copy 2

FILE COPY

DOE/EIS-0048-FS-1

Final Supplement
Final Environmental Impact Statement

to Department of the Interior FES 75-79, Issued 9-16-75

BONNEVILLE POWER ADMINISTRATION

Proposed Fiscal Year 1976 Program
Facility Location
Okanogan Area Service

Douglas and Okanogan Counties, Washington

U.S. DEPARTMENT OF ENERGY

JANUARY 1980

DOE/EIS-0048-FS-1

Final Supplement
Final Environmental Impact Statement

to Department of the Interior FES 75-79, Issued 9-16-75

BONNEVILLE POWER ADMINISTRATION

Proposed Fiscal Year 1976 Program

Facility Location

Okanogan Area Service

Douglas and Okanogan Counties, Washington

Responsible Official

Ruth C. Clusen

Assistant Secretary for Environment

U.S. DEPARTMENT OF ENERGY
WASHINGTON, D.C. 20545

JANUARY 1980

NOTE TO REVIEWERS

This final statement is one of a series prepared by BPA on various facets of its construction and maintenance activities. This statement covers the potential impact of a major new facility originally proposed for fiscal year 1976. It must be reviewed and used in conjunction with the overall programmatic environmental statement. For convenience the various components and their relationship are outlined in the chart below.

Environmental Statements and Supplements on
BPA Construction and Maintenance Activities

Appendix B to the "Role EIS" - BPA Power Transmission

Describes BPA's overall construction and maintenance program in general, the Pacific Northwest environment in which it operates, and the environmental impacts that typically occur from transmission line construction and maintenance activities. Provides a framework for evaluation of specific proposals.

Final Fiscal Year 1976 Program Statement

Describes the cumulative impact on the Northwest environment of all of the specific major transmission facilities and maintenance activities included in BPA's Fiscal Year 1979 Proposed Program.

Bound Together in one Document

Final Facility Planning Supplements

Identifies the need for a specific new transmission facility proposed as part of the Annual Proposed Program, and outlines in preliminary form the probable environmental impact of constructing the facility in accordance with a general proposed system plan and alternative plans.

Final Facility Location Supplements

Expands the facility planning supplements to include alternative locations for the proposed new facility and environmental impacts associated with each alternative location. This supplement is prepared after public and agency review of the final planning supplement has been completed and reconnaissance studies have been made.

FFLS:Okanogan Area Service
Wg0035P:11-02-79

Summary

( ) Draft (X) Final (X) Facility Location Supplement

Department of Energy, Bonneville Power Administration

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

2. Brief Description of Action: This document describes a proposal for transmission facilities to serve the Okanogan Valley. The original need for additional energy was determined in 1973 and discussed in a location supplement to the Fiscal Year 1976 Program Environmental Statement. Issues pending between the Colville Tribal Council and the U.S. Government have deferred the project since that time. BPA reliability standards have not been met and electrical loads have continued to increase since 1975. Because of these problems, BPA felt it could no longer defer the transmission project and offered a different proposal from that presented in 1976. This new routing (Alternate A) was detailed in a Draft Facility Location Supplement issued in June 1979.

However, since the issuance of that second Draft Facility Location Supplement, BPA has negotiated a settlement with the Confederated Colville Tribes allowing a routing of the proposed transmission line across the Colville Reservation.

BPA has therefore reverted to its original proposal (Alternate B) which has less environmental impact, is less expensive, and more feasible from an engineering standpoint. A few minor location changes have been made to the

1976 proposal and a change in the substation plans in the Okanogan-Omak area has been made. Those alterations have been detailed in this final supplement which presents the proposal BPA will construct.

States and counties involved: Douglas and Okanogan Counties, Washington.

Summary of environmental impacts and adverse environmental effects: The proposed plan of service is 55 miles (88 km) long, beginning at Chief Joseph Substation, continuing to a new proposed Coleman Butte Substation, and following the existing Okanogan-Tonasket 115-kV line to Tonasket Substation. Alternate B (the proposed route) crosses the Colville Indian Reservation and has few conflicts with natural resources. This route also has few economic, engineering, or environmental impacts, is less expensive, and shorter than other routes. Therefore, it has been selected as BPA's plan of service.

Alternatives considered: Nonconstruction, two routing alternatives (one alternative with two options and the other alternative with three options), energy conservation, and load management. The Draft Role Environmental Statement, Appendix B, references alternatives to construction including local generation, underground transmission, limiting consumption of electricity, as well as alternative methods of locating transmission facilities.

FFLS:Okanogan Area Service
Wg0035P:11-02-79

Comments have been requested from the following 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. (See pages 44-45 for complete list.)

Date made available to Environmental Protection Agency and to the Public:

(Original) Draft Location Supplement: April 15, 1975

(Original) Final Location Supplement: September 16, 1975

(Revised) Draft Location Supplement: June 8, 1979

(Revised) Final Location Supplement: MAR 28 1980

For additional information contact:
John Kiley, Environmental Manager
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97208
Area Code (503) 234-3361, Ext. 5137

INTRODUCTION

This document is a Final Facility Location Supplement to the Fiscal Year 1976 Program Environmental Statement. It describes a proposal for transmission facilities to serve the Okanogan Valley. The original need for additional energy was determined in studies done in 1973 and first discussed as a planning supplement. Initial load estimates and systems load flow studies of the Okanogan Area conducted by BPA and its customers during the fiscal year 1972-73 indicated additional power transmission facilities would be required to serve growing loads and improve reliability of existing systems by 1975. It was determined that in order to supply the increased needs of the area additional transmission facilities would be required. Since 1975 BPA reliability standards have not been met and electrical loads have continued to increase. Outages have been experienced north of Omak. The planning supplement from the FY 1975 Program Statement contains information on the various plans of service considered and characteristics of the existing environment.

STATUS

The Okanogan project was first presented to the public as a draft planning supplement to BPA's Fiscal Year 1975 Draft Program Environmental Statement filed with the Council on Environmental Quality on January 14, 1974. A public information meeting was held in Okanogan, Washington, on February 7, 1974. The project supplement was then revised, finalized, and filed with CEQ as part of BPA's Fiscal Year 1975 Final Program Environmental Statement. Comments received from public and agency review were incorporated.

After alternative site and line locations were examined during reconnaissance surveys, the project was described in a draft location supplement to BPA's Fiscal Year 1976 Program Environmental Statement and filed with CEQ on April 15, 1975. A public information meeting on the location supplement was held in Okanogan, Washington, on May 29, 1975. Comments received from public and agency review were included in the final location supplement.

Since 1975 the project has been held in abeyance. BPA has deviated from its standard reliability policy pending resolution of issues with the Colville Tribal Council.

In addition to the original load forecast needs and reliability criteria new factors have prompted altered demands for the project:

1) Previously forecast loads for the area were found to be close to the new revised estimates with the exception of three additional major loads. The Bureau of Reclamation and Department of Natural Resources have increased irrigation pumping needs, and the Omak lumber mill requires electrical backup. These additional loads result in the need for facilities above and beyond the capacity of those forecast in the 1976 supplement.

The Bureau of Reclamation is constructing new pumping facilities to replace an old, wooden, gravity flume system serving irrigation needs in the Oroville-Tonasket vicinity. Additional pumping requirements increase the Bureau's electrical need projection from the present 2,000 kW to 10,500 kW.

Washington State Department of Natural Resources is also proposing an irrigation project (Crazy Rapids) north of Brewster consisting of 4000 acres (1620 ha) and pumping requirements of 1700 kW forecast by spring 1980.

The Omak mill can generate up to 10,000 kW of its own power and is interconnected to the distribution system served from Okanogan Substation. Because Okanogan County PUD's contract with the mill requires the PUD to serve the mill load if generation is off, this load has now been included in Okanogan County PUD's estimate when it had been previously omitted.

2) Recent power flow studies have shown the two sources of power into the area share power loads differently than projected in the FY 1974 studies. The source from Wells Dam provides more power to the overall electrical system; therefore, overloads occur sooner at this source than previous studies indicated.

3) The BPA Administrator met with the utilities of the Okanogan area in March 1978 and agreed to review the load estimates, to restudy the area, and to restore full reliability of service as soon as possible.

The original load studies, done in 1973, were for a 10-year forecast. The new studies, performed in 1978, five years into the original 10-year forecast, were based on a 25-year forecast. The new studies indicate that existing facilities cannot meet loads forecast for 1982. Consequently, for system needs and reliability purposes, new facilities must be provided to the Okanogan Area by the fall of 1981.

The increased electrical needs as outlined in the new studies have altered the design originally given for the project from single to double-circuit 230-kV construction from the Chief Joseph/Foster Creek Substations to the proposed new Coleman Butte Substation, and from single to double-circuit 230-kV construction from the Coleman Butte Substation to the Tonasket Substation.

The following discussion briefly reviews plans and routes considered in previous phases of the project. Included are reasons for rejection or inclusion of those alternatives in this current analysis.

Plan of Service Review

Two plans of service were originally considered in the planning supplement (FY 1975 Program) for meeting system needs. The originally adopted or proposed plan included a new 230-kV transmission line from Chief Joseph Dam up the Okanogan Valley connecting to the Okanogan Substation and a second 115-kV line continuing from there to the Tonasket Substation.

The other plan included a 230-kV line from Grand Coulee Dam to Okanogan Substation and a 115-kV line from Okanogan Substation to Tonasket Substation. To meet the new 25-year forecasted loads and reliability requirements, this second alternative plan would have to be revised to include a 230-kV transmission line from Chief Joseph Substation to the Okanogan Substation, and rebuilding the existing Grand Coulee-Okanogan 115-kV transmission line to 230-kV. In addition, a double-circuit 115-kV line would be required from the Okanogan Substation to the Tonasket Substation while retiring the existing Okanogan-Tonasket 115-kV line.

This second alternative plan presented no superiority over the proposed plan in that it environmentally impacted more area, had no engineering advantages, and cost over 5 million dollars more. This plan of service was therefore not considered feasible and was dropped from further discussion.

In May, 1979, BPA abandoned its original proposed route from Chief Joseph Dam across the Colville Reservation to Okanogan and Tonasket. It appeared at the time that negotiations between the U.S. government and the Colville Tribes would not be concluded for several years and the pressing need for electrical service in the upper Okanogan Valley would not tolerate such a delay. BPA instead adopted one of its original alternatives as its new proposal; one which was entirely outside the Colville Reservation. Although this new proposal had many engineering and environmental problems as compared to the original proposal, it was felt that this was the only manner in which power could be supplied when needed.

Additional routings besides the new proposal were investigated which would bypass all agricultural, urban and wildlife impacts encountered by the new proposed route. However, very rugged terrain or heavily increased cost figures precluded use of these options. In addition, they failed to meet the electrical need to service the Omak area.

The previous Okanogan location supplement (Fiscal Year 1976) discussed five alternative routes which would have met plan of service needs. At that time, Alternate B was selected as the proposed route. It had the least

environmental impacts, fewest engineering problems, and cost less than other alternatives. In addition, expansion capabilities at the Okanogan Substation are limited for any possible future facilities beyond the scope of this project.

Alternate A, as presented in the June 1979 Draft Location Supplement as BPA's new proposal, had some slight route modifications from the original Alternate A from the 1976 supplement. These modifications were made as mitigation measures to avoid impacts to urban and agricultural resources.

The three remaining routes identified as C, D, and E, in the 1976 supplement were not given full coverage because they were not feasible for engineering and/or environmental reasons as briefly given below.

Alternate C followed the same route as Alternate A to the West Okanogan Substation, then proceeded through the highlands west of the Okanogan Valley to Tonasket. This line would not be routed into the Omak Substation and therefore would not meet power distribution requirements.

Alternate D was routed parallel to existing lines wherever possible to the Okanogan Substation, then followed Alternate A into Tonasket. This route was longer and more expensive than other alternates, created significant soil erosion and scarification problems from access road building, posed adverse conflicts with orchards near Bridgeport and Brewster, had high visual impacts, and would possibly cause removal of buildings at Brewster. In addition, this route also crossed a portion of the Colville Reservation. The combination of these problems made this route unacceptable and it was dropped from further consideration.

Alternate E crossed rugged terrain on the Colville Reservation, but to the east of Alternate B. Significant problems would result from access road construction which would increase erosion potential and scarification of the landscape. Since this route had no significant advantages over Alternate B, it too was dropped from further consideration.

A nonconstruction alternative was also considered in the planning phase of the Okanogan project. It was determined that while adoption of such a course of action would eliminate the financial and environmental impacts of the project, it would also significantly restrict power availability in the near future. Mandatory curtailment of electricity to prevent overloading existing facilities would be necessary. This curtailment of power could result in brownouts or extended outages decreasing business activity, causing layoff of workers, and a decline of economic activity. Impacts from not building the transmission line were considered to outweigh those which would occur if it were built.

An agreement was reached between the Colville Tribes and BPA prior to issuing the Final Location Supplement for the new June 1979 proposal. This agreement allowed BPA to cross the Colville Reservation along the route of the original proposal. BPA has reverted to its 1976 original proposal because it had less engineering problems, was environmentally more acceptable, and less expensive. This final location supplement is being issued as an addendum to the FY 1976 supplement because the original proposal has been slightly altered although impacts remain essentially the same as described in 1975.

This final location supplement reflects these design and location changes. It discusses the revised line location and site evaluations for the Coleman Butte Substation.

Public and agency comments received as part of the review process will be incorporated in the final location supplement.

Scheduled dates for remaining phases of the project are:

Routes selected and approved.....Fall 1979
Land acquisition.....Spring 1980
Construction.....Spring 1981
Energization.....Fall 1981

OKANOGAN AREA SERVICE
STUDY AREA 75-5

Table of Contents

FFLS:Okanogan Area Service
Wg0035P:11-07-79

DESCRIPTION OF THE TRANSMISSION LINE ROUTES, THEIR POTENTIAL IMPACT AND MITIGATION

DESCRIPTION OF THE ROUTES CONSIDERED

LOCATION DESCRIPTION

Alternate B is BPA's proposal to satisfy electrical power and reliability needs of the Okanogan Valley. Note figure 1 for location of Alternates A, B, and B-1.

Proposed Route - This 55-mile (88 km) route (Alternate B) would begin at the Chief Joseph Substation with a temporary 115-kV connection to the Douglas County PUD Foster Creek Substation. The proposal would cross the Columbia River just upstream from Chief Joseph Dam, proceed north across the Colville Indian Reservation, past Soap Lake and bypass Okanogan to Coleman Butte Substation located north and east of Omak. From Coleman Butte Substation, Alternate B would generally follow the existing Okanogan-Tonasket 115-kV line to Tonasket Substation. North of Riverside, the proposed route would be as much as one-half mile east of the existing line. The existing 115-kV single-circuit line between Omak and Tonasket would be removed after the new circuits are energized. This proposal deviates from existing rights-of-way in order to mitigate impacts to residential and agricultural (orchard) resources.

Limitation of expansion capabilities at the Okanogan Substation and right-of-way problems near the substation for future facilities beyond those proposed in this document prompted additional studies of facilities including a routing of Alternate B into the proposed new Coleman Butte Substation. A second option would route the proposal into the West Okanogan Substation site to avoid problems discussed above. That alternative (B-1) is presented below.

Alternatives Considered - Alternate A is 63 miles (101 km) long. It would begin at the Chief Joseph Substation with a temporary 115-kV tie line into the Douglas County PUD Foster Creek Substation. Alternate A would proceed over Dyer Hill to a Columbia River crossing 1.5 miles (2.4 km) west of Brewster. This route would continue northeasterly over Harmony Heights to a new proposed West Okanogan Substation site 3 miles (5 km) southwest of Okanogan. From the West Okanogan substation, Alternate A would continue northeasterly to a point 2.5 (4 km) miles west of Omak Substation where it turns due east and follows a 1/4 section line across Pogue Flat to the Omak Substation. The 31 miles (50 km) of new transmission line from Chief Joseph to Omak would require new right-of-way. From Omak Substation the proposed route would generally follow the existing Okanogan-Tonasket 115-kV line to Tonasket Substation.

The routing between Omak and Tonasket would be the same as for the proposed route which has been previously described.

Option A-1 - This option heads northwest from Alternate A at a point one mile west of Malott and proceeds along the foothills around Tarheel Flats to the proposed West Okanogan Substation site. Option A-1 would be 1 mile (1.5 km) longer, cross more rugged terrain, and require more extensive access roads and costly angle structures than Alternate A. It is included as a possible mitigation measure for potential environmental affects in the Malott area.

Option A-2 - This location option departs from Alternate A at a point 2.5 miles (4 km) west of the Omak Substation. Option A-2 continues northeast to a point near Riverside where it rejoins Alternate A. A tap line would be constructed for Option A-2 from a point 2.5 miles (4 km) west of Omak Substation to the substation. Overall length, terrain crossed, access roads required, and angle structures would be similar to Alternate A. The main advantage of the option, as later detailed, is that it avoids land use conflicts along the existing right-of-way north of Omak.

Alternate B-1 - This location option would depart from the proposed route north of Soap Lake, cross the Okanogan River, and continue into the West Okanogan Substation. From there north to the Tonasket Substation, this alternative would be identical to Alternate A. This option would be 7 miles (11 km) shorter than Alternate A and therefore lower in cost. Alternate B-1 would cross the Okanogan River near Chiliwist and would pass near the Caribou Trail historic marker and picnic area along Highway 97.

GENERAL CONSTRUCTION REQUIREMENTS

Tower Design
(Note Table 1)

Double-circuit structures would be used for the entire length of Alternate A, Alternate B (the proposed route), and Alternate B-1. From Chief Joseph Substation to the proposed Coleman Butte Substation site or the West Okanogan Substation, construction would be double-circuit 230-kV steel similar to the tower design shown in figure 2. From the Coleman Butte or West Okanogan Substation to Tonasket Substation, construction would also be 230-kV double-circuit steel. A typical lattice steel tower base would occupy 0.02 acres (0.01 ha). There would be four to five structures per mile (3 structures/km). Up to 0.5 acre (0.20 ha) could be temporarily disturbed at each tower site during tower assembly and erection.

Table 1 - Construction Requirements Summary

Requirements	Route A	Route B	Route B-1
Line length (miles/kilometers)[1/]	63/101	55/88	56/90
Right-of-Way (R/W) width (feet/meters)	100/30	100/30	100/30
Tower type	Double-circuit	Double-circuit	Double-circuit
Tower height (feet/meters) 230-kV	Lattice steel 125/38	Lattice steel 125/38	Lattice steel 125/38
Minimum ground clearance (feet/meters) 230-kV	26.5/8	26.5/8	26.5/8
Tower sites: area required for construction total (acres/hectares)	140/57	125/51	125/51
Tower bases: total permanent area required (acres/hectares)	6/2	6/2	6/2
Pulling and reeling sites: total number	25	21	22
Transmission line R/W requirements (acres/hectares)	764/309	668/270	680/275
Access roads (miles/kilometers): Off transmission line R/W -			
New construction	45/72	20/32	25/40
Improvement of existing roads	15/24	7/11	10/16
Cost of each total plan[2/] ($ million)	22	18	20

1/ All values are estimates.

2/ Figures include present worth costs for a 25-year period of transmission line and substation expenditures. Also included are costs of operation and maintenance, and transmission losses.

