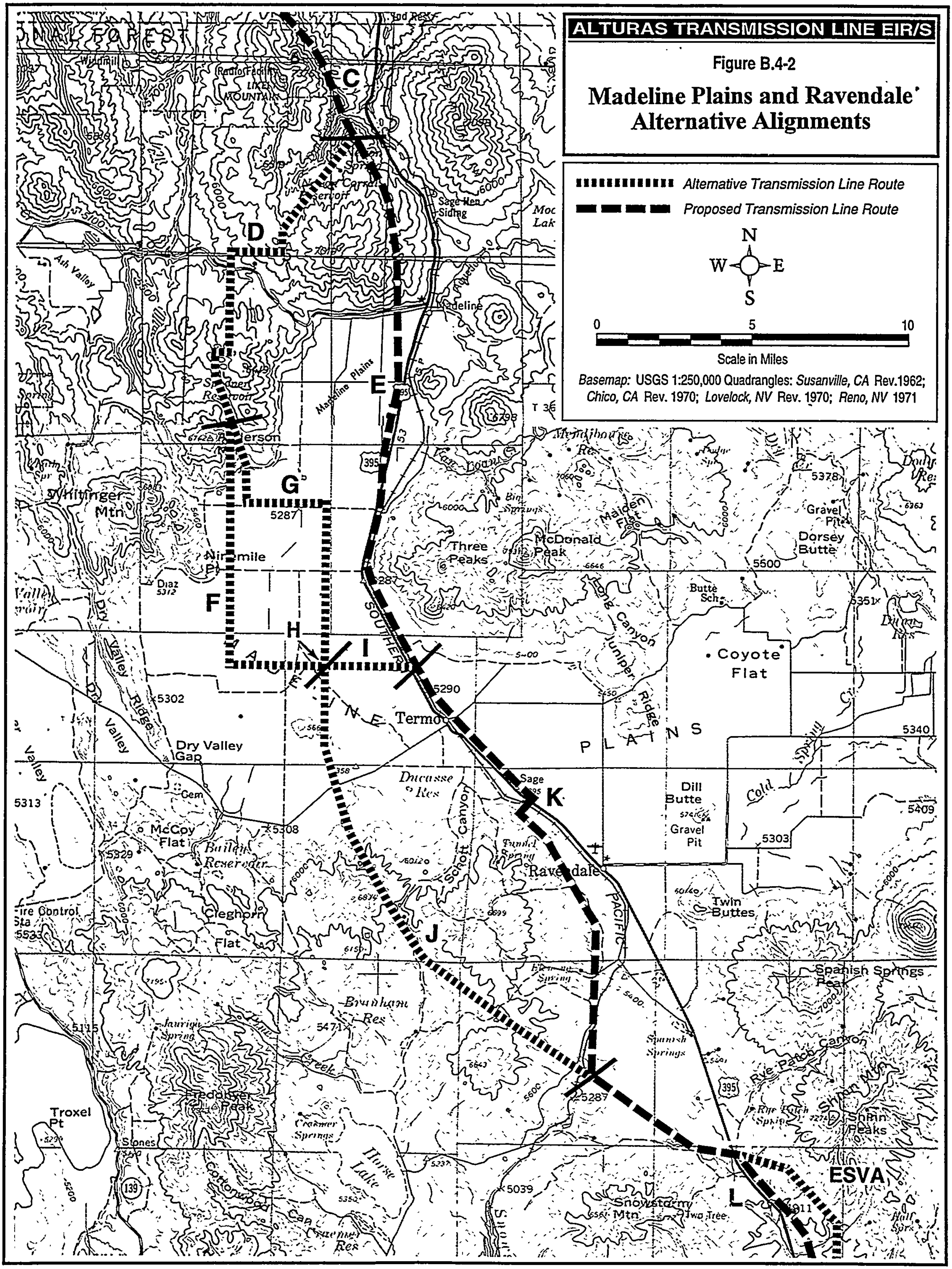


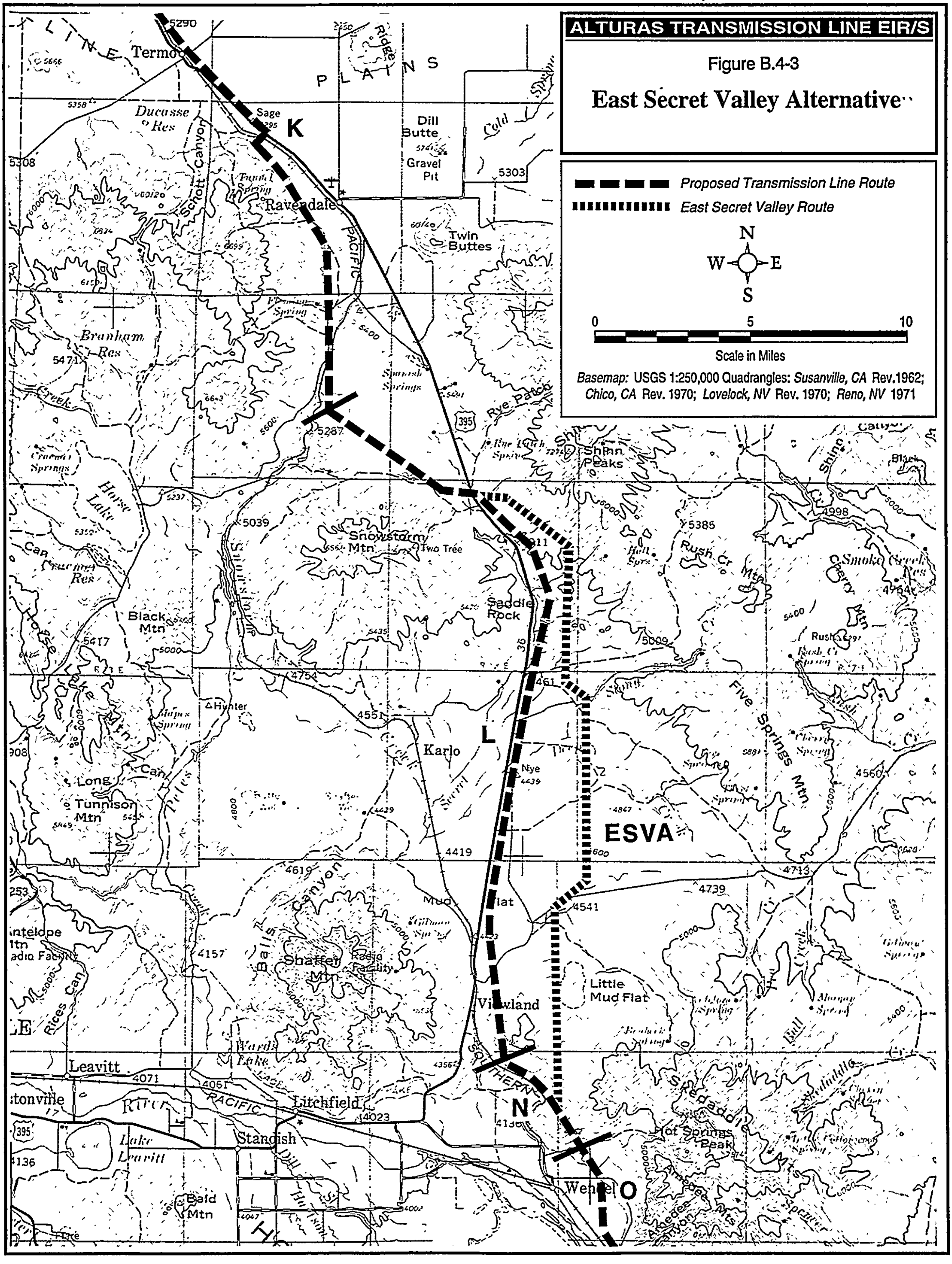
ALTURAS TRANSMISSION LINE EIR/S

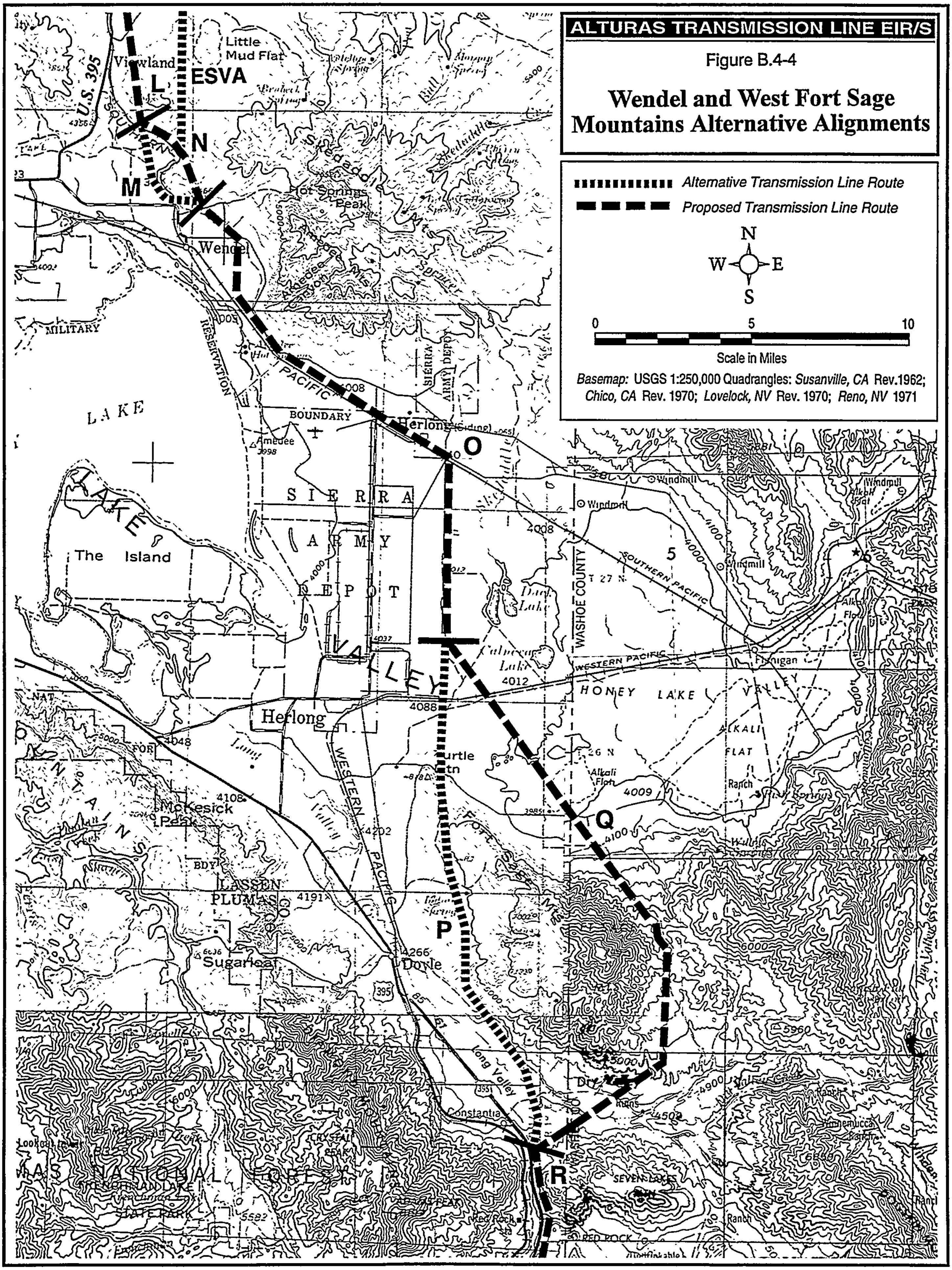
Figure B.4-1

Alturas Alternative Alignment

(See Figures B.2-2a and B.2-7 for Proposed Alignment in this Area)


ALTURAS TRANSMISSION LINE EIR/S
Figure B.4-2
Madeline Plains and Ravendale Alternative Alignments
Alternative Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
C
D
E
F
G
H
I
J
K
L
ESVA
Madeline
Madeline Plains
Whitinger Mtn
Ninemile Pl
Three Peaks
McDonald Peak
Maiden Flat
Dorsey Butte
Coyote Flat
Termo
Dry Valley Gap
Dry Valley Ridge
Sage
Dill Butte
Gravel Pit
Ravendale
McCoy Flat
Cleghorn Flat
Twin Buttes
Spanish Springs Peak
