DOE/EIS-0050-FS

Final Supplement
Final Environmental Impact Statement

BONNEVILLE POWER ADMINISTRATION

Proposed Fiscal Year 1979 Program

Facility Location Supplement

Southwest Oregon Area Service, Buckley - Summer Lake 500 kV Line

U.S. Department of Energy

June 1980

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U.S. Department of Energy
Washington, D.C. 20545

Responsible Official

Ruth C. Clusen
Assistant Secretary for Environment

June 1980

Summary

( ) Draft (X) Final Facility Location Supplement
Department of Energy, Bonneville Power Administration

1. Type of Action: (X) Administrative ( ) Legislative

2. Brief Description of Action:

The Bonneville Power Administration (BPA) proposes to construct transmission facilities which will coordinate with the Midpoint-Malin 500-kV line to be constructed by the Pacific Power and Light (PP&L) Company. These are: (1) the 156-mile (250 km) Buckley-Summer Lake 500-kV line which is scheduled to be energized in the fall of 1982, (2) the 84-mile (135 km) LaGrande-McNary 500-kV line, (3) a 44-mile (70 km) McNary-Slatt 500-kV line to be constructed by BPA when additional generation is added at McNary. This coordinated project will facilitate the transfer of electric power from the Pacific Northwest to BPA customers in southern Idaho and Utah. In addition, it allows power generated in Wyoming to be delivered to the Pacific Northwest, including southwest Oregon. It would also reinforce the existing PNW-PSW Intertie within the State of Oregon. Finally, the BPA facilities provide additional transmission capacity for wheeling services and other transactions needed in the region. Additional discussion of the planning for the project appears in the Final Facility Planning Supplement for Southwest Oregon Service.

This document assesses the environmental impacts of the proposed 156-mile Buckley-Summer Lake 500-kV transmission line; the proposed Buckley Substation near Maupin, Oregon; and the proposed Summer Lake Substation near Silver Lake, Oregon.

3. States and Counties Involved: Wasco, Jefferson, Crook, Deschutes, Lake, and Klamath counties; all within the State of Oregon.

4. Summary of Environmental Impacts and Adverse Environmental Effects:

The proposed facilities will parallel an existing transmission corridor for their entire length. Buckley Substation will be built on about 10 acres of non-irrigated farmland used for wheat farming. Summer Lake Substation will require about 10 acres of low density ponderosa pine forest land. This forest cover primarily serves as wildlife habitat. The transmission line will cross several types of land cover, including (in order of magnitude): rangeland, forest range, forest, non-irrigated agriculture, agriculture. The most significant impacts will be in forest and agricultural land.

5. Alternatives Considered:

Non-construction, energy conservation and load management were considered as alternatives. They are discussed in the Final Facility Planning Supplement for Southwest Oregon Service filed September 24, 1979. The Draft Role EIS, Appendix B, discusses alternatives to construction, including local generation, underground transmission, as well as alternative methods of locating transmission facilities.

6. Comments Have Been Requested From the Following Agencies:

U.S. Department of Agriculture: Forest Service; Soil Conservation Service; U.S. Department of Defense: Army Corps of Engineers; U.S. Department of the Interior: Bureau of Indian Affairs; Bureau of Land Management; Fish and Wildlife Service; Geologic Survey; Heritage Conservation and Recreation Service; State of Oregon. (See pages 37-38 for a complete list).

7. Date Made Available to Environmental Protection Agency and to the Public:

Draft Supplement: November 5, 1979
Final Supplement:

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SOUTHWEST OREGON SERVICE: BUCKLEY-SUMMER LAKE 500-kV TRANSMISSION LINE

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INTRODUCTION

The Bonneville Power Administration (BPA) proposes to construct transmission facilities which will coordinate with the Midpoint-Malin 500-kV line to be constructed by the Pacific Power and Light (PP&L) Company. These are: (1) the 156-mile (250 km) Buckley-Summer Lake 500-kV line which is scheduled to be energized in the fall of 1982, and (2) the 84-mile (135 km) LaGrande-McNary 500-kV line (BPA will build the LaGrande to McNary portion of the Brownlee-McNary line. Idaho Power Company will build the section of line between Brownlee and LaGrande) which will be a future budget item with a tentative energization date of January 1987; and, (3) a 44-mile (70 km) McNary-Slatt 500-kV line to be constructed by BPA when additional generation is added at McNary. This coordinated project will facilitate the transfer of electric power from the Pacific Northwest to BPA customers in southern Idaho and Utah. In addition it allows power generated in Wyoming to be delivered to the Pacific Northwest including southwest Oregon. It would also reinforce the existing PNW-PSW Intertie within the State of Oregon. Finally the BPA facilities provide additional transmission capacity for wheeling services and other transactions needed in the region. Additional discussion of the planning for the project appears in the Final Facility Planning Supplement for Southwest Oregon Service.

This document assesses environmental impacts of the proposed Buckley-Summer Lake 500-kV transmission line; the proposed Buckley Substation near Maupin, Oregon; and the proposed Summer Lake Substation near Silver Lake, Oregon. Figure 1 shows the geographic location of the project study area.

LOCATION DESCRIPTION

One route has been examined for construction of a 500-kV single-circuit transmission line between Buckley Substation and Summer Lake Substation (Figure 2). This route is adjacent to the east side of an existing corridor containing two single-circuit 500-kV lines.

Buckley Substation would be 10 miles east of Maupin at the intersection of the BPA Slatt/Marion 500-kV and the BPA John Day/Grizzly 500-kV lines (Figure 2). From this substation, the single-circuit 500-kV would be adjacent to the John Day/Grizzly No. 1 and No. 2 500-kV lines south for 53.5 miles to BPA's Grizzly Substation, 12 miles southeast of Madras. The Bakeoven compensation station is 5 miles south of the proposed location for Buckley Substation.

Summer Lake Substation would be about 10 miles south of the intersection of the AC Intertie lines and Oregon State Highway 31. This is where PP&L's proposed Midpoint-Malin transmission line intersects the AC Intertie lines.

The proposed substation site is located 1/4 mile north of the intersection where PP&L's Midpoint-Malin line will join the existing corridor. In the draft EIS this was identified as Site 3. Two other sites were considered. Alternate Site 1 is located 3/4 mile south of the line intersection while Alternate Site 2 is 1/4 mile south of the intersection. All sites are adjacent to the east side of the existing corridor. Because conditions at the three sites are similar the later discussion of impacts at the proposed site will apply to the alternative sites unless indicated differently in the text. The substation site will not be discussed within a resource category if that resource will not be affected.

Between Grizzly and Malin substations the existing corridor that would be paralleled contains BPA's Grizzly/Malin No. 1 500-kV line and Portland General Electric Company's Grizzly/Malin 500-kV line. Malin Substation is 76 miles south of the sites for Summer Lake Substation. Three compensation stations, (Sand Springs, Fort Rock, and Sycan) are located at intervals along the 178.5 miles between Grizzly and Malin. Compensation stations, in effect, shorten the length of the line electrically. The new 500-kV line would be located east of the existing corridor.

Utilization of the electrical power transmitted from Buckley to Summer Lake requires construction of PP&L's Midpoint-Malin transmission line. Power flowing from Buckley to Summer Lake will be transferred to PP&L's line at Summer Lake Substation. If PP&L was unable to construct the Midpoint-Malin line in time to meet energization requirements, BPA planned to also construct the transmission line between Summer Lake and Malin substations. The construction of Summer Lake Substation would have been deferred until PP&L constructs its line from Midpoint Substation to the AC Intertie corridor.

On October 2, 1979, PP&L received the final Federal right-of-way grant from the Bureau of Land Management for construction of the Midpoint-Summer Lake and Summer Lake-Malin Transmission Line. PP&L plans to award construction contracts in October 1980 and will build the transmission line between Summer Lake Substation and Malin Substation. As a result, BPA construction between Summer Lake and Malin is not being considered.

This document includes discussion of the impact of the 76-mile section of line which BPA might have constructed from Summer Lake to Malin Substation. Rather than being discussed in a separate part of the

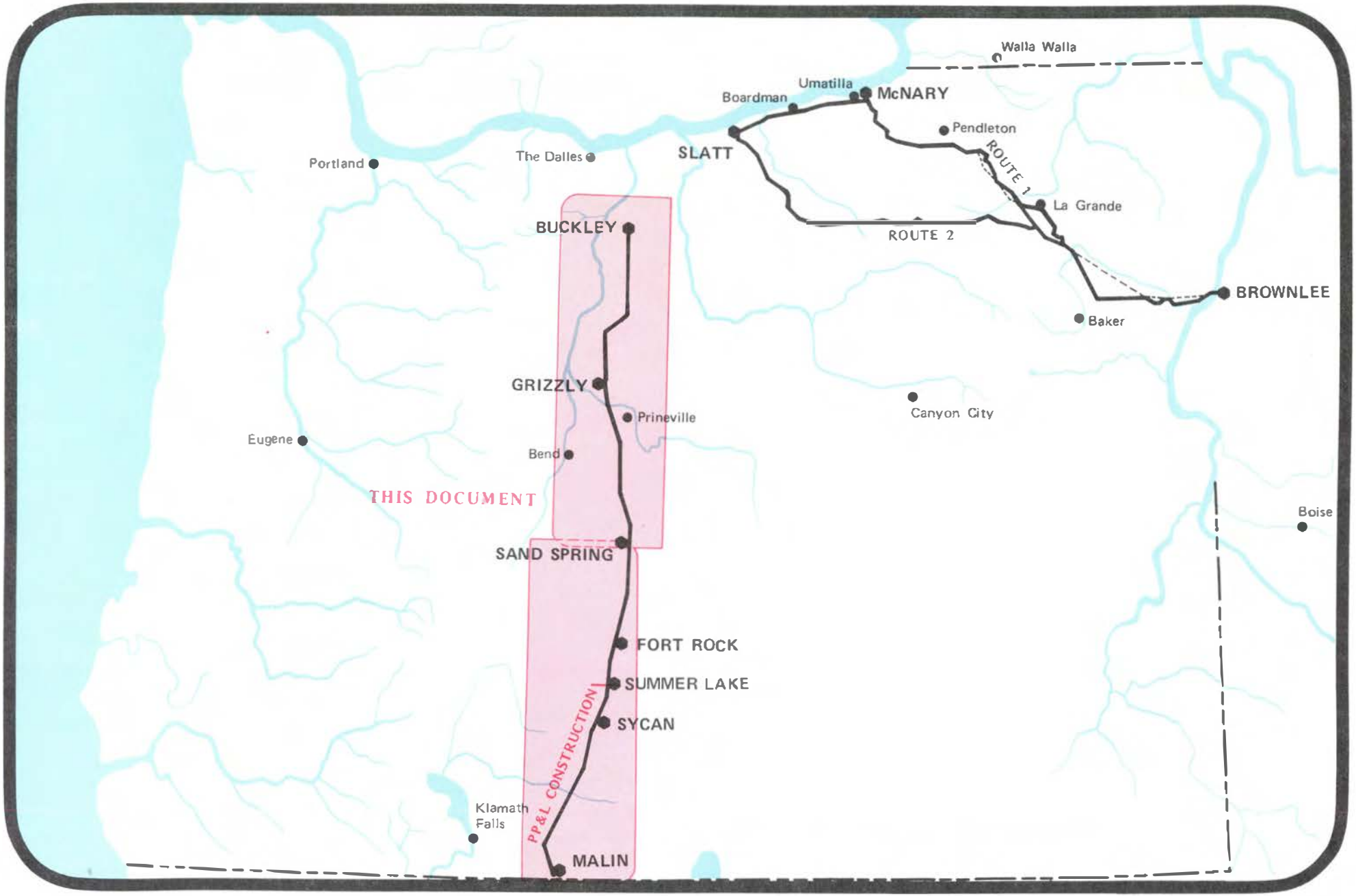

FIGURE 1
KEY MAP
SOUTHWEST OREGON SERVICE
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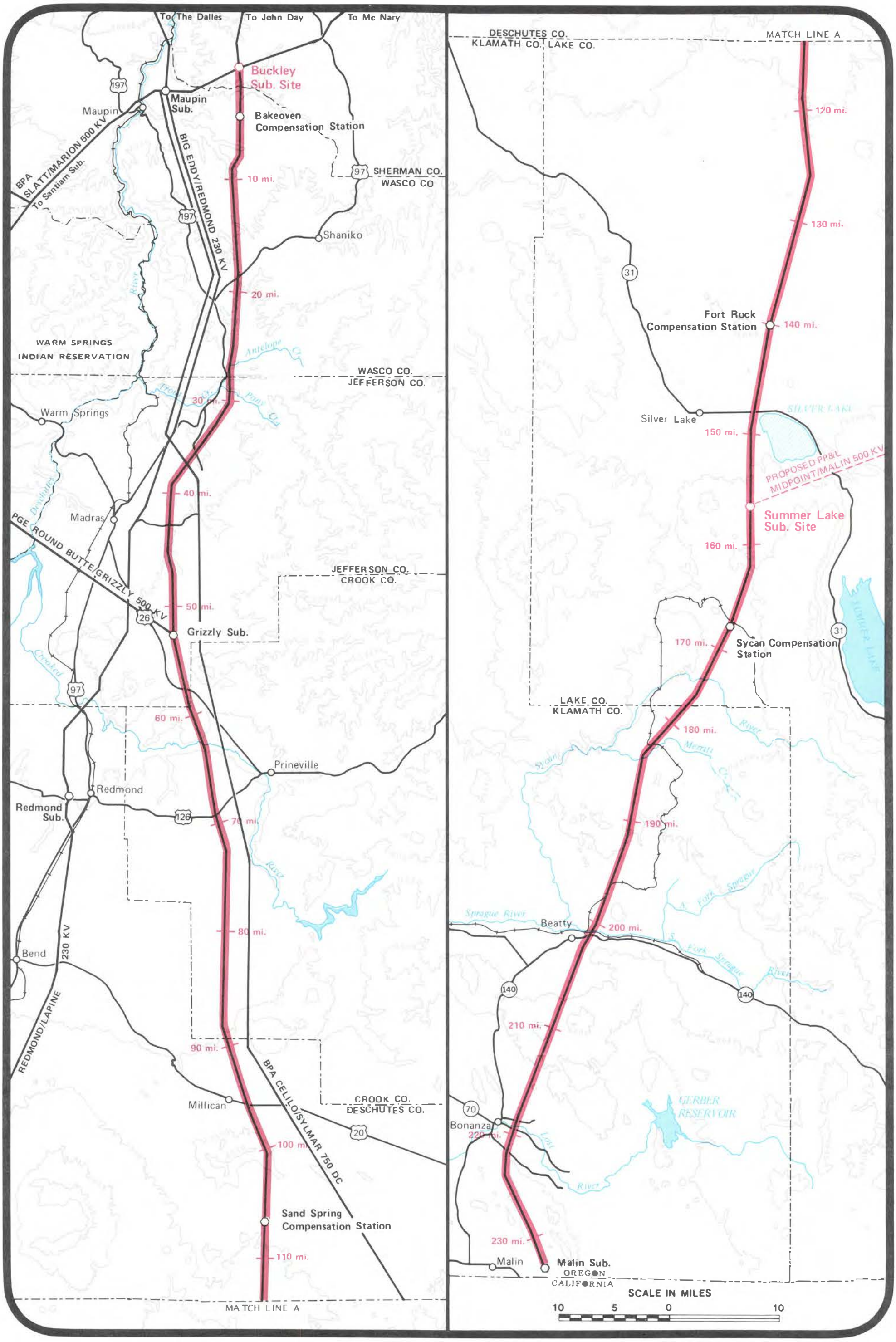

FIGURE 2
BUCKLEY–SUMMER LAKE STUDY AREA
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document, it appears concurrently under each resource heading with the discussion of the Buckley-Summer Lake transmission line and Buckley and Summer Lake substations. There is no specific discussion of Impacts for the Summer Lake to Malin segment if the particular resource will not be impacted, or if the nature of general impacts is not different from Buckley to Summer Lake impacts. Additional information on the Summer Lake to Malin Line segment can be found in the Final EIS for PP&L's Midpoint, Idaho to Medford, Oregon Transmission Line (U.S. Dept. of the Interior, Bureau of Land Management, April, 1979)

GENERAL CONSTRUCTION REQUIREMENTS

Data from this section are summarized in table 1.

Tower Design and Material Requirements

Single-circuit 500-kV towers utilizing a "delta" configuration of conductors will be used for most of this line. Typical tower configurations and dimensions are shown in figure 3. Between miles 40 and 63 a new "cross rope suspension" tower will be used. This tower design requires a wider right-of-way but will require less ground disturbance at tower sites and will require only four towers per mile compared to five for conventional towers.

It is estimated that 8,600 tons of tower steel will be needed. The Summer Lake-Malin line would require an additional 5,000 tons of tower steel. More precise quantities will be known upon completion of surveys and design of the line.

Buckley and Summer Lake substations will be 500-kV switching stations with no transformers. Major components will include manual switches, power circuit breakers and shunt reactors.

Right-of-Way (ROW) Requirements

Construction of the new line would require an additional 77.5 feet of right-of-way (ROW) to allow for adequate clearances between the new and existing lines.

For 23 miles the cross rope suspension towers will require up to 150 feet of new right-of-way. At tower sites an additional 80 ft. by 200 ft. area would be required. These are maximum possible distances and may be somewhat less depending upon the final design of the line.