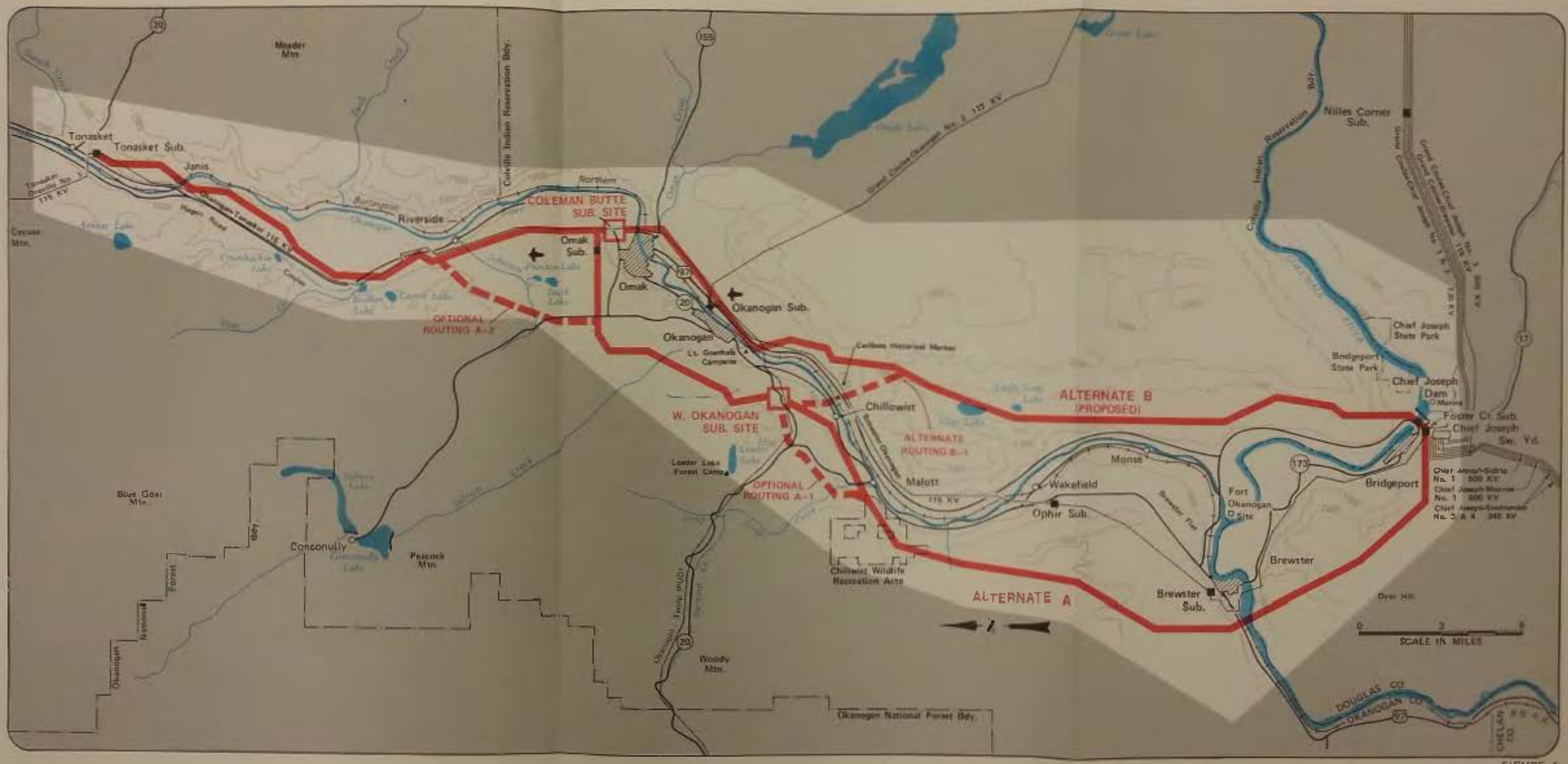
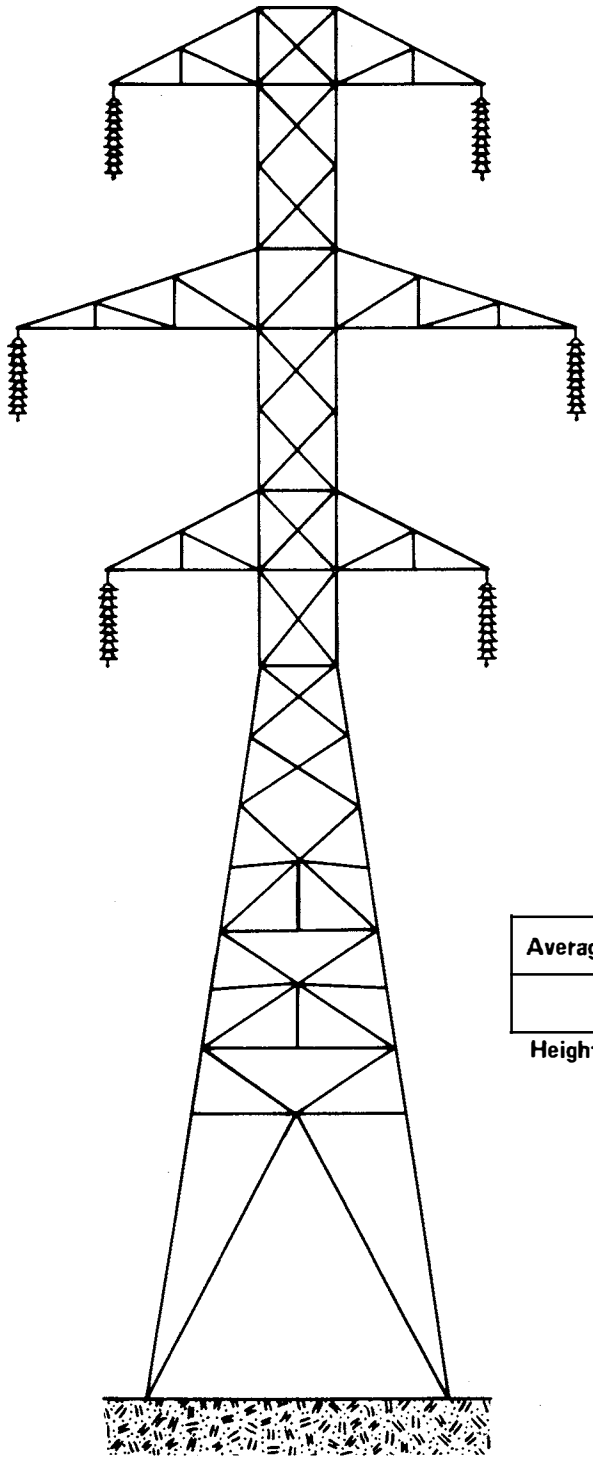


FIGURE 1
POTENTIAL NEW ROUTES
OKANOGAN AREA SERVICE
75-5



	230kV
Average Height	124′
Width	34′

Height Variable

TYPICAL 230KV DOUBLE CIRCUIT TOWER

FIGURE 2
TOWER DESIGN
OKANOGAN AREA SERVICE
75-5

Right-of-Way Requirements

Details on right-of-way needs are summarized in Table 1.

Access Road Requirements

It is BPA policy to provide ground access to every structure except in unusual circumstances. Off right-of-way access roads range in width from 12-16 feet (3.7 to 4.9 m). In mountainous terrain, their lengths may range from 1/4 to more than 1-1/2 miles (.4-2.4 km) of road per mile of transmission line. In flat or rolling terrain, access road construction may not be needed or range up to 1 mile (1.6 km) of road per mile of line. A 20-foot (6.1 m) wide easement would be acquired on existing private roads. New access roads would be up to 16 feet (5 m) wide. These estimates will vary considerably with local conditions.

No permanent access roads would be constructed in agricultural lands. In agricultural areas the property owner would be paid for any crop damage caused by and during construction and subsequent operation and maintenance of the transmission line. Development of the access road system would be coordinated with landowners where possible to accommodate their present and future road requirements. See table 1 for more specific information.

Other Construction Characteristics

Various construction activities are associated with the building of a transmission line. Among these are clearing the right-of-way and access roads of trees and brush which would interfere with construction and future safe operation of the transmission line.

After clearing operations, excavation and installation of tower footings takes place followed by tower assembly and erection, and conductor stringing. Site clean-up and restoration follows.

Details concerning the scope, magnitude, and impacts of construction activities are in BPA's Draft Role EIS, Appendix B, Chapter V.

Cost Requirements

Table 1 shows route cost comparisons. Due to its greater length and additional angle structures, Alternate A is the most expensive. Cost figures for Alternate A do not include options A-1 or A-2. Utilization of either or both of these options could alter estimated cost figures.

OPERATION AND MAINTENANCE REQUIREMENTS

See Chapter VI of Appendix B of the Draft Role EIS for information concerning operation and maintenance requirements.

THE POTENTIAL IMPACT OF THE ROUTES AND THEIR MITIGATION

NATURAL RESOURCES

The following sections describe construction, operation, and maintenance impacts to the natural resources of the Okanogan area which are attributable to the project. The duration and quantification of these impacts are discussed where possible. Specific mitigation measures important to the resource are also presented.

Information concerning the presence and extent of a particular resource has been previously detailed in the final planning supplement for Okanogan Area Service.

Atmosphere

The air quality of the Okanogan area is generally quite good. Urban areas of Tonasket, Omak, Okanogan, and Brewster are the major year-round sources of air pollution in the Okanogan Valley. Fruit and wood processing plants in or near urban areas contribute pollution which remains localized. Periodic use of smudge pots to alter freezing conditions also contributes to air quality deterioration. Normally atmospheric pollution is not noticeable; however, during times of air inversion, stagnation can result in the valley and air pollution increases. The study area is under the jurisdiction of the State of Washington, Columbia Basin Air Pollution Control District.

Construction activities result in minor adverse impacts to air quality. Combustion by-products and particulates from burning, dust from disturbed soil, and vehicle and equipment exhaust emissions are the main sources of air pollution.

The amount of increased atmospheric pollution (gases and particulate matter) from transmission facility construction is primarily a function of the length of the line as it relates to vegetation disposal, access road preparation, and vehicular activity on or near the right-of-way. The magnitude of impact due to construction would be minor, short-term, and restricted to nearby homes or highways.

Slash is disposed of by burning where permitted by local, State, and Federal regulation. Normally burning is restricted near population centers during periods of poor dispersion.

Air pollution in the form of odors and drifting particulate matter could occur during application of herbicides for vegetation control in construction and maintenance of the line. Use of herbicides will be minimal because natural vegetation grows slowly and orchards in the region can be adversely affected by its use. If herbicide use is necessary, special care will be taken to avoid application near orchards.

Mitigating measures utilized by BPA or contractors in performing construction work are discussed in BPA's Draft Role EIS, Appendix B, Chapter VIII, Section A.1.

Proposed Route - Heaviest air pollution increases along the proposed route (Alternate B) would be from slash burning. Burning would be restricted to areas where tree removal would be necessary and where permitted by local, State, and Federal regulations. As stated in the Forestry section, amounts of tree removal would be insignificant, consequently utilization of slash for waste fuel burning for electrical generation would not be economically feasible. The increase in particulate matter would be evident only during burning periods and would be localized at burning sites. Heaviest impact along the proposed route from slash burning is expected between Soap Lake and the area south of Okanogan and also south of Janis where the proposal crosses forest/range lands. It is not expected any urban areas would be adversely affected by drifting smoke.

Building of access roads and other construction activities would increase dust in localized areas but should not be noticeable except to nearby residences and then only for short periods during construction or maintenance. Most urban areas will not notice any increased air pollution. Overall impacts to air quality are minimal.

Alternatives Considered

Alternate A - Impacts attributable to Alternate A would be of the same scope as the proposed route except that total pollution from burning would be increased because more slash disposal would be required.

Heaviest impact along Alternate A from slash burning would be on the north side of Dyer Hill, in the hills between Brewster and Malott, and also in the area south of Janis discussed under the proposed route.

Option A-1 - Use of Option A-1 would increase overall particulate matter in the air west of Tarheel Flat due to the more extensive access road system required. Impacts to urban area air quality would not be noticeable however, because of the more remote location of the option. Some additional slash burning beyond that required for Alternate A and its resultant impacts would also be attributable to use of this option.

Option A-2 - This optional location is remote from most residences and little or no slash burning would be required. Overall impacts to air quality attributable to use of this option would be slight.

Option A-2 would eliminate impacts to residences adjacent to the existing line north of Omak as construction and maintenance activities would be decreased. A short period of activity required for removal of the existing line would increase dust in the area.

Alternate B-1 - Little impact would be noticeable from construction of this alternate between Chief Joseph Dam and the Okanogan River crossing. Little or no slash burning would take place and the main source of air pollution would be from dust raised by vehicle movement along access roads. Some increased pollution would be evident south of Janis where slash burning would be necessary. Dust from access roads from the Okanogan River crossing north to Tonasket would be noticed during construction and maintenance periods but impact would be minimal and short-lived.

Geology, Soils, and Minerals

Routes associated with this project would cross five geology/landform groups. These include the Valley, Upland, Breakland, Foothill, and Glaciated Uplands. Figure 3 shows the location and extent of these groups, while tables 2 and 3 summarize their general physical and engineering characteristics.

Precipitation is critical to soil erosion potential. Average annual rainfall in the study area ranges between 10 and 15 inches (25-38 cm). Vegetation cover supported by this amount of rainfall commonly is not sufficient to prevent erosion during intense rain. In addition, lack of vegetation can lead to instances of wind erosion. However, in the Okanogan Valley, evidence of wind erosion is insignificant and potential for it as a result of transmission line construction is slight.

Several mineral resources exist in the Okanogan area. These include dolomite deposits west of Riverside, metallic minerals west of Omak, sodium carbonate and sodium sulfate deposits in the Soap Lake area, and occasional basalt or sand and gravel quarries. The proposal or alternative would be located to avoid or minimize impacts to mining operations or mineral resources.

Seismic activity has been low. The few earthquake epicenters recorded in this area had magnitudes less than 5 on the Richter Scale. The probability of serious damage to transmission facilities or transmission line outage caused by an earthquake is low.

	TOPOGRAPHY			CLIMATE	GEOLOGY		SOIL		
Group	Landform	Elevation Range Ft.	Slope Range %	Average Annual Precipitation In.	Lithology	Structure	Texture	Depth In.	Drainage Characteristics
Qg	Valleys	750 to 1,440	0 to 10 Escarpments 18 to 24	10 to 15	Glacial Drift Undivided Glacial And Glacial Fluvial Sand Gravel Silt and Clay Locally Alluvium		Gravelly Sandy Loams To Sandy Loams	20 to 40+	Except For The Columbia And Snake Rivers Low Density Intermittent Streams
	Uplands	1,200 to 1,600 2,600 to 2,800	0 to 12				Loams	0 to 40+	
Mv	Breakland	1,000 to 1,720 2,000 to 2,800	10 to 45	10 to 15	Basalt	Nearly Horizontal Flows	Stoney Loam Silt Loam And Sandy Loam	0 to 40+	Moderate Density Intermittent Streams and Gullies
Mzg	Foothills	1,120 to 2,800	5 to 30	10 to 15	Granitic Rocks Undivided Diorite Gabbro Gneiss And Schists	Folded Beds 3 Joint Systems Widely Spaced	Stoney Loam Silt Loam And Sandy Loam	0 to 40+	Low Density Prennial And Intermittent Streams
	Glaciated Uplands	1,400 to 1,600	5 to 15						Poorly Developed Numerous Small Lakes

Table 2 Physical Descriptions of Geology Groups

		SUITABILITY FOR		POTENTIAL OF			
Group	Natural Stability	Access Roads	Transmission Line Towers	Road Cut Bank Failure	Soil Compaction	Water Erosion	Major Hazard
Qg Valleys	Very Good To Poor (Escarpments)	Very Good To Poor	Very Good To Poor	Low To Moderate	Low	Low To Very High	Potential Erosion On Escarpments
Qg Uplands	Good	Good	Good		Low	Low To Moderate	Locally Wind Erosion Hazard
Mv Breakland	Good To Poor (Small Landslides)	Good To Poor	Good To Poor	Low To High	Low	Low To Very High	Water Erosion On Steeper Slopes Locally Unstable Ground
Mzg Foothills	Good To Poor (Rock Falls)	Good To Poor	Good To Poor	Low To Moderate	Low	Low To High	Water Erosion On Steeper Slopes
Mzg Glaciated Upland	Good	Good To Poor (Exposed Rock)	Good	Low	Low	Low To Moderate	Exposed Rock Limitation To Access Roads

Table 3 Engineering Characteristics of Geology Groups

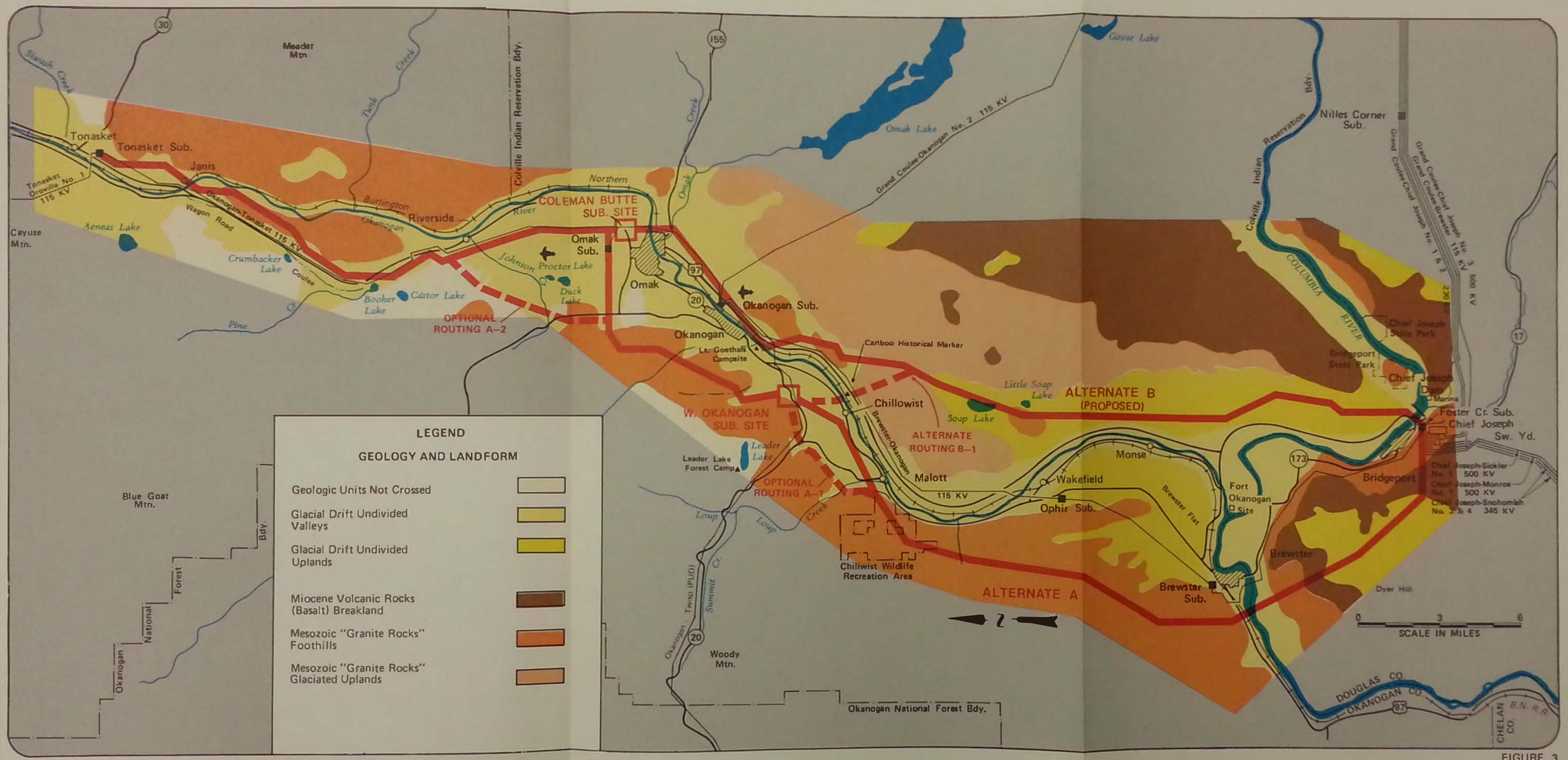


FIGURE 3
GEOLOGY AND LANDFORM
OKANOGAN AREA SERVICE
75-5

Typical impacts to geologic and soil resources would be related to access road construction and soil disturbances around tower sites. Such disturbances could locally accelerate water erosion. Figure 4 identifies the potential geologic and soil hazards along each route.

Proposed Route - Alternate B crosses the Valley, Upland, Breakland, and Foothill landform groups. Terrain crossed between Chief Joseph Dam and Omak is highly suitable for transmission line construction. Slopes are predominantly less than 15 percent, with only one small area approximately 5 miles (8 km) south of Okanogan approaching 40 percent. Almost all of the proposal crosses areas with low water erosion potential.

A potentially unstable area is southeast of Chief Joseph Dam near the point BPA would like to cross the Columbia River. BPA is aware of this area and currently has geologists investigating the south side of the river to determine a geologically acceptable site for its transmission tower.

From Omak to Tonasket the proposed route would cross the Valley and Foothill landform groups. Slopes range from nearly level to 45 percent. Approximately 85 percent of this portion of the proposal would cross terrain that has low water erosion potential. Access would require construction of approximately 20 miles (32 km) of new permanent roads.

The existing line between Omak and Riverside would be removed resulting in temporary soil disturbances within the right-of-way. Any impacts associated with this soil disturbance would be slight and short-term. No special mitigation measures would be necessary. West of Riverside the proposed route would cross 1 mile (1.6 km) of terrain with moderate to high water erosion potential with little expected impact. Overall impacts attributable to this routing would range from low to moderate.

The proposed route would require 7 miles (11 km) of temporary access and 20 miles (32 km) of new permanent access, all across favorable terrain. Impacts to geology, soils, and minerals associated with this alternative would range from low to locally moderate because of the high percentage of suitable terrain crossed and the minimal access road requirements.

The most practical mitigation measures for the proposed route are to limit the extent of soil disturbances caused by equipment operation around tower sites; to limit vehicle access to specific areas; and to minimize road construction cut and fill. Therefore, access roads will avoid moderate to steep slopes as much as possible. Where steep slopes are spanned by the lines, access would be dead ended from each side. If access roads must be constructed on moderate to steep slopes, water bars will be installed at appropriate intervals and exposed areas will be seeded or otherwise stabilized. Additional mitigation measures are described in the BPA Draft Role Statement, Appendix B, Chapter VIII.

Alternatives Considered

Alternate A - This alternative would cross all geology/landform groups previously discussed. Terrain varies from nearly level slopes adjacent to the Columbia River, to 80 percent slopes on canyon walls south of Chiliwist Creek. Impacts to soils associated with this plan would range from low to high depending on locale. Portions of the route cross areas with soils that have a moderate to high potential for water erosion.

Alternate A would require 45 miles (72 km) of new permanent access roads and 15 miles (24 km) of temporary access. Thirteen miles (21 km) of the permanent access would be constructed across moderate to steep slopes, or through areas with bedrock near the surface. Construction through these areas would result in significant cut and fill disturbances. Those areas disturbed by construction activities would have a moderate potential for accelerated water erosion. Disturbances would be long-term due to the granular soils and slow revegetation associated with the granitic rocks. The major areas where these construction impacts could occur are mapped on figure 4.