Troxel Pt
Stones
Snowstorm Mtn
Two Tree
Shinn Peaks
Rye Patch Canyon
Long Canyon
Juniper Ridge
Schott Canyon
Fredonyer Peak
Horse Lake
5287
5290
5302
5308
5329
5313
5340
5378
5409
5303
5500
5039
5471
5115
Diaz 5312


ALTURAS TRANSMISSION LINE EIR/S
Figure B.4-3
East Secret Valley Alternative
Proposed Transmission Line Route
East Secret Valley Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
K
L
N
O
ESVA
Termo
Ravendale
Dill Butte
Gravel Pit
Twin Buttes
Snowstorm Mtn
Saddle Rock
Karlo
Nye
Mud Flat
Little Mud Flat
Viewland
Shaffer Mtn
Radio Facility
Leavitt
Litchfield
Standish
Wendel
Hot Springs Peak
Five Springs Mtn
Shinn Peaks
Black Mtn
Long
Tunnison Mtn
Hunter
Bald Mtn


ALTURAS TRANSMISSION LINE EIR/S
Figure B.4-4
Wendel and West Fort Sage Mountains Alternative Alignments
Alternative Transmission Line Route
Proposed Transmission Line Route
N
W
E
S
0
5
10
Scale in Miles
Basemap: USGS 1:250,000 Quadrangles: Susanville, CA Rev.1962; Chico, CA Rev. 1970; Lovelock, NV Rev. 1970; Reno, NV 1971
L
ESVA
M
N
O
P
Q
R
Little Mud Flat
Viewland
U.S. 395
Hot Springs Peak
Wendel
MILITARY
RESERVATION
PACIFIC
BOUNDARY
Herlong
Amedee
SIERRA ARMY DEPOT
LAKE
The Island
VALLEY
Herlong
WASHOE COUNTY
SOUTHERN PACIFIC
WESTERN PACIFIC
HONEY LAKE VALLEY
ALKALI FLAT
Turtle Mtn
McKesick Peak
LASSEN
PLUMAS
Sugarloaf
Doyle
WESTERN PACIFIC
Long Valley
Constantia
NATIONAL FOREST
SEVEN LAKES
RED ROCK