Buckley Substation would require about 13 acres of land for the substation and access road. Future development at Buckley Substation could require an additional 12 acres of land. Therefore a total of about 25 acres of land will be acquired. Summer Lake Substation would also require about 10 acres of land for the substation. The access road would require about 5 acres of land.

Access Road Requirements

Access roads are necessary for construction and maintenance of the transmission line. Providing access consists of designing and building new roads, improving existing roads to BPA standards and acquiring rights to use and/or improve existing roads. Only minor access road construction and improvement will be required, as the roads acquired or constructed for the two existing lines will serve the new line over most of the route.

Buckley Substation would require the construction of about 3,000 feet of access road to provide access to the substation.

Summer Lake Substation may require upgrading about 8 miles of existing Forest Service access road. It would also require about 0.5 miles of new access road.

Cost Requirements

Total estimated costs for the Buckley-Summer Lake Line is $35.8 million. The estimated costs for the Summer Lake-Malin line is $21.0 million. Buckley and Summer Lake Substations are estimated to cost $6.4 and $4.4 million respectively.

OPERATION AND MAINTENANCE REQUIREMENTS

Operation and maintenance will continue for the life of the transmission line. Operations will have little or no effect on the right-of-way. Maintenance activities such as routine and emergency repair to electrical equipment, tower structures, conductors, and access road work and vegetation management will impact the environment of the ROW. These activities are essential to ensure continued, reliable operation.

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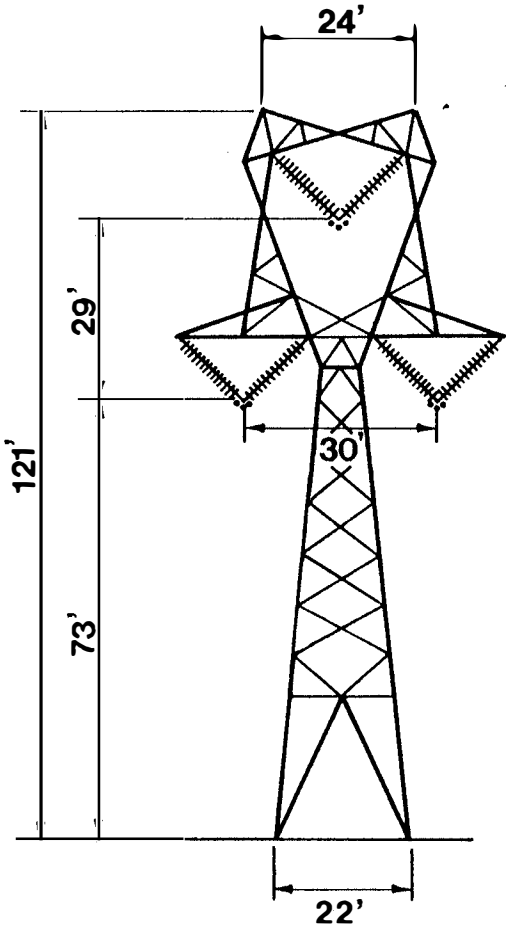
Buckley-Summer Lake:Wg0062P:05-06-80

Table 1. - Transmission Right-of-Way (ROW) and Access Road Requirements

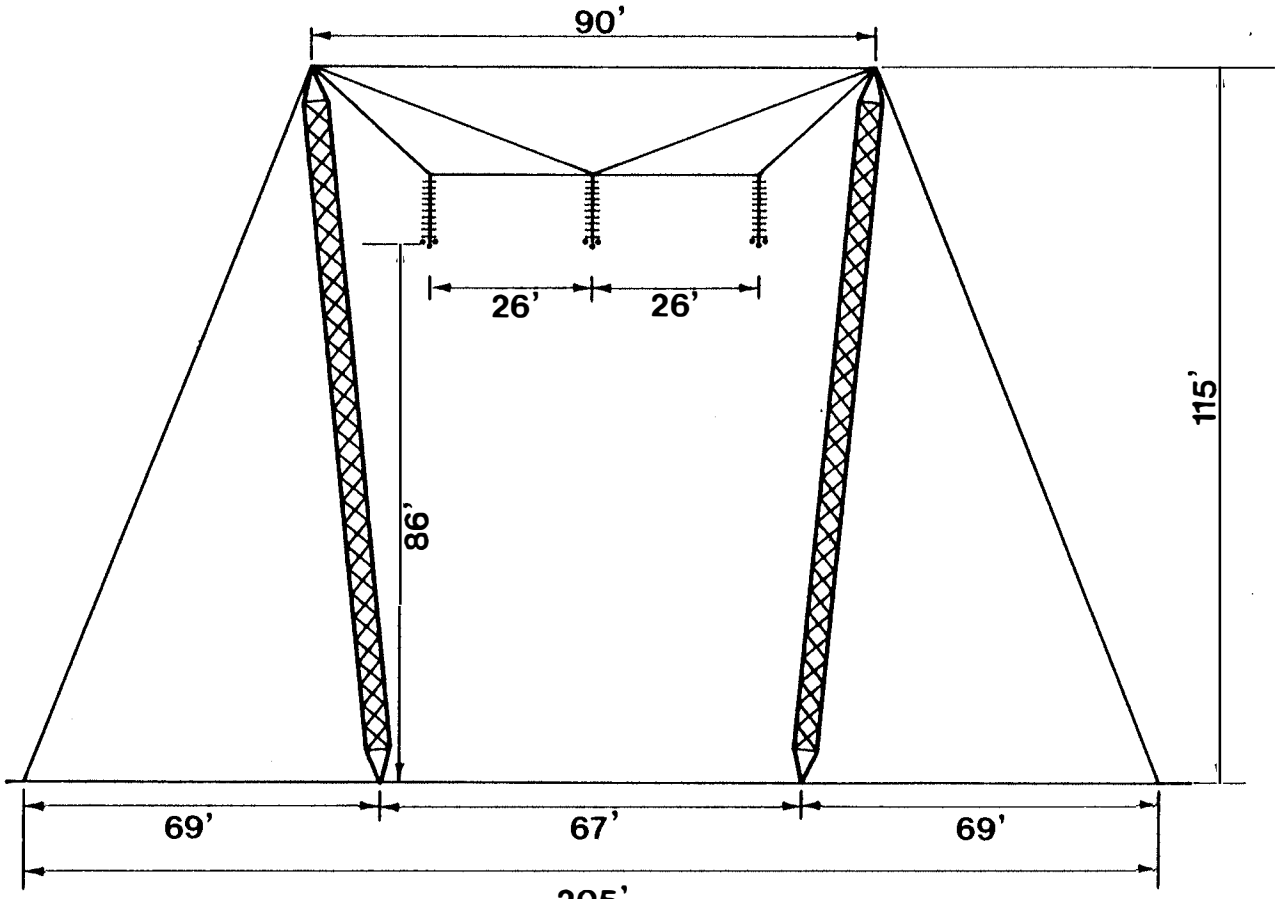
	Buckley-Summer Lake	Summer Lake-Malin
Length	156.4 miles (251.6 km)	75.6 miles (121.6 km)
Towers	Single-Circuit Steel	Single-Circuit Steel
Tons of Steel	8,600 (7800 M.T.)	5,000 (4535 M.T.)
Right-of-Way (ROW)		
Existing Right-of-Way Available	0	0
Additional 77.5 ft. (23.2 meters) Required	133.4 miles (214.6 km)	75.6 miles (121.6 km)
Additional 150 ft. (45.7 meters) Required	23 miles (37.0 km)	
Access Road Requirements		
New construction	0.38 miles (0.6 km)	0.79 miles (1.28 km)
Improve Existing Roads	1.7 miles (2.7 km)	1.2 miles (1.95 km)
Acquire Easement on Existing Roads	0.95 miles (1.5 km)	0
Rock Surfacing	5,500 cu. yd. (4,204 m3)	5,261 cu. yd. (4022 m3)

TYPICAL DIMENSIONS



R/W WIDTH 115'

SELF SUPPORTING SUSPENSION TOWER



R/W WIDTH 150'

CROSS-ROPE SUSPENSION TOWER

FIGURE 3
TOWER CONFIGURATION
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Maintaining the access road system requires an ongoing scheduled program of grading, seeding, ditching and erosion control. This level of maintenance is now being performed on the existing road system. The additional spur roads required for the new line will not significantly affect the scope of road maintenance activities on the ROW.

Management of vegetation on the ROW is another long term maintenance activity. Tall-growing vegetation is controlled to prevent it from growing into or near conductors. Cutting and selective application of herbicides are methods of control . Management of vegetation will be required on a 10-year cycle because of the growth characteristics of the limited areas of forest vegetation found along the proposed line. See the Role EIS, Appendix B, Chapter VI and the Proposed Fiscal Year 1979 Program EIS for additional information on the use of herbicides.

THE POTENTIAL IMPACT OF THE ROUTES

NATURAL RESOURCES

Atmosphere

The impact on atmospheric resources is related to line length, the amount of clearing, and the extent of access road preparation required. Impacts to air quality result from particulates and gases produced during the burning of ROW clearing debris, dust from construction, road building, and motor vehicle exhaust emissions. Proximity to population centers, weather, and rate of atmospheric dispersal influence impact significance.

The operation and maintenance of transmission lines and substations results in discharge of minor amounts of oxidants (ozone and nitrous oxide). Experience and studies to date indicate the amount of oxidants produced are not measurable above ambient levels and have no adverse effects on humans, animals, or plants (BPA 1977). (For further discussion see the ELECTRICAL and BIOLOGICAL EFFECTS sections). The use of herbicides in right-of-way maintenance can introduce chemical fumes and odors into the air. The effects of herbicides and the precautions BPA takes to minimize their impacts are discussed in the Role EIS, Appendix B, Chapters VI and VII.

Atmospheric impacts will be short term and primarily result from slash burning and airborne dust and exhaust emissions from construction equipment. Slash burning will occur in the forested areas shown on figure 5. The corridor passes at considerable distances from major population centers, consequently few people would be affected by the minor atmospheric pollution caused by transmission line construction.

Geology, Soils, and Minerals

Between Buckley and Malin substations, four landform groups would be crossed. These include the Deschutes Plateau, the Ochoco Foothills, the High Lava Plain, and the Basin and Range Groups. The topography between these groups varies from nearly level slopes to moderately steep mountainous areas. Potential geologic and soil hazards/impacts that could result when transmission line construction occurs across specific geologic and slope groups are summarized in table 2.

Seismic activity in the study area has been low. Epicenters near Madras, Bend, and Silver Lake have produced earthquakes with magnitudes less than 3.7 on the Richter Scale. A few earthquakes with magnitudes to 5.0 have occurred near Klamath Falls. Earthquakes of this intensity normally have no effect on transmission lines.

Construction activities will cause some soil disturbance. The potential for accelerated erosion is increased as a result of temporary roads, tower excavation, and other areas receiving heavy use during construction activities. Displacement is the removal of the surface soil layers or a mixing of the mineral and organic portions of the soil. Displacement is detrimental to the land in that it increases the potential for soil erosion and stream sedimentation. It also may result in reduced productivity of the soil because of loss of the fertile topsoil layers.

Loss of topsoil layers will result from construction activities associated with tower sites, cable pulling sites, and any other areas where leveling is necessary. Forest topsoil layers are generally thin but are an extremely important part of the soil. It is the most fertile and friable layer of the profile. It contains most of the organic matter which is an important part of the moisture and fertility regimes. Removing this layer also reduces the overall depth of the soil which is critical in some areas.

For the following discussion, figure 4 identifies where potential geologic and soil hazards exist along the route. Since this transmission line would parallel an existing corridor, access road disturbances would be limited to those areas where temporary access is required or where occasional spur roads to tower sites are necessary.

Miles 0-50* - This segment crosses nearly level to gently sloping terrain underlain by basalt flows, rhyolite intrusions and welded tuffs. Due to the gentle slopes crossed and minimal construction disturbances, impacts would be limited to localized rill erosion. This erosion would be low in magnitude and easily mitigated.

* To help the reader to locate resources, the transmission line on the maps has been numbered in 10-mile segments, starting with 0 at Buckley Substation.

Table 2. — Geologic Groups—Potential Impact Hazards

Group	Slope %	Landforms	Natural Stability	Potential Of				Suitability For	
				Road Cut Bank Failure	Soil Compaction	Erosion		Access Roads	Transmission Towers
						Water	Wind		
Alluvium	0-5	High Lava Plain Ochoco Foothills Basin And Range	Good	Low	Low To Moderate	Low	Low To High	Good To Fair	Good
	5-15	High Lava Plain	Good			Low To Moderate			
Sedimentary Rocks	0-5	High Lava Plain	Good	Low	Low To Moderate	Low	Low To High	Good	Good
Welded Tuffs And Tuffaceous Sedimentary Rocks	0-5	High Lava Plain Basin And Range	Good To Fair	Low	Low To Moderate	Low	—	Good	Good
	5-15	Ochoco Foothills Basin And Range				Low To Moderate		Good To Fair	
	15-30	Ochoco Foothills		Low To Moderate		Moderate		Fair To Poor	Good To Fair
	30-50			Moderate To High		Moderate To High			
	>50								
Basalt Flows With Breccias And Minor Pyroclastics	0-5	Deschutes Plateau	Good	Low	Low To Moderate	Low	—	Good	Good
	5-15	Deschutes Plateau High Lava Plain				Low To Moderate		Good To Fair	Good To Fair
	15-30	Deschutes Plateau		Low To Moderate					
	30-50								
	>50								
Rhyolite And Dacite Flows	0-5	High Lava Plain	Good	Low	Low To Moderate	Low	—	Good	Good
	5-15	High Lava Plain Ochoco Foothills				Low To Moderate			
Basalt Flows	0-5	High Lava Plain Ochoco Foothills	Good	Low	Low To Moderate	Low	—	Good	Good
	5-15	High Lava Plain							
	15-30	Basin And Range				Low To Moderate			
	30-50	High Lava Plain							

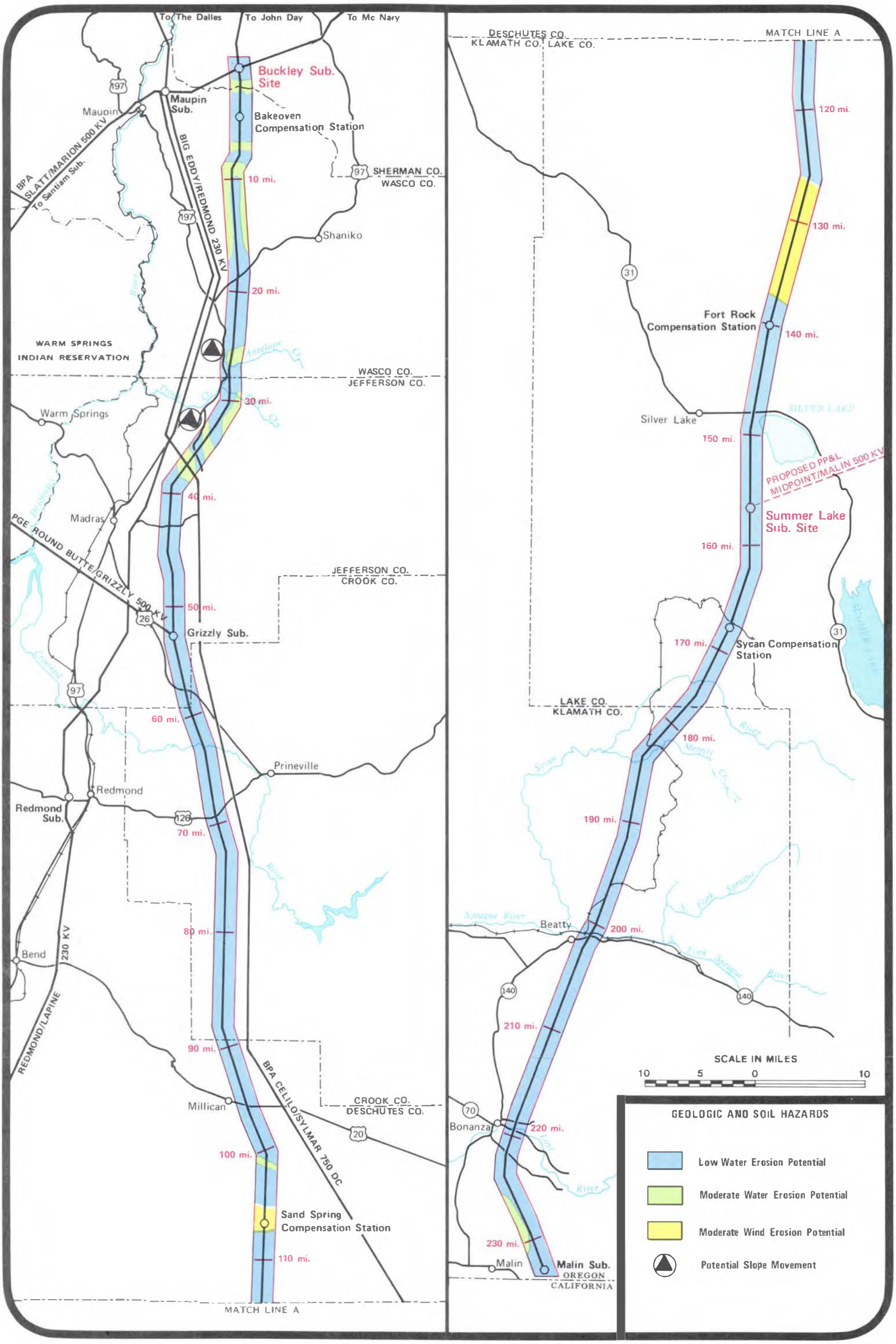

FIGURE 4
GEOLOGIC/SOIL HAZARDS
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Miles 50-110 - This segment crosses nearly level terrain and isolated buttes. The nearly level terrain is underlain by basalt flows and local alluvial deposits. Minimal construction disturbances would occur on this terrain and would limit impacts to minor rill and localized wind erosion.