Impacts from Omak to Tonasket would be the same as described for the proposed route.

Option A-1 - An optional routing in the Malott area (A-1) is located to avoid potential impacts to orchards and visual amenities. This alinement would pass through rugged terrain undesireable for access road construction. Removal of vegetation and topsoil could result in unstable conditions, especially on steep slopes. Access roads may have to be cut into bedrock in certain areas, leaving permanent scars.

Option A-2 - An optional route (A-2) from west of the Omak Substation to north of Riverside is not expected to have any significant impact on geology, soils, or minerals.

Alternate B-1 - Impacts to geology and soils attributable to Alternate B-1 would be essentially the same as those described for the proposed route. This route would require an additional 1.5 miles (2 km) of access constructed across terrain with low water erosion potential. Minimal soil impacts would occur. There are two local areas along Alternate B-1 southeast of the West Okanogan Substation with moderate potential for water erosion, however, stabilized access exists through these areas and no additional impacts are expected.

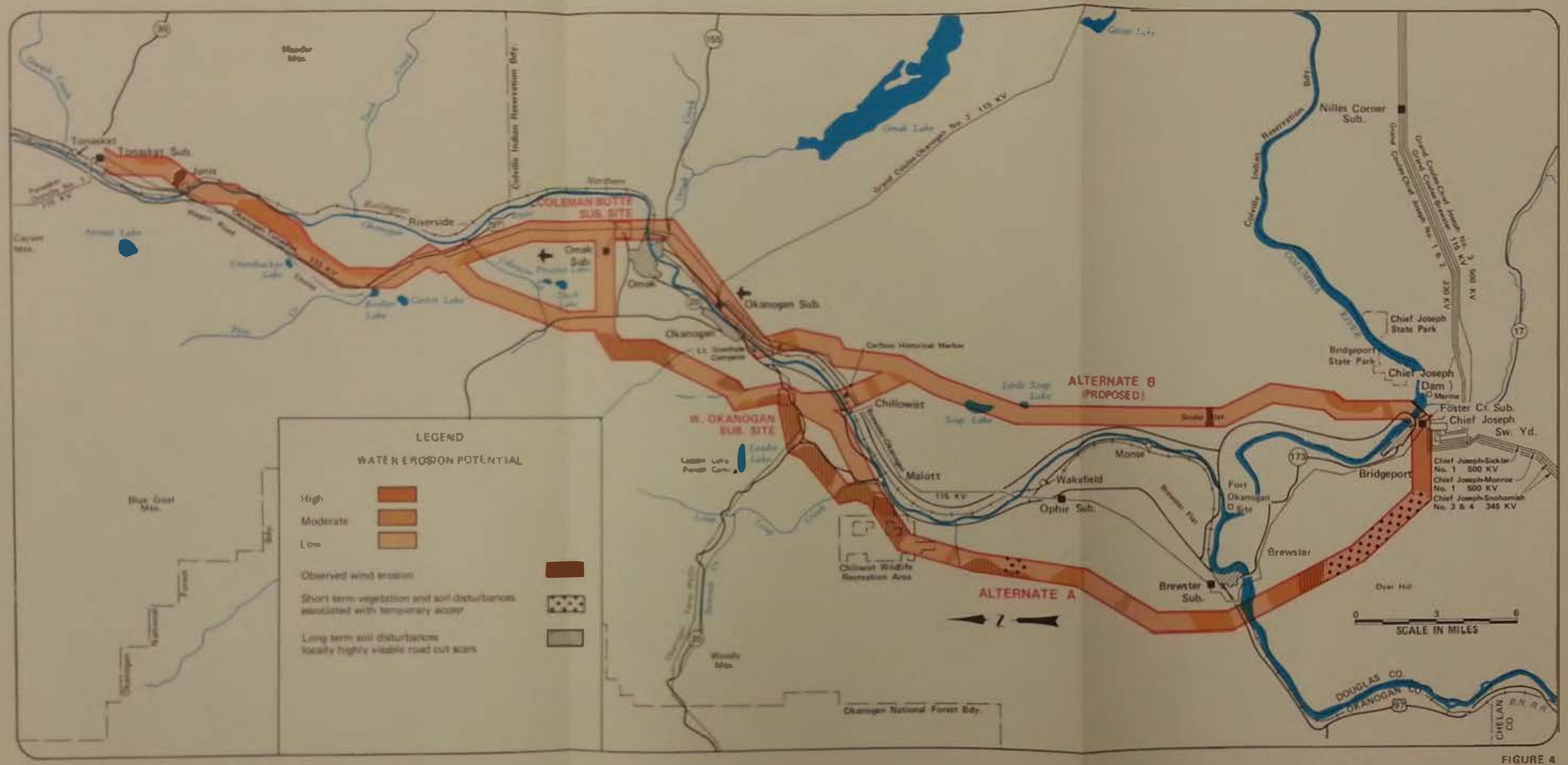


FIGURE 4
POTENTIAL GEOLOGIC AND SOIL HAZARDS
OKANOGAN AREA SERVICE
75-5

Hydrology

Surface runoff in the study area is less than 5 inches (13 cm) per year. Two major rivers crossed by this project, the Columbia and Okanogan, originate outside the study area. Other hydrologic resources present include several small perennial and intermittent creeks, and a few lakes.

Sediment yield varies considerably and is dependent on such factors as the geology and soil of a local area, precipitation, snow melt, and degree of slope. As discussed in the Geology, Soils, and Minerals section, erosion potential varies throughout the project area.

Water quality in the Okanogan Valley is generally good. It is influenced by problems such as streambank erosion and sedimentation. Water withdrawals, elevated water temperatures, and nuisance algae or aquatic plant growth contribute to periodic stream quality problems.

Right-of-way clearing, access road building, and tower construction contribute both directly and indirectly to hydrologic impacts. Such construction activities may increase sedimentation and accelerate runoff and erosion, affecting water quality.

Most impacts to hydrology are short-term, spanning the duration of the stabilization period following construction disturbance. Typically, impacts are most pronounced immediately after construction. The amount of surface runoff, and to a lesser extent the water quality may experience change until stabilization is reached. The stabilization period can last from several months to several years depending on geology, soil, slope, and precipitation of a particular area.

Construction of the transmission line is not expected to result in excessive discharge of fill or dredged material into any waters of the United States. The U.S. Army Corps of Engineers has issued a nationwide permit for discharges of dredged or fill material placed as backfill or bedding for utility line crossings, provided there is no change in preconstruction bottom contours (33 CFR 323.4).

Pursuant to Executive Orders 11988 and 11990, and Department of Energy (DOE) Regulations at 10 CFR Part 1022, BPA has determined that its proposal would not effect any identified wetland areas. This determination is based upon reference to the U.S. Fish and Wildlife Service's National Wetlands Inventory U.S. Geologic Survey maps, as well as BPA's own field and aerial photography investigations. However, BPA has consulted Department of Housing and Urban Development (HUD) and current Washington State Water Resource inventory maps and has determined its proposal would be within identified 100-year floodplains. Specifically, BPA's proposed transmission line would be within the 100-year floodplain where it crosses the Columbia and Okanogan Rivers.

As there are two intercepting rivers (the Columbia and the Okanogan) between the areas to be served and the nearest source of additional power (Chief Joseph Substation), there is no alternative to locating a total of approximately 8 to 10 structures within their 100-year floodplains. The only alternative available would be to choose between different river crossings (and different sections of the 100-year floodplain).

Structures within floodplains will be designed to withstand any flooding which might occur. BPA's proposal will conform with applicable State and/or local floodplain protection standards. Short and temporary spur roads may be required for access to towers within floodplains. Much of the temporary road would be across agricultural land along the Okanogan River. Following construction these areas would be rehabilitated in accordance with BPA policy to return the land to its former productive use. There will be no long term effects from any road construction necessary within the floodplain.

Appendix B, Chapters VII and VIII, Section A.3., of BPA's Draft Role EIS detail impacts to hydrology from construction, operation, and maintenance of a transmission line and mitigation measures used to reduce or eliminate those impacts.

Proposed Route - Hydrologic impacts associated with the proposed route would be minimal. Construction activities at the crossing tower sites would not significantly impact water quality. As the Columbia and Okanogan crossings entail the construction of structures over navigable waters of the United States, Section 10 permits will be required pursuant to the River and Harbor Act of 1899 (33 USC Sec 403) and 33 CFR Part 322.3(a)(1). These permits will be obtained from the Corps of Engineers prior to commencement of construction.

In addition, to the Columbia and Omak Rivers, Omak Creek and several intermittent streams would be crossed. Existing access at creek crossings would be adequate. No impacts to hydrologic resources are expected.

In limited incidents sediment transported from construction sites could reach a creek or one of the nearby lakes. If this did occur, the magnitude of sediment would be low and potential impacts to the water quality would be minimal.

Little Soap Lake and Soap Lake would be near the right-of-way. Since primary access already exists, impacts would be minimal.

Where accelerated soil erosion is a potential problem, mitigation measures such as vegetation seeding, water bars, and sediment traps will be implemented. Additional mitigation measures are described in BPA's Draft Role Statement Appendix B, Chapter VIII.

Vegetation management along the right-of-way will not require the extensive use of herbicides. Consequently the chances of herbicides deteriorating water resources are minor. In addition, herbicides are not applied near water bodies or known water supplies. Herbicides in use generally have an active life or persistence of from a few days to an extreme of a year or two.

Alternatives Considered

Alternate A - This route would cross the Columbia and Okanogan Rivers. Impacts would be the same as described for the proposed route. In addition, several smaller perennial creeks (Loup Loup, Tallant, Salmon, and Johnson) and intermittent streams would be crossed. Existing roads and bridges would be used at each crossing and tower sites would not be adjacent to creeks.

As stated for the proposed route, herbicide use would be minimal.

Mitigation measures as mentioned for the proposed route would be applied where necessary on Alternate A.

Option A-1 - This option would cross both Loup Loup and Tallant Creeks. Possibilities for increased turbidity and sedimentation exist at Loup Loup Creek due to the access road construction which would be needed through the drainage. These impacts would be short-term and be measurable only during construction periods and until stabilization takes place.

The option crosses Tallant Creek where its valley is flat and soils are stabilized. Existing bridges and access roads would be used. No impacts or deterioration to water quality is expected.

Option A-2 - Johnson Creek is the only major drainage crossed by this option. It is crossed in a relatively flat valley where access roads and bridges exist. No impacts to the creek's water quality will occur.

Alternate B-1 - In addition to impacts mentioned for the proposed route, this alternate would have another Okanogan river crossing. Towers would be located on either side of the river with an adequate vegetative buffer to prevent any impacts to hydrologic resources.

Vegetation

Natural vegetation within the project boundaries consists of three basic communities: ponderosa pine woodlands in the elevations above 2,500 feet (762 m), brush/grasslands in the lower portions of the valley, and riparian species in moist areas (figure 5). The majority of the vegetation is brush/grassland. Few extensive patches of native vegetation remain in the Okanogan Valley due to man's alteration of the land. Because native vegetation is scarce, care will be taken to avoid severe changes to that which remains.

Impacts to vegetation will vary according to species. Trees will be removed from the right-of-way and adjacent lands where necessary. Space requirements for transmission facilities, cranes and pulling/reeling sites would require removal of trees. Overall impacts to forested areas are expected to be minor

due to the open characteristics of the stands. Where trees are cleared, grasses, brush, and weeds will eventually constitute the cover species. Little disruption of the natural system of brush and grass species associated with the pine will result from construction other than in areas immediately adjacent to rights-of-way and access roads.

The majority of the land affected is rangeland. Removal of vegetative cover and topsoil will cause the greatest disturbance. Permanent vegetation loss will occur on access roads and short-term vegetation losses will result from construction at structure and pulling/reeling sites. Soil compaction may retard vegetative recovery for several years; however, seeding of some sites should accelerate restoration. Seeding would have to be of other than native species because seed of native species is not available commercially. Any seeding programs for the project would be carried out in coordination with Federal, State, and local agencies to assure desired rehabilitation results and compatibility of new species with native species.

Natural vegetation is slow to reinvade an area from which it has been removed. Revegetation of shrub species should occur within 10 years except on rocky, unproductive sites. How fast each site recovers will depend on precipitation, soil type, growing season, and livestock grazing. Rabbitbrush can be expected to invade the drier sites.

Undesirable weed species are expected to invade some sites where range vegetation is disturbed and not seeded. Once well-established, weeds such as cheatgrass tend to become a widespread and permanent feature. BPA cooperates with local weed control districts and landowners to prevent the spread of noxious weeds and poisonous plants.

Minor adverse disturbance to riparian vegetation will occur at river and stream crossings. Only taller trees or brush will be permanently removed.

Unauthorized use of BPA access roads by off-road vehicles may cause damage to surrounding vegetation. Heavy coatings of dust raised by vehicle movement can block the photosynthetic capabilities of plants to the extent they can no longer survive. Vegetation removal can also increase water erosion and can cause minor changes to wildlife habitat.

Fire poses a significant danger to bitterbrush and other species which are especially vulnerable. The possibility of accidental fire will increase during construction periods. Early spring periods should not present a problem, but later summer periods may, depending on rainfall amounts and moisture availability. Caution will be taken to avoid the possibility of accidental fire. No slash burning will be allowed during periods deemed to be hazardous.

Threatened and endangered plants are usually so classified due to their low tolerance levels to various types of competition or because of restricted

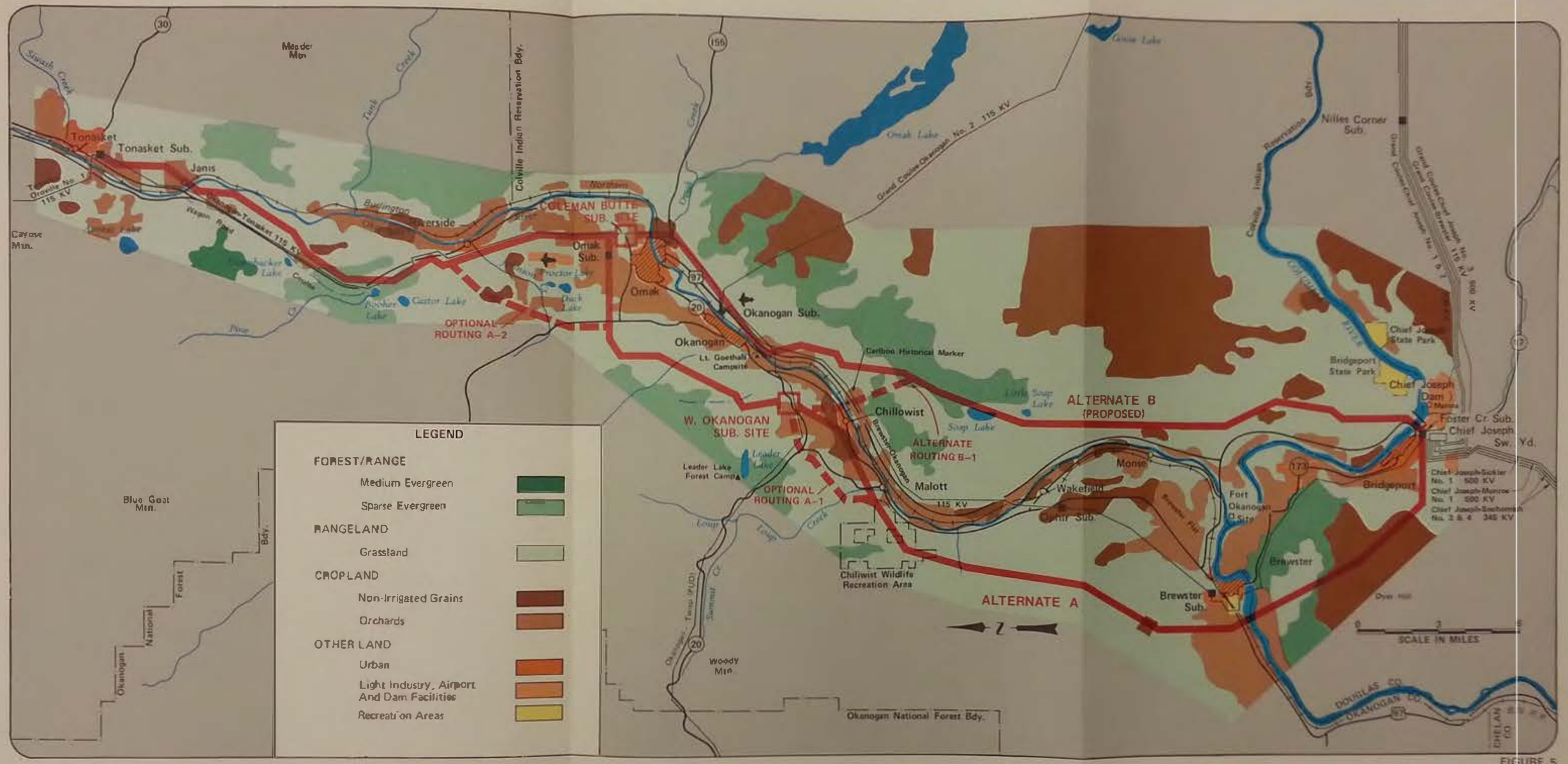


FIGURE 5
LAND USE
OKANOGAN AREA SERVICE
75-5

habitat. Clearing near such classified plants has the potential of altering their habitat. There are currently no known plant species in the study area officially listed at 50 CFR Part 17 and in the Federal Register and defined in Section 3 of the Endangered Species Act of 1973, as amended. Pursuant to Section 7(c) of the Endangered Species Act, as amended, BPA asked the FWS whether any listed or proposed species are present in the study area of BPA's proposed action. BPA was notified by FWS that two species listed as endangered may be present. Subsequently, a biological assessment was conducted by an independent research botanist. The results of this ground survey was that no listed or proposed endangered or threatened species was within the study area.

BPA also worked with the Nature Conservancy in cooperation with the Washington State Department of Game to conduct an herbaria search for any rare, threatened or endangered plants which might be found in the study area. Further investigation and analysis of any known or potential sites was conducted to assure compliance with laws pertaining to rare and endangered plants. Results of these investigations indicate that no species classified as threatened or endangered by the State of Washington will be disturbed.

Herbicide use and its associated impacts are expected to be minimal. For a discussion of BPA policy on herbicide use and further information concerning generalized impacts to vegetation and mitigating measures refer to BPA's Draft Role EIS, Appendix B, Chapter VIII, Section A.4.

Proposed Route - Approximately 28 miles (45 km) of rangeland between Bridgeport and Okanogan would be crossed by Alternate B. Vegetation consists of a brush/grassland mix. Forty-five acres (18 ha) of vegetation would be disturbed during construction periods; however, seeding will be done to accelerate recovery. Total vegetation loss should be less than 2 acres (1 ha).

From Okanogan to Tonasket, Alternate B would cross approximately 27 additional miles (43 km) of range and forest/range land affecting an estimated 58 acres (23 ha) of rangeland during construction. Only about 12 acres (5 ha) of rangeland would be permanently impacted for access roads and tower sites. Overall impacts to vegetation would be minor.

Recovery species would be brush, grass, and weeds similar to the surrounding area. Overall impacts to vegetation will be minor. Mitigation measures would follow those detailed in the Role EIS, Appendix B, Chapter VIII, Section A.4, and would consist mostly of seeding at selected sites to accelerate recovery and prevent the growth of noxious weeds.

Where trees are removed, impacts and recovery rates would follow those discussed previously.

According to the Nature Conservancy, mapping and analysis of endangered or rare vegetation in the Okanogan Valley has just begun. Consequently, the existence, condition, and location of such vegetation are currently unknown.

North of Riverside, is a now rare native vegetation combination of bitterbrush/needle and thread grass whose precise location and extent was investigated to ascertain possible impacts. An independent biological assessment filed with the U.S. Fish and Wildlife Service has determined no impact will occur to this plant association.

In addition, a photogrammetric analysis was conducted to determine if the habitats of three plants identified by the Nature Conservancy as being rare or endangered were within the proposed routing. Although it was suspected that suitable habitat for these plants did exist in the area, subsequent field surveys and assessment showed that none of these plants grew in the area nor was any suitable habitat affected. A biological assessment supporting these conclusions has been filed with the USFWS.

Alternatives Considered

Alternate A - The majority of land crossed by Alternate A consists of either open rangeland or a scattered forest/range mix. A total of 56 miles (90 km) of these land types would be crossed. Of that total approximately 7 miles (11 km) would be forest/range. The majority of forest/range is on the north side of Dyer Hill and a 3 mile (5 km) section of land southwest of Tarheel Flat. Additional forest/range vegetation is found north of Riverside but would not be affected by Alternate A.

Rangeland consisting of brush and grass will be disturbed to a minor extent for access roads, tower sites, and heavy equipment use. Vegetation loss is estimated at a maximum of 20 acres (8 ha), most of which will eventually regenerate.

It is known that Alternate A would cross the largest remaining area of bitterbrush/Idaho fescue shrub-steppe on granitic soil left in the state. This site is near Davis Canyon and has been recommended for preservation. The extensiveness of the site does not allow for rerouting around the area. Any impacts are expected to be minor. BPA will work in conjunction with the Washington State Department of Fish and Game and the Nature Conservancy to avoid adverse impacts.