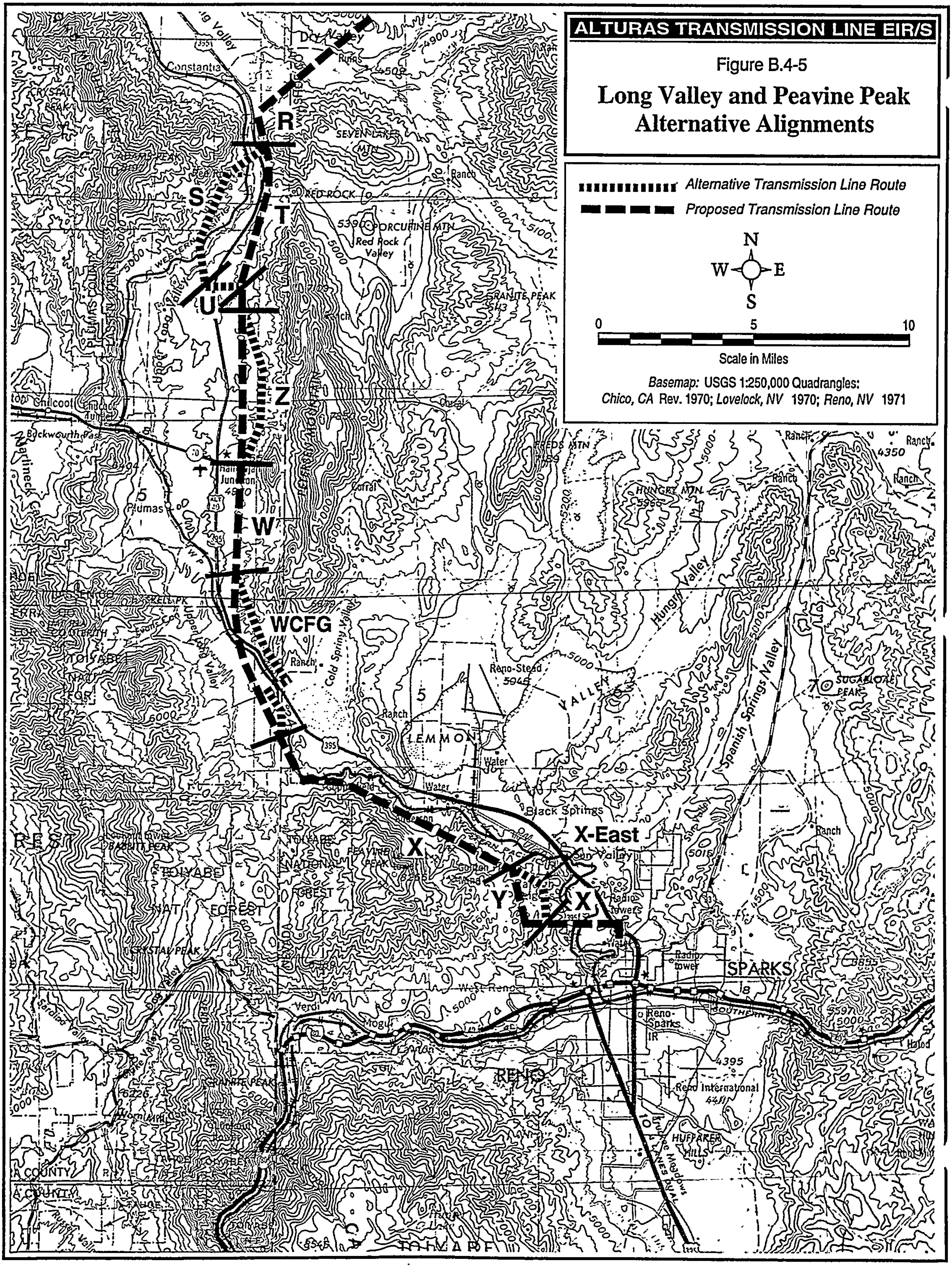


Figure B.4-5

Long Valley and Peavine Peak Alternative Alignments

Alternative Segment D

Alternative Segment D extends from its intersection with Proposed Segments C and E, south, to its intersection with Alternative Segments F and G at Angle Point DØ8, east of Anderson Mountain. The landscape along Alternative Segment D consists primarily of rolling hills and angular ridgelines covered by scrub vegetation and patchy-to-dense stands of juniper. From Angle Point C10 to Angle Point DØ1, Alternative Segment D passes southeast of Harter Flat and Nelson Corral Reservoir. The alternative parallels the Nelson Corral Reservoir unpaved access road and then crosses several four-wheel drive roads. From Angle Point DØ1 to Angle Point DØ7 the alternative crosses juniper- and scrub-covered hills and several four-wheel drive roads, before reaching Sagebrush Flat at Angle Point DØ7. Between Angle Points DØ3 and DØ4, Alternative Segment D crosses Ash Valley Road within Holbrook Canyon. From Angle Point DØ7, the alternative extends southeast along the southeastern edge of Sagebrush Flat before passing through Anderson Canyon to Angle Point DØ8, paralleling the four-wheel drive access road to Spooner Reservoir.