The isolated buttes are underlain by either basaltic or rhyolitic vent rocks. Although access exists along this segment, equipment operation on existing roads and tower construction disturbances on the rhyolitic buttes could result in rill and minor gully erosion producing moderate impacts. Minimal impacts from minor rill erosion would occur on the basaltic buttes.

Miles 110-150 - Impacts from the Fort Rock compensation station to just north of Silver Lake would be limited to minor rill erosion.

Buckley Substation - Construction of Buckley Substation will require construction of about 3,000 feet of access road and clearing a 10 acre site for the substation equipment. The site is nearly level so grading requirements are minimal. Impacts will be limited to rill erosion which would be low in magnitude and easily mitigated.

Summer Lake Substation - The geology of the area basically consists of shallow soils overlying basaltic rock. Broken basalt and volcanic ash is readily seen on the surface throughout the region. Shallow soils are evident as seen by the small tree growth and soil profiles adjacent to intermittent stream channels.

Proposed Site - This site, located about 1/4 mile north of the PP&L line intersection, is a large level site. The surface is rocky and has a shallow soil profile. Depending upon subsurface conditions, this site may require rock blasting to prepare a level substation site.

Alt. 1 - This site, located about 3/4 miles south of where PP&L's Midpoint-Malin line would join the existing corridor, is the smallest of the three sites considered. It is relatively level and would require a minimal amount of grading. As a result, soil erosion would be low in magnitude.

Alt. 2 - This site is located about 1/4 mile south of the PP&L line intersection. The slope of the terrain would require a significant amount of grading. Grading the site would require rock blasting and soil movement. The potential for soil erosion would be higher than for the other sites but would still be fairly low.

Summer Lake-Malin. From Silver Lake south, the terrain crossed varies from nearly level internal basins to moderately sloping isolated mountains underlain predominately by basalt with localized tuffaceous rocks.

Impacts along this segment would be minimal. Locally, rill erosion could occur on the steeper slopes. In isolated cases gullies could form on the steeper slopes underlain by tuffaceous rocks.

Hydrology

ROW clearing, access road building, and tower construction can cause hydrology impacts by increasing sedimentation, accelerating runoff and erosion, and reducing water quality. The extent of impact is variable and can be expected to persist through the stabilization period following construction. Appendix B, Chapters VII and VIII, Section A.3. of the Role EIS details impacts to water resources caused by a transmission line and the mitigation measures used to reduce or eliminate them.

Over 90 percent of the route between Buckley and Malin substations crosses nearly level to moderately sloping terrain. Seventy-five percent of the route crosses watersheds having low sediment yield potential, the remaining 25 percent has a high potential for sediment. Several small wetlands, predominately marshy spots and playas, are encountered along this route. Playas are small, shallow intermittent lakes or ponds that form in low spots in desert areas following rainfall.

Most impacts would result from minor sheet wash along exposed road surfaces transporting sediment to streams. Relatively little physical disturbance is expected since existing access roads can be used for most of this parallel line, and relatively few streams are crossed. Since the road network was first built in 1965, there have not been serious erosion problems.

During periods of flow in intermittent and perennial streams, fording would resuspend material from stream channels. The rate at which it would settle depends on specific streamflow and soil characteristics. Little new sediment would be introduced to the streams. Line construction would not significantly change streamflow characteristics, the chemical composition of the water, or markedly increase the streams' sediment loads.

Wetlands

Several marshy areas and adjacent slow-moving tributary streams will be crossed. The corridor and its road systems are already established so little additional impact is expected. The marshy areas are linear in

configuration and cross the existing ROW so no practical alternative would completely avoid them. The wetland areas are small enough that they will be spanned by the line. Construction of towers and any additional access roads will be in accordance with the provisions of Executive Order 11990 which pertains to the preservation of wetland resources.

Overall, the impact potential on water features including wetlands is low.

According to flood hazard maps published by the U.S. Department of Housing and Urban Development, the line will cross the 100-year floodplain of the Crooked River. At the crossing the entire floodplain is about 350 feet wide. No towers will be located within this area. Any activity within the floodplain including access road construction will be temporary; any impact will be mitigated including reseeding and erosion control as necessary.

Vegetation

The form, composition, diversity, and productivity of vegetation communities is affected directly by right-of-way clearing. To characterize the impact on vegetation, major vegetation communities within the study area are classified into four general groups: forest, riparian, shrub-steppe (i.e., sagebrush rangeland) and steppe (i.e., grassland range) based on life-form similarities.

Natural vegetation along the route between Buckley and Malin substations is 45 percent steppe, 15 percent shrub-steppe, 33 percent forest, less than 1 percent riparian, and 5 percent other. Related land cover information is presented in table 3.

Major impacts to vegetation would be confined to forested areas. Approximately 165 acres of forest would be cleared for the ROW on the Buckley-Summer Lake Section during construction. Unstable danger trees that grow adjacent to the right-of-way, and could fall on conductors are removed.

In areas of steppe, shrub-steppe and riparian cover impacts will be confined primarily to the immediate construction areas. Natural vegetation should be reestablished at these sites within 10 years except on rocky, unproductive sites. Recovery rates will depend on precipitation, soil type, growing season, and livestock grazing.

The main access road along the existing transmission lines would be used by construction equipment for most of the proposed line with the exception of few spur roads on and off the ROW.

During maintenance BPA uses herbicide spraying and hand cutting on the right-of-way to prevent vegetation from growing high enough to interfere with operation of the line. To prevent accidental drift into rivers, streams, or lakes, no aerial application of herbicides takes place within 100 feet of any body of water. Aerial spraying by BPA contractors is not permitted when wind velocity measured on the ground is 6 mph or higher (Ground application by rotoist sprayers is not permitted when the wind exceeds 10 mph. See BPA's Role EIS, Appendix B, and the Proposed Fiscal Year 1979 Program EIS for additional discussion of BPA's use of herbicides).

Forest

Forest trees are entirely removed from the ROW for the life of the line, except where deep draws can be spanned. Therefore, impacts on forest land are more serious than for any other broad vegetation type. ROW clearing can lead to: 1) increased erosion and sedimentation on steep forested slopes (see Geology); 2) changes in wildlife habitat (see Wildlife); and 3) visual alteration (see Esthetics). Other impacts include damage to understory vegetation from logging, slash burning, access road construction, and off-road vehicle use. Future maintenance will involve scheduled removal of trees that may interfere with operation of the transmission line.

About 12 percent (18.3 miles) of the land that would be crossed by the Buckley-Summer Lake line is forested, chiefly with ponderosa pine and juniper. About 165 acres of forest will be cleared primarily between miles 110 and 140 (fig. 5). More trees are removed from ponderosa pine than juniper zones because the lower-growing juniper often do not interfere with operation of the line and can remain in the right-of-way.

In the ponderosa pine communities encountered near the Sand Spring compensation station extensive clearing will be required. Any timber areas cleared for ROW would be removed from future production for the life of the facility. Revegetation will be grass and shrub communities.

Riparian

Riparian communities which may comprise less than one percent of the natural vegetation encountered may generally be avoided or spanned by transmission lines. Activities associated with erecting towers, stringing conductors, and crossing streams cause some soil scarification, rutting, or removal of riparian vegetation. Long term impacts would result from these actions in areas of significant streamflow fluctuation. Increased erosion/siltation, loss of mature trees that serve as seed sources, invasion of weedy species, and a lowered resistance to flooding would result from the construction process (USGS 1978). The impacts would be most severe where larger trees are removed

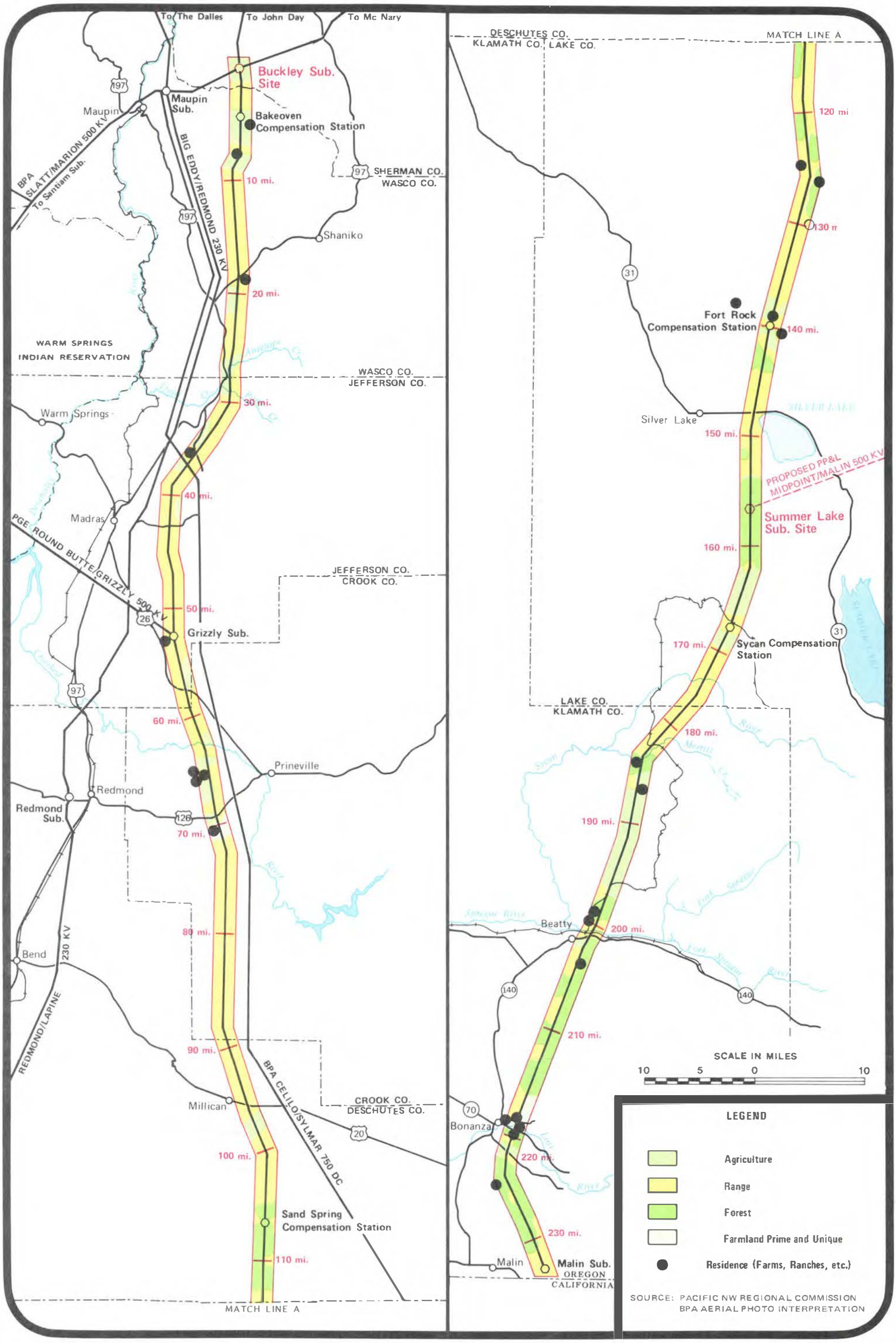

FIGURE 5
VEGETATION COVER/LAND USE
SOUTHWEST OREGON SERVICE
79-5

Table 3. - Land Use

Resource Category	Units of Measure	Buckley-Summer Lake 156.4 mi. 251.6 km.	Summer-Lake-Malin 75.6 mi. 121.6 km.	Total 232 mi. 373.3 km
Irrigated Agriculture	Miles/	3.0	0.5	3.5
	km	4.8	0.8	5.6
Nonirrigated Agriculture	Miles/	6.0	1.3	7.3
	km	9.6	2.0	11.7
Range	Miles/	128.4	14.2	142.4
	km	206.3	22.8	229.1
Forest	Miles/	6.5	19.9	26.4
	km	10.4	32.0	42.4
Forest-Range	Miles/	11.8	39.0	50.8
	km	18.9	62.7	81.7
Residential	No. within 1 mile of ROW	7	4	11
Wetland	Miles/km	0.7	0.7	1.4
		1.1	1.1	2.2
Urban Centers	No. within 1 mile	0	0	0
	No. within 3 miles	0	0	0
1-5 residences	"	7	4	11
		14	3	17
6-25 residences	"	0	1	1
		0	0	0
Highway crossings	"	7	4	11
		1	0	1
River crossings	"	2	3	5
		0	0	0
Parks	"	0	0	0
		0	0	0
Waysides	"	1	0	1
		0	0	0
Historic Sites/ Trails	"	7	1	8
		0	0	0

or along drier stream channels where vegetation recovery rates are slower. Because of the small amounts of riparian vegetation encountered and the ability to span it in most cases, impacts will be very low.

Shrub (sagebrush rangeland)

ROW through sagebrush rangeland will have little effect on the vegetation except for disturbance at tower sites and access roads. Impacts at tower sites would generally be short term with the rate of recovery depending on fertility, moisture and soil. Long term impacts would result from the removal of vegetation for access roads. Scarification and disturbance of steep slopes can lead to soil erosion severely limiting the nature and extent of revegetation. Accumulation of dust on leaf surfaces can also become a problem.

The proposed line crosses about 54 miles of sagebrush rangeland, primarily between miles 0 and 100. Approximately 5 acres of shrub vegetation will be permanently removed by tower sites. The remaining 500 acres within the ROW should experience negligible impacts except where short segments of new access road construction is required. Where new roads are built a permanent loss of vegetation will occur.

Very few areas of the shrub-steppe vegetative zones will require clearing between Buckley and Malin substations. Where cleared during construction impacts would be primarily of short duration. Only on new access spurs would a long term loss of vegetation be encountered.

Impacts caused by maintenance stem primarily from the use of selected herbicides and localized soil compaction which may inhibit root penetration and growth.

Steppe (grassland range)

Grassland vegetation is least susceptible to long term disturbance. Other than actual removal of the vegetation cover, soil compaction is the greatest impact. Few undisturbed native grasslands remain in this region. Those that do are confined primarily to steeper areas inaccessible for farming. Between mile 40 and 60 the existing line crosses the Crooked River National Grassland.

Grasslands located on steep slopes present a potential erosion problem. Erosion can initiate changes in community composition through alterations in soil nutrient levels thereby enabling the establishment of more tolerant plant species such as noxious weeds. The spread of noxious weeds and some poisonous plants such as larkspur and death camas could increase and pose additional problems to landowners. BPA will cooperate with local weed control districts and landowners to prevent the spread of noxious and poisonous plants.

Natural recovery of disturbed grasslands should occur within 3-8 years.

Forty-nine percent (76 mi) of the land crossed by the Buckley-Summer Lake line is covered with steppe vegetation. A total of 7 acres of grassland range will be disturbed for tower sites. Long term impacts on rangeland will be minimal since revegetation will occur on the tower sites except at the footings.

Summer Lake Substation - Ponderosa pine is the overstory and understory tree. Juniper is mixed in, and is a component of most areas except where the pine growth is denser. Mountain mahogany is present in small rockier areas. Sagebrush mixed with bitterbrush is found throughout the area. Bunchgrass and fescue are the dominant grasses. Construction of the substation will require permanent removal of about 10 acres of vegetation. Upgrading the access road to the substation will not require removal of any significant amounts of vegetation. Less than one mile of new access road construction would require removal of less than 5 acres of vegetation.

Summer Lake-Malin - Impacts to vegetation would be similar in nature to those described for the Buckley-Summer Lake line. Fifty-eight miles of transmission line would be cleared removing about 553 acres of forest vegetation. Construction of the line would also cross 15 miles of grassland vegetation. Three acres of grassland will be disturbed for tower sites. Other vegetation types are not found in significant quantities along this section of transmission line.

Endangered and Threatened Plants

Plant species have been proposed by the U.S. Fish and Wildlife Service (USFWS) for endangered or threatened classification. These plants have a limited distribution and/or occur in fragile habitats.

In accordance with the Endangered Species Act as amended, BPA requested the USFWS to review our proposal and identify any listed species or habitat that might be affected. There were no listed species. USFWS did provide a list of candidate species.

Plants proposed for protection should not be impacted because: 1) existing access roads will be used wherever possible; 2) if a plant population is located, the line can be routed around or span it and new maintenance and construction roads can avoid known populations; 3) BPA operation and maintenance practices will be modified to protect endangered or threatened plant species.

Wildlife

The proposed transmission facilities will impact wildlife by physically changing habitat, increasing accessibility, and bringing in construction personnel and equipment. Information on impacts related to corona and field effects is in the section BIOLOGIC EFFECTS. For more information concerning general impacts to Fish and Wildlife, refer to Appendix B, Chapter VII of BPA's Draft Role EIS.