Alternate A would have the same impact on the bitterbrush/needle and thread grass area north of Riverside as the proposed route.

Mitigation measures would be the same as for the proposed plan.

Option A-1 - This optional route west of Malott would result in the removal of a few scattered pines and local disturbances to brush and grasses along 4.5 miles (7 km) of access roads and at tower sites. Revegetation would be slow because of the steep terrain and poor soils. Recovery species would be small species of brush, cheatgrass, and weeds.

Option A-2 - Adoption of the optional route (A-2) west of Omak to Riverside would result in clearing along 3 miles (5 km) of scattered forest/range vegetation. Trees on this optional route are widely scattered and few would require removal. Regeneration following access road construction and at tower sites would consist of brush, cheatgrass, and weeds. Revegetation would take several growing seasons.

Alternate B-1 - Overall impacts to vegetation from Alternate B-1 would be similar to those for the proposed route. Approximately 27 miles (43 km) of range vegetation consisting of grass, bitterbrush, and rabbitbrush would be crossed between Bridgeport and the West Okanogan Substation. Forty-three acres (17 ha) of range vegetation would be temporarily effected during construction periods. Impacts would be the same as those detailed under the proposed route. A total of less than 2 acres (1 ha) of this vegetation would be eliminated at tower construction sites.

A vegetative buffer zone would be maintained at the Okanogan River crossing north of Chilowist to minimize possible impacts to hydrologic resources.

From the West Okanogan Substation to the Tonasket Substation, impacts would be the same as described for the proposed route, Alternate B.

Wildlife

Wildlife habitats within the study area include riparian, aquatic, brush/grassland, timber/brushland, and cropland. The planning supplement provides information on wildlife species found in these habitats.

Riparian habitat consists of surface waters and lands and vegetation adjacent to them. It is important to waterfowl, especially geese, and to upland birds, furbearers, reptiles, amphibians, and other kinds of wildlife. The Washington Department of Game reports that high densities of Canada geese nest on the Okanogan River. Depending on timing, construction could disturb nesting, feeding, and/or resting cycles of riparian wildlife where their habitats are crossed. During critical months (April through August), construction near or across the habitat could also disrupt nesting and resting waterfowl.

Aquatic habitat includes the Okanogan and Columbia Rivers, and streams, ponds, and lakes in the area. Fish resources include anadromous and resident species. Impacts to species within the aquatic habitat are expected to be minimal since the transmission line will span those areas and vehicles will not be permitted to ford them except on approved roads and crossings.

Brush/grassland habitat covers a large portion of the study area and supports a variety of wildlife species. The habitat is important to mule and whitetail deer as a winter range and to grouse for brooding and nesting. Species such as upland birds, songbirds, and rodents could be displaced if cover and

nesting areas are removed during construction. Removal of bitterbrush could have an adverse impact on deer winter range if severe winter conditions occur the first few years after construction. Brush removal along access roads and at tower sites would reduce the productive capacity of the winter range. Much of the clearing would be of a temporary nature. Revegetation would be the same as that described in the Vegetation section.

Timber/brushland habitat in the higher areas is suitable for many species depending upon the season of the year. Mule deer prefer it in summer but generally move to brush/grassland habitat in winter. Upland birds that prefer this habitat include blue and ruffed grouse.

Cropland habitat is particularly important for upland birds, especially sharptailed grouse. Construction could increase mortality to young ground-nesting birds during spring nesting and rearing periods. Permanent access roads will not be built in cropland habitat; consequently impacts from construction would be short-term and restricted to the actual activity period and a short post-construction recovery period estimated at less than one year.

The only known and officially listed endangered or threatened species that may occur in the area include the American peregrine falcon (endangered) and the northern bald eagle (endangered). No impacts are anticipated to any endangered or threatened wildlife species within the area.

For additional discussion of impacts to terrestrial and aquatic wildlife, refer to Appendix B, Chapter VII, Section A.5., of BPA's Draft Role EIS.

Proposed Route - The proposed route, Alternate B, crosses the Columbia and Okanogan Rivers and could cause some increased mortality to waterfowl. The crossing at the Columbia River would be less hazardous to waterfowl than the Okanogan crossing because birds have adapted their flight patterns to the Chief Joseph Dam and surrounding obstructions.

The proposed double-circuit line may create an obstacle for waterfowl and other birds flying along the Columbia and Okanogan Rivers. Studies of a similar type line have shown that waterfowl flights across the line resulted in collisions (Meyer 1978). Most collisions were thought to have occurred with overhead groundwires. Actual numbers of waterfowl involved in collisions is slight and the level of mortality is not considered biologically significant. Similar results are expected with the proposed line. The chance of collision would be increased for flocks which cross the transmission line repeatedly. Most waterfowl in this area are transient and would be affected for only a short period.

BPA is conducting research to reduce the potential for bird collisions with transmission lines. Mitigation measures include elimination or marking of overhead groundwires where the transmission line crosses the Columbia and Okanogan Rivers. The overhead groundwire will be eliminated along the entire

line with the exception of a 1 mile (2 km) section adjacent to each substation. It is expected this effort will greatly reduce potential for bird strikes.

The BPA studies also found that a 230-kV line caused alteration of bird flight patterns. Most waterfowl fly above transmission lines. Less than 1 percent of the waterfowl observed altered their flight path to the extent that they would not fly across the line. Effects of the proposed line are expected to be essentially the same.

The proposed route crosses several miles of mule and whitetail deer winter range and blue grouse brooding and nesting habitat west of Bridgeport State Park. Sharptailed grouse habitat would be crossed at Snider Flat. Reduction or modification of this habitat could increase mortality rates for species dependent on such limited habitat areas. Impacts are expected to be slight because of lack of vegetative clearing required.

In some areas, essential breeding cover or drumming areas for sharp-tailed and blue grouse, chukars, and quail could be disturbed or eliminated by access roads and construction or maintenance activities. Johnson Creek near Riverside is an important grouse, chukar, and quail habitat, and care will be taken to avoid disturbance to these upland bird areas. BPA has consulted the Washington State Game Department and Colville Tribal biologists prior to surveying and construction to avoid or mitigate impacts in those areas. By avoiding seasons when breeding and drumming occur, it is thought that any potential impacts can be minimized.

Near Johnson Creek and Riverside, the proposed plan transects highly important mule deer winter range and migration areas. From Riverside this winter range continues through the Pine Creek and Carter Mountain areas north to Tonasket. Vegetation removal, construction activity, and other habitat modification could have long-term effects on deer using this winter range. The long-term effects would be removal of browse and reduction in productive capacity of the winter range. Bitterbrush on winter ranges is slow growing; once removed it may take years to re-establish and sometimes never recovers.

Studies have shown transmission corridors have little or no noticeable effect on game movement or migratory routes of deer and elk (Goodwin, 1975). Equivalent results are expected with this project.

Overall, the proposed plan would have low to moderate impacts to wildlife populations and associated habitat.

Alternatives Considered

Alternate A - Wildlife and their habitat would be impacted along several areas of Alternate A. These would include waterfowl flyways along the Columbia

River west of Brewster and near Janis where the line crosses the Okanogan River. The density of Canada geese along these sections of the Okanogan and Columbia Rivers is among the highest found along river watercourses in the state. It is considered of high value and importance by the Washington State Department of Game. Also impacted would be areas of upland bird habitat, deer winter range, and the Chiliwist Wildlife Recreation Area.

The main concern at the river crossings would be the overhead groundwire. Impacts attributable to, and mitigation measures for the groundwire would be the same as described for the proposed route.

A communal bald eagle roost has been identified along the cliffs above the Columbia River southeast of Brewster. Since the bald eagle enjoys endangered species status, BPA entered into consultation with the U.S. Fish and Wildlife Service and the Washington State Department of Game to determine possible impacts which may occur if Alternate A were constructed and methods to mitigate such impacts. It was determined by the FWS that Alternate A would not jeopardize the continued existence of the bald eagle near Brewster. The FWS and BPA examined various design alternatives available and concluded if Alternate A were built, wood poles would be utilized near eagle flightpaths, no overhead ground wire would be installed, construction in this area be by helicopter to avoid putting access roads near the roost, construction avoid the subject area from October 15 to March 15, and the roost be monitored to ascertain the effects of the transmission line.

Alternate A also crosses approximately 2.5 miles (4 km) of the Chiliwist Wildlife Recreation Area west of Malott. This area is managed by the Washington State Department of Game for upland birds and deer browse. Transmission lines in this area could cause some interference with hunting activities by altering population densities or changing flight patterns of birds. Increased mortality rates are expected to ground-nesting birds during construction periods. Elimination of deer browse will occur on access roads and at tower sites.

Important sharptail grouse habitats are in Davis Canyon, the Chiliwist Wildlife Recreation Area, and the Pine Creek and Carter Mountain areas. Johnson Creek near Riverside, and Spring Coulee west of Okanogan are also key grouse, chukar, and quail habitat. Important blue grouse brooding and nesting habitat is between Swamp Creek and Davis Creek and near Salmon and Johnson Creeks.

From Davis Creek, and the Chiliwist area, and continuing to Spring Coulee, Salmon Creek, Johnson Creek, and Riverside, Alternate A crosses important mule deer winter range and migration areas.

Impacts to wildlife from this area and north to the Tonasket Substation would be similar to those discussed under the proposed plan. Overall, Alternate A would have a moderate impact on wildlife populations and their habitats.

Option A-1 - The area crossed by Option A-1 is considered a part of deer winter range, but the sparsity of vegetation indicates it is not as important as other areas nearby.

This option also crosses quail and chukar partridge habitat near Tallant Creek but would have no significant long-term impact. Upland birds inhabiting areas near construction sites would be displaced during building and maintenance periods.

Option A-2 - Upland bird habitat would be crossed southwest of Riverside with few long-term impacts. Quail and sharptail grouse would be displaced for short periods during construction and maintenance activities. Depending on timing of construction, a slight increase of young bird mortality may be evident.

Alternate B-1 - As described for the proposed route, Alternate B-1 crosses primarily rangeland habitat. Impacts between Bridgeport and the Okanogan River crossing near Chilowist have been described for Alternate B and would be the same for Alternate B-1. Some upland bird habitat would be crossed on both sides of this river crossing. Impacts are expected to be short-term and minimal. Birds would be displaced during construction and maintenance periods. A slight increase in young bird mortality may occur depending on timing of construction. New access road construction could cause long-term impacts to small animals dependent on rangeland habitat by reducing carrying capacity through vegetation removal and by reducing habitat. Overall impacts, however, are expected to be minor.

As discussed in the proposed route, possibilities of collisions of waterfowl with the transmission line at the Okanogan River crossing would be slight and the level of mortality would not be considered biologically significant.

Impacts attributable to Alternate B-1 to wildlife between the West Okanogan Substation and the Tonasket Substation would be the same as previously described.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

The following sections describe man's present use of the natural resources of the study area. Discussions detail impacts to those resources and uses attributable to construction and maintenance of transmission facilities described in this document.

Demographic and Economic Considerations

The project is in Douglas and Okanogan counties; however, the majority of construction will take place in Okanogan county. Population densities are

low, indicative of the area's rural character and its distance from major population centers. Population is on the increase but at a rate less than half the state average. Employment is based on the wood and fruit products industries, wholesale and retail trade, and various types of local, State, and Federal service.

Demographic and economic impacts resulting from transmission line construction vary according to length of line, number and size of communities near the line, and the time required to complete the project.

Establishing transmission line rights-of-way proceeds in stages. In order, these include reconnaissance and surveying, land appraisal and acquisition, right-of-way clearing and road system improvement, and finally line and substation construction. The skills needed for these construction activities are specialized and often not available locally. Consequently, there is a need to bring in a large percentage of the work force. This can result in demographic and economic impacts to communities. Workmen require housing and food, and a variety of trade and service items. The work force is seldom concentrated anywhere long enough to strain a community's resources. Usually only a few workers bring their families; most stay in motels or hotels, and the rest use trailer facilities. Actual impact of any population increase on a community depends largely on the size of the community, its facilities and the magnitude of the project.

Temporary construction jobs are often available to local residents. If people are not available locally, they are recruited elsewhere. BPA and its contractors attempt to use local facilities and equipment when possible, especially to perform clearing and grading operations and to supply the concrete and rock for substation construction. The potential income from increased employment, trade, and services is a positive economic effect for most communities, especially in predominantly rural, low population areas.

Further discussion concerning impacts of BPA construction on the economic and demographic resources of an area as well as information on changes in property values and tax bases can be found in BPA's Draft Role EIS, Appendix B, Chapters VII and VIII.

Proposed Route - Construction of Alternate B is expected to have low impacts to demographic and economic resources. This plan would employ a work force estimated at between 50 and 60 for line construction, and approximately 18 for substation construction. The work load and personnel would experience a gradual buildup to a peak work period and then slowly decline as the job approaches final completion. It is estimated that between 80 and 85% of the work force would be imported. The work force would require local services for 12 to 14 months, providing a temporary stimulus to the local economy. Workers would not be concentrated in any one spot along the line, hence communities would not be servicing a large work force.

Alternatives Considered

Alternate A - Impacts to economic and demographic resources attributable to construction of Alternate A would be essentially the same as for the proposed route. Minor increases in the number of workers for the transmission line would be evident since clearing activities for construction would be more extensive than for the proposed route.

Option A-1 - Use of this optional route would not change impacts from those detailed for Alternate A.

Option A-2 - Use of this optional route would not change impacts from those detailed for Alternate A.

Alternate B-1 - Economic and demographic impacts from construction of Alternate B-1 would be the same as for the proposed route.

Land Use

Agriculture

Orchards and non-irrigated grains are the main croplands within the Okanogan area as shown on the Land Use map, figure 5. The Columbia and Okanogan river valleys and terraces above the flood plains are the predominant orchard sites, although new lands are continuously being developed for orchards. Almost all of the orchardists raise apples, but pears, peaches, and cherries are also grown. Much of the area is planted to high density (200 trees per acre) Red and Golden Delicious apple varieties. Grain fields, usually wheat, are on higher plateaus where irrigation is not used. Summer fallow is necessary to conserve moisture to produce low yield crops.

Routings avoid croplands wherever possible and only a minimal number of towers would be within orchards or fields along either route. Tower heights are sometimes raised when crossing orchards to allow trees to be grown within the right-of-way and beneath the powerline. No access roads would be constructed in the orchards. Some trees within the right-of-way could require removal or be damaged by heavy equipment necessary for tower erection during construction. The orchardist would be reimbursed for trees damaged or removed.

Irrigation projects and pumping units along the Columbia and Okanogan Rivers make possible the production of fruit crops. Solid set sprinkler irrigation is prevalent; no system interference is expected by construction of a line across an orchard. A few tower sites may be placed in grain fields, causing inconvenience to farming practices. Lands for temporary access roads may be taken out of production during construction periods. Following construction and rehabilitation these areas and other land in the right-of-way may again be

utilized for agricultural production. Total land temporarily lost for construction sites and permanently lost for tower sites is noted under specific impacts for each of the alternates.

Normally orchard crops are sprayed with insecticides from the ground rather than by aerial operations. Towers in orchards would not interfere with ground spraying. Grain crops are normally aerial sprayed. Transmission towers and conductors would be an obstacle and hazard to planes where aerial spraying is done to either orchards or dryland grains.

Impacts to soils and stabilization periods following construction have been previously discussed in the Geology, Soils, and Minerals section. Duration of soil disturbances in agricultural lands would be much shorter than other areas due to intensive cultivation and mitigation procedures such as recontouring land and seeding commonly used by BPA and its contractors.

Crops and production yields should not be significantly affected by either route. Production losses would be evident in wheatfields during construction periods as the land adjacent to and within the right-of-way could not be used for one growing season. Overall crop losses would be minimal. Orchardists would lose production only from trees which would be removed. Total number of trees to be removed is expected to be minor.

Lands with suitable soils, irrigation, and high value crops are often classified as prime or unique by the Soil Conservation Service. The orchard land in the Okanogan Valley is so classified. Although not restricted from crossing prime and unique farmlands, it is BPA's policy to avoid them whenever possible or to mitigate adverse affects through selective tower location.

For further information concerning impacts to agricultural lands and mitigating measures applied by BPA and our contractors in construction and maintenance activities, consult BPA's Draft Role EIS, Appendix B, Chapters VII and VIII. More specific impacts attributable to various corridors for this project are detailed below.

Proposed Route - The proposed route would cross approximately 2 miles (3 km) of dryland crops between Bridgeport and Okanogan. In addition, there is a small area of irrigated hayfields. Impacts to the dryland wheat areas would be minor; less than 1/2 acre (.2 ha) is expected to be permanently lost from production. Presently irrigated land can probably be avoided. The Bureau of Reclamation has made initial studies on potential irrigable land in the southwest portion of the Colville Reservation. No recommendations for development have as yet been made; therefore, potential impact of the alternative cannot be determined.

A small amount of orchard land would be crossed between Okanogan and Omak, but impacts are expected to be minimal. It is possible one or two towers would require location in orchards.

Approximately 3 miles (5 km) of land south of the Okanogan River crossing at Janis is considered to be suitable land for orchard and will probably be developed as such in the near future. The existing line now bisects this land. Relocating the proposed line a few hundred feet to the east would avoid location through potential orchard lands. BPA will work closely with the developer during the location phase to avoid impact wherever possible.

The proposed route would be adjacent to several orchards between Janis and Tonasket, but location outside field boundaries is probable. No interference to orchards is expected on this portion of the route.

The Soil Conservation Service (SCS) has classified the orchard land in the Okanogan Valley as prime or unique. BPA has considered the effect of its proposal upon the continued use and viability of the farmland in question. Basically, transmission facilities are compatible with agriculture (see Appendix B of the Draft Role EIS, Chapter VII.B.1.). The only land that would be irreversibly committed to other uses would be the comparatively small amount of land actually occupied by the tower footings. A major reason for the proposed new facilities is to service the increased loads in the area brought about by intensified irrigation of agricultural land (much of which is prime or unique farmland). Accordingly, BPA's proposal is not likely to have any effect upon the continued use and irrigability of such farmland. On the contrary, BPA's proposal is conducive to the continued viability of farming in the entire Okanogan River Valley.

Alternatives Considered

Alternate A - Alternate A crosses approximately 4 miles (6 km) of dryland wheat between Bridgeport and Brewster on the Dyer Hill plateau. An estimated 10 acres (4 ha) of land for tower construction sites and access roads would be temporarily disturbed. Most of these lands may be recultivated and permanent land loss would be less than 1 acre (.4 ha).

As shown on the Land Use map (figure 5), orchards on both sides of the Columbia River would be crossed. There will likely be one or more towers located in the orchards. A small number of trees will be removed for tower location and assembly areas. Compensation will be made for production loss and crop damage during construction. Any alteration or damage to irrigation or drainage systems or to fences will also be compensated.

Further north near Malott, Alternate A crosses Tarheel Flat. The line would be located to avoid orchards wherever possible in this area and impacts are expected to be minimal. The location of one tower within an orchard on the southern end of Tarheel Flat is possible; however, the orchard probably could be spanned.

Little impact is expected to agricultural land between Malott and Omak. Near Omak Alternate A turns eastward into the substation. Field lines would be followed between orchards. It is not expected that any tree removal would be necessary.

Several miles of land between Omak and Riverside is potential orchard land although not currently being used for that purpose. Construction of the Alternate A could alter plans for future orchard development. Productive land loss would be partially offset by removal of the existing line between Okanogan and Tonasket. Impacts from Riverside to Tonasket would be the same as those described for the proposed route.

Option A-1 - Adoption of this option west of Malott would have only minor impact on agricultural land. A small hayfield near Tallant Creek may have a tower placed within its boundaries. Actual tower location however is not known at this time. This option would eliminate any potential impacts to orchard lands on Tarheel Flat.

Option A-2 - This option would be routed on new right-of-way from west of the Omak Substation to north of Riverside. This optional route avoids impacts to existing agricultural lands between Omak and Riverside by skirting to the west of them. Land crossed by the optional route is potential orchard. Construction of a new line here could alter future plans for agricultural development. The existing Okanogan-Tonasket line would be removed following energization of the proposed line. Removal of this line would cause short-term disruption of agricultural practices and use of the land but would have an overall long-term beneficial affect by allowing land now occupied by transmission towers to be used for agricultural purposes.

Alternate B-1 - Impacts to agricultural land on the Colville Reservation would be the same as described for the proposed route. In addition, this alternative would cross a small strip of orchard on either side of the Okanogan River. It is not now known whether any tower would be located within either orchard. If this alternative becomes feasible further studies will be made to determine tower locations and possible impacts.

Impacts between the West Okanogan Substation and the Tonasket Substation would be the same as described for that portion of line in Alternate A.

Forestry

Forested areas within the project boundaries are at elevations generally above 2,500 feet (762 m). Ponderosa pine is the dominant tree type although Douglas-fir and lodgepole pine are associated species where conditions are favorable. Distribution of forest land in the project area is shown on figure 5.

Pine stands are utilized mainly as recreation and grazing lands. Commercial logging is restricted by lack of access, difficult terrain, and low tree density. Most of the forest areas are in private ownership and used either as grazing lands or held for later development as private recreational lands. These land uses will not be altered by either alternative.