Alternative Segment F

Alternative Segment F extends from Angle Point DØ8, east of Anderson Mountain, south to its intersection with Alternative Segments G, J, and I, approximately two miles west of Angle Point EØ8 on U.S. 395 at Angle Point FØ4/JØ1. Alternative Segment F is more distant from U.S. 395 than Alternative Segment G (both having a north-south orientation). Alternative Segment F crosses the Madeline Plains approximately four to five miles to the west of U.S. 395 and passes approximately one-half mile east of Ninemile Point. The landscape crossed by Alternative Segment F is primarily agricultural fields and flat scrub-covered plains. The alternative would be backdropped by the distant hills to the west of the plains, becoming more visible as it turns east at Angle Point FØ3 toward U.S. 395. This portion of Alternative Segment F crosses public and private lands. In addition, between Angle Points DØ8 and FØ1, the alternative crosses an existing telecommunication line.

Alternative Segment G

Alternative Segment G extends from Angle Point DØ8, south to its intersection with Alternative Segments G, J and I at Angle Point FØ4/JØ1. Alternative Segment G crosses the Madeline Plains approximately three miles closer to U.S. 395 than Alternative Segment F does. Like Alternative Segment F, Alternative Segment G also crosses private and public lands used primarily for agricultural activities.

Alternative Segment H

Alternative Segment H is a very short connection between Alternative Segments F and I. Alternative Segment H crosses one private and one BLM parcel.

Alternative Segment I

Alternative Segment I is a relatively short (two-mile) connecting segment that extends from Angle Point JØ1, due east to Angle Point IØ1, immediately adjacent to U.S. 395, directly across from Angle Point EØ8. Alternative Segment I was added by SPPCo to provide a connection between Proposed Segment E and Alternative Segment J, or Alternative Segments D, F, G, and H with Proposed Segment K. Alternative Segment I crosses agricultural areas and scrub vegetation as it converges on U.S. 395. Between Angle Point IØ1 and U.S. 395, the alternative would cross an existing telecommunication line.

B.4.1.3 Ravendale Alternative Alignment (Segment J,I)

Alternative Segment J would replace Proposed Segment K and would traverse hills near Branham Reservoir, west of Ravendale. Access to Alternative Segment J would be gained via Alternative Segment I (see description above). Alternative Segment J extends from Angle Point, FØ4/JØ1 south and southeast to its intersection with Proposed Segments K and L near Snowstorm Creek. Alternative Segment J would provide a more concealed alternative to the more visible Proposed Segment K that parallels U.S. 395 before diverging from the highway in the vicinity of Ravendale.

Alternative Segment J crosses the southern portion of the Madeline Plains before entering hilly terrain west, and southwest, of Ravendale. The landscape along this alternative transitions from the open agricultural and scrub lands of the Madeline Plains to the scrub- and juniper-covered hills to the south. Between Angle Points JØ3 and JØ4, Alternative Segment J crosses the paved, two-lane Termo-Grasshopper Road which extends from Termo on U.S. 395, west to State Route 139 in Grasshopper Valley. From Angle Points JØ4 to JØ8 the alternative crosses Schott Canyon Road (to Horse Lake), Horse Lake Road, and several four-wheel drive roads in the hills and mountains northeast of Horse Lake. This portion of Alternative Segment J would require upgrading of existing four-wheel drive roads in the vicinity of Angle Points JØ4 and JØ5, as well as intermittent blading to allow overland travel. Alternative Segment J is located predominantly on public lands.

Alternative Segment J,I: 19.2 miles Proposed Segment K: 15.4 miles

B.4.1.4 East Secret Valley Alignment (Segment ESVA)

Alternative Segment ESVA would be located about 1.5 miles to the east of Proposed Segment L, adjacent to the east side of U.S. 395 (see Figure B.4-5). Alternative Segment ESVA would depart from the proposed route at Angle Point LØ1 north of Snowstorm Mountain and would traverse the east side of Secret Valley, rejoining the proposed route at Angle Point NØ2. The BLM recommended Alternative Segment ESVA to mitigate visual impacts along the highway and at the roadside rest stop near Tule Patch Spring.

Alternative Segment ESVA: 23.0 miles Proposed Segment L,N: 21.1 miles

B.4.1.5 Wendel Alternative Alignment (Segment M)

Alternative Segment M essentially provides a Honey Lake Valley alternative to Proposed Segment N crossing of the Skedaddle Mountains. At its junction with Proposed Segments L and N at Angle Point LØ8, Alternative Segment M extends south and east around the base of the foothills of the Skedaddle Mountains before rejoining Proposed Segment N (Angle Point MØ3) northeast of Wendel. Alternative Segment M stays at a lower elevation than Proposed Segment N and parallels the Southern Pacific Railroad between Angle Points MØ1 and MØ2. Alternative Segment M generally crosses scrub vegetation in northern Honey Lake Valley. Views in this vicinity are generally dominated by the Skedaddle Mountains to the north and east, and panoramic vistas to the east, south and west across Honey Lake Valley to the Fort Sage and Diamond Mountains in the distance. Alternative Segment M would be visible from Wendel Road. Alternative Segment M crosses private lands, as well as public lands.