Although the line will span several streams, the overall impact to fishery resources will be low because vehicles can utilize existing roads and bridges and avoid new stream crossings.

Construction of the transmission line through non-forested wildlife habitat (fig. 5) would result in few wildlife impacts. Sagebrush, grassland, and agricultural habitats would remain essentially unaltered except where new access roads are required and at tower footings, and crane and reel sites. Such impacts are not expected to be significant, and natural revegetation is expected within 3-8 years.

The overhead groundwire on the new line may create an obstacle for waterfowl and other birds. This will most likely be in the vicinity of Silver Lake just north of Summer Lake Substation. The impact of the groundwire as an obstacle may be significantly lessened by the presence of the existing lines and the obstacle they present.

The chance of collision is increased for flocks which cross the transmission line repeatedly. Most waterfowl using these areas are migratory and would be affected primarily during spring and fall migrations.

A study conducted for BPA shows transmission lines caused some alteration of bird flight patterns (Meyer, 1978). Most waterfowl however, pass well above transmission lines and less than 1 percent of waterfowl observed altered their flight path to avoid flying across the line. Between .1 and .5 percent of the birds flying at or below the height of the transmission line collided with the line.

Deer and antelope range and winter range occurs at several locations along the line between Buckley and Malin. Major areas are between miles 95 and 120 and near Silver Lake, Sycan Marsh (mile 177), Beatty (mile 200) and the Lost River (mile 200).

Among the more significant effects on deer and antelope range would occur from clearing additional forest land at the edge of the existing ROW. Tree removal eliminates an essential component of winter ranges, namely, escape and thermal cover, and thereby reduces the carrying capacity of such areas. Escape and thermal cover habitats are encountered in the vicinity of Mahogany Butte (Mile 105) in the Deschutes National Forest. Loss of protective tree cover in this area could cause increased

mortality to animals during winter and hunting periods. Because of the small amount of clearing required and its linear nature, significant impacts are not expected. Short term wildlife harassment and temporary dispersal during critical periods would result from noise and activity of construction crews. Construction will generally not occur during winter, a critical period for large mammals.

The northern bald eagle is classified as "threatened" in Oregon by the Endangered Species Act of 1973. The pergrine falcon is classified as "endangered". As required by the act, BPA has assessed the potential for impact to these species and has determined no impact would occur as a result of construction of this project. Consultation has been completed with the U.S. Fish and Wildlife Service (USFWS) and the USFWS has concurred with the results of BPA's biological assessment.

Overall, construction of the line is expected to have minimal impacts upon wildlife or wildlife habitats because of its parallel location and the limited amount of new access road construction and clearing required. Waterfowl concentration areas will experience a continuing collision problem. Some bird mortality will occur, but it should be significantly less than if the proposed construction was not in an established corridor.

Summer Lake Substation - Construction of Summer Lake Substation would require the removal of approximately 10 acres of vegetative cover and wildlife habitat. The vegetative cover on the site provides escape and thermal cover as discussed above.

Summer Lake-Malin - This section of line would cross about 44 miles of forest cover within the Fremont National Forest. This vegetation also serves as important escape and thermal cover. The relative abundance of cover in the area will reduce the significance of this loss of cover.

The overhead groundwire on the new line may create an obstacle for waterfowl and other birds near Sycan Marsh and the Sprague and Lost rivers. As discussed above, the potential for impact of the new line will be lessened by the presence of existing transmission lines parallel to the proposed. Some bird mortality will occur, but it should be significantly less than if the proposed construction was not in an established corridor.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

Demographic and Economic Considerations

The skills needed for transmission line construction are specialized and often not available locally. Therefore about 2/3 of the work force is imported from outside the construction area. This can result in demographic and economic impacts to communities as workers require

housing and food, and a variety of trade and service items. Work crews seldom are concentrated in one location long enough to strain a community's resources however. Most construction work on transmission lines is performed during the summer months which may also be a peak tourism period. Seasonal impact on community services is thus a general consequence.

Temporary construction jobs are often available to local residents. BPA and its contractors also attempt to use local facilities and equipment when possible, especially to perform clearing operations and supply the concrete and rock for construction. The income from increased employment, trade, and services is a positive economic effect for most communities. The benefits are most noticeable in predominantly rural, low population areas.

The extent of impacts to demographic and economic resources primarily relates to line length, construction crew size, duration of the project, and the size of the communities serving the needs of the work force.

Approximately 14 months will be required during 1981 and 1982 to complete construction on this line. As much as 5 months may be non-working time due to weather and other considerations. For construction purposes, the line will be divided into three sections or "schedules" of 50 miles each. An average of 55 workers will be required per schedule over the 2-year span, with 220-240 people working on the entire line during the peak construction period in 1981. Crews probably will be based in Madras, Prineville or Bend.

Overall, adverse impacts from construction of this line should be low because most areas will be able to absorb the effects of additional population for the short term involved. Some benefits will occur, however, they will be small, reflecting the small size of the work force.

Summer Lake-Malin - Construction of this section of line would require an additional six months of construction time. This construction may be concurrent with the construction from Buckley to Summer Lake. From 100-110 workers could be involved in the construction of this section. Construction crews would probably be based in Klamath Falls.

Land Use

Transmission facilities may affect planned or zoned land uses. However, most land uses can exist compatibly with transmission facilities. Specific information on potential land use conflicts is presented in following sections. The proposed facilities are consistent with provisions of the land use plans provided by the counties within the study area.

Agriculture

During construction typically about 1 acre of ground per tower is temporarily disturbed. This is the amount of ground required to handle the excavation dirt from footings, assembly of steel tower sections, travel between towers, and parking various pieces of construction equipment. The tower base occupies about 900 sq.ft. or .02 acres.

The proposed line will require about 0.6 acres of irrigated farmland and 1.2 acres of nonirrigated farmland for tower bases. This land will be near the crossing of highway 126 (mile 68) where the Soil Conservation Service has designated areas of prime and unique farmland. These areas will be within the legs of the tower and cannot be farmed. Compaction of soil can also result from construction activities.

Growing crops may be damaged. BPA will pay for damages to crops and facilities such as: irrigation equipment, tiles, or fences. If tower locations require modification of sprinkler systems, these costs will also be paid by BPA. Crop damage is minimized by scheduling construction during non-growing seasons when possible.

As shown in table 3 and figure 5 the route crosses only several small areas of agriculture. Approximately 15 miles along the route in the Fort Rock Valley and 3-4 miles in Silver Lake Valley are identified as being suitable for circular irrigation development.

Buckley Substation - Construction of Buckley Substation would displace about 10 acres of non-irrigated farmland used for wheat production. The construction of the access road will displace an additional 3 acres. The land actually occupied by the substation and access road will be permanently removed from production. Nearby surrounding areas that will be disturbed during construction can be returned to production, although the use of farm machinery may be slightly hindered by the presence of the facilities.

Summer Lake-Malin - This section of line will displace about 0.1 acre of irrigated farmland and 0.3 acre of nonirrigated farmland. This land would be near Lost River (mile 218) where areas of designated Prime and Unique Farmland are being irrigated using side roll irrigation methods.

The irrigated farmland is adjacent to the Lost River and because of its linear nature cannot be avoided. The existing lines, however, cross the farmland at a narrow point. Present cultivation patterns are adjusted to the location of the existing lines and towers. By locating towers at field edges and other uncultivated locations the impact to Prime and Unique farmland will be minimal. For further information concerning the effects of transmission line construction on agricultural areas, see the BPA Role Statement, Appendix B, Chapter VII.

Forestry

The majority of commercial forest areas are controlled by the Deschutes and Fremont National Forests, Weyerhaeuser Company, and the Bureau of Land Management, with small holdings of the State of Oregon, private concerns, and individuals. Table 4 outlines information on land ownership and other forest resources data.

Forest land is grouped into five major areas: Mahogany Butte (Mile 105) to Buzzard Rock (Mile 120); Silver Lake to Sycan Marsh (Mile 175); Sycan Marsh to Beatty, Oregon (Mile 200); Beatty, over Yainax Butte (Mile 210) to Bonanza, Oregon (Mile 220); and Bonanza to Malin Substation. The Deschutes National Forest administers most of the area from Mahogany Butte to Buzzard Rock. The BLM administers a sizable amount of land south of Bonanza. Weyerhaeuser Company owns tracts intermingled with Fremont National Forest northeast and east of Sycan Marsh, around Camp 6 (mile 188), and on Yainax Butte. Fremont National Forest administers the majority of the forest south of Silver Lake to Bonanza. National Forest Land is mixed with Weyerhaeuser, private, and BLM lands.

The dominant species is ponderosa pine. Lodgepole pine and white fir are secondary species. Ponderosa pine or mixed pine/fir stands are most common. In these stands, size classes are mixed, giving them the appearance of being in several layers. Smaller size classes are largely the result of fire exclusion or logging.

Ponderosa pine stands occur in widely spaced park-like stands bordering non-forest areas and at lower elevations. Denser, mixed conifer/ponderosa pine communities are common at middle elevations. Stands of mixed conifer or lodgepole pine are more predominant at higher elevations.

Ponderosa pine is the climax species in drier areas and low elevations. Lodgepole pine is the primary successional stage to a white fir climax and is only climax in poorly drained or cold air basins. White fir is the climax species at higher altitudes and on moister sites.

The higher elevation or more difficult logging sites support the densest timber stands. This is because growing conditions are more favorable due to higher moisture and access for logging is more difficult.

Site (tree growing capability) is low to medium. Low site plus past logging results in low volumes per acre--generally 600 to 1,400 cubic feet. Unlogged areas have higher per unit volumes, but the amount of this type crossed is low. Some areas crossed are on marginal sites near the forest/desert fringe.

Most areas have been logged at least once, sometimes twice, by railroad or tractor. Cable logging is becoming more common on restrictive sites. Even-age management, using shelter wood or clearcuts, is the dominant timber management system. Past logging has left most areas well developed with skid trails, roads, and railroad grades. New area disturbance from roads and skidding can be kept to a minimum by using old facilities for timber management or transmission lines wherever possible.

Forests play an important role in the economy of the area. Mills are located at Bend, Gilchrist, Malin, Chiloquin, Klamath Falls, Lakeview, and Bly. The economics of Deschutes Lake and Klamath counties are highly dependent on the timber industry and the jobs it generates. The annual growth loss due to the project is estimated to be .003 percent of the annual harvest for the counties affected (1976 U.S. Forest Service). While forestry is a major component of the economy in three counties in the study area, the amount of timber production affected is insignificant.

The main impacts of a right-of-way through forest land are 1) tree cutting; 2) loss of tree growth; 3) interference with timber management practices; and 4) changed land use. These impacts are long term and irreversible for the life of the line. Cleared areas will be periodically maintained to prevent trees from growing into or interfering with transmission facilities. These impacts can be substantially reduced by paralleling existing lines, and/or building on land of marginal productivity. Both situations exist in this proposal.

Impacts such as sunscald, windthrow, logging damage, branch retention, and insect or disease attacks may occur on trees next to cleared rights-of-way. These are generally short term impacts and should stabilize or diminish over time. Any growth or volume losses, however, will be present until tree or stand liquidation.

Certain inherent factors discussed below reduce the adverse effects of a transmission line in the forests of south central Oregon.

- Sizable areas of juniper, a non-commercial species, occur along this route. Juniper's growth habit is generaly 15 to 30 feet tall, and widely spaced on the forest/range fringe. Impacts are low because juniper forests require minimal clearing.

- Many cutover stands are crossed by this route. After being logged one or more times, cutover stands have only a few large trees per acre left which would have to be removed for a transmission line.

Table 4 - Summary of Impacts to Forestry Resources

DESIGNATION	SEGMENT Mile 0 to 107	Mile 107 to Summer Lake	Summer Lake-Malin
Length (Miles/km)	107/172.1	50/80.4	76/122.3
Forested Length (Miles/km)	1.7/2.7	16.6/26.7	58.9/94.8
Forest Area (Acres/ha)	16.2/6.6	150.3/60.8	553.2/223.8
DOMINANT COVER (ACRE/ha)			
Range	105.3/169.4		35.2/14.2
Juniper			47.8/19.3
Ponderosa Pine	14.3/5.8	92.5/37.4	338/136.8
Lodgepole Pine	1.9/.8	57.8/23.4	14.7/5.9
Pine/Fir Mix			98.1/39.7
Plantation			19.4/7.8
OWNERSHIP (ACRE/ha)			
State			7.4/3
Weyerhaeuser Company			71.5/28.9
Private			126.3/51.1
BLM	5.2/2.1	22.5/4.5	52.8/21.4
USFS	10.9/4.4	127.8/51.7	295.2/119.4
VOLUME OF WOOD TO BE CUT (ft^3/m^3)			
Total	10,000/285	51,000/1445	300,000/8500
State			5,000/140
Weyerhaeuser Company			36,000/1020
Private			78,000/2210
BLM	3,000/85	17,000/480	32,000/905
USFS	7,000/200	34,000/965	150,000/4250
TOTAL GROWTH LOSS (ft^3/m^3)			
Annual	405/11.5	5260/149	19362/548
Life of Facility	20250/573.5	263,025/7449	968,100/27417

In plantation or young growth areas, clearing can be confined to the right-of-way. As the young trees grow, they will be stable and windfirm from long term exposure to the transmission line opening just as they would be stable and windfirm from growing by natural openings in the forest.

Ponderosa pine trees naturally grow in open stands with an overstory of large trees and a sappling understory. There are few large trees per acre to be removed, as compared to dense mixed conifer or lodgepole pine forests. Therefore, clearing has less impact than in those denser forest types.

Further discussions of impacts to forest land and measures used to reduce those impacts can be found in BPA's Role EIS, Appendix B, Chapter VII, Section B1.

Mile 0 to Mile 107 - This section of line crosses 1.7 miles (16.2 acres) of forest land. The forest areas are situated between Mahogany Butte (mile 105) and BPA's Sand Spring Compensation Station. Information regarding forest types and ownership or administrative control of the forest land along the line is contained in table 4.

Timber productivity is low. Only about 25 cubic feet/acre/year of tree growth will be lost with a total of 20,250 cubic feet of volume foregone over the projected life of the facility (50 years). This last volume is roughly what one faller cuts in about a week, or a tractor can skid in one or two days.

Overall, the amount of forest land is small, representing only about 3 percent of the land along this section of line. Site and volumes are low. The degree of impact on this forest area is moderate to high. The amount of forest land on this segment is so small, however, that the actual impact on forest resources is low. Routing the line around this forest land would require a minimum of 15 miles of additional new right-of-way and access road.

Mile 107 to Summer Lake - This section crosses 16.6 miles (155.6 acres) of forest land. This represents about 33 percent of the land along this section of line. The forest areas lie between Sand Spring Compensation Station and Buzzard Rock (Mile 120) over Fox Butte (Mile 114), and from Silver Lake south to Summer Lake Substation. This segment ends .8 mile inside the Fremont National Forest boundary.

An old growth management area of about 200 acres of lodgepole pine lies just south of Sand Spring Compensation Station, on the east side of the existing transmission lines in Sections 30 and 31 (T21S R16E, WM). The Deschutes National Forest Land Management Plan identifies this area as a source of old growth timber for wildlife management of the appropriate

species, and as a gene pool. The Forest Service is preparing a management plan for these areas. Until this plan is completed, no timber sales will be conducted. Requirements for additional right-of-way will not affect this forest land.

The most productive Deshutes National Forest land is within this section, near Fox Butte (Mile 114). Growth loss for the section is about 35 cf/acre/year with a total of 263,025 cubic feet of volume lost during the projected life of the facility.

There will be noticeable long term changes in the forest because of clearing for the transmission line, and its effects on the forest and special concerns in this section. The degree of impact is moderate to high.

Summer Lake-Malin - This section of line crosses 58.9 miles (553.2 acres) of forest land. This represents about 77 percent of the land along this section of line. Forest areas are from Summer Lake Substation to Sycan Marsh (Mile 175); Sycan Marsh to near Beatty, Oregon (Mile 200); Beatty to Bonanza, Oregon (Mile 220) over Yainax Butte (Mile 210); and Bonanza to Malin Substation; with gaps in river valleys or flatlands.

Annual growth loss is about 35 cf per acre with a total of 968,100 cubic feet of volume lost during the projected life of the facility.

Because cleared transmission line right-of-way eliminates forest cover on that land, and considering the nature of the forests crossed, the degree of impact to forest resources in this section is moderate to high.

Urban and Residential

Impacts to urban and residential land use will be minimal since few urban areas or even single residences are near the existing corridor. Impacts to residents along the line will be primarily from noise, dust, and visual impacts. A few residents may experience some brief problems with smoke during disposal of debris.

Visual impacts will be the only long term effect on local residents. The existing line has previously altered natural visual conditions. See the Esthetics section for additional discussion of visual impacts.

The existing line is within 1 mile of 11 houses or farm residences. An additional 17 residences are within a 3 mile distance (figure 7). The transmission line is located far enough from these residences for impacts to be minimal or non-existent.