Impacts to forested lands would be minimal. Because of the location of routings in relation to wooded areas, few trees would be removed. Those trees within or immediately adjacent to rights-of-way which could fall into the transmission line will be felled to maintain electrical service reliability. Location of a line through forested lands is not expected to inhibit timber harvesting practices. Those routes and their access roads which require tree removal will be so noted under the specific impacts for each route. Brush and low growing shrubs in the rights-of-way will not be cleared except at tower sites and along access roads and will provide a diversity of habitat for wildlife.

Further description of impacts to forest lands and mitigation measures employed to help alleviate these impacts can be found in BPA's Draft Role EIS, Appendix B, Chapter VII, Section B.1.

Proposed Route - A very small portion of forest-rangeland may be crossed by the proposed route between Soap Lake and Okanogan. A few trees may require removal over this area but overall impacts would be negligible.

Impacts to forest land between the Omak Substation and Tonasket would be restricted to tree removal along access roads, within the right-of-way, and any adjacent trees which could effect the reliability of the line. Approximately 3 miles (5 km) of forest/range vegetation would be crossed. The right-of-way would be periodically maintained to prevent new trees from interfering with operation of the line. Naturally occurring species of grasses, herbs, brush, and weeds would revegetate the area.

Alternatives Considered

Alternate A - Alternate A will require tree removal for tower sites and access roads on the north side of Dyer Hill, and between Brewster and Malott. It is expected that less than five miles (8 km) of tree removal would be necessary. Between Malott and the Omak Substation only an occasional tree would require removal. From Omak to Tonasket impacts would be identical to those described for the proposed route.

Option A-1 - This option would require more tree removal between Malott and the West Okanogan Substation than Alternate A. Rugged terrain with scattered pines would be crossed for approximately 3 miles (5 km). Trees would be removed for access roads and the transmission line corridors. Revegetation patterns would follow those described for Alternate A.

Option A-2 - Only a few scattered trees would require removal if Option A-2 were used. Overall impacts would be insignificant.

Alternate B-1 - Impacts to forest resources attributable to Alternate B-1 would be identical to the proposed route.

Urban and Residential

As shown on figure 5, the distribution of urban and residential land uses is concentrated along the Columbia and Okanogan river valleys. The largest cities in the area are Omak and Okanogan, followed in size by Brewster, Bridgeport, and Tonasket. Smaller towns include Riverside, Malott, and Monse. Other settlement patterns include moderately concentrated rural homesites among the valley orchards and more dispersed homes in the wheat-growing and cattle-grazing lands.

The economic base is centered around fruit production, followed in importance by livestock, wheat, forest and dairy products, and recreation. Main industries include fruit processing, lumber mills, construction and agricultural services. Other facilities of economic importance are cold storage warehouses, railroad shipping docks and a livestock auction market.

County officials were contacted to determine the status of zoning and planning. Copies of applicable zoning ordinances and comprehensive plans were reviewed and revealed that lands affected by either alternative were mainly classified for agricultural use or as general rural land. Zoning allows for transmission line construction that is compatible with county plans. These plans call for minimizing adverse effects created by transmission line construction. BPA's proposal will be consistent with all applicable land use plans in accordance with OMB Circular A-95, revised January 2, 1976.

Impacts to urbanized land will be minimal since little is near the transmission line corridors. In the more remote areas, direct impacts will be limited to noise, dust, and visual impacts to nearby residents.

In the more intensely developed parts of the study area, impacts to urbanized land use may differ slightly. In addition to noise, dust, and visual impacts from construction activities, there would be more potential for conflicts with existing or future land use along the rights-of-way. Because of higher population densities there is more potential for safety hazards and traffic disruption should an energized conductor accidentally fall. Energized lines are automatically switched off in less than 1/2 second, but fire could result from such incidents. Additional information on safety hazards of transmission lines can be found in Appendix B, Chapter VII of BPA's Role EIS.

The proposed facilities are not expected to cause television or radio interference. However, if residents suspect television and/or AM radio

interference, mitigation in accordance with BPA policy as outlined in BPA's Draft Role EIS, Appendix B, Chapter VIII, will be undertaken to restore reception.

Proposed Route - No impacts to urban or residential land would result between Bridgeport and Okanogan from construction of Alternate B. Visual impacts as described in the Esthetics section would be evident in the Okanogan-Omak vicinity.

From Omak to Riverside the new line would parallel the existing line, causing visual impacts to residents in that area. This new visual impact would be partially mitigated by removal of the existing line once the new line is energized.

The proposed line would pass approximately 1 mile (1.6 km) east of the Omak airport on a nearly parallel course to the runway. The increased height of the towers would increase potential obstruction for aircraft. BPA will be in compliance with all FAA clearance regulations and mark any towers and/or lines deemed necessary by the FAA.

Between Riverside and Janis is a new subdivision development near Crumbacher Lake. The line will pass to the east of this subdivision and will cause impacts as noted in the Esthetics section.

Just south of the Okanogan River crossing at Janis, the line will cross approximately 2 miles (3 km) of land being subdivided into 40 acre (16 ha) lots for combination homesites and orchards. BPA will work with developers in this area to mitigate any impacts through selective transmission line location.

Alternatives Considered

Alternate A - Alternate A would not have significant impacts on any urban centers, nor is it expected to require removal of any existing homes. Several potential homesites may be eliminated where the right-of-way passes near Brewster, Malott, and Janis. The primary impact of Alternate A would be one of visual intrusion in these three areas.

Effects to the Omak airport and from Riverside to Tonasket would be the same as outlined for the proposed route.

Option A-1 - Use of this option would reduce adverse impacts to urban land as the line would avoid the Malott area thereby eliminating visual impacts. This option would also eliminate the potential of restricting building sites in the Malott area.

Option A-2 - This route, west of the Omak Substation, would bypass most scattered residences north of Omak. Four homesites proposed for development 1 mile (1.5 km) north of the Omak tap point could experience visual intrusion

by the transmission line depending on its final location. BPA will work with landowners to avoid impact where possible. The existing Omak-Tonasket line would be removed, resulting in a beneficial impact to those homeowners near the existing line.

Alternate B-1 - No impacts to urban and residential resources between Bridgeport and the Okanogan River crossing would occur as a result of construction of Alternate B-1. On the west side of the Okanogan River, two residences would lie within 500 feet of the line which would disrupt their views of the river.

Impacts from the West Okanogan Substation to the Tonasket Substation would be the same as described for Alternate A.

Esthetics

The Okanogan area is noted for its scenic quality. Such amenities as the Columbia and Okanogan Rivers, diverse physiographic features, extensive apple orchards, and cultivated fields combine to form a visually rich and diverse landscape.

Varying degrees of visual impacts will result from the location, construction, and maintenance of the proposed transmission line. These impacts depend on the line's compatibility with its surroundings, screening provided by landform and vegetation, design of towers and access roads. Impacts also depend upon the number of viewers, their distance from the line, and their visual sensitivity.

Visual resources within the study area were analyzed relative to two components: visual landscape characteristics, and viewer characteristics.

Landscape characteristics include the scenic value of distant views or overall "visual quality", and the scenic value of near views or "site attractiveness". Figure 6 summarizes these landscape zones.

Viewer characteristics indicate visually sensitive land uses within a viewshed such as residences and travel routes.

Visual impacts normally occur when one or more of the following conditions are met: facilities cross areas recognized for their scenic quality; facilities are located across areas prone to long-term scarring from access road construction, clearing, and maintenance activities; facilities are out of scale and/or incompatible with major visual patterns; facilities occupy a major portion of the viewed landscape; residents are exposed to immediate views of the line.

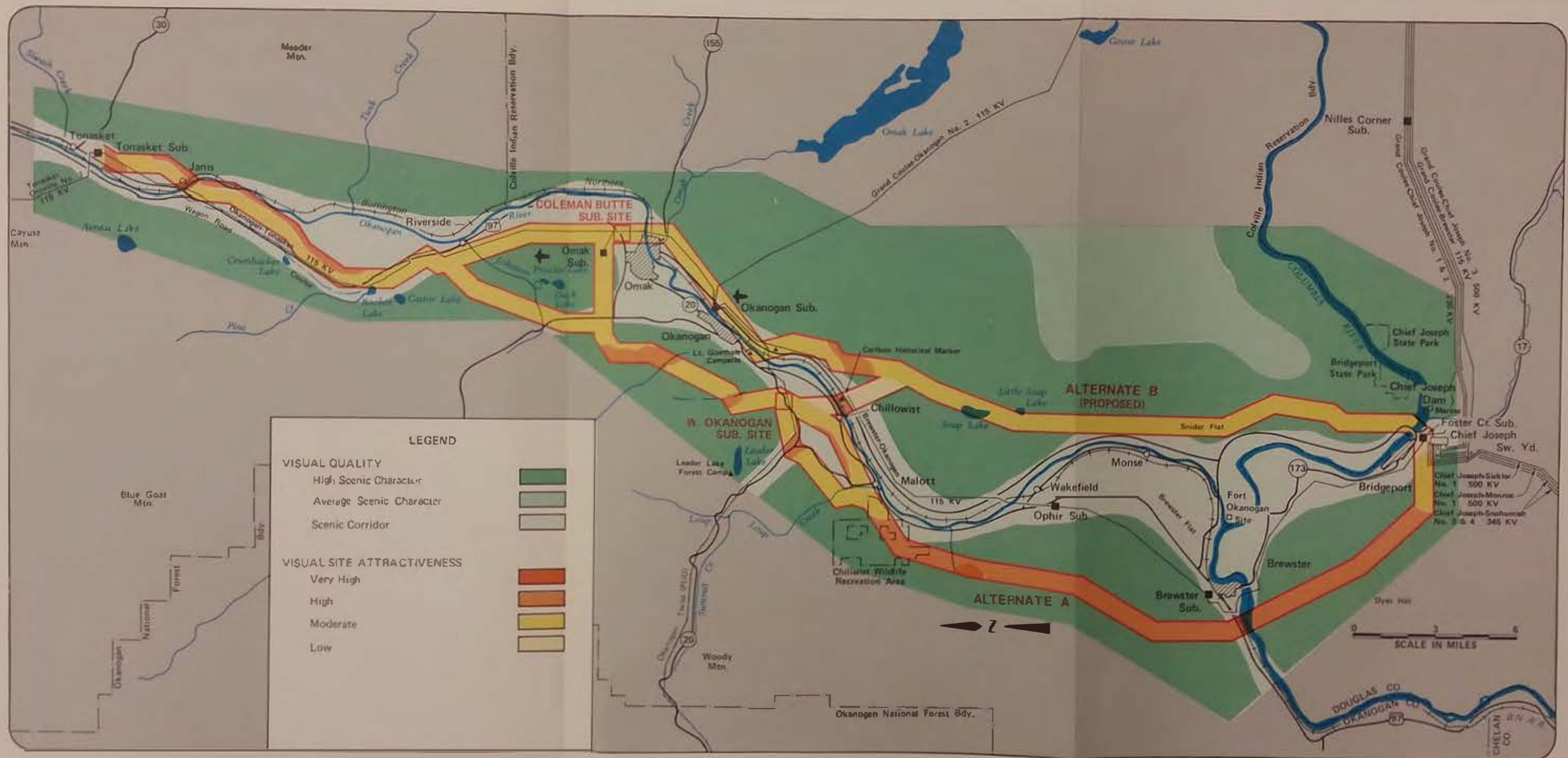


FIGURE 6
VISUAL R SOURCES
OKANOGAN AREA SERVICE

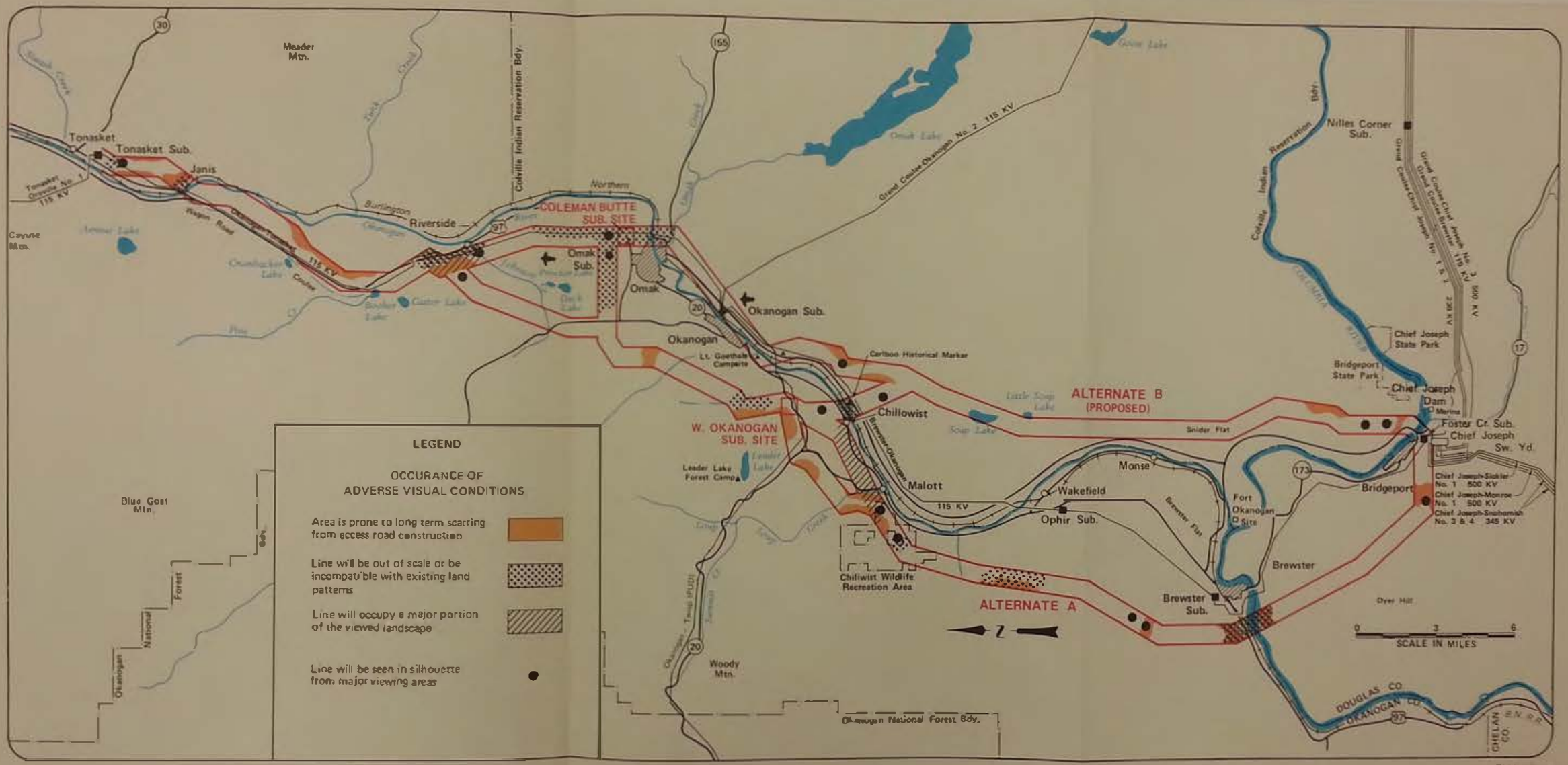


FIGURE 7
ADVERSE VISUAL CONDITIONS
OKANOGAN AREA SERVICE

Areas where these conditions are likely to occur are shown on figure 7. Table 4 shows the number of residential groups and travel routes within the viewshed.

Viewsheds along the route encompass portions of the urban centers of Bridgeport, Brewster, Mallot, Okanogan, Omak, Riverside, and Tonasket. A large number of suburban and rural residences would also be within the viewshed. The major through highway is U.S. 97. Other primary routes are State Highways 20 and 173.

BPA will attempt to keep visual impacts at a minimum by accomplishing the following where practicable:

1) Placing towers to minimize the need for clearing.

2) Locating towers to minimize skylining and to take advantage of all topographic features to screen the lines from view.

3) Locating towers to avoid immediate views from residences.

4) Using existing roads for access as much as possible. Design and construction of new access roads should fit the terrain and reduce scarring.

Other similar recommendations are in the Department of the Interior/Department of Agriculture publication, Environmental Criteria for Electric Transmission System.

Proposed Route - Visual impacts would be low for Alternate B except where the line crosses U.S. Highway 97 near Okanogan. Many highway travellers would be exposed to foreground views of the line.

The proposed route would be exposed to a high number of viewers near Chief Joseph Dam but would not be out of character with the existing visual environment. Between the dam and Okanogan Substation the line crosses land isolated from view. The ability of the landscape to visually absorb transmission towers is high. Scars from access roads will be minimal because existing roads can be used.

The 7.5 miles (12 km) between the Okanogan and the Coleman Butte Substation site would be constructed on double-circuit lattice steel towers which would dominate the view. Though few towers would be skylined, they would be more visible than the wood pole structures they replace because of their greater height and complexity.

From Omak to Tonasket, the existing line will be removed and replaced with a new double-circuit line. This new line will deviate from the existing right-of-way north of Riverside to take advantage of the terrain's screening and absorption capabilities. In areas where the existing right-of-way is

Table 4 - Visually Sensitive Land Uses

Foster Creek Substation to Omak Substation

Housing Groups Within Viewshed	Alternate A	Alternate B	Alternate B-1
1-5 Homes	*330 Groups	*294 Groups	*298 Groups
6-25 Homes	7 Groups	8 Groups	7 Groups
26+ Homes	4 Groups	4 Groups	4 Groups
Urban Centers	5	3	2

Travel Routes Within Viewshed	Miles(km)/Crossings		
Principal through Highways	19(31)/2	16(26)/2	17(27)/3
Other through Highways	36(58)/4	25(40)/2	26(42)/3
Local Roads	150+(241+)/16	150+(241+)/7	150+(241+)/8

Omak Substation to Tonasket

Housing Groups Within Viewshed	Common Segment
1-5 Homes	105
6-25 Homes	4
26+ Homes	1
Urban Centers	1

Travel Routes Within Viewshed	Miles(km)/Crossings
Principal through Highways	25(40)/1
Other through Highways	9(14)/9
Local Roads	25(40)/8

*Housing groups may or may not be screened from views of the line. The majority of these housing groups are located within the major urban areas of Bridgeport, Brewster, Malott, Okanogan, Omak, and Tonasket.

retained, visual impacts will be increased because larger, more complex towers will replace the less obtrusive wood poles in areas of high visibility. Where a new alinement is proposed, the overall visual effects will be reduced.

Tower skylining will occur where the proposed route crosses the Okanogan River valley north of Riverside. This will be very apparent to southbound travelers on U.S. 97.

The proposed route passes to the east of a new subdivision near Crumbacher Lake. The subdivision is in a pine grove which screens most of the homesites from views of the line. Landowners would be exposed to views of the line when using the access road to the subdivision. Overall impacts to the subdivision would be moderate.

Additional homes proposed south of Janis may be adversely affected depending on their orientation. If homes take advantage of downstream views of the Okanogan River, visual disruption will be minimal.

The new line will not alter the visual condition of the Tonasket Substation to a great extent.

Alternatives Considered

Alternate A - Overall impacts along Alternate A are moderate with high impacts occurring at the Columbia River crossing near Brewster. Areas of high impacts also occur near Malott, Omak, and Janis. Other areas may have high localized impacts but will not affect the overall Okanogan Valley environment or be visible to a large number of observers.

Alternate A will be visible from Bridgeport and adjacent areas. However, the ability of the terrain and vegetative cover to absorb the structural outline of towers will reduce the line's visual effect. In addition, the existing lines from Chief Joseph and Foster Creek Substations have already modified the visual amenities of the area.

At Brewster visual impacts will be high. The line will cut across the valley, disrupting the landscape. Also, the size of the towers in relation to their surroundings will tend to dominate the setting. This will be more pronounced by larger river crossing towers and required FAA markings. Several homes have been built to take advantage of the view. These views and views from Brewster, its surrounding areas, and major highways will be adversely affected. If additional access roads are needed, the resultant scarring would be highly visible.

From Harmony Heights to Malott visual impacts will be low to moderate. Some scarring from access roads may occur.

By following the base of Tarheel Flat near Malott, disruptions to visual amenities can be kept to a minimum. However, because of the number of viewers that will be exposed to the line, the visual impacts will be high.

Between the West Okanogan Substation and Johnson Creek visual effects will be minimal. The presence of a transmission line would contrast with the rural/agricultural appearance of Johnson Creek valley and would be visible to several homes and along a county road in Spring Coulee.

Salmon Creek and the county road there would be spanned by the line with minimal disruption to visual resources. Extensive clearing would not be required.

For 2.5 miles (4 km) into the Omak Substation, the line follows a half section line through a rural/suburban residential section. Extensive orchards will partially screen many segments from view and also reduce the apparent contrast in size between the towers and nearby features.

Option A-1 - If this alternate routing around Malott is used, fewer residences would be exposed to views of the line than along Alternate A. This option, however, would result in scarring from access road construction on steep slopes.

Option A-2 - An optional routing west of Omak departs from Alternate A at Johnson Road and traverses open landscape to Highway 97 north of Riverside. Views will be backgrounded and visual disruption will be low. Visual improvement will result from removal of the existing Okanogan-Tonasket line between Omak and Riverside.

Alternate B-1 - Impacts to visual amenities between Chief Joseph Dam and the Okanogan River crossing near Chilowist would be the same as for the proposed route. Conflicts with visual land patterns would occur at the Okanogan River crossing near Chilowist. Viewer exposure would be high for nearby residences, travellers on U.S. Highway 97, State Highway 10, and users of the Cariboo Trail commemorative wayside.