Alternative Segment M: 3.6 miles Proposed Segment N: 3.2 miles

B.4.1.6 West Side of Fort Sage Mountains (Segment P)

Alternative Segment P provides an alternative alignment to Proposed Segment Q located on the east side of the Fort Sage Mountains. From Honey Lake Valley (Angle Point OØ5), Alternative Segment P extends south along the western foothills of the Fort Sage Mountains and on the west side of Long Valley, before intersecting Proposed Segments Q and R at Angle Point PØ9. Alternative Segment P would be visible to motorists on U.S. 395, which is approximately three miles west of the northern portion of the alternative segment, and U.S. 395 converges to within less than one-half mile at the southern end of the alternative segment. The terrain between U.S. 395 and Alternative Segment P consists of expansive, flat, scrub-covered plains. The northern portion of the alternative would appear as a distant background feature with the Fort Sage Mountains beyond. The southern portion of the alternative would be considerably more visible due to its closer proximity to U.S. 395. Between Angle Points QØ5 and PØ1, Alternative Segment P crosses an existing overhead telecommunication line. Alternative Segment P could reduce the potential land use impacts associated with transmission line routing east of the Fort Sage Mountains.

Alternative Segment P: 17.6 miles Proposed Segment Q: 21.0 miles

B.4.1.7 Long Valley Alignments (Segments S, U, Z, and WCFG Alternative)

The Long Valley Alternative Alignments include Alternative Segments S, U, Z, and an alternative alignment (referred to as the WCFG Segment) identified by the CDFG. The combination of Alternative Segments S and U provide a routing alternative to Proposed Segment T. Alternative Segment Z provides a more easterly route to Proposed Segment W, between Angle Points WØ1 and WNØ4. The Alternative Segment WCFG provides a more easterly routing alternative to Proposed Segment WØ3 through XØ1 near the Border Town Substation site.

Alternative Segments S, U

From its northern junction with Proposed Segment R at Angle Point RØ2 (adjacent to U.S. 395 and just north of the U.S. 395/Red Rock Road intersection), Alternative Segment S extends south to its junction with Alternative Segment U. Alternative Segment S crosses U.S. 395 at Angle Point RØ2 and travels in a southwest direction, crossing to the west side of the Southern Pacific Railroad, west of Long Valley Creek. Generally, Alternative Segment S then parallels the railroad to its southern terminus at Angle Point SNØ1. This alternative would be visible to motorists travelling north and south on U.S. 395, particularly that portion of the alternative that crosses U.S. 395 near Angle Point RØ2. Alternative Segment S then crosses to the west of U.S. 395 to Long Valley.

Alternative Segment U is a relatively short (approximately two miles) crossover segment that connects Alternative Segment S (at Angle Point SNØ1) with Proposed Segment W (at Angle Point WNØ1). Alternative Segment U travels in a northwest-southeast direction, crossing an existing overhead telecommunication line and U.S. 395. Alternative Segment U crosses a relatively flat, scrub- and sage-dominated landscape with scattered juniper. This alternative would be visible to both northbound and southbound motorists on U.S. 395. Alternative Segment U would cross BLM lands.

Alternative Segments S,U: 5.9 miles Proposed Segment T: 4.9 miles

Alternative Segment Z

Alternative Segment Z is a bypass segment that is located approximately one-half mile to the east (at its most distant point) of Proposed Segment W, between Angle Points WØ1 and WNØ4. Alternative Segment Z was located to bypass private property approximately two miles northeast of Hallelujah Junction. Alternative Segment Z would be located further to the east than Proposed Segment W, at a slightly higher elevation, as it crosses a series of finger ridges and foothills at the base of Petersen Mountain.

Alternative Segment Z: 4.5 miles Proposed Segment W: 3.8 miles

Alternative Segment WCFG

Alternative Segment WCFG provides an alternative route, north of U.S. 395, to Proposed Segments W and X between Angle Point WNØ4 (just north of Angle Point WØ3) and Border Town Substation near Angle Point XØ1. Between Angle Points WNØ4 and WNØ6, the alternative crosses numerous finger ridges in the southwestern foothills of Petersen Mountain. Between WNØ6 and WNØ7, Alternative Segment WCFG crosses U.S. 395 before turning southeast and then south to the Border Town Substation site. Vegetation along Alternative Segment WCFG is primarily scrub and sagebrush. Alternative Segment WCFG would be visible to both north and southbound viewers on U.S. 395 and Border Town residents oriented toward Long Valley. The alternative segment would cross BLM lands.

Alternative Segment WCFG: 4.2 miles Proposed Segment W: 4.0 miles

B.4.1.8 Peavine Peak Alternative Alignment (Segment X-East)

Alternative Segment X-East would replace Proposed Segment Y and would bring the route further down the slope from Peavine Peak into an existing transmission line corridor for a portion of the route. From Angle Points XØ9 to X12, Alternative Segment X-East provides a more easterly alternative to Proposed Segment Y, crossing the eastern foothills of Peavine Peak. From Angle Point XØ9 through X12, the alternative crosses similar landscapes as Proposed Segment Y. Alternative Segment X-East would be seen by residences at the western-most end of Hoge Road. Other developed features in the landscape include a radio transmission tower and fence lines.