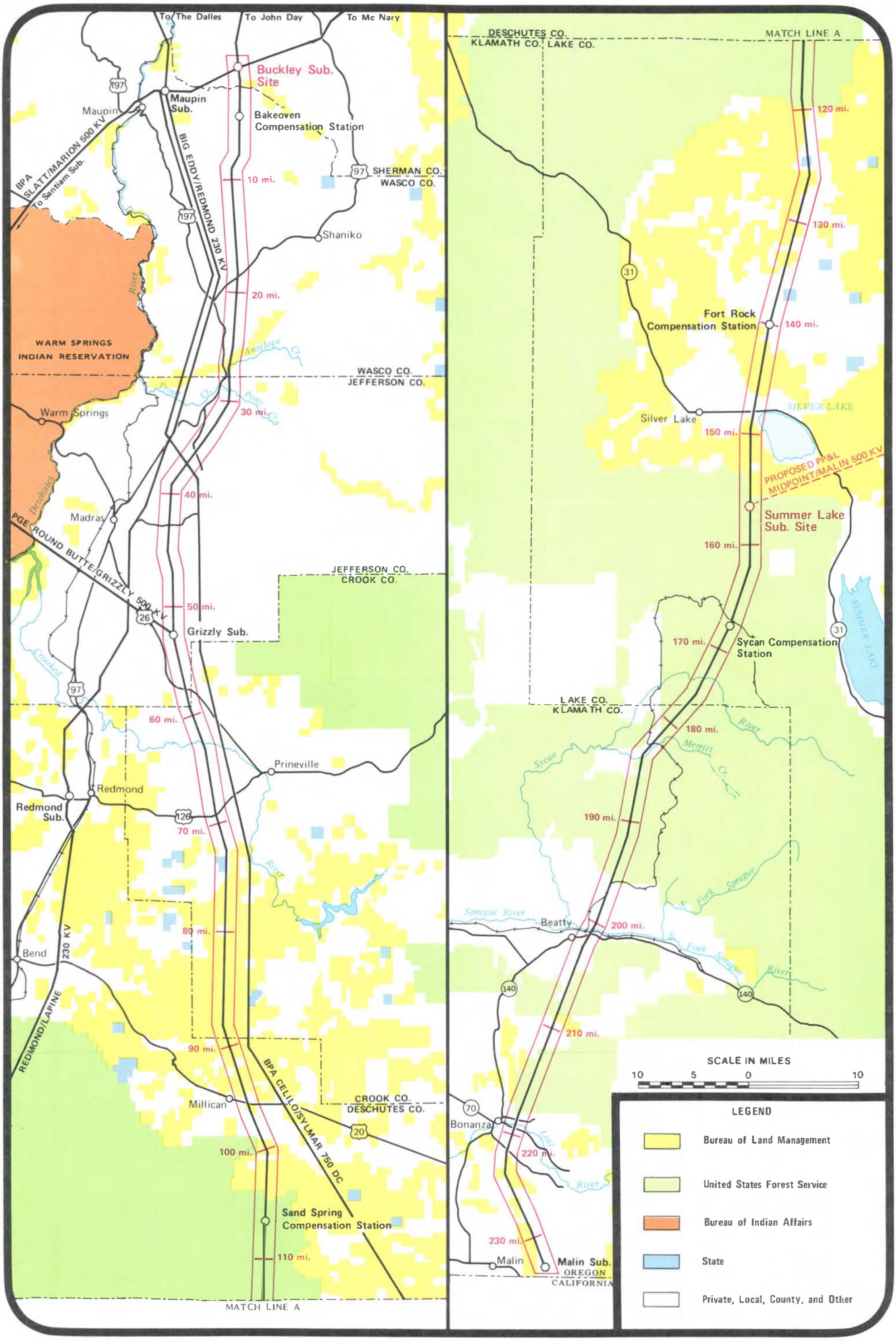

FIGURE 6
LAND OWNERSHIP
SOUTHWEST OREGON SERVICE
79-5

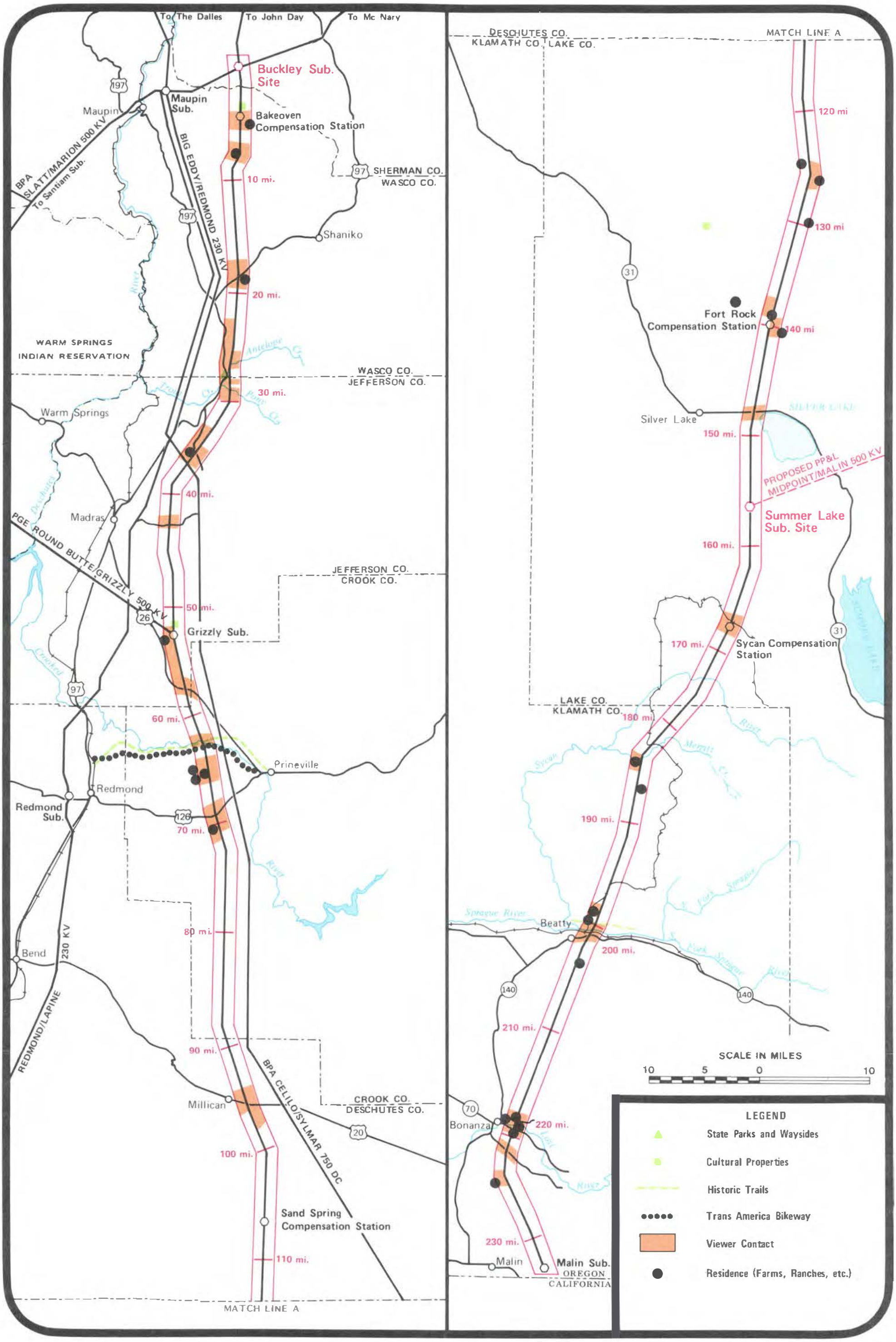

FIGURE 7
VISUALLY SENSITIVE LAND USE IMPACTS
NATURAL/RECREATIONAL/CULTURAL RESOURCES
SOUTHWEST OREGON SERVICE
79-5

The small communities of Willowdale (Mile 30) and Millican (Mile 95) each contain between one and ten residences. These communities, between 1 and 3 miles from the right-of-way, may receive minor visual impacts during construction of the new transmission line.

The proposed facilities may cause television or radio interference. If experienced, mitigation will be undertaken in accordance with BPA policy as outlined in BPA's Role EIS, Appendix B, Chapter VIII.

Near Madras a pipeline parallels portions of the existing line for about 35 miles. If necessary, BPA would utilize mitigation measures to minimize induced current in this pipeline.

Railroad and telephone communications facilities will cross under or parallel the line for short distances at a few locations along the proposed route. No adverse impacts to these facilities are anticipated. If any problem to wire communications facilities do occur, they would be handled and mitigated as discussed in the Electrical Effects section of this document.

Buckley Substation - Several rural residences are about 1 mile northwest of the Buckley Substation site. Due to the lack of vegetation and the relatively level terrain, the substation will be readily visible from the houses. Although electrical facilities are already present, the substation appearance is quite different from the transmission lines and will cause a signficant change in visual conditions.

During construction nearby residents may be disturbed by noise and dust but because of distance, these effects should be quite minor.

Infrequent operation of the substation's power circuit breakers and the accompanying impulse sound may disturb residents. Operation of these circuit breakers is not in violation of noise control regulations established by the Oregon Department of Environmental Quality.

Summer Lake-Malin - The small community of Beatty contains less than 10 residences; Bonanza has about 50. These communities, between 2 and 3 miles from the right-of-way may receive minor visual impacts from construction of the new transmission line. One residence is sited within a few hundred feet of the line near Merritt Creek (Mile 183). Although relocation of the residence will not be required, its occupants may experience many of the impacts described above.

Esthetics

The visual impact of the proposed transmission line will be generally low. This is due to two factors:

1. The number of viewers is quite low. Table 3 summarizes the number and types of land uses from which the transmission line would be seen.

2. The visual compatability of the transmission line is high relative to many other areas in the Pacific Northwest. The majority of the land crossed is treeless and relatively flat, minimizing vegetation removal and thereby eliminating the highly visible cleared ROW and access road system. The line also parallels two existing lines, eliminating the intrusion of a new line into an undisturbed landscape.

The line will cross five highways including U.S. 97, U.S. 26, Oregon 126, U.S. 20, and Oregon 31. It also crosses seven county highways. Because of the presence of existing lines the new line will not significantly change existing visual conditions. Impacts at the highway crossings thus will be low.

The highest impact highway crossing occurs where the line crosses a county highway parallel to the Crooked River (Mile 63). The Crooked River has been identified as a potential state scenic waterway (Department of Transportation 1978) and its valley is one of the most scenic areas encountered along the route. In this location the line also crosses the Trans-America Bicycle Trail. In the vicinity of these crossings the Crooked River Valley has a broad flat floor about 1/2 mile wide. The sides of the valley rise abruptly about 400 feet. Transmission towers would be located within 700 feet of the highway and river crossings. Near Willowdale (Mile 26) the line is about 1/2 mile east of a highway wayside and picnic area. In each the line would be briefly visible to passing motorists and bicyclists or during recreational use of the river or picnic areas. Visual impact of the new line is minimized by the presence of the existing lines.

Representatives of the Deschutes National Forest have identified two forest service roads, nos. 2043 and 2442 as visual corridors. Road 2043 parallels the existing line for several miles and would likely be visually affected by the line.

Residents near the line would be the most likely persons to notice changes in visual conditions along the ROW. Even though there are two existing lines, through their familiarity with the right-of-way and their awareness of construction activities, residents may perceive the changed conditions.

The location of major highway crossings, river crossings and residences are shown in figure 7.

Cross rope suspension towers, as illustrated in figure 3, will be used between miles 40 and 63. This new tower design has not been used in the United States so its level of visibility relative to other tower designs is not known. Much of the structural steel used in a conventional tower is replaced by thinner steel cables; the structural steel members used are also smaller than on most tower designs; and fewer towers are used per mile. Because of these differences, the visibility of these towers may be less than conventional towers at distances of more than one mile.

Summer Lake - Malin - This section of line will cross Oregon Highway 140 and two county roads. Because of the existing lines, the new line will not significantly change visual conditions. Impacts at these crossings will be low.

Recreation

Construction of the transmission line will have a minimal effect on recreational land use. Four specific recreation sites are located near the line: a highway wayside and picnic area 4 miles north of Willowdale (Mile 26); the Crooked River which crosses the ROW near Prineville (Mile 63); the Trans-America Bicycle Trail adjacent to the Crooked River; and Sand Springs Campground (Mile 107) which is less than 1/2 mile east of the existing corridor in the Deschutes National Forest. The Trans-America Bicycle Trail was established in 1976 and is the only designated and marked bicycle route across the United States. Impacts to these resources and other dispersed recreation activities will be primarily visual. They will be minimal after completion of construction because the additional line will not significantly change visual conditions along the existing right-of-way. Visual impacts are discussed in the Esthetics section. Construction in the vicinity of Sand Springs Campground will disturb users with noise and potential dust impacts. See the Mitigation section for a discussion of the mitigation of dust impacts.

Historical/Archeological

Impacts on historic and archeological resources not directly on access roads or within ROW are usually minor. Direct impact occurs where actual physical alteration or destruction of sites or surface artifacts results from vegetative clearing, road construction, tower construction, or conductor stringing. Sub-surface archeologic resources, not discovered during field surveys, are susceptible to disturbance or destruction by construction of access roads and excavation of tower sites. Such impacts are permanent since they involve the partial or total loss of site integrity and the archeological knowledge obtainable from the site.

Indirect impacts result from visual, audible, or atmospheric intrusions on cultural settings. The latter two are generally short term, construction-related effects, whereas visual intrusions persist for the life of the line. See Esthetics for a more complete discussion of visual impacts.

Prior to publication of the Draft Location Phase EIS a cultural resources overview was conducted following the guidelines in 36 CFR Part 66, Appendix B, Section 1.

Since then professional archeologists have conducted an intensive ground survey along the proposed right-of-way. Fifty-eight archeological sites and forty-five historic sites were recorded along the right-of-way. Four of the historic sites were determined to be potentially eligible for the National Register of Historic Places. Thirty-seven of the archeological sites are considered potentially eligible for the National Register and require testing to further assess their eligibility.

Information gained from these surveys will be used in determining the location of towers and new access roads. If a site is discovered during construction, building will be halted and procedures outlined in 36 CFR 800 will be followed. Through consultation with the State Historic Preservation Officer and the National Advisory Council on Historic Preservation, any adverse impact to archeological sites listed on or eligible for inclusion in the National Register due to construction activities will be mitigated, or sites will be excavated prior to construction.

Summer Lake Substation - The substation site is in an area where the potential for encountering archeological sites is very high. The site will be surveyed by professional archeologists. If a site is discovered during construction, work will be halted and procedures outlined in 36 CFR 800 will be followed.

ELECTRICAL EFFECTS

Corona and field effects are electrical phenomenon associated with a 500-kV transmission line. Corona occurs on conductors, insulators, and hardware when sufficient energy is imparted to charged particles to cause ionization of the air. Corona causes radio and television interference, audible noise, and production of small amounts of ozone.

Field effects result from electric and magnetic fields at the power frequency of 60 Hz and its harmonics in the proximity of high voltage conductors carrying electric current. The high voltage creates the electric field and the current flowing in the conductors is the source of the magnetic field. Electric field strength would be about 9.0 kV/m maximum. The maximum at the edge of the right-of-way would be 5.0 kV/m.

The magnetic field strength would be about 0.6 Gauss and maximum ozone concentration produced by the line would be approximately 0.0005 ppm. Audible noise during rain 100 feet from the right-of-way would be 44.1 dB(A).

The following provide some source of comparison to the electrical parameters discussed above:

electric field strength 30 cm from an electric blanket	0.25 kV/m
magnetic field strength near a color television set	1-5 Gauss
ambient ozone concentration (average)	0.01-0.03 ppm
light auto traffic at 30 m (100 feet)	50 dB(A)

Television and AM radio reception in areas near the proposed line which are remote from broadcast transmitters may suffer interference during foul weather. However, if residents experience television or AM radio interference, mitigation in accordance with BPA policy as outlined in BPA's Role EIS, Appendix B, Chapter VIII, will be undertaken to restore reception. Other effects associated with the electrical factors discussed above are addressed in the following section.

Power transmission lines produce electromagnetic and electrostatic fields which have the potential to cause excessive voltages to appear on buried or aerial wire-type communication circuits, such as those operated by telephone and railroad companies. The influence of the powerline 60 Hz current and its harmonics up to 5,000 Hz may be of sufficient intensity to induce electrical noise on voice, data transmission, and signal circuits. BPA takes action through its inductive coordination program with the telephone utilities and the railroads to minimize powerline influence to wire communication facilities. If a telecommunications or railroad company determines that a problem may be occurring because of the operation of BPA power transmission facilities, it will be investigated and mitigated according to BPA policy in cooperation with the affected company.

BIOLOGICAL EFFECTS

Considerable public interest over effects from electrical characteristics has arisen in recent years. This section will address the kinds of "biologic effects" which are associated with 500-kV transmission lines.

BPA has prepared a booklet which discusses this subject in greater detail and it is free upon request ("Electrical and Biological Effects of Transmission Lines: A Review").

The electric and magnetic fields produced by a 500-kV line will induce voltages and currents into objects, including animals and people, near the line. Under most conditions these will not be perceivable to people and most animals. Some people can perceive effects of the electric field as slight hair stimulation on the head or on outstretched arms when standing under a line.

It is also possible to receive discharge shocks when touching metal objects near 500-kV lines. The magnitude of the shock depends on a number of factors. Usually such shocks would be similar to that produced by walking across a carpet and touching a metal object. To prevent shocks, metal objects near 500-kV lines are routinely grounded by BPA maintenance personnel. In addition to the publication cited above, additional information on this subject is contained in the BPA publication, "Tips on How to Behave Near High Voltage Power Lines."