Impacts from the West Okanogan Substation to the Tonasket Substation would be the same as those previously described for Alternate A.

Recreation

A variety of recreational activities are available within the study area boundaries and are detailed in figure 5. Rufus Woods Lake, backwater of Chief Joseph Dam, is a popular boating, fishing and water sports area. Bridgeport State Park offers facilities for camping and picnicking and a nearby marina provides water access.

Facilities for camping are located throughout the region. Okanogan City Park, Lt. George Goethals' campsite, and Leader Lake State Forest Campground have camping and picnic sites. A few U.S. Forest Service campgrounds are scattered through forested lands.

A park with a baseball field and tennis court is at Brewster. Other recreational sites include the Okanogan Valley Golf Course, Stampede Fairground and city park in Omak, and a roadside park on Highway 30 west of Tonasket.

Alkali Lake and a few smaller lakes in the vicinity, although not suitable for fishing or swimming, provide a potential scenic setting for vacation homes. No direct impacts to any of the activities mentioned are anticipated, but the physical presence of the line would be an intrusion on recreation in the natural setting.

Adverse impacts to recreational resources are normally limited to visual intrusion by the transmission line. People using recreation areas may be impacted by structures that dominate views and affect the scenic values of recreation sites.

The commitment of land for a transmission right-of-way can also reduce an area's potential for designation under a more restrictive classification such as wilderness. Although visual impacts would be evident from the Okanogan proposal, no designated recreation areas would be physically impacted.

Unauthorized use of transmission line rights-of-way by recreational vehicles can cause detrimental effects such as increased erosion, disturbance to wildlife, fire hazards, and annoyances to landowners. Such impacts would be made possible because of new access opened up along BPA roads.

Proposed Route - The proposed route would be visible from Bridgeport State Park. The line could also be seen in distance views north and south from Soap Lake. The new line would also be visible from Okanogan City Park, the Okanogan Golf Course, and at Crumbacher and Duck Lakes.

Deer and bird hunting, and fishing are important to local residents. These outdoor recreational opportunities also attract many people from more distant areas who contribute to the economy of the Okanogan area. These activities could be temporarily interrupted near the transmission line during construction periods but overall long-term impacts would be minimal. No change should occur to recreational activities in the Okanogan Valley as a result of transmission line construction.

Alternate B would be visible from the city park in Omak, the Stampede Fairgrounds, and Crumbacher Lake but would have no other impact upon them.

Alternatives Considered

Alternate A - Alternate A would require a river crossing near Brewster which would be visible from the nearby park.

Impacts to the city of Okanogan would be the same as those stated for the proposed route.

Option A-1 - This optional route is not expected to have impacts other than those described for Alternate A.

Option A-2 - This optional route is not expected to have impacts other than those described for Alternate A.

Alternate B-1 - Impacts attributable to Alternate B-1 would be the same as for the proposed route with the exception of a small roadside picnic area near the river crossing south of Okanogan. This travellers wayside would be in full view of the transmission line. Views of the river from the wayside would be directly affected as the line crosses the river only a few hundred feet from the picnic area. No mitigation is available to diminish this impact.

Historical/Archeological

As stated in the planning supplement there has been no systematic archeological survey for the study area. A review of the National Register of Historic Places and its addenda through November 1978 indicates one site in the area on or eligible for the Register; the Fort Okanogan Historic Site.

Consultation with the State Advisory Council on Historic Preservation indicates that Sites I and II of Fort Okanogan are listed on the State Register and the National Register of Historic Places. Both sites are completely inundated when the Wells Dam pool is full. An interpretive center overlooks the area. Although the center is not a National Register property, the State Historic Preservation Officer has been consulted concerning the effect of the routes upon the view from the center. There is concurrence that no adverse impact will result.

No other sites are listed on the State Register or National Register which are within any route's zone of influence. Three sites in the study have been recognized with historic markers and nominated to the State Register by the Okanogan County Historical Society. The Cariboo Trail is marked on U.S. 97, 3.5 miles (6 km) south of Okanogan. The marker itself is not eligible for the National Register because commemorative symbols are not within the scope of the program. Riverside, 7 miles (11 km) north of Okanogan on U.S. 97, was the terminus of steamboat navigation on the Okanogan River until the railroad came in 1914 and as such gained its historic significance. The last site

commemorates Lt. George Goethals, the Panama Canal engineer, who camped with an exploring expedition at the mouth of Salmon Creek in Okanogan in 1883. This nomination has not yet been accepted by the State Council for the State Register.

A heavy concentration of archeological sites along the Columbia and Okanogan Rivers has been recorded by Dr. G. F. Grabert. Some of the sites were flooded by the backwaters of Wells Dam.

Prior to construction BPA will identify any potential historic or archeologic sites in the vicinity of the proposed line which have not been previously identified and will apply the criteria of the Advisory Council on Historic Preservation to determine if sites found in this review are potentially eligible for the National Register. If sites are determined to be potentially eligible, BPA will make arrangements for nomination of the sites in question, advise the Advisory Council and State Historic Preservation Office, and enter into discussions with the Council and State Historic Preservation Office to discuss mitigating measures.

In all cases, BPA will comply with the guidelines and procedures of the Advisory Council (36 CFR Part 800), the provisions of Section 106 of the National Historic Preservation Act (16 USC Section 470f), Executive Order 11593 (May 13, 1971), and the National Environmental Policy Act (42 USC 4321-4327).

Should any archeological resources suitable for nomination be identified, excavation of the resources would not be undertaken without approval of the Advisory Council on Historic Preservation. Construction crews are instructed by contract to notify the Contracting Officer and to suspend operations in the vicinity of a site uncovered during construction.

Further discussion of BPA procedures and compliance activities concerning historical and archeological resources can be found in the BPA Draft Role EIS, Appendix B, Chapter VII and VIII.

Proposed Route - No recorded prehistoric sites are within the zone of influence of Alternate B. The Lt. Goethals campsite is across the Okanogan River from this alternate, and from the campsite the tops of a few structures will be visible on the opposite bluff with a highway, railroad, and existing transmission line first in line of sight. Washington's State Historic Preservation Office indicates that there will be no adverse effect on the site by construction of the proposed route. No other historic properties eligible for the National Register have been recorded in the vicinity.

The city of Riverside is of local historic significance as a shipping terminal. The town has no status on the National Register. The proposed route would pass approximately 1 mile (1.5 km) to the west of the town. Impacts would be limited to visual intrusion.

Alternatives Considered

Alternate A - Alternate A would pass within 1/2 mile (1 km) of the Cariboo Trail historic marker. However, because remains of the trail are no longer discernible it is not eligible for the National Register.

Consultation with the State Historic Preservation Officer indicates that alternatives will not affect the Lt. Goethals campsite.

No other sites considered eligible for the National Register have been recorded in the area.

Prehistoric sites have been recorded along the Columbia and Okanogan Rivers near the crossing points of Alternate A. These and any additional historic properties will be identified and evaluated by additional background research, an intensive survey, and relevant Federal statutes and regulations.

Option A-1 - This optional route is not expected to have impacts other than those described for the proposed route.

Option A-2 - This optional route is not expected to have impacts other than those described for the proposed route.

Alternate B-1 - In addition to impacts described for Alternate B, this route would pass within a few hundred feet of an historic marker for the Cariboo Trail. Impacts to historical resources north of the West Okanogan Substation site have been described for the proposed route and would be the same for Alternate B-1. A literature search for historic and prehistoric sites will be done for the final location supplement and an intensive survey will be conducted if this option is selected.

ROUTE ANALYSIS SUMMARY

The proposed route, Alternative B, would be the shortest of the locations under consideration and, as a consequence, the least expensive. The proposed route presents fewer engineering obstacles than any of the other route location options. The proposal has few land use and natural resource conflicts. Alternate B would have a low to moderate impact to geology and soils in certain areas due to access road construction. Landscape scarification, increased erosion potential, and soil compaction would be among the more noticeable affects but all would be minor in nature. Some local water resources could be affected through occasional siltation and increased turbidity. Vegetation removal would be necessary through scattered forest areas and at tower erection sites. A few important nesting, breeding, and drumming grounds for grouse and other upland gamebirds would be crossed. In addition, important deer wintering grounds would be crossed with some loss of browse. New obstacles would be erected along heavily used waterfowl flyways.

A few orchards and dryland grain fields would be crossed, with resultant loss of production. Urban and residential lands would be affected visually; the line could also influence future land development patterns. The proposed route would have several points of intrusion on the scenic vistas of the Okanogan Valley.

Alternates A and B-1 have more significant impacts than the proposed route. The most significant impacts would occur south of Omak where urban and agricultural lands would be crossed. There would be some potential land use conflicts with future land development projects, a slight amount of vegetative impact where scattered trees would require removal, and some intrusion on the visual amenities of the upper valley. Engineering and economic factors would be favorable. Overall impacts for these alternative routes would be more extensive than for the proposed route.

The following matrix summarizes potential impacts for the alternatives. BPA has chosen as its proposal that route which best meets engineering, economic, and environmental restraints.

IMPACT SUMMARY

The summary matrix indicates environmental impacts for the alternatives discussed in this document. Two factors were considered in evaluating impacts: the likelihood of the occurrence of an impact; and the expected degree of that impact. The following criteria are used in evaluating these factors:

LIKELIHOOD OF IMPACT OCCURRENCE

Low - Resource or use occupies only a small portion of the corridor and could be avoided in final alinements. "Low" is used where the degree is "none".

Medium - Resource or use partially occupies the corridor and may be impacted in final alinement.

High - Resource or use is found along the entire corridor and would be impacted if final alinement were within the presently defined corridor.

DEGREE OF IMPACT

None (N) - Because of the compatibility of the resource or use with transmission facilities, or because the resource or use is outside of the defined corridors, we expect no significant measurable adverse impact.

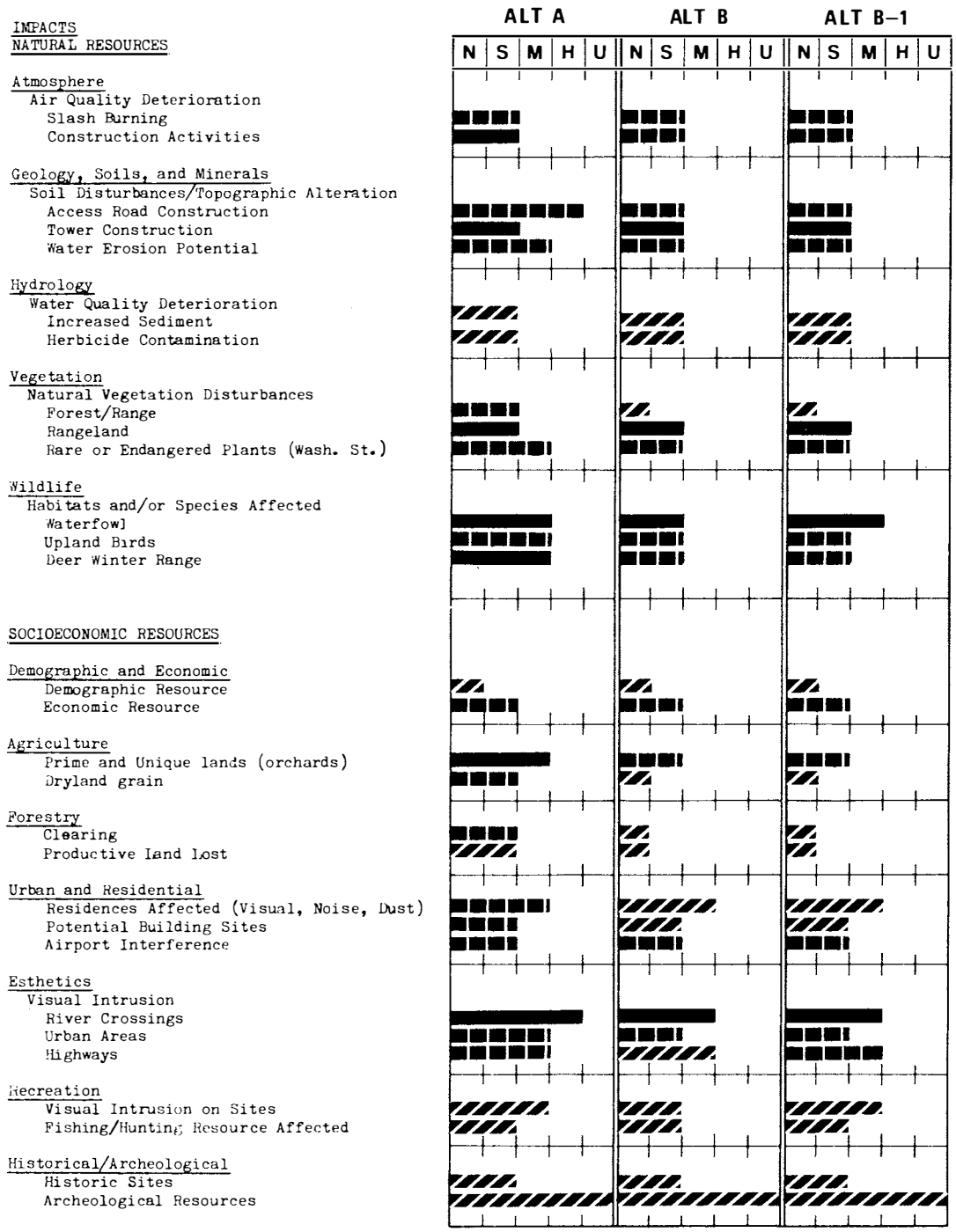
Slight (S) - Modifications as a result of construction and/or maintenance activities with no noticeable long-term changes in conditions expected.

Moderate (M) - Modifications as a result of construction and/or maintenance activities with noticeable long-term changes in conditions possible.

High (H) - Modifications as a result of construction and/or maintenance activities with highly noticeable long-term changes in conditions possible.

Unknown (U) - Due to the nature of the resource or use or lack of available data, we are unable to predict impacts.

IMPACT SUMMARY MATRIX



Likelihood of Impact Occurrence

High

Medium

Low

Data concerning construction requirements, material needs, and costs can be found in Table 1 of this document.

FFLS:Okanogan Area Service
Wg0035P:11-02-79

DESCRIPTION OF THE SUBSTATION AND ITS POTENTIAL IMPACT AND MITIGATION

SITES CONSIDERED

Introduction

The Draft Facility Planning Supplement had presented two locations for the West Okanogan Substation. However, since a new plan of service proposal has been adopted, a West Okanogan Substation site is no longer BPA's preferred option. BPA's new substation proposal will be north and east of Omak, Washington for local distribution to the Omak and Okanogan areas, and to serve as a connection to the northern Okanogan Valley and Tonasket area. This new site will be known as the Coleman Butte Substation.

Site Description

Most of the characteristics in the area evaluated are essentially the same as indicated in the Description of Existing Environment found in the planning supplement. Information here is supplemental to that regional description and is included to provide a better understanding of each site and the differences in sites under consideration.

The proposed Coleman Butte Substation is located south and east of Coleman Butte at a point where an existing BPA transmission line taps the Omak Substation to the Okanogan-Tonasket 115-kV line. The site is approximately one mile north of Omak and on and adjacent to the existing BPA right-of-way. Vegetation is sparse with bitterbrush, rabbitbrush, and bluebunch wheatgrass being the most prevalent vegetative species. The area appears over-grazed and offers little forage for livestock.

Soils in the area are sand and gravel mix; the result of glacial outwash. They are droughty soils with a rapid permeability rating.

The substation site is relatively flat with slow surface runoff and consequently little water erosion hazard.

Although only 4 acres (2 ha) of land would initially be developed; approximately 15 acres (6 ha) would eventually be required for ultimate substation development.

Location Impact Evaluation

Description - The substation is in Section 24, T.34N, R.26E, W. M. Okanogan Co., Washington, approximately one mile (2 km) northeast of Omak, Washington, 400-600 feet (122-183m) north of Washington State Highway 215, adjacent to BPA right-of-way. The substation would require a short access road from the highway. Land requirements would be approximately 15 acres (6 ha).

Natural Resources - Coleman Butte Substation would initially remove approximately 4 acres (2 ha) of existing vegetation made up of grasses, brush, and forbs. Wildlife habitat would be eliminated at the substation site, however, this habitat is not of a critical nature to any species and abundant similar habitat is available nearby. Impacts would be negligible. Temporary disturbance to surrounding wildlife due to construction of a manmade facility in an otherwise undeveloped area would occur. There would be no impact to any threatened or endangered species. Slight adverse impacts to soils in the immediate area would occur with slight possibility of water or wind erosion. Potential slight adverse effects on the existing surface drainage system are possible.

Cultural Resources - Moderately adverse visual impacts to users of Washington State Highway 215 will be evident as the substation will be built in a relatively open landscape. The substation will not impact any National Register of Historic Places properties. Additional historic and prehistoric research and field survey will be conducted prior to construction.

Land Use - Would remove about 4 acres (2 ha) of rangeland from grazing and other potential agricultural uses. The closest residence to the area is approximately 1/2 mile (1 km) away and would not be affected. Future land use of the area indicates possible development as light industrial property. A substation here would be a compatible use with this type development.

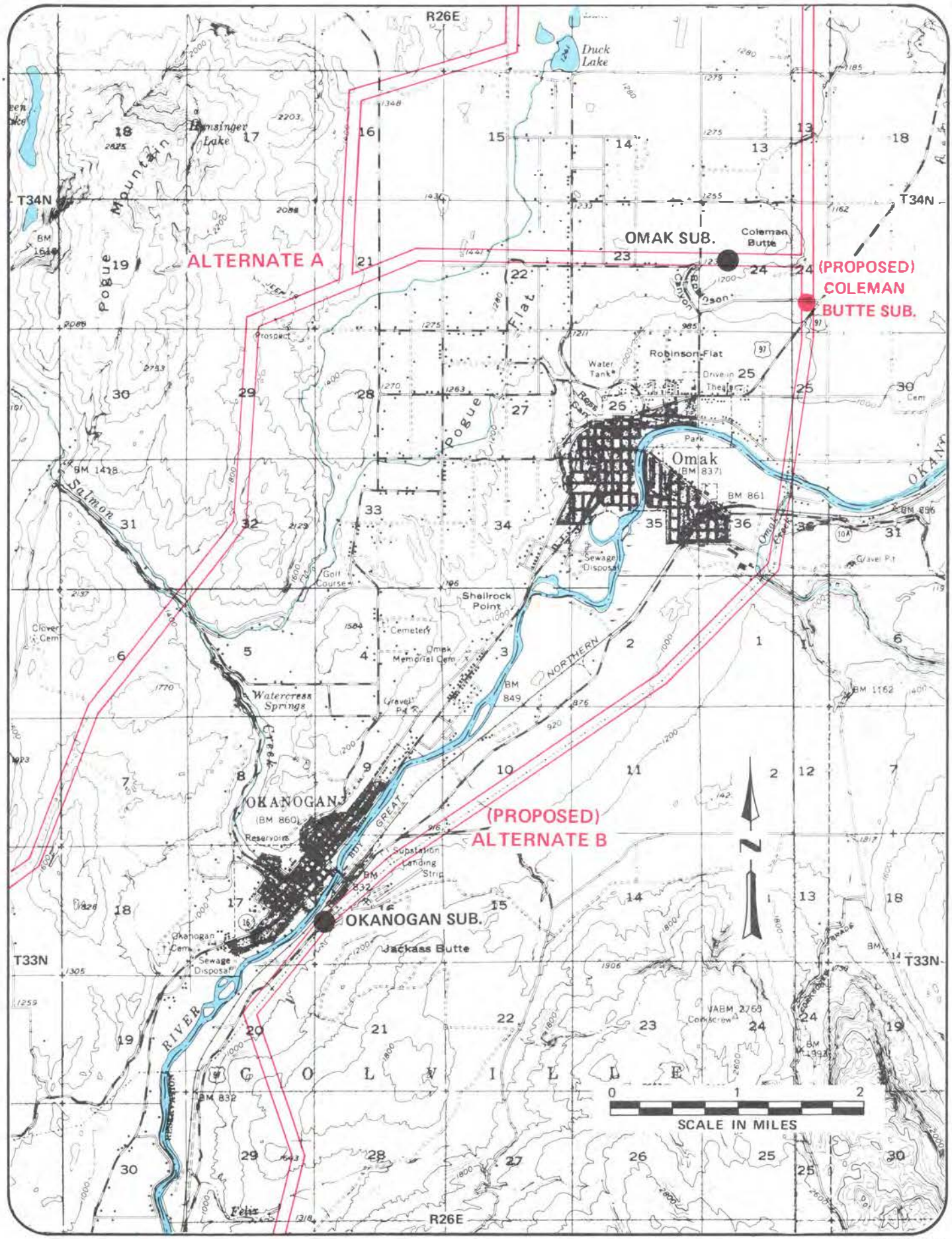


FIGURE 8
SUBSTATION LOCATION MAP
OKANOGAN AREA SERVICE
75-5

UNAVOIDABLE ADVERSE IMPACTS

Certain limitations on land use and productivity would be an unavoidable result of the construction of the Okanogan project. This includes the restriction on construction of buildings or tall structures on the right-of-way.