Alternative Segment X-East: 2.3 miles Proposed Segment Y: 2.1 miles

B.4.2 SUBSTATION ALTERNATIVES

B.4.2.1 Alturas Substation Alternative (Mill Site)

The Alturas Substation Alternative, known as the Mill Site, is located adjacent to Alternative Segment B, between Angle Points BØ6 and BØ7. The site would be located in an open, grass and scrub vegetated field south of Highway 299 and immediately north of the western end of 4th Street, west of Alturas. From the north, the site would be visible to residents adjacent to, and motorists on, Highway 299. The site would also be visible to residents on Mill Street to the east, motorists on 4th street immediately to the south, two rural residences to the southwest, and a rural residence to the west (see Figure B.4-1). It is approximately eight acres in size.

B.4.2.2 Border Town Substation Alternative (SPPCo Site)

An alternative site for the proposed Border Town substation is located just to the south of the proposed substation site (see Figure B.2-9). It is about 176 acres in size and is owned by SPPCo. Facilities to be located on this site would be the same as described in Section B.2.2.3.

B.4.3 NO PROJECT ALTERNATIVE

The No Project Alternative required for consideration under CEQA and NEPA regulations would mean that the Alturas Transmission Line Project would not be built. Under the No Project Alternative, no adverse environmental impacts from the construction and operation of the Proposed Project would occur. However, SPPCo would need to augment existing facilities and add new transmission and generation capacity to compensate for existing system limitations and anticipated load growth.

Over the short-term (one to three years) some existing system limitations could be mitigated by augmenting existing transmission facilities (e.g., system enhancement alternatives and Frenchman Tap

type projects) and constructing new generation capacity (e.g., Piñon Pine Power Plant and Fort Churchill Combustion Turbine). These short-term transmission modifications would provide some improvement in the service reliability to the Reno/Lake Tahoe area, but not to the level required by SPPCo in the event projected load growth is realized. In addition, none of the short-term system modifications would provide additional access to the Pacific Northwest power market or improve import capability, with the exception of improved response for long-term emergencies.

To improve import capability and gain additional access to the Pacific Northwest power market, SPPCo would need to pursue a major transmission facility comparable to the Proposed Project. Given design, permitting and construction timelines, SPPCo does not expect such a transmission facility would be available for operation until the year 2000-2002 timeframe. This delay would severely affect SPPCo's ability to service projected growth, in accordance with Western State Coordinating Council Operating Guidelines (see Section A.6, Purpose and Need).

B.5 SCENARIO FOR ANALYSIS OF CUMULATIVE IMPACTS

The cumulative scenario consists of projects that are reasonably foreseeable (i.e., planned or projected) during the life of the proposed Alturas Transmission Line Project. This section provides a listing of various projects comprising the cumulative scenario. These projects are listed as cumulative projects to the Alturas Transmission Line based on discussions with various planning agencies overseeing the projects. Therefore, the listed projects are those which, when considered together with the Alturas Transmission Line, may compound or increase environmental impacts.

Cumulative projects do not include existing projects that are completed or in operation (with the exception of existing projects that would have increased activities over the baseline assumptions). These existing projects are included in the environmental setting for individual issue areas in Part C. Section E-3, Growth-Inducing Impacts of the Proposed Project, discusses the potential of the Proposed Project to encourage other utility companies to propose additional utility construction within the project right-of-way. Table B-14 presents the cumulative projects considered for this study. Cumulative projects are mapped, by segment, on the Base Maps at the end of Volume I, showing the approximate geographic locations of key future projects in the study area.

Tuscarora Pipeline. The Tuscarora Natural Gas Pipeline Project is a 250 mile pressurized underground natural gas pipeline and ancillary facilities that would transport natural gas from Malin, Oregon to SPPCo's existing Tracy Thermal-Electric Power Generation Plant located East of Reno, Nevada, and is considered a linear project. The Tuscarora Pipeline is designed to transport approximately 110 million cubic feet per day of sweet natural gas at a maximum operating pressure of 1,000 pounds per square inch. The pipeline would be buried with a minimum depth of cover of 36 inches in soil and 24 inches in rock. The proposed width of the permanent right-of-way (easement) is 50 feet. During construction, the required right-of-way would consist of the permanent easement plus additional temporary working space, but would not exceed 100 feet in width.