Another possible effect of electric and magnetic fields involves cardiac pacemakers. When a person touches an electrical tool or appliance, or is in an electric field, a low level current can flow in the person's body. Some pacemakers sense the low level voltages of the heart to function properly and extraneous currents and voltages of sufficient level can interfere with this function. Recent research at the IIT Research Institute indicates transmission line fields pose only a minimal risk to pacemaker wearers. This depends on the type of pacemaker and the way in which it has been implanted. To date we are not aware of any situation where a transmission line caused a serious health problem to the wearer of a pacemaker. Persons who would like additional information on this subject can contact their physician or the nearest BPA office.

Much attention in recent years has focused on the possible long term biologic effects of electric and magnetic fields. Questions have been raised as to the significance of induced body currents which may be below the level of perception.

Interest in this subject developed largely as a result of studies done in the Soviet Union in the early 1960's on electrical substation workers. These studies attributed medical problems in the workers to the electric field environment in the substations. Some laboratory studies with rodents have also suggested electric fields cause adverse biologic effects.

Operating experience of electric utilities in the U.S. and many other countries and most of the laboratory research done on this subject, does not indicate there is need for concern over the possible health hazards

of transmission lines. This is the general conclusion of most published reviews on this subject of which we are aware. In addition, investigations conducted by the U.S. Environmental Protection Agency, and State agencies in New York, California, and Minnesota have not found that transmission line electric fields are a hazard to people or animals. Such investigations indicate additional research on this subject is desirable. Such research could provide information for understanding why some studies have produced seemingly contradictory results. A number of research projects are underway on this subject, most of which are funded by the Electric Power Research Institute and the U.S. Department of Energy.

In addition to the "field effects" described above, "corona effects" are also of interest. As described in the "Electrical Effects" section, corona results in audible noise, ozone production, and radio and television interference. The amount of ozone produced by a 500-kV transmission line is generally considered to be insignificant and usually not measureable above ambient levels.

Audible noise is probably the most noticeable corona effect. This noise, most apparent during wet weather, was found to be a source of annoyance when the first 500-kV lines were constructed. The proposed line will utilize the latest design for minimizing the production of audible noise. This is accomplished by installing large diameter conductors in bundles of three for each of the three line phases. Based on BPA experience and research on this subject, we do not expect that the amount of audible noise produced by the proposed line would have any important effect on people, or animals near the line. The noise levels produced by the line are within limits for noise as identified by the U.S. Environmental Protection Agency and by the Oregon Department of Environmental Quality.

M I T I G A T I N G M E A S U R E S

Mitigation measures BPA routinely employs during transmission line construction and maintenance are described in Appendix B of the Role EIS, Chapter VIII. The following section discusses, for each resource category, specific measures and areas where they would be applied.

NATURAL RESOURCES

BPA contractors will attempt to limit the amount of dust and particulates added to the atmosphere, especially where the potential for excessive amounts of pollution from these sources is high and in the few places where people could be affected. To aid in dust control, limitations will

be imposed as to type of equipment and allowable speeds. Water, straw, wood chips, oil, dust palliative, gravel, or combinations of these would be used on unpaved roads in critical areas. Oregon State Department of Environmental Quality (DEQ) regulations and permit procedures regarding slash disposal will be followed.

Vehicle exhaust emissions are controlled by applicable Federal, State, and local laws. The contractor is required to maintain engines and equipment in proper adjustment to avoid excessive emissions. Sometimes emissions can be lowered by limiting operations. Contractors are not allowed to burn tires, plastics, or other debris.

For geologic and soils resources, the best mitigation measure is to limit the extent of soil disturbances caused by equipment operation around tower sites, by limiting vehicle access to specific areas and keeping activities such as road construction cut and fill to a minimum. This would include locating and constructing access roads away from moderate to steep slopes and sensitive areas as much as possible. If access roads must be constructed on slopes, water bars are installed at appropriate intervals and exposed areas reseeded or stabilized. Only a very small amount of access road construction will be required.

Figure 4 shows the major areas of potential geologic and soil hazards. In areas with moderate to high erosion potential, especially those areas where new access road construction would be necessary, mitigation measures are required. Construction in areas susceptible to high wind or water erosion would be timed to avoid seasonal periods of high wind or intense rainfall.

Many mitigation measures used to reduce geologic and hydrologic impacts also limit impacts to vegetation, especially on steep slopes, in areas of high erosion potential, or near riparian communities. Site-specific measures are discussed below.

Tower location efforts focus on avoiding impact-sensitive areas. Wetland areas are avoided whenever possible. At the minimum, disturbances in such areas will be avoided immediately prior to spring runoff peaks. Disturbance after spring flooding would result in less impact. Grasslands also would not be disturbed early in the year when the soil may be saturated with water. Temporary access roads in marginal forest habitat (such as Ponderosa pine/steppe parkland) would follow clearings and avoid removing trees because such areas recover from disturbance slowly.

Where disturbance is unavoidable, efforts are undertaken to restore the original conditions, especially on steep slopes. Wherever erosion is a

problem, non-palatable species are preferred for reseeding operation. Grazing should be deferred for at least 3 years on all reseeded areas to enhance the success of recovery.

There are four types of wildlife use areas for which mitigation should be undertaken: waterfowl and upland bird nesting and breeding sites, waterfowl concentration areas, deer/antelope winter ranges, and forest wildlife habitats.

Construction is limited in the vicinity of waterfowl and upland bird breeding sites during the peak nesting period of March, April, and May, to avoid disturbing or destroying ground nests. Critical waterfowl areas are near Silver Lake, Sycan Marsh, and the Sprague and Lost Rivers.

Construction across identified deer/antelope winter ranges would be restricted during the critical use period from November 15 to April 30. Closing and posting access roads in these areas to reduce harassment and poaching of big game animals will also be required.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

In agricultural land, BPA construction activity can have significant impact on irrigated areas. In the Prineville and Lost River areas efforts would be made to complete construction between late October and mid-February to reduce damage to crops in and outside the ROW. Careful planning and close cooperation between property owners and construction workers will be necessary to complete construction with a minimum of crop and property damage.

BPA or its contractor will give fair compensation for damage to growing crops, irrigation equipment, tiles, or fences that results from construction. BPA or its contractor will also pay for modifications to sprinkler systems made necessary by tower locations.

The presence of a transmission line will cause visual impacts; it is difficult to blend the towers and conductors into the landscape to avoid all visual intrusions. However when crossing major highways and rivers the transmission line towers will be located for minimum visibility.

U N A V O I D A B L E A D V E R S E I M P A C T S

Unavoidable adverse impacts will depend upon the effectiveness of site-specific mitigative measures. General impacts will occur as a result of the transmission line, even after application of mitigating measures.

Dust, slash burning, and vehicle emissions during transmission line construction will contribute to short term local air pollution. Small amounts of ozone and nitrogen oxides will be produced during powerline operation for the life of the project. None of these pollutants is expected to significantly degrade air quality or harm the public.

Ambient noise levels of the predominantly rural locales will be increased during construction. These levels are not expected to adversely affect human health or exceed worker exposure standards. Low-level noise is expected from powerline operation in foul weather, but is not expected to impact hearing although it could be annoying. Wildlife in the vicinity of such noise could be similarly affected.

Construction of the transmission line will change the topography slightly along the ROW. Cut and fill slopes for a small amount of new access road, graded platform locations, and leveled lands for support facilities modify the natural topography. This will be primarily in areas of steep terrain.

Some increase in soil mass movement will be unavoidable as a result of line construction. Soil will be lost through accelerated erosion. Additionally, soil will decrease in value as a medium for plant growth because of compaction, obliteration of the soil profile, and loss of soil nutrients.

Small increases in suspended sediments, turbidity, water yield, and dissolved solids are expected, even with mitigation measures. The increase in dissolved and suspended solids will be small, and will be insignificant following revegetation.

Impacts to wildlife will include loss of small amounts of cover area and possible reduction in carrying capacity of species associated with higher strata in forest habitat types. Stress will occur not only from noise and dust but also from human contact during construction. The physical presence of additional transmission facilities will cause some bird mortalities, especially in migratory waterfowl flyways.

Dust-covered vegetation will be undesirable as a forage source for livestock and wildlife. The small amount of forest clearing will remain for the life of the project, indefinitely reducing the forest contribution toward sustained timber yield.

A small amount of irrigated and nonirrigated agricultural land under tower bases will be removed from production for the life of the line. Other unavoidable impacts include production losses from soil disturbance during construction, difficulties in operating automated irrigation equipment near the lines, and impaired movement of large farm machinery.

Cultural resources, including some archeological, paleontological, or historical sites, likely will be lost, except for artifacts and information that can be salvaged before construction. Some will be made more accessible to potential losses, and some will become less attractive or lose historical-cultural integrity because of the presence of the corridor. The magnitude of such losses, though not known from existing data, will become more apparent during route survey.

Some homes will be visually impacted by the presence of the lines. A certain amount of dust, noise, and inconvenience is inevitable. Radio and TV interference may occasionally occur.

Larger communities near the route will be affected, to a minor degree, by an influx of construction workers and their dependents. Whether this will be a benefit or an impact depends on several factors such as the size of the influx, the size of the community, the compatibility of the lifestyles of the inmigrants and the residents, the duration of the influx, and the availability of needed goods and services. Operation of the line may cause concern to people living or working near it.

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed transmission line is a portion of a project that will distribute electrical energy from thermal generating plants in Wyoming to the Pacific Northwest and allow transfer of power from west to east to serve seasonal irrigation loads. It will allow the transmission of additional electrical energy into southwest Oregon. The transmission capability will enhance agricultural and industrial productivity of the region and serve energy needs.

The useful life of the transmission lines, support structures, and substations is 50 years. The proposal adds to an existing transmission corridor. The corridor is a major north-south right-of-way. Chances of the transmission facilities returning to other uses appear remote.

The transmission ROW will interfere with certain land uses, including rangeland, forest land, cropland, and recreation. The potential economic loss from preempted land use will be insignificant compared with economic gains from the project. Since BPA will pay for easement rights, the landowner will not suffer economic losses. Further, certain land uses can occur under the transmission line.

The most serious effects on long term vegetative productivity along the ROW and by implication to rangeland, forest land, cropland, and biological productivity, will result from disturbance to soil. Although impacts will occur during construction, vegetative productivity in the affected areas will be diminished from existing levels in the long term since decades are required to replace or repair the soil. Because road and tower sites will be subject to the greatest soil impacts, the proportion of land seriously impacted versus that within the designated right-of-way is small.

In the absence of severe soil disturbance, it is estimated a return to existing rangeland productivity along the right-of-way should occur in zones of higher precipitation (greater than 15 inches per year) within approximately 5 years after construction of the transmission facilities; 10 years or somewhat more may be required for revegetation in semiarid zones. Agricultural productivity is expected to return to pre-transmission-line levels within a few years also. Only recovery is expected, not enhancement.

Forest productivity will be diminished in the long term even in areas of slight disturbance. It is difficult to project a recovery period for forest, although it would be shorter in higher precipitation zones. The economic loss associated with this local short term use will be experienced primarily on the Fremont National Forest.

Biological productivity in terrestrial and aquatic ecosystems will be diminished for the time necessary for the land to return to the existing condition. It is not known how long the effects of erosion on productivity of aquatic ecosystems will last, although accelerated erosion is expected to occur for only a few years during and after construction. Some increases in water yield, dissolved solids, and water temperature will persist as long as the right-of-way is maintained and vegetation is prevented from reaching preconstruction conditions. Because these impacts are not of large magnitude, long term productivity will not be significantly affected.

Productivity of terrestrial ecosystems will be affected by loss of vegetative stratification. Again, except where soil disturbance is severe or where tree growth is quite slow, a relatively quick recovery is expected. The importance of long term loss of biological productivity in the ROW would be magnified if threatened, endangered, or rare species were affected.

Impacts of the transmission system to recreational use of land comprising the right-of-way and nearby areas are expected to last only slightly longer than the project construction since revegetation, for the most part, will be fairly quick and recreational land uses will not be precluded by disturbance of the ROW. Visual quality of the land will not be diminished significantly.

Social resources will, like economic and agricultural resources, be expanded throughout the transmission service area. Construction of the transmission system should have few long term effects on social resources along the ROW since no permanent changes or improvements in social services or institutions will be made to accommodate the workers. Little strain on local social resources is expected during transmission construction because the work force will be spread out over 160 miles and probably be based in urban areas. These urban centers can easily accommodate the incoming electrical workers and will supply part of the work force.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Construction and presence of the Buckley-Summer Lake and Summer Lake-Malin 500-kV transmission lines and Buckley and Summer Lake substations commits the land to use as a utility corridor for the economic life of the facilities. Seven hundred and twenty acres of timber, less than 1 acre of rangeland for tower footings, and about 14 acres of cropland will be removed from production for the life of the project and recovery period. The resources that could have been produced on these lands will be lost. They are, however, for the most part renewable if the ROW is reclaimed (except where soils are severely disturbed).

Existing biological production on these acreages will also be irreversibly committed for the life of the project and recovery period. In the comparatively small areas where soils are irreversibly altered, the existing plant and animal communities will be irretrievably committed.

The ROW will irreversibly preempt certain land use options, including residential, commercial, and industrial buildup. Agricultural buildings and possibly certain irrigation systems also will be restricted. Unless secondary effects such as reduced land values prevail, all existing land use options will be viable if the line is removed in the future.

Accelerated surface water runoff and erosion during construction will irreversibly commit undetermined amounts of water and soil and make them unavailable to plants and animals in the construction areas. A small undetermined amount of stream production will be irreversibly committed during periods of increased turbidity and sedimentation.

Undiscovered archeological and paleontological sites along the ROW could be irreversibly altered by construction activities. Although historical sites are more obvious and can be avoided, any along the right-of-way may have their larger environmental context irreversibly altered.

In addition to resources of the land comprising the transmission corridor, undetermined amounts of fossil fuels and structural materials will be committed. Examples of quantities projected are 8,600 tons of steel for the towers, 15,312 tons of steel and aluminum for the conductors, and 139,780 insulators. The fuels are irretrievable. Much of the structural and repair materials could be salvaged for future use but concrete, road materials, and chemicals will be irretrievably committed.

Manpower such as that provided by the 320-350 workers needed will be irreversibly committed and thus unavailable for similar projects. A capital investment of at least $45.3 million will be irreversibly expended for the transmission line, support structures, and ancillary facilities.

C O N S U L T A T I O N A N D C O O R D I N A T I O N W I T H O T H E R S

PLANNING COORDINATION

The following agencies and organizations were contacted by BPA economists, engineers, and environmentalists during the location phase of this project. Information on land use plans, resource data, and engineering concerns were exchanged.

Federal Agencies
- U.S. Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- U.S. Department of the Army
  - Army Corps of Engineers
- U.S. Department of the Interior
  - Bureau of Land Management
  - Fish and Wildlife Service
  - Geological Survey

State Agencies
- Oregon State
  - Attorney General's Office
  - Department of Environmental Quality
  - Department of Fish and Wildlife
  - Historic Preservation Office

Local Agencies
- County Planning Commissions
  - Crook County
  - Deschutes County
  - Jefferson County
  - Klamath County
  - Lake County
  - Sherman County
  - Wasco County

Other
- Idaho Power Company
- Pacific Power and Light

COORDINATION IN THE REVIEW OF THE DRAFT FACILITY LOCATION SUPPLEMENT

The FY 1979 Draft Facility Location Supplement was sent to Federal agencies, State clearinghouses, and to local clearinghouses where these have been established by States, or to County or metropolitan planning commissions and environmental agencies where local clearinghouses have not been established. These agencies are listed below. As a part of the FY 1979 Program, this supplement will be forwarded to all agencies listed. A notice of availability of the Draft Facility Location Supplement will be placed in the Federal Register.

AGENCIES REQUESTED TO COMMENT ON THE DRAFT FACILITY LOCATION SUPPLEMENT

Federal Agencies

- U.S. Department of the Interior
  - Fish & Wildlife Service
  - Bureau of Mines
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Heritage Conservation and Recreation Service
  - National Park Service
  - Geological Survey
  - Bureau of Reclamation
- U.S. Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- U.S. Department of Health, Education and Welfare
- U.S. Department of Housing and Urban Development
- U.S. Environmental Protection Agency
- Federal Energy Regulatory Commission
- Federal Aviation Administration
- Advisory Council on Historic Preservation
- U.S. Department of the Army
  - Army Corps of Engineers
- U.S. Department of Transportation

State Agencies

- Oregon State
  - Attorney General's Office
  - Department of Energy
  - Department of Environmental Quality
  - Historic Preservation Office
  - Intergovernmental Relations Division

Local Agencies

- County Planning Commissions
  - Crook County
  - Deschutes County
  - Jefferson County
  - Klamath County
  - Lake County
  - Sherman County
  - Wasco County

Other

Idaho Power Company
Pacific Power and Light
Environmental Defense Fund
Pacific Northwest Conservation Council
Sierra Club, Pacific Northwest Chapter
National Wildlife Federation
Federation of Western Outdoor Clubs
Friends of the Earth
Natural Resources Defense Council
The Wilderness Society
Natural Resources Law Institute
Oregon Environmental Council

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L I S T O F P R E P A R E R S

Gary Insley, Forester

Eight months working for REA electric cooperative in right-of-way maintenance and line construction. One year timber inventory and timber stand examination, U.S. Forest Service. Two years timber and land appraisal, BPA. Two years timber sale administration and resource administration, U.S. Forest Service. Since 1979 has been working as a forester and environmental specialist for BPA.