Some increased erosion and sedimentation can be expected, particularly at stream crossings. Tree cover within the right-of-way will be removed for the life of the facility. Tall trees adjacent to the right-of-way likely to fall into the line will also be felled. Individual animals dependent upon this vegetation for food and shelter will be affected.

Certain limitations on agricultural and residential land uses will result. Orchardists would lose production from any trees requiring removal. BPA will work with landowners to explore appropriate mitigation measures. Landowners will also be compensated for the loss of crops during construction. Activities such as grazing, storage, recreation, and the raising of crops which would not interfere with the operation of the line would be allowed.

The increased height and addition of new towers and conductors will add to the visual impact.

Temporary unavoidable impacts include the noise, dust, and visual impact of the construction equipment, and disturbances to residents and wildlife. Other adverse effects are described in the section "Potential Impact of the Proposed Plan of Service."

RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Based on present technology, the line and associated facilities needed for the proposed plan will have an expected useful life of 30 to 50 years. Experience in past years has shown that, in many cases, transmission corridors are upgraded to higher capacity in response to technological advancements and energy demands. This, along with BPA's policy of constructing new facilities on or parallel to existing corridors, may result in a long-term use of this corridor. However, if required, complete removal of these transmission facilities, including tower footings, would be possible in order to make the land available for other uses.

Removal of transmission facilities would permit most of the area to return to its natural state (revegetation may take several years). This would terminate adverse impact on land and its productivity directly created by the line, but benefits to productivity resulting from the availability of the power would be

lost. Removal of the line would make the corridor available for a full range of uses. However, if adjacent land use patterns have been modified by the existence of the line, the uses of the corridor may be limited.

Some of the environmental consequences associated with the construction of the facility are short-term. These are primarily associated with construction activities and include disturbance to nearby wildlife and humans from noise, dust, and visibility of men and equipment.

Long-term impacts on the environment and productivity, including the increased productivity of other activities resulting from the availability of electric energy, are directly dependent on continued existence of the transmission facility itself. The increased productivity benefits from the Okanogan project include an allowance for increased irrigation, greater potential for cold storage facilities and related industrial expansion, and a more reliabile power system. The productivity resulting from the use of electricity provided by new facilities will be substantially the same over the life of the facility. Similarly, the adverse effects on productivity, which are primarily related to land use considerations, will last as long as the facility remains in place.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The Okanogan project will require construction that will affect several resources. The loss of soil through accelerated erosion is not irreversible; erosion can be slowed by revegetation, water bars, contouring, and other mitigating measures. However, soil which is lost through erosion before mitigating measures take effect is irretrievable. Obliteration of the soil profile at tower footing sites and the loss of soil nutrients are irreversible impacts. However, soil forming processes working over a long period of years will reduce these impacts, and therefore soil profiles are not irretrievably committed.

Possible surface water degradation from turbidity and siltation would have only a short-term impact in the Okanogan area and would not constitute an irreversible or irretrievable commitment of resources. Refer to Chapter VIII, Appendix B of BPA's Draft Role EIS for a list of mitigating measures commonly employed by BPA in instances of possible water quality degradation.

Irretrievable commitments of vegetation would be limited to that lost during construction and maintenance of the proposed facilities. It is doubtful that native vegetation will reinvade areas where weed species become established. The Okanogan project is not considered an irreversible commitment of the vegetative resource because no significant impacts are predicted to plant communities. Right-of-way and access road clearing and continued control of tree growth will result in a minor irretrievable timber production loss over the life of the facility.

Access road and vegetative maintenance may cause irreversible commitments of wildlife resources by causing physiological stress or mortality to individual animals adapted to the original environment. Stress may reduce animals' and particularly upland birds' capacity to successfully produce and rear young. Direct destruction of individuals animals and birds may be caused by crushing, collision (with vehicles or structures), or shooting (legal and illegal). The destruction of animals and birds is an irretrievable commitment of those individuals, but is not an irretrievable commitment of any species. No threatened or endangered species in the Okanogan area would be affected.

During the life of the facilities certain uses of the land will be restricted. The principal limitation will result from the restriction of large structures from the right-of-way. This limits the use of the right-of-way as a site for residential, commercial, industrial, and agricultural buildings. Because of the linear nature of a right-of-way, other lands suitable for development are usually available nearby.

Irreversible commitment of agricultural lands involves only those lands occupied by tower bases, guying cables or ancillary facilities. These areas will not be available for agricultural production during the lifetime of the project. Individual trees may require removal in a few orchards. Production loss from those trees would be an irretrievable loss. This loss of production would be insignificant when considered as a portion of total agricultural production within the area. Compensation will be made for such losses as a result of construction and maintenance activities.

In theory, the right-of-way for this transmission line could, if abandoned, be developed to urban and residential land uses so that no irreversible and irretrievable commitment of urban or residential land would occur. In reality, however, line location will have an irreversible impact on urban growth patterns. Transmission lines are generally considered more compatible with industrial or commercial land use than with residential.

All of the mitigation practices recommended in Chapter VIII, Appendix B of the Role EIS will reduce the impact on recreation resources to some degree. However, because outdoor recreation relies heavily upon the "visual environment," the physical presence of the transmission line with its supporting facilities is the major recreation impact. The relative importance of these recreation impacts varies from area to area but all visual intrusions would be considered irreversible for the life of the project.

Visual impacts that remain after restoration and revegetation of construction related scars would exist as long as the transmission lines are maintained. If the corridor is abandoned and towers and lines removed, many areas will, in time, revegetate, reducing contrasts and visibility of the project.

In addition to the commitment of land resources, approximately 4000 tons (3729 mt) of steel and aluminum required for the manufacture of the tower structures and conductor will be irreversibly committed to transmission uses. If any of this equipment should later be retired, materials used in their construction can normally be reused elsewhere or recycled.

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

A draft location supplement for Okanogan Area Service discussed alternative locations for the proposed new facilities and the environmental impact associated with the alternative locations. This project was proposed for the first time in the Fiscal Year 1975 Environmental Statement which was filed with the Council on Environmental Quality on August 23, 1974. The new location supplement presented a plan of service modified from the original proposal.

In preparing the draft environmental statement for fiscal year 1975, BPA consulted with various Federal, regional, and local planning agencies. A draft planning supplement for this facility was sent to numerous Federal, State, and local agencies, environmental groups, and the public, for review and comment. A public information meeting on the facility was held in Okanogan, Washington, on February 7, 1974. Additional public meetings were held July 24 and 25, 1979, in Okanogan and Brewster, Washington. Comments received during the review period were considered in the preparation of the final location supplement. As a result of this new proposed plan of service all groups and agencies previously contacted were notified of this change.

COORDINATION IN THE REVIEW OF THE DRAFT FACILITY LOCATION SUPPLEMENT

The draft 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. A notice of availability of the draft location supplement was placed in the Federal Register and in local news media in advance of the proposed public meetings held in Okanogan and Brewster, Washington. This final location supplement will be redistributed to those same agencies, thereby notifying them of the change in plan of service.

FFLS:Okanogan Area Service
Wg0035P:10-30-79

Federal Agencies
- U.S. Department of the Interior
  - Fish & Wildlife Service
  - Bureau of Mines
  - Bureau of Indian Affairs
  - Bureau of Land Management
  - Bureau of Outdoor Recreation
  - 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
- Energy Research and Development Administration
- Nuclear Regulatory Commission
- Federal Power Commission
- Federal Aviation Administration
- Advisory Council on Historic Preservation
- U.S. Department of the Army
  - Army Corps of Engineers

State Agencies
- State of Washington
  - Department of Natural Resources
  - Washington Game Department
- Washington State Advisory Council on Historic Preservation

County Agencies
- Douglas County Planning Commission
- Okanogan County Extension Service
- Okanogan County Regional Planning Commission
- Okanogan County Commission

Others
- Washington Archeological Research Center
- Washington Environmental Council
- National Wildlife Federation
- Federation of Western Outdoor Clubs
- Nespelem Valley Electrical Cooperative
- Okanogan Electrical Cooperative
- Douglas County Public Utility District
- Friends of the Earth, Northwest Coordinator
- Natural Resources Defense Council
- North Cascades Conservation Council
- The Wilderness Society

The Sierra Club, Northwest Representative
Northern Rockies Chapter
Pacific Northwest Chapter
Northwest Steelheaders Council of Trout Unlimited
Pacific Northwest Conservation Council
Colville Business Council, Colville Confederated Tribes
Okanogan Public Utility District
Omak Chamber of Commerce
Okanogan County Historical Society

R E F E R E N C E S

Biological Studies Task Team. 1977. Electrical and Biological Effects of Transmission Lines: A Review. Bonneville Power Administration. Portland, Oregon. 1977.

Bonneville Power Administration. 1975. Fiscal Year 1976 Proposed Program. Okanogan Area Service Supplement. Portland, Oregon. 57 pp.

Bonneville Power Administration (BPA). 1977. The Role of The Bonneville Power Administration in The Pacific Northwest Power Supply System. Part II and Appendix B. Portland, Oregon.

Bureau of the Census. 1973. 1970 Census of the Population. Vol. 1, Parts 14, 28, 39, 49. U.S. Government Printing Office. Washington, D.C.

Columbia-North Pacific Technical Staff (CNP Staff), 1969-1972. Columbia-North Pacific Region Comprehensive Framework Study. Pacific Northwest River Basins Commission. Vancouver, Washington. 16 Appendices.

Daubenmire, R. and Jean B. Daubenmire. 1968. Forest Vegetation of Eastern Washington and Northern Idaho. Washington Agricultural Experiment Station. Washington State University. Pullman, Washington. 104 pp.

Degler, Stanley E.. 1971. Federal Pollution Control Programs: Water, Air, and Solid Wastes. Revised ed. BNA Environmental Management Series. Washington, D.C. 176 pp.

Fish and Wildlife Service (FWS). 1974. United States List of Endangered Fauna. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. 22 pp.

Fish and Wildlife Service (FWS). 1977. Endangered and Threatened Wildlife and Plants. Federal Register, Vol. 42, No. 135. July 14, 1977. pp. 36420-36431.

Franklin, J.F., and C. T. Dyrness, 1973. Natural Vegetation of Oregon and Washington. Forest Service General Tech. Report PNW-80. Pacific-Northwest Forest and Range Experiment Station. 417 pp.

Goodwin, John G. Jr. Big Game Management Near a 500-kV Transmission Line in Northern Idaho. June 1975. WICHE RDIP. Boulder, Colorado.

Hall, J. Alfred. 1976. Forest Fuels, Prescribed Fire, and Air Quality. Pacific Northwest Forest and Range Experimental Station. U.S. Department of Agriculture - Forest Service. Portland, Oregon. 44 pp.

Highsmith, Richard M., Jr. (editor). 1973. Atlas of the Pacific Northwest. (5th ed.) Oregon State University Press. Corvallis, Oregon. 168 pp.

Hitchcock, C.L. and A. Cronquist. 1973. Flora of the Pacific Northwest. Oregon State University Press. Corvallis, Oregon. 168 pp.

Interagency Committee for Outdoor Recreation (IAC). 1973. Washington Statewide Comprehensive Recreation and Open Space Plan. State of Washington. Olympia, Washington. 2 Vols.

Interagency Committee for Outdoor Recreation (IAC). 1974. Washington State Trails Program. State of Washington. Tumwater, Washington. 41 pp.

Lee, J. M., Jr. and D. B. Griffith. 1978. "Transmission Line Audible Noise and Wildlife." in Effects of Noise on Wildlife. J. L. Fletcher, and R. G. Busnel, Eds., Academic Press. New York. pp. 105-168.

Lee, J. M., Jr. 1978. "Effects of Transmission Lines on Bird Flights: Studies of Bonneville Power Administration Lines." in Proceedings of the Workshop on Impact of Transmission Lines on Migratory Birds, Oak Ridge, Tennessee. Oak Ridge Associated Universities.

McKee, Bates. 1972. Cascadia: The Geologic Evolution of the Pacific Northwest. McGraw-Hill Book Company. 394 pp.

Meteorology Committee, Pacific Northwest Rivers Basin Commission. 1969. Climatological Handbook, Columbia Basin States. Vol. I and II. Vancouver, Washington.

Meyer, James R. 1978. "Effects of Transmission Lines on Bird Flight Behavior and Collision Mortality." Prepared for Bonneville Power Administration, Engineering and Construction Division, by Western Interstate Commission for Higher Education (WICHE), Resources Development Internship Program. Boulder, Colorado. 201 pp.

Shannon and Wilson, Inc. 1972. Seismic Regionalization Studies. Shannon and Wilson, Inc., Portland, Oregon. 180 pp.

The Conservation Foundation. 1972. A Citizen's Guide to Clean Air. Washington, D.C. 95 pp.

U.S. Department of the Interior. Bonneville Power Administration. 1976. Washington-Population, Employment, and Housing Units Projected to 1995. Portland, Oregon. 78 pp.

U.S. Department of the Interior. National Park Service. 1976. The National Register of Historic Places, and addenda through November 1978. Washington, D.C. 961 pp.

FFLS:Okanogan Area Service
Wg0478P:11-02-79

COMMENTS RECEIVED DURING THE REVIEW PROCESS

David W. Heiser, Wash. St. Parks & Recreation Comm. (July 10, 1979)

Comment: Alternative B, however, would have aesthetic impacts on users in Bridgeport State Park. We request that detailed specifics delineating what those specific aesthetic impacts would be should be provided in a revised EIS by BPA if alternative B becomes the preferred alternative.

Response: Exact alignment for alternative B has not been finalized. Due to ongoing location investigations only general impacts can be addressed.

According to centerline locations now being studied, the most severe impact would occur with the transmission line located within 1/2 mile of Bridgeport State Park. Many of the towers would be skylined and southern views from the park would be dominated by transmission lines.

Other alignments would be less visible to park users, however, travelers on Highway 10 would have expansive views of the towers and conductors when in this vicinity. Any alignment would require park users to pass under the lines.

BPA is currently in consultation with Washington State Parks to attempt to minimize any impacts to Bridgeport State Park.

Steven L. Weaver, Johnny Appleseed Co. (July 18, 1979)

Comment: Johnny Appleseed Company is adamantly opposed to Alternate A. This route would disrupt our orchard operations and air application of pesticides. It would also create a high danger to planes landing at the Johnny Appleseed airstrip which is a vital part of our operation.

Response: Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to construct the transmission line across the Colville Reservation thereby avoiding impacts to the above-mentioned orchards and airstrip.

Stan Allen (August 10, 1979)

Comment: This proposed line, if built where the map indicated at the informal hearing would greatly decrease the value of my home, both to me and to any perspective buyer, not only because the line itself is an eye sore but because it would totally ruin an existing beautiful view.

Response: See comment response for Clarence E. and Janet L. Hinch, which follows.

Clarence and Janet Hinch, (July 25, 1979)

Comment: This letter is to serve as our official objection to the proposed transmission facilities being constructed on or over our property since no mention was made in Mr. Wilkerson's letter of our receiving any monetary compensation for the devaluation these facilities may bring to our property. The proposed construction would not only affect the scenic aspect of our property, but the building flexibility as well.

Response: In the acquisition of right-of-way, appraisers for BPA consider what effect the transmission line would have on the whole property. Therefore, if there is a loss in value to the property outside of the right-of-way, payment is made for such loss. Investigation by BPA and several others shows that only rarely is the value of adjacent property affected. However, successful negotiations with the Confederated Colville Tribes have been concluded, which allow BPA to route this transmission line across the Colville Reservation, thereby avoiding impacts to the above-mentioned property.

Cara L. Anders (August 1, 1979)

Comment: I strongly oppose the suggested plan that locates the BPA transmission line from Chief Joe to Okanogan approximately one (1) mile downriver from Brewster.

It is not only ecologically unsound but financially extremely expensive. That particular part of the river is a wide spot where many families live or recreate. Brewster and Pateros families swim, boat, fish and ski there. Homes and land would be greatly devalued by the line and accompanying towers. Orchard land would be taken out of production. Views for those living along the river as well as those traveling the river would be destroyed. It is also an additional hazard for pilots, many of whom travel the river to the Brewster Airport. The close proximity of the line to homes, existing now and possibly existing later, would or could be an additional danger.

Response: See following response to W. J. Leonard.

Dorothy M. Kline, (July 31, 1979)

Comment: The Brewster area already has one group of lines crossing the river which disrupt the landscape and a second group would be just that much more unsightly. Many homes have been built in Brewster to take advantage of the view and I feel these towers and power lines would ruin their view.

Response: See following response to W. J. Leonard.

FFLS:Okanogan Area Service
Wg0478P:11-02-79

Grace MacKenzie, (September 21, 1979)

Comment: I object to the transmission lines being placed in my area.

Response: See following response to W. J. Leonard.

W. J. Leonard, Brewster Ranch (July 22, 1979)

Comment: Would the transmission lines be routed in vicinity of what is known as Brewster Ranch properties? Under any of the alternatives? If so, what, if any, would the reimbursement be to the property owner if the lines were routed over.

Response: Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to construct the transmission line across the Colville Reservation thereby avoiding the Brewster vicinity.

R. P. Sellevold, U.S. Corps of Engineers (July 31, 1979)

Comment: We should like to advise you that a Department of the Army permit is required for overhead power transmission lines over navigable waters of the United States unless those lines are part of a water power project subject to the Federal Power Commission.

Response: The necessity of obtaining Section 10 permits from the U.S. Army Corps of Engineers is discussed in the Hydrology section of this EIS. BPA has initiated contact with the Corps and is coordinating efforts related to obtaining a Section 10 permit.

William & Betty Keran, (August 1, 1979)

Comment: We object to Plan A as the lines go over a parcel of land (32 acres) we have surveyed out to sell and have listed for sale as view property. You landed by plane on the back side of this property and set a flag - without permission from us - the result of this is we have lost 3 sales of said property - as no one - wants those power lines over or close to them.

Response: See comment response for Gladis Leber which follows.

Gladis Leber, (August 1, 1979)

Comment: The potential for development (of landowners property) in the near future has become apparent. Crossing of the property with power transmission lines does not appear to me to enhance its value and if feasible to place the line elsewhere, I would favor that action.

Response: In the appraisal of right-of-way for transmission lines, the appraisers use the most recent sales from the area they can find in estimating value. If the property is subdivision property, the appraiser would consider how the proposed line would affect the subdivision, and the offer would include any loss in value caused by the transmission line. However, successful negotiations with the Confederated Colville Tribes have been conducted which allow BPA to route this transmission line across the Colville Reservation thereby avoiding impacts to the above-mentioned property.

Dorothy M. Kline, (July 31, 1979)

Comment: I own five acres of land on the Douglas County side of the river that has been in the family for many years and is now taxed as orchard land. My son, who is a career Navy man, has expressed a desire to put a small orchard and home on the acreage when he retires. I feel the lines would be a hazard to orchard workers besides being unsightly.

Response: All transmission lines, including those of BPA, pose an inherent hazard if objects such as irrigation pipe, construction booms, or other conducting materials are brought into contact with or close to the line. Because conductor height from the ground increases with voltage, the probability of such accidents is greatest with low-voltage lines. However, since any transmission line can represent a hazard, people must observe basic safety precautions in their activities underneath and immediately adjacent to the lines.

BPA has produced a special publication entitled, Tips on How to Behave Near High-Voltage Powerlines which sets forth those safety precautions which should be followed when in the vicinity of transmission lines. The rules and safety precautions to be followed should pose no hindrance to full use of the land involved. Orchards and other types of farming underneath BPA lines are commonplace. Additional information concerning electrical hazards from transmission lines may be found in BPA's draft ROLE EIS, Appendix B, Chapter VII.

Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to construct the transmission line across the Colville Reservation thereby eliminating possible impacts to the above-mentioned property.

Stan Allen, (August 10, 1979)

Comment: I understand that a formal hearing was held some time last month, I was not notified of it, either before or after it was held. By your agency, in spite of the fact that the proposed line will be within 300 feet of my property.

Informal public information meetings were held in Okanogan and Brewster, Washington on April 17, and 18, 1979. The meetings were announced in local newspaper and radio ads. Additional formal public meetings were held in Okanogan and Brewster July 24 and 25 respectively. The general public was informed of these meetings by notification in the Federal Register June 19, 1979, local newspapers June 21 and July 19, 1979, and local radio ads. Landowners within one-half mile of the proposed route were notified of the latter meetings by direct mailing.

Stan Allen, (August 10, 1979)

Comment: Furthermore, I have a seaplane, and your proposed power line would create an extreme hazard to me and any passengers I might carry.

Response: Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to locate the transmission line across the Colville Reservation. This means the crossing of the Columbia River will be somewhere in the vicinity of Chief Joseph Dam. This is an area of various aircraft obstructions such as construction booms, power lines, and the dam itself. Aircraft operators would likely be more acutely aware of hazards in this area and probably avoid situations of decreased flight safety. In addition, the towers along the river will be painted with airway markings, may be lighted, and may have marker balls strung on the conductor depending on FAA rulings. All these items should minimize safety hazards to pilots.

Larry Lowe, (August 4, 1979)

Comment: The first area, concerning Alternate B, is the fact that the Colville Confederated Tribes is going to need power for the Mt. Tolman project. This, as I'm sure you realize, gives you a powerful argument for the use of Alternate B. Again, my vote goes first to Alternate B, the easiest and most logical alternate; across reservation land.