Table B-14 Cumulative Projects by County

Site No.	Project	Project Type	Project Location	Proximity Proposed Project	Permitting Status
Linear Projects (Multi-County)					
*	Tuscarora Pipeline	20-inch diameter pressurized, underground, natural gas pipeline	See text description	See text description	Approved; projected completion 12/95
Modoc County					
1*	Centerville Estates	One Land Subdivision	Near Three Sisters; northwest of Centerville Road	Approximately 2 miles west of Hwy 395	Approval pending
2*	Modoc Farms T00	One Land Subdivision	Near Three Sisters; Northwest of Centerville Road	Approximately 2 miles west of Hwy 395	Approved
3*	Wildlife Estates	One Land Subdivision (residential)	West of U.S. 395; south of Centerville Road	Approximately 2 miles west of Hwy 395	Approved/not recorded; pending road improvements
4*	Land Subdivision	Three subdivisions	Township 41-42, approximately 3.5 miles west of Hwy 395	Near proposed project route Segments A-6 to C-1	Approved
Lassen County					
5+	Hog Farm	Swine rearing and finishing facility	Assessor Parcel No. 119-200-10; 2 miles east of Hwy 395; north of Honey Lake Valley	Near alternative project route Segment M, south of L-8	Approval pending
6*	LMUD Intertie with the Alturas Transmission Line	Intertie of a municipal transmission line to the Alturas 345 kV line to provide a more economical power and energy source for Lassen County	Would cross through eastern portion of Lassen County and LMUD's service area	LMUD intertie at Wendel site in East Lassen County	Project completion projected at approximately 2004
7+	Gas-fired Power Plant	Development of a 200 MW Gas-fired Power Plant being considered by Raytheon Engineers and Constructors, and LRRW Power Plant	Near Calneva Lake	Approximately 3 miles east of angle point 0-05	Application pending
8+	Fish Springs Ranch Pumping Project	Pump 13,000 acre feet of water per year from Fish Springs Ranch to the Lemmon Valley Area	East side of Fort Sage Mountains	Portion of route is near proposed project route Segment Q	Application pending
9*	Sierra Lady Mineral Project	Establishment and operation of a pozzolan recovery and processing operation	East of Long Valley along route	Four 5-acre sites near route Segments U, V, W, and Z	Approved 12/2/93; 5 year projected completion
10	California Correctional Facility	New correctional facility	Susanville area	13 miles from proposed project	State approved project; 90% constructed; projected completion 12/95

Site No.	Project	Project Type	Project Location	Proximity Proposed Project	Permitting Status
			Sierra County		
11*	Ski Resort/Golf Course	Large ski resort and 18-hole golf course	Long Valley/Balls Canyon area	Less than 1 mile west of Hwy 395	Application withdrawn
			Washoe County		
18	Residential development; up to 335 homes on 440 acre site	Residential subdivision, Washoe County North Valleys Area Plan amendment	Washoe County, California/Nevada border, south of Border Town area	Alturas Project would traverse subject property	Application filed with Washoe County
19	Evans Creek Watershed Project	Flood control dam and drainage pipe (54")	Northwestern Reno	Soil excavation area for dam within Segment X	Permit Application by summer 1996
			BLM Lands		
12	East Lassen Management Area	Ecosystem management project; would involve managing multiple uses within an ecosystem framework	East Lassen Management Area		Currently at early EIS preparation stage
13*	BLM/CDFG Land Exchange	BLM would exchange a portion of Bass Hill for portion of Doyle Wildlife Area	South of Honey Lake Valley and West of Virginia Mountains	Near proposed project Segment Q	Approval pending for 2-3 years
14+	Alturas Reservoir Management Project	Existing artificial irrigation reservoirs would be managed to enhance the recreational fishery by managing timing of irrigation	Hollbrook Canyon Area	Near proposed project Segment D (angle point D-01)	Cooperative Agreement under Negotiations
15*	Infernal Caverns Battlefield Trail Project	Land exchange and development of battlefield area as a historical site with Construction of a 4.5 mile, 3 foot wide recreational trail leading to the Infernal Caverns Battlefield	Infernal Caverns Area	Near proposed project segment (between angle points C-03 and C-04)	Environmental Assessment approved for portion of trail on BLM
16	West Valley Pumped Storage Hydroelectric Plant (WVPSHP)	Proposed WVPSHP would consist of existing Moon Lake Dam/Spillway and a new dam	Between Moon Lake Reservoir and West Valley Reservoir adjacent to and including Cedar Creek on BLM Lands	Approximately 5 miles east of Hwy 395	Preliminary application under FERC review
17+	Ravendale School	Proposed elementary school	Termo-Grasshopper Road	Near route Segments J-3 to J-4	Lease approved; projected completion 6/96

* Project plotted on base maps for Proposed Project (at the end of Volume I)
\+ Project plotted on base maps for alternative route segments (at the end of Volume I)

The route of the Tuscarora Natural Gas Pipeline Project is adjacent to the proposed transmission line along approximately 37 miles of their length. As illustrated on the base maps at the end of Volume I, the pipeline would either cross or traverse along the same corridor as the Alturas Transmission Line in the following locations:

- At approximately 4.6 miles south-west of the City of Alturas the two routes cross
- At approximately 3.0 miles south of Madeline the two routes join and traverse south along the same corridor for approximately 14 miles, splitting at approximately 4 miles southeast of Termo
- One mile northeast of Tule Patch Spring the two routes join and traverse south along the same corridor for approximately 13 miles through Secret Valley and Mud Flat.
- At approximately 2.5 miles southeast of Wendel, the two routes join and traverse the same corridor for approximately 8.0 miles to the northeast corner of the Sierra Army Deport boundary.
- Finally, the two routes cross on the east side of the Fort Sage Mountains, and then join and traverse south along the same corridor for approximately 1.7 miles.

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