Educational Background:

BS - University of Minnesota - Forest Resources Development, 1973.

Marvin L. Jeffers, Environmental Specialist

Nine years working for Bureau of Land Management in land use and resource planning and grassland management. Since 1974 has been working as an environmental specialist concentrating on wildlife and vegetation analysis and endangered species.

Educational Background:

BS - Fort Hayes Kansas State College - Botany and Range Management
MS - Fort Hayes Kansas State College - Plant and Wildlife Ecology

Nicholas M. Mariana, Writer/Editor

Forty-five years writing, editing, Radio and TV broadcasting. Reporter, editor of several newspapers, magazine articles, TV and Radio scripting. Twelve years as Regional Conservation Education Coordinator, Bureau of Sport Fisheries and Wildlife; produced motion pictures, slide shows, and articles. Six years as writer/editor BPA.

Educational Background:

BA, Journalism, University of Montana, 1938.

Dennis E. Maxwell, Landscape Architect

Two years teaching landscape architectural design and plant materials at the University of Oregon. Four years as a Civil Engineering Officer, U.S. Air Force. Since 1973 has been working as a landscape architect and environmental specialist for BPA.

Educational Background:

BLA - University of Florida - Landscape Architecture
MLA - University of Oregon - Landscape Architecture

Judith A. Nisperos, Visual Information Specialist

Nine years working for U.S. Bureau of Land Management, Cadastral Survey and Cartography Section. Since 1976 has been working as an Engineering Draftsman and Visual Information Specialist for BPA.

Educational Background:

Portland State University, Portland Community College, Mt. Hood Community College.

Janice M. Peterson, Archeologist

Assistant Professor of Anthropology at Oregon State University. Archeological Consultant - principal investigator for archeological project, director of archeological excavations. Archeological field experience in California, Oregon, and Washington. Recipient of two National Science Foundation Grants.

Educational Background:

BS - Portland State University - Philosophy/Biology
MS - University of Oregon - Anthropology
Additional Graduate work - course work for PHD completed at University of Oregon

(Now employed by U.S. Fish and Wildlife Service in Portland, Oregon.)

Lawrence K. Purchase, Environmental Specialist

Seven years working as an environmental specialist for BPA (1972 to present).

Educational Background:

BS - Oregon State University - Range Management, Botany.

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Buckley-Summer Lake:Wg0312A:05-06-80

Stephen D. Vickers, Environmental Specialist/Geologist

Two years working for U.S. Geologic Survey on Willamette River Intensive River Quality Study. Since 1975 has been working as an environmental specialist for BPA, concentrating in areas relating to geology, soils, minerals, and hydrology.

Educational Background:

BS - Oregon State University - Geology
Graduate work - one year postgraduate studies at Portland State University in environment/engineering and geology

COMMENTS RECEIVED DURING THE REVIEW PROCESS

U.S. Department of the Interior
December 31, 1979

Comment:

The draft contains no information on impacts on threatened or endangered species or on candidate species. While the Errata Sheet indicates that consultation has been initiated on both plant and animal species, in fact, "consultation" under Section 7 of the Endangered Species Act has not taken place for either group. The Fish and Wildlife Service did provide a listing of those species which could occur and which could be impacted. Assessments by BPA apparently have still to be carried out. These assessments could lead to official consultation with the Service. Any final location supplement which does not incorporate the results of these assessments of impacts on threatened or endangered species and of any subsequent consultation would be inadequate in displaying the environmental consequences of the location decision.

Response:

An assessment of potential impacts on endangered and threatened animal species was forwarded to the U.S. Fish and Wildlife Service (USFWS) on March 19, 1980. The results of that assessment are incorporated in the text of the EIS (see page 14). On April 18, 1980, the USFWS concurred with the results of the assessment.

Comment:

The proposal will reduce adverse visual and recreational impacts by paralleling an existing transmission corridor. We suggest the final supplement discuss the alternative of stringing additional conductors from existing or larger replacement towers in the existing corridor, thus reducing or eliminating the need for additional right-of-way clearing.

Response:

The existing transmission towers have been designed to carry a specific number of conductors. They would be in danger of falling if they supported more weight than they are designed for. Modification or replacement of the existing towers would be quite expensive and would cause the existing circuits to be out of service during the construction period lasting several years.

Comment:

According to the Bureau of Mines Mineral Industry Location System (MILS), three stone deposits are near the proposed transmission line; however, because of the lack of detailed maps in the statement, it is difficult to determine if the deposits are within the corridor.

Although we anticipate that the project will have no significant impact on mineral resource development, we suggest that BPA assess this possibility prior to the final selection of transmission route.

Response:

East of Prineville, two county-owned quarries are near the right-of-way. Pumice for road construction is being extracted from the southern quarry, while at the present time, the northern quarry is inactive. These pumice deposits do not extend onto the right-of-way and will not be impacted.

Comment:

Page 4, Operation and Maintenance Requirements. The statement would benefit from inclusion of more specific information on herbicides to be used to control tall-growing vegetation on the right-of-way.

Page 7, Hydrology. The potential for adverse effects on surface water draining areas treated by herbicides should be assessed. In addition, it should be stated whether any potential for contamination of ground water by herbicides will exist, particularly in areas where broken or fractured basaltic or other igneous rocks are at or near the surface. If so, an assessment of potential impacts would be needed.

Response:

The Proposed Fiscal Year 1979 Program EIS contains specific information on the herbicides which will be used. A reference to this document will be added to the text of the EIS.

The use of herbicides to control vegetation along the right-of-way in this semi-arid climate will be minimal. At most, herbicides may be applied locally near the southern end of the line, at the frequency of once every 10 years. Surface water resources are also sparse in this climate. However, to ensure minimal degradation of these resources, all herbicides will be applied following those precautions described in BPA's Role Statement, Appendix B, Chapters VII and VIII. The impact of herbicides on ground water resources will also be insignificant. Even in areas of highly fractured igneous rocks, the herbicides used by BPA will have decomposed to harmless levels before reaching the ground water table.

Comment:

Page 22, Esthetics. Item 2 states that visual compatibility of the transmission line is high because the predominantly treeless landscape minimizes the need for vegetation clearing. We feel the statement is misleading, as it does not recognize the high visibility of transmission facilities in open rangeland. Towers in such areas are generally the most dominant features, and, together with conductors, can produce a very discordant visual effect in an otherwise natural landscape. The effect often exists for a much greater distance than in forest because of long sight distances in semiarid, level terrain. In our view, paralleling the existing line is the most important factor in reducing visual impacts of the proposed project.

Response:

We agree that the transmission facilities are quite visible in open rangeland areas. However, their visibility is not as high as in some other locations. According to a study prepared for BPA (Jones and Jones, November 1976): in a rangeland setting a high visual impact from the transmission towers would occur at distances up to 1.1 miles. Visual impacts from the towers were judged to be barely detectable at 14.5 miles. On a forested mountainside, the respective figures are 1.4 miles and 18.5 miles. On a forested hillside, a cleared right-of-way for two parallel transmission lines would be visible up to 25 miles away. These figures will vary depending upon atmospheric and lightning conditions, as well as vegetation and soil colors. They do, however, provide reasonable guidelines which we use to assess visual impacts.

We have changed the text to qualify our judgment of high visual compatibility.

Comment:

The final supplement should give more detailed information on impacts at the Crooked River crossing (last paragraph). We urge that special consideration be given to mitigating adverse visual impacts in this area.

Response:

Additional discussion of the visual impacts at the Crooked River crossing has been included in the text of the EIS. The transmission line will cross the river in a broad valley, and towers will be within 700 feet of the river. At these distances, most mitigation techniques would be ineffective.

Southwest Oregon Service SA 79-5
Buckley-Summer Lake:Wg0312A:05-06-80

Comment:

Pages 23, 24, Historical/Archeological. The draft lists seven sites of national, State, or local significance that are located within 1 mile of the route or within its viewshed. However, there is no indication of compliance with 36 CFR 800 to determine whether these sites are eligible for inclusion in the National Register of Historic Places. Three potential substation sites are reported to have high potential for archeological artifacts. Although the draft states the sites are being surveyed by professional archeologists, it does not reflect consultation with the State Historic Preservation Officer (SHPO) in regard to surveys of these and other sites.

The final statement should indicate more complete compliance with CFR Part 800 and should contain a letter from the SHPO reflecting consultation as required. Briefly, the requirements include consultation on: the need for and type of survey(s) to identify historical and archeological properties, survey boundaries, application of National Register eligibility criteria to identified properties, determination of the effects of the proposal on National Register or eligible properties, and other 36 CFR 800.4 procedures if such properties will be affected. The Advisory Council on Historic Preservation must be given the opportunity to comment on any sites determined eligible that may be affected by the project.

Response:

See the response to comments made by the Advisory Council on Historic Preservation and revisions in the text of the EIS.

Advisory Council on Historic Preservation
December 3, 1979

Comment:

Generally, the Council considers environmental evaluations to be adequate when they contain evidence of compliance with Section 106 of the National Historic Preservation Act, as amended. The environmental documentation must demonstrate that either of the following conditions exists:

1. No properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will not affect any such property. In making this determination, the Council requires:

--evidence that the agency has consulted the latest edition of the National Register (Federal Register, February 6, 1979, and its monthly supplements);

--evidence of an effort to ensure the identification of properties eligible for inclusion in the National Register, including evidence of contact with the State Historic Preservation Officer, whose comments should be included in the Final Environmental Statement. The SHPO for Oregon is Mr. David G. Talbot, 300 State Highway Building, Salem, Oregon 97310.

2. Properties included in, or that may be eligible for inclusion in, the National Register are located within the area of environmental impact, and the undertaking will or will not affect any such property. In cases where there will be an effect, the Final Environmental Statement should contain evidence of compliance with Section 106 of the National Historic Preservation Act through the Council's regulations.

Response:

BPA has contracted with the Washington Archaeological Research Center (WARC) to provide a survey of historic and archeological resources within the study area. In addition, they are to test sites identified and if they meet the necessary criteria, to provide documentation for nomination to the National Register of Historic Places. WARC has consulted the latest supplement to the National Register and contacted the State Historic Preservation Officer. Documentation of these actions will appear in WARC's final report to us. The text of the final EIS has been revised to indicate the latest status of the surveys and site testing.

U.S. Environmental Protection Agency
December 17, 1979

Comment:

We would like the supplement to contain a clear statement of BPA's policy on wetland avoidance. While there are marshy areas within the existing right-of-way (page 8), it appears that disturbances of these areas could be minimized by sensitive placement of the new towers. The discussion of mitigating measures for tower location on page 29 should include BPA's intent to avoid these areas wherever possible.

Response:

The referenced page does indicate that wetland areas are disturbed only if absolutely necessary. The discussion of mitigating measures references BPA's Role EIS which contains additional information on wetlands and their avoidance.

Oregon Forestry Department
December 6, 1979

Comment:

Specifically, the Southwest Oregon Area Service Facility Planning Supplement, September 1979, page 53, states that 40 miles of "...designated forest land would be crossed by the Buckley-Malin corridor, 20 of which are considered to have commercial value." The Buckley-Summer Lake 500-kV Line Facility Location Supplement, table 3, identifies 77.2 miles of forest land crossed by the same line. Similarly, the total loss of commercially productive forest land was estimated at 120 acres in the Facility Planning Supplement, page 53; the Facility Location Supplement, table 3, on the other hand, totals forest area at 719.7 acres. It may be that these discrepancies exist because of differences in definition. It may, however, be that the route proposed in the Location Supplement withdraws more commercial forest land than the route identified in the Facility Planning Supplement. Should that in fact be the case, alternatives that would decrease the amount of forest land removed from production should be thoroughly examined.

Response:

The route discussed in the Facility Location Supplement is the same as in the planning supplement. Much of the data used in the planning supplement was based on maps and other documents. Data in the location supplement was based on interpretation of aerial photographs and field study. Our criteria for identifying forest land apparently differed from that used for the maps and other information used earlier.

Oregon State Soil and Water Conservation Commission
December 14, 1979

Comment:

The erosion control plans appeared to be adequate. However, we request that BPA engineers review project erosion control plans with the local Soil and Water Conservation District offices in each county.

Response:

The erosion control districts will be consulted to discuss our erosion control plans in areas where erosion problems may occur.

Oregon Division of State Lands
December 14, 1979

Comment:

If the project would require the removal, fill or alteration of 50 cubic yards or more of material within the banks of the waterway(s), we urge the applicant to apply for state fill or removal permits well in advance of construction deadlines to prevent unnecessary project delays.

Response:

This project will not require construction of structures within the banks of any waterways.

Oregon State Highway Department
December 14, 1979

Comment:

Please coordinate, as necessary, with the appropriate Highway Division Regional Office regarding the crossing of state highways.

Response:

The Highway Division Regional Offices will be contacted to discuss mitigating measures to be used at highway crossings.

Oregon Department of Land Conservation and Development
December 14, 1979

Comment:

This project needs to be closely coordinated with Wasco, Crook, Deschutes, Lake and Klamath counties, to ensure it does not conflict with their comprehensive plans.

Response:

Each county within the study area was contacted to obtain copies of their comprehensive plans and zoning ordinances. These documents were studied to determine whether our proposal conflicted with their plans. In addition, a copy of the draft EIS was sent to each county planning commission. No comments were received from any of the counties.

Southwest Oregon Service SA 79-5
Buckley-Summer Lake:Wg0312A:05-06-80

Pacific Power and Light Company
December 11, 1979

Comment:

A casual reading of the brief description on page 7 of the three Summer Lake substation sites may intimate to some readers that Site 1 is preferable, when in fact, information obtained from a recent field reconnaissance by representatives of BPA and PP&L indicate that Site 2 is preferable both environmentally and economically.

This detailed field reconnaissance indicates that the substation can be designed at Site 2 without a significant amount of grading and rock blasting, contrary to the statement on page 7. Furthermore, when the impacts of the additional transmission line are included for Sites 1 and 3, the overall environmental impact is least for Site 2.

Additionally, Site 2 is the most economical. We estimate the total cost of utilizing Site 1 to be close to a million dollars more than Site 2.

Response:

The information in the EIS was based on a field report which described the conditions at the three sites. Due to an error in numbering the sites in the field report, the sites which you are referring to are not the same as described in the final EIS.

As indicated in the EIS, conditions at all three sites are very similar. The major differences are geological. With standard mitigating measures, the difference in impact at any of the sites would be negligible. The impacts would be low at any of the sites.

COMMENT LETTERS

BUCKLEY - SUMMER LAKE

Page	Individual/Organization	Date Received
54	Oregon State Clearinghouse Intergovernmental Relations Division	November 14, 1979
55	Advisory Council on Historic Preservation	December 6, 1979
57	State of Oregon Forestry Department	December 7, 1979
58	Pacific Power & Light Company	December 12, 1979
59	U.S. Environmental Protection Agency, Region X, Seattle, WA	December 19, 1979
60	State of Oregon Executive Department	December 20, 1979
68	Department of the Army, Corps of Engineers, Portland District	December 27, 1979
69	U.S. Dept. of Interior, Office of the Secretary, Pacific NW Region	January 8, 1980
72*	U.S. Dept. of Agriculture, Forest Service	January 14, 1980

* Late Letters (letters received that were postmarked beyond the official close of comment date which was December 31, 1979).

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
Room 306, State Library Building
Salem, OR. 97310, Phone: 378-3732
Toll Free Number--1-800-452-7813

PROJECT ACKNOWLEDGEMENT

APPLICANT: BPA

PROJECT TITLE: Southwest Oregon Area Svc, Supplement to 1979 Pgm

DATE RECEIVED: November 8, 1979

PNRS #: 7911 2 180

Your project has been assigned the file title and number that appear above. Use this reference in all future correspondence regarding this project.

[ ] Initial 30-day State Clearinghouse review of your Notice of Intent began on the above date.

[ ] The 30-day State Clearinghouse review of your final application began on the above date.

[ ] Initial 30-day State Clearinghouse review of this HUD Housing project began on the above date.

[ ] Initial 30-day State Clearinghouse review of your Direct Federal Development project began on the above date.

[ ] The 30-day State Clearinghouse review of your final Environmental Impact Statement began on the above date.

[X] Initial 45-day State Clearinghouse review of your draft Environmental Impact Statement began on the above date.

[ ] The 45-day State Clearinghouse review of your State Plan/ Amendment began on the above date.

Your project must also be submitted to the affected area-wide clearinghouses for review.

If you have questions or need assistance, contact the State Clearinghouse at the above address and telephone number.

Advisory Council On Historic Preservation

1522 K Street N.W.
Washington D.C.
20005

December 3, 1979

Mr. John Kiley
Environmental Manager
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

This is to acknowledge receipt of the draft supplement to the final environmental statement for the Bonneville Power Administration Proposed Fiscal Year 1979, Facilities Location Supplement Southwest Oregon Area Service, Buckley-Summer Lake kV Line, on November 13, 1979. We regret that we will be unable to review and comment on this document in a timely manner pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969.

Nevertheless, the Bonneville Power Administration is reminded that, if the proposed undertaking will affect properties included in or eligible for inclusion in the National Register of Historic Places, it is required by Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. Sec. 470f, as amended, 90 Stat. 1320) to afford the Council an opportunity to comment on the undertaking prior to the approval of the expenditure of any Federal funds or prior to the issuance of any license. The Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800.4) detail the steps an agency is to follow in requesting Council comment.

Generally, the Council considers environmental evaluations to be adequate when they contain evidence of compliance with Section 106 of the National Historic Preservation Act, as amended. The environmental documentation must demonstrate that either of the following conditions exists:

1. No properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will not affect any such property. In making this determination, the Council requires:

--evidence that the agency has consulted the latest edition of the National Register (Federal Register, February 6, 1979, and its monthly supplements);

--evidence of an effort to ensure the identification of properties eligible for inclusion in the National Register, including evidence of contact with the State Historic Preservation Officer, whose comments should be included in the final environmental statement. The SHPO for Oregon is Mr. David G. Talbot, 300 State Highway Building, Salem, Oregon 97310.

2. Properties included in or that may be eligible for inclusion in the National Register are located within the area of environmental impact, and the undertaking will or will not affect any such property. In cases where there will be an effect, the final environmental statement should contain evidence of compliance with Section 106 of the National Historic Preservation Act through the Council's regulations.

Should you have any questions, please call Brit Allan Storey at (303) 234-4946, an FTS number.

Sincerely,

Louis S. Wall
Chief, Western Division
of Project Review

VICTOR ATIYEH
GOVERNOR

Forestry Department

OFFICE OF STATE FORESTER

2600 STATE STREET, SALEM, OREGON 97310 PHONE 378-2560

December 6, 1979

John Kiley, Environmental Manager
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

Thank you for the opportunity to respond to the B.P.A. proposed fiscal year 1979 program — Final Location Supplement (Southwest Oregon Service Area, Buckley-Summer Lake 500 kV Line).

It is recognized that constructing new transmission lines adjacent to existing corridors generally impacts the forest land base less than pioneering new routes. However, reasonable and economically sound construction methods or routes, which would decrease the amount of commercial forest land removed from production, should be given serious consideration.

Specifically, the Southwest Oregon Area Service Facility Planning Supplement, September, 1979, p. 53, states that forty miles of "...designated forest land would be crossed by the Buckley-Malin Corridor, 20 of which are considered to have commercial value." The Buckley-Summer Lake 500 kV Line Facility Location Supplement, Table 3, identifies 77.2 miles of forest land crossed by the same line. Similarly, the total loss of commercially productive forest land was estimated at 120 acres in the Facility Planning Supplement, p. 53; the Facility Location Supplement, Table 3, on the other hand, totals forest area at 719.7 acres. It may be that these discrepencies exist because of differences in definition. It may, however, be that the route proposed in the Location Supplement withdraws more commercial forest land than the route identified in the Facility Planning Supplement. Should that in fact be the case, alternatives that would decrease the amount of forest land removed from production should be thoroughly examined.

Again, your current efforts are appreciated and we thank you for the opportunity to make these comments.

Sincerely,

J. E. SCHROEDER
State Forester

By: Gary J. Lettman
Resource Studies Assistant

GL:dj

PACIFIC POWER & LIGHT COMPANY
920 S.W. SIXTH AVENUE · PORTLAND, OREGON 97204 · (503) 243-1122

Robert W. Moench
Senior Vice President

December 11, 1979

Environmental Manager
Bonneville Power Administration
P. O. Box 3621-SJ
Portland, OR 97208

Dear Sir:

Pacific Power & Light Company appreciates this opportunity to comment on the "Draft Facility Location Supplement, Final Environmental Impact Statement, Southwest Oregon Area Service, Buckley-Summer Lake 500 kv line."

A casual reading of the brief description on page 7 of the three Summer Lake substation sites may intimate to some readers that Site 1 is preferable, when in fact information obtained from a recent field reconnaissance by representatives of BPA and PP&L indicate that Site 2 is preferable both environmentally and economically.

This detailed field reconnaissance indicates that the substation can be designed at Site 2 without a significant amount of grading and rock blasting, contrary to the statement on page 7. Furthermore, when the impacts of the additional transmission line are included for Sites 1 and 3, the overall environmental impact is least for Site 2.

Additionally, Site 2 is the most economical. We estimate the total cost of utilizing Site 1 to be close to a million dollars more than Site 2.

We appreciate the opportunity to comment and look forward to working out the details of this interconnection.

Sincerely yours,

RWM:rbk

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE

SEATTLE, WASHINGTON 98101

REPLY TO ATTN OF: M/S 443

DEC 17 1979

John Kiley, Environmental Manager
Bonneville Power Administrator
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

We have completed our review of the draft facility location supplement to your Fiscal Year 1979 Program Environmental Statement which discusses the environmental impacts associated with the proposed Buckley-Summer Lake 500-KV line. We offer the following comments for your consideration.

We would like the supplement to contain a clear statement of BPA's policy on wetland avoidance. While there are marshy areas within the existing Right-of-Way (page 8), it appears that disturbances of these areas could be minimized by sensitive placement of the new towers. The discussion of mitigating measures for tower location on page 29 should include BPA's intent to avoid these areas wherever possible.

From the standpoint of the Environmental Protection Agency's areas of concern and expertise, we are rating this statement LO-1 (LO - Lack of Objections; 1 - Adequate Information). This rating will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act, as amended.

We appreciate the opportunity to review this draft environmental impact statement. Please do not hesitate to contact me or Judi Schwarz, of my staff, should you have questions or desire further information regarding our comments. We can be reached at (206) 442-1285 or (FTS) 399-1285.

Sincerely,

Daniel Steinborn, for
Roger K. Mochnick, Acting Chief
Environmental Evaluation Branch

VICTOR ATIYEH
GOVERNOR

Executive Department

155 COTTAGE STREET N.E., SALEM, OREGON 97310

December 19, 1979

John Kiley
Environmental Manager
Bonneville Power Administration
P.O. Box 3621
Portland, OR. 97208

SOUTHWEST OREGON AREA SERVICE, SUPPLEMENT TO 1979 PROGRAM
PNRS 7911 2 180

Thank you for submitting your draft Environmental Impact Statement for State of Oregon review and comment.

Your Draft Supplement was referred to the appropriate state agencies. The Departments of State Lands, Soil & Water, Forestry, Land Conservation and Development and Highway offered the enclosed comments which should be addressed in preparation of the your final Environmental Impact Statement.

We will expect to receive copies of the final statements as required by Council of Environmental Quality Guidelines.

Rod Orlando for

MARTIN W. LORING, MANAGER
GRANTS COORDINATION AND MANAGEMENT SECTION

MWL:cb

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon, 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: 7911 2 180 Return Date: 12-14-79

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

(X) The environmental impact is adequately described.

( ) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

If the project would require the removal, fill or alteration of 50 cubic yards or more of material within the banks of the waterway(s), we urge the applicant to apply for state fill or removal permits well in advance of construction deadlines to prevent unnecessary project delays. Specific information on the need for permits may be obtained from the Division of State Lands' office at 1445 State Street, Salem, OR 97310. Phone 378-3805.

Thank you for the opportunity to comment on this project.

Agency Lands By

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon, 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: 7911 2 180 Return Date: NOV 14 79

NOV 23 1979

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

Wasco, Jefferson, Crook - Bonneville Power Administration
Deschutes, Lake, Klamath

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

The erosion Control plans appear to be adequate - However we request that BPA Engineers review project erosion Control plans with the local Soil & Water Conservation District office in each County.

RECEIVED
NOV 13 1979
STATE SOIL AND WATER CONSERVATION COMMISSION

Agency Soil & Water By Charles V. Giles

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: 7911 2 180 Return Date: 12-14-79

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

PLEASE COORDINATE, AS NECESSARY, WITH THE APPROPRIATE HIGHWAY DIVISION REGION OFFICE REGARDING THE CROSSING OF STATE HIGHWAYS.

Agency Highway By Leroy A. Roth

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon 97310
Phone Number: 378-3732

BNRS STATE REVIEW SALEM

Project BEND 7911 2 180 Return Date: 12-14-79

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

(X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

This project needs to be closely coordinated with Wasco, Crook, Deschutes, Lake and Klamath Counties, to ensure it does not conflict with their comprehensive plans.

Agency LCDC By

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
306 State Library Building, Salem, Oregon, 97310
Phone Number: 378-3732

PNRS STATE REVIEW

Project #: 7911 2 180

Return Date: 12-14-79

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

If you cannot respond by the above return date, please call to arrange an extension at least one week prior to the review date.

ENVIRONMENTAL IMPACT REVIEW
DRAFT STATEMENT

( ) This project has no significant environmental impact.

( ) The environmental impact is adequately described.

( ) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement.

( ) No comment.

Remarks

Agency Forestry By Joyce Brown

VICTOR ATIYEH
GOVERNOR

Forestry Department

OFFICE OF STATE FORESTER

2600 STATE STREET, SALEM, OREGON 97310 PHONE 378-2560

December 6, 1979

John Kiley, Environmental Manager
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

Thank you for the opportunity to respond to the B.P.A. proposed fiscal year 1979 program — Final Location Supplement (Southwest Oregon Service Area, Buckley-Summer Lake 500 kV Line).

It is recognized that constructing new transmission lines adjacent to existing corridors generally impacts the forest land base less than pioneering new routes. However, reasonable and economically sound construction methods or routes, which would decrease the amount of commercial forest land removed from production, should be given serious consideration.

Specifically, the Southwest Oregon Area Service Facility Planning Supplement, September, 1979, p. 55, states that forty miles of "...designated forest land would be crossed by the Buckley-Malin Corridor, 20 of which are considered to have commercial value." The Buckley-Summer Lake 500 kV Line Facility Location Supplement, Table 3, identifies 77.2 miles of forest land crossed by the same line. Similarly, the total loss of commercially productive forest land was estimated at 120 acres in the Facility Planning Supplement, p. 53; the Facility Location Supplement, Table 3, on the other hand, totals forest area at 719.7 acres. It may be that these discrepencies exist because of differences in definition. It may, however, be that the route proposed in the Location Supplement withdraws more commercial forest land than the route identified in the Facility Planning Supplement. Should that in fact be the case, alternatives that would decrease the amount of forest land removed from production should be thoroughly examined.

Again, your current efforts are appreciated and we thank you for the opportunity to make these comments.

Sincerely,

J. E. SCHROEDER
State Forester

By: Gary J. Lettman
Resource Studies Assistant

GL:dj

multi

OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
Room 306, State Library Building
Salem, Oregon 97310, Phone: 378-3732

P N R S – STATE REVIEW

Project #: 7911 2 610 Due Date: DEC 14 1979

To Agency Addressed: If you intend to comment but cannot respond by the return date, please notify us immediately. If no response is received by the due date, it will be assumed that you have comment and the file will be closed

---

PROGRAM REVIEW AND COMMENT

To State Clearinghouse: We have reviewed the subject Notice and have reached the following conclusions on its relationship to our plans and programs:

(X) It has no adverse effect.

( ) We have no comment.

( ) Effects, although measurable, would be acceptable.

( ) It has adverse effects. (Explain in Remarks Section)

( ) We are interested but require more information to evaluate the proposal. (Explain in Remarks Section)

( ) Please coordinate the implementation of the proposal with us.

( ) Additional comments for project improvement. (Attach if necessary)

---------- Urban Homesteading

REMARKS (Please type or print legibly)

The $1,301,000 in HUD Homestead Section 312 Loan funds requested by this application would operate a City of Portland Urban Homesteading program in calendar year 1980. Under the program, vacant and abandoned buildings meeting certain criteria, including feasibility of rehabilitation, would be reclaimed. Various sections of the city are involved. Based on a detailed discussion of the proposed program with City of Portland Development Commission representative Mark Davis, we believe the program is unlikely to affect properties eligible for inclusion in the National Register of Historic Places. The State Historic Preservation Office will be consulted by PDC if questions concerning historic or architectural significance of properties should arise in the course of the program.

Agency SHPO 67 By _____

DEPARTMENT OF THE ARMY
PORTLAND DISTRICT, CORPS OF ENGINEERS
P. O. BOX 2946
PORTLAND, OREGON 97208

NPPEN-PL-3

21 December 1979

Administrator (SJ)
Department of Energy
Bonneville Power Administrator
P.O. Box 3621
Portland, OR 97208

Dear Sir:

The U.S. Army Corps of Engineers, Portland District, has reviewed your draft supplement Environmental Impact Statement, Southwest Oregon Area Service, Buckley-Summer Lake 500-kV Line. The document was reviewed for the Corps' functional areas of responsibility for hydropower, flood control, navigation, and permits, and we have no comments.

Sincerely,

D A Geiger

for ROBERT P. FLANAGAN
Chief, Engineering Division

United States Department of the Interior

OFFICE OF THE SECRETARY

PACIFIC NORTHWEST REGION
500 N.E. Multnomah Street, Suite 1692, Portland, Oregon 97232

December 31, 1979

ER-79/1081

Environmental Manager
Department of Energy
Bonneville Power Administration
P. O. Box 3621 - SJ
Portland, Oregon 97208

Dear Sir:

The Department of the Interior has reviewed the draft supplement to final environmental statement for Buckley-Sumner 500 kV Line, Facility Location in Southwest Oregon Area Service, and we offer the following comments.

General Comments

The draft contains no information on impacts on threatened or endangered species or on candidate species. While the Errata Sheet indicates that consultation has been initiated on both plant and animal species, in fact, "consultation" under Section 7 of the Endangered Species Act has not taken place for either group. The Fish and Wildlife Service did provide a listing of those species which could occur and which could be impacted. Assessments by BPA apparently have still to be carried out. These assessments could lead to official consultation with the Service. Any final location supplement which does not incorporate the results of these assessments of impacts on threatened or endangered species and of any subsequent consultation would be inadequate in displaying the environmental consequences of the location decision.

The proposal will reduce adverse visual and recreational impacts by paralleling an existing transmission corridor. We suggest the final supplement discuss the alternative of stringing additional conductors from existing or larger replacement towers in the existing corridor, thus reducing or eliminating the need for additional right-of-way clearing.

According to the Bureau of Mines Mineral Industry Location System (MILS), three stone deposits are near the proposed transmission line; however, because of the lack of detailed maps in the statement, it is difficult to determine if the deposits are within the corridor.

Although we anticipate that the project will have no significant impact on mineral resource development, we suggest that BPA assess this possibility prior to the final selection of transmission route.

Specific Comments

Page 4, Operation and Maintenance Requirements. The statement would benefit from inclusion of more specific information on herbicides to be used to control tall-growing vegetation on the right-of-way.

Page 7, Hydrology. The potential for adverse effects on surface water draining areas treated by herbicides should be assessed. In addition, it should be stated whether any potential for contamination of ground water by herbicides will exist, particularly in areas where broken or fractured basaltic or other igneous rocks are at or near the surface. If so, an assessment of potential impacts would be needed.

Page 22, Esthetics. Item 2 states that visual compatibility of the transmission line is high because the predominantly treeless landscape minimizes the need for vegetation clearing. We feel the statement is misleading, as it does not recognize the high visibility of transmission facilities in open rangeland. Towers in such areas are generally the most dominant features, and, together with conductors, can produce a very discordant visual effect in an otherwise natural landscape. The effect often exists for a much greater distance than in forest because of long sight distances in semiarid, level terrain. In our view, paralleling the existing line is the most important factor in reducing visual impacts of the proposed project.

The final supplement should give more detailed information on impacts at the Crooked River crossing (last paragraph). We urge that special consideration be given to mitigating adverse visual impacts in this area.

Pages 23, 24, Historical/Archeological. The draft lists seven sites of national, State, or local significance that are located within 1 mile of the route or within its viewshed. However, there is no indication of compliance with 36 CFR 800 to determine whether these sites are eligible for inclusion in the National Register of Historic Places. Three potential substation sites are reported to have high potential for archaeological artifacts. Although the draft states the sites are being surveyed by professional archaeologists, it does not reflect consultation with the State Historic Preservation Officer (SHPO) in regard to surveys of these and other sites.

The final statement should indicate more complete compliance with CFR Part 800 and should contain a letter from the SHPO reflecting consultation as required. Briefly, the requirements include consultation on: the need for and type of survey(s) to identify historical and archaeological properties, survey boundaries, application of National Register eligibility criteria to identified properties, determination of the effects of the proposal on National Register or eligible properties, and other 36 CFR 800.4 procedures if such properties will be affected. The Advisory Council on Historic Preservation must be given opportunity to comment on any sites determined eligible that may be affected by the project.

We appreciate the opportunity to review and comment on this document.

Sincerely yours,

Charles S. Polityka
Regional Environmental Officer

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
324 25th Street
Ogden, Utah 84401

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No. Date
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By Date

LATE LETTER

1950
2800

JAN 4 1980

Mr. Ray Folern
Acting Administrator
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Folern:

We have reviewed the Facility Location Supplement to the Draft EIS for BPA's proposed FY 1979 program.

Because no facilities are planned for construction within the Intermountain Region of the Forest Service during the period of time your supplement covers, we have no comments.

We appreciate having the opportunity to review these documents.

Sincerely,

RICHARD K. GRISWOLD
Director, Planning and Budget

I N D E X