Response: Since publication of the draft EIS, BPA and the Confederated Colville Tribes have reached an agreement authorizing BPA's use of the route located across the Colville Reservation. As a result, Alternate B has been endorsed as BPA's proposal.

Larry Lowe, (August 11, 1979)

Comment: The second area is that of stretching a high voltage wire 124 feet in the air where the line should "turn due east and follow a 1/4 section line across Pogue Flat to the Omak Substation." Although I realize that this does not concern the FAA now, for those of us that are someday looking forward to regularly scheduled air flight into the area this poses a great problem. When from the hill behind my house I watch those fire fighting planes skim above the orchards and then try to imagine a 124 foot tower in their path, it scares me.

Response: BPA follows FAA guidelines in locating and designing transmission lines and towers. To minimize tower height BPA could build two single circuit lines with flat configuration (all conductors on the same level) towers and reduce span lengths. Conductors could also be marked with large balls that are highly visible to pilots and towers could be painted and lighted.

Larry Lowe, (August 11, 1979)

Comment: You mentioned on Page 1 of the Impact Statement that even if Alternate A-2 is used that a "tap line" would be needed to put in. What does a tap line consist of?

Response: A tap line is a transmission line that connects to a main transmission line. The tap line is of the same voltage as the main line and brings some of the power from the main line into a substation.

Larry Lowe, (August 11, 1979)

Comment: I would like to know more on the feasibility of maybe putting a substation somewhere in Alternate A-2. This might ease the conflict involved with Alternate A and the many people involved?

Response: Even if a new substation were constructed west of the existing Omak Substation, a transmission line would still need to be constructed to the existing Omak Substation. Alternate B, the new proposed plan, avoids the location conflicts west of the existing Omak Substation.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The draft does not provide convincing evidence that viable alternatives with less adverse impact do not exist. For example, maps in the document show an existing 115-kV line from Brewster to Okanogan and another from Brewster to the Bridgeport area. The final supplement should thoroughly discuss the practicality and relative environmental impacts of utilizing this and other existing corridors.

Response: Note the Plan of Service Review section (page iv) of both the draft and final location supplements for this project. Discussions therein concern paralleling or utilizing existing BPA corridors. Paralleling BPA's 115-kV line from Bridgeport to Okanogan was not found to be feasible from an engineering and environmental standpoint.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Less ecologically disruptive methods to cross rivers should be explored such as combining powerlines with bridges and using underwater crossings.

Response: The new proposed plan of service (Alternate B) will cross the Columbia River near Chief Joseph Dam and its associated transmission line facilities. The proposed plan will also be sited to incur the least overall environmental impact. Alternate B crosses the Okanogan River parallel to BPA's existing Okanogan-Tonasket 115-kV line. Underwater river crossings with this voltage transmission lines have been found to be economically prohibitive. Samples of river crossing estimates for this project approach $1,000,000 for an overhead crossing and $4,500,000 for an underwater crossing. In addition, combining the transmission line with a bridge for a crossing was considered, but not without strong local opposition due to safety concerns as well as being engineeringly infeasible because of the great weight required for an insulated cable crossing on the bridge.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The draft does not provide enough information to give readers a clear understanding of visual impacts. We suggest the final supplement contain photographs of visually sensitive areas along the route, preferably with artist's renderings of proposed transmission facilities.

Response: Adoption of Route B as the proposed plan of service has diminished much of the expected impact of the transmission line. Detailed descriptions of those potential impacts are included in the Esthetics section of the document. Additional graphic presentation of the locations of expected visual impacts are given as Figures 6 and 7.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The final supplement should also specifically describe recreation and visual resources of the Chiliwist Wildlife Recreation Area and probable impacts on those resources.

Response: Adoption of a route crossing the Colville Indian Reservation has eliminated any potential impacts to the recreational or visual resources of the Chiliwist Wildlife Recreation Area.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The final supplement should be strengthened by inclusion of correspondence from the State Historic Preservation Officer reflecting consultation as required by the above regulation (as amended in the Federal Register, January 30, 1979). These requirements include consultation on: the need for and type of survey(s) to identify historic and archeological properties eligible for inclusion in the National Register, survey boundaries, application of National Register criteria to identified properties, determination of effect of the proposal on National Register or eligible properties, and other 36 CFR Part 800.4 procedures if such properties will be affected.

Response: The results of consultation with the State Historic Preservation Office have been summarized and included in the text under the Historical/Archeological section. All consultation requirements under the amended guidelines have been met. Surveys along the proposal, Route B, will be completed prior to construction activities. Naturally, any sites found will be given proper attention in accordance with all current legislation as is BPA policy in all such cases.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Route A corridor will cross a major roosting area for wintering bald eagles immediately across Wells Reservoir from the mouth of the Okanogan River and the town of Brewster, Washington. Judging by the language of the document, considerable scarification and modification of soils and vegetation will be required to provide clearance for transmission towers and lines. From all appearances the loss of snags, perching trees, and the eminent threat of bird strikes with towers and high voltage lines may occur. This matter is currently being addressed through Section 7 consultation under the Endangered Species Act by the Department's Fish and Wildlife Service (FWS) as requested by the project sponsor (BPA). A clear interpretation and review of FWS findings should be included in the final document prior to issuance of that document and

any permits and approvals required by appropriate Federal and State agencies having jurisdiction over lands and waters affected by the project.

Response: Consultation under Section 7 of the Endangered Species Act has been completed (see letters of the Fish and Wildlife Service contained elsewhere in this document). However, the change in location of the proposal with a new route across the Colville Reservation will avoid all possible impact to the bald eagle areas near Brewster.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The Columbia is a major flyway route for eagles and migratory waterfowl in this area. Bird strikes and interference with movement up and downstream would be expected. We do not believe these areas of impact have been adequately addressed nor do we see evidence of specific amelioratory measures to preclude or minimize these impacts included in the document.

Response: BPA has undertaken formal consultation with the U.S. Fish and Wildlife Service concerning the bald eagle and its habitat in this area. Mitigation measures acceptable to them were proffered to BPA and were being included in BPA line design. However, successful negotiations with the Confederated Colville Tribes allowed BPA to route the transmission line across the Reservation thereby avoiding potential impacts to the eagles and their habitat.

BPA studies have concluded that overhead groundwires pose the greatest potential for waterfowl collisions on 230-kV and 500-kV lines. As a result, line design on this project has been altered to eliminate all groundwire except for a distance of one mile outside of each substation. This mitigative measure should significantly diminish collision occurrence along the transmission line. Bird collision with transmission lines is a rare event and the biological or ecological impact of mortality caused by such a collision has been found to be of very little significance to overall populations.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Route B will cross the west portion of the Colville Indian Reservation in an area where numerous wetlands, ponds, lakes, and small marshes attract heavy concentrations of migratory waterfowl and birds of prey. In some cases, larger waterfowl such as Canadian geese have established a small flight corridor between grainfields and forage areas

to the east of the project and surface waters to the west. This increases the likelihood of bird strikes and alteration of bird movements during critical winter months when food supplies are low and flight conditions (visibility, etc.) are poor.

Response: Alternate B has now been established as BPA's proposed plan of service. BPA recognizes the potential for collision impacts to migratory waterfowl from the presence of the new transmission line and is currently working with U.S. Fish and Wildlife Service and Colville Tribal biologists to develop mitigation measures to lessen the potential of collision. One such measure being undertaken is the elimination of the overhead groundwire which has been found to be responsible for most bird strikes. Studies show that while birds did collide with this thin groundwire, there were very few collisions with the heavier and more visible conductors of 230-kV and 500-kV transmission lines. It was also found that birds flying in fog may be more susceptible to collision with transmission lines due to reduced visibility but the effect on overall transmission line caused mortality may be small because of reduced flight intensities at line height. Overall, the biological and ecological impact of bird collisions is of little significance.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Secondary impacts of noise, air pollution, land scarification, and presence of humans are suspected which, while mentioned, are not discussed in adequate detail.

Response: Since the above-detailed impacts are for the most part short-term and transitory (i.e., limited to construction periods), they have been dealt with on a more limited scale than impacts which were considered more primary to the project. Adoption of Alternate B as BPA's proposal will further diminish the effects of these potential impacts by moving the line to remote locations and away from urban centers.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Finally, Route B will also cross the Okanogan River near Omak and Tonasket, thereby posing additional threats to migratory bird movement up and down the Okanogan Valley. Major Canada goose production and movement also occur in this area and impacts may be significant unless powerline placement is designed to minimize bird interference.

Response: Waterfowl studies sponsored by BPA have concluded the presence of an overhead groundwire is one of the most significant factors contributing to bird collisions. As a result, BPA has eliminated all

overhead ground wire for this project except for one mile out of each substation. It is expected this mitigation effort will eliminate most of the potential for bird strikes. Overall, the biological and ecological impact of bird collisions with 230-kV and 500-kV transmission lines has been found to be insignificant.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: Further north, the transmission corridor crosses through areas heavily used by big game, upland birds, and birds of prey which are of concern to Indian Tribal biologists. Project construction is expected to adversely impact these resources but these impacts have not been adequately discussed in the document. We believe there are a number of minor corridor realignments and mitigative schemes possible which could minimize these effects. Field coordination and project review will be conducted by Tribal and FWS personnel to evaluate possible mitigation and compensation measures.

Response: BPA is presently working with Colville Tribal biologists and U.S. Fish and Wildlife Service personnel to establish corridor realignments as mitigative measures to insure minimal adverse impacts to big game, upland birds, and birds of prey.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: We believe the draft supplement should more adequately document efforts that have been made to secure right-of-way across lands of the Colville Indian Reservation, inasmuch as that route (Alternative B) would not only cost $3.6 million less to construct, but would result in significantly less environmental impact than the proposed route (Alternative A).

Response: Successful negotiations have been concluded with the Confederated Colville Tribes which do, in fact, allow for this transmission line to be routed across the Reservation.

Larry Meierotto, Department of Interior (August 22, 1979)

Comment: The supplement should indicate plans for monitoring the fate of herbicides after spills. Research has demonstrated that degradation of the herbicide 2,4-D, for example, is influenced by concentration, type of soil, rainfall, herbicide mobility, temperature, and other factors.

Response: Herbicides accidentally spilled break down at a rate dictated by the local physical environment. Our own monitoring program has verified this. Chapter V of the BPA Right-of-Way Management Standard No. 63040-50 spells out action to be taken in case of spills, including monitoring.

We have provided no residue monitoring plans for the subject EIS since:

a) BPA has experienced exceptionally few spills in its herbicide use history which may be called "biologically significant" to local biota.

b) The probability for the occurrence of a spill is extremely remote, especially in this area of relatively little vegetative growth with consequently little herbicide use.

c) Monitoring should reflect all on-site conditions, a "custom prescription" so to say. If necessary, expert advice may be consulted from the scientific community or the industry. No one plan would satisfy all possible conditions.

Eugene Fried, (August 10, 1979)

Comment: Although I was not able to review available information as you listed, I am interested in: a) knowing the results of meetings; b) decisions made on route of power lines; c) impacts on weaving (sic) of the transmission lines over private property.

Response: Negotiations with the Confederated Colville Tribes have been concluded with Alternate B located on the Colville Reservation being selected as BPA's proposed plan of service. Results of the public meetings and impacts of the transmission line are detailed in the final EIS for Okanogan Area Service. Mr. Fried has been added to BPA's mailing list and will receive a copy of this document.

COMMENTS RECEIVED DURING PUBLIC MEETINGS

Peggy Fisher (July 24, 1979)

Comment: From what I have seen tonight in the EIS, it appears, because of the visual impact, soil erosion impact, the wildlife impact, having to cross so many smaller pieces of property rather than the Colville Indian Reservation which is in larger chunks, it looks like Alternate B is much, much better than Alternate A. Another reason I feel this way, I am a taxpayer. If we can save three million dollars by using Alternate B, somebody is going to have to pay for the extra three million dollars and it is going to be us, an additional cost for our power. We are not against bringing more power in here, we know we have to have more power, we are not against improvements, but we feel Alternate B is the most economical and most feasible way to do it.

Response: See following response to Jean Cowan.

Robert Hensel (July 24, 1979)

Comment: In listening tonight to your site environmental impact, your erosion (potential), and the additional ten miles in line length, it looks to me it is pretty well determined that your logical route is for you to powwow (with the Colville Tribes) and come forth with a solution for Alternative B.

Response: See following response to Jean Cowan.

John Fisher (July 24, 1979)

Comment: I have an orchard which would be crossed by the proposed Route A, and it seems to me I am not affected by the existing power line, but if Paul is uncomfortable with one now I am sure I would be uncomfortable with a new one across my orchard.

Response: See following response to Jean Cowan.

Al Ziontz (July 24, 1979)

Comment: I was interested in what is going to be the impact on the Chiliwist Game Refuge, what mitigation efforts you have there.

Response: See following response to Jean Cowan.

Jean Cowan, Citizen (July 24, 1979)

Comment: I feel that your Alternate Route A is going to disrupt a large amount of agricultural land as well as residential area, and I feel that your Alternate B would be a much better route to follow because you don't have all this agricultural and residential (land).

Response: Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to construct the transmission line across the Colville Reservation thereby avoiding impacts to the above-mentioned resources.

David Schindler (July 24, 1979)

Comment: I know that you people have talked with the airport and the FAA, and I heard a rumor that it (the transmission line) is okay so far, but I watch those planes take off loaded, DC-6's, and they clear those apple trees by about 20 feet, and when they get to the edge of that hill they drop down; I don't see how they will clear a hundred twenty-foot tower when they are only about 50 feet off the ground to begin with.

Response: See following response to John Fisher.

John Fisher (July 24, 1979)

Comment: My orchard is directly south of the Omak Airport and we are getting a lot of traffic there now with large aircraft, and I feel like I should crawl down off a ladder occasionally when those planes come over now, and I just feel a (transmission) line across there would be a hazard to the traffic at the airport, both in good and bad weather.

Response: BPA follows FAA guidelines in locating and designing transmission lines and towers. To minimize tower height BPA could build two single-circuit lines with flat configuration (all conductors on the same level) towers and reduce span lengths. Conductors could also be marked with large balls that are highly visible to pilots and towers could be painted and lighted.

John Fisher (July 24, 1979)

Comment: I would like to comment on Harold's last comment there about the right-of-way that they asked us to sign a release on, and it would scare you to death. It gives BPA permission to cut down trees, build roads, and you know, we don't know anything, like you say, exactly where the power line is going to be, the center of it, this thing has really disturbed me.

Response: Mr. Fisher was asked to sign a permission to survey form which allows BPA to go on the land to survey. It does not include the right to build roads. It provides that BPA will compensate the owner for damages. When right-of-way is requested, the location of the strip of land is defined so the exact location is known.

Paul Freese (July 24, 1979)

Comment: There are occasions when the BPA doesn't do their own work, they subcontract. We had a situation where a pole-spray outfit came in to treat the poles and didn't do it properly. The spray was placed on the poles, drifted across the orchard, turned the apples a horrendous, well disfigured them. The warehouse didn't want to handle them, particularly because the FDA said that possibly the residue would cause the entire lot of apples in the warehouse to be rejected.

Response: The incident causing damage to Mr. Freese's crops occurred about 1960; Mr. Freese was compensated to his satisfaction. It is BPA policy to compensate landowners for all damage that may occur to their property, whether caused by construction, operation, or maintenance activities.

Paul Freese (July 24, 1979)

Comment: I am not interested in standing in the way of progress, but, if we need power in the north country and it must go across my property, so be it; but I think I should be adequately compensated for that, for the interference of TV reception, just the fact I enjoy my property as free from these things as possible, so I think I should be compensated for it....I don't know who sets the compensation for these lines going in, but I think it's got to be adequate.

Response: An appraisal is made by a professional appraiser for any right-of-way acquired by BPA. The owner is offered at least the amount of the highest approved appraisal. It is BPA's objective to fairly pay a landowner for any rights acquired.

Paul Freese (July 24, 1979)

Comment: I have a neighbor who is also a business partner who is a ham operator and I am not sure that he will lie directly in the hundred-foot access, but just absolutely adjacent to it, if he is not within it. How is this going to affect the operation of his ham equipment?

Response: Interference from BPA transmission lines has not been a problem with ham equipment. In fact, this type of 230-kV line rarely interferes with any AM or FM radio or television equipment. The slight possibility that ham reception could be affected depends on the signal strength, the carrier frequency, and the modulation characteristic of the signal being received. Interference will not occur on frequency modulated (FM) signals. Personnel from BPA will investigate suspected cases of interference when requested. If it is found that the interference is caused by BPA equipment, then mitigative measures will be implemented to rectify the situation and eliminate the interference.

Rodney Dodge (July 25, 1979)

Comment: You could undoubtedly look forward to extreme damage to people from electrical shock and probably death, particularly across irrigated lands and lands where there are numerous people, I think you should take that into your account.

Response: All transmission lines, including those of BPA, pose an inherent hazard if objects such as irrigation pipe, construction booms, or other conducting materials are brought into contact with or close to the line. Because conductor height from the ground increases with voltage, the probability of such accidents is greatest with low-voltage lines. However, since any transmission line can represent a hazard, people must observe basic safety precautions in their activities underneath and immediately adjacent to the lines.

BPA has produced a special publication entitled, Tips on How to Behave Near High-Voltage Powerlines, which sets forth those safety precautions which should be followed when in the vicinity of transmission lines. The rules and safety precautions to be followed should pose no hindrance to full use of the land involved. Orchards and other types of farming underneath BPA lines are commonplace. Additional information concerning electrical hazards from transmission lines may be found in BPA's draft ROLE EIS, Appendix B, Chapter VII.

Successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to construct the transmission line across the Colville Reservation thereby eliminating possible impacts to more populated areas with more intensive uses.

FFLS:Okanogan Area Service
Wg0478P:11-02-79

Ralph Hagy (July 25, 1979)

Comment: Why don't you use that power (eminent domain) to go across on the reservation where there is no farmland.

Response: Since publication of the draft EIS, BPA and the Confederated Colville Tribes have reached an agreement authorizing BPA's use of the route located across the Colville Reservation. As a result, Alternate B has been endorsed as BPA's proposal.

Rodney Dodge (July 25, 1979)

Comment: I have a statement basically in opposition to the Alternate A plan, and I would like to read it. It is addressed to the Bonneville Power Administration.

> Dear Sirs:
>
> We wish to go on record in opposition to the proposed BPA transmission line Alternate A.
>
> We question first the need for increased power in the Tonasket area. It appears the proposed power increase is being determined on possible demand increases--not actual need.
>
> If power is actually needed, we question why BPA is the only source to meet the need. We would request a thorough study into local facility development to meet increased power demands, i.e., Smilikimean River, there is an old dam on the river which perhaps could be rebuilt or perhaps a new dam built, coal and wood products generating power plants, solar generation.
>
> If, after exhaustive study BPA is the only source of power, we question whether they have the power available to transmit. We hear constantly of the limitation of power development on the Columbia River. There is a limit to power supply. Does BPA anticipate other means of power development such as nuclear power plants which are so much a question of late?

If the transmission lines are to go in, we question why by BPA's very statement in the May 1979 Final Environmental Impact Statement, the route proposed is the longest and most expensive to the taxpayer to the tune of 3.6 million dollars. Quoted from the BPA statement, "Alternate A has numerous land use and natural resource conflicts. This route also has substantial economic engineering and environmental impacts." Alternate B, however, states, "The engineering and economic factors associated with Alternate B are favorable and the overall impacts are minimal." Why do an impact statement if it is to be disregarded? According to the statement there will be greater engineering obstacles with Alternate A; impact on geology and soil due to access roads; landscape scarification; increased erosion potential; local water resources affected through siltation and increased turpidity; Chiliwist Wildlife Recreation Area crossed as well as important nesting areas for grouse and other game birds; loss of browse for deer; obstacles to waterfowl flyways; loss of production to orchard and dryland grain fields; urban and residential lands affected visually with influence on future land development pattern. "The proposed route (A) would have several significant points of intrusion on scenic vistas of the Okanogan Valley."

Of interest to us is the problem of navigation hazard at the Brewster area with aircraft for both land and water-based planes. The area below the Brewster bridge is ideal for landing of seaplanes and has four estuaries usable for anchorage. Also, it would seem a proposed power line within one mile of the Omak Airport would constitute a hazard.

Alternate B is by far the best route to go--even the BPA cannot deny this. But because of "conflict" with the Colville Indian Reservation, BPA appears to choose Alternate A. We wish to inform the BPA there is conflict along Alternate A too. Have the congressmen and senators of Washington been contacted concerning

the Colville dispute? Have you had face-to-face meetings with the Colvilles to settle the dispute? Why does the taxpayer who will finance the proposed project assume second-class citizenship in the light of the Indian federation decision?

It is within the realm of possibility that due to the considerable ecological impact of proposed Alternate A and the political impact of Alternate B that BPA should not supply power to the Tonasket Substation via transmission towers from Chief Joseph Dam. Some other method of supply must be found. Respecially submitted, Rodney L. Dodge.

Response: The demand used to determine needed facilities are obtained from our standard load forecasts which are prepared in conjunction with the Pacific Northwest Utilities Conference Committee. These are forecasted future loads, not the present actual loads.

Studies of power potential on the Smilikimean River show this source could provide 1 year's load growth in this area. It is more expensive than present power sources and may have several as yet undetermined environmental problems. Other local power generation sources were also examined, but are much more expensive than transmission from Chief Joseph.

BPA has notified its customers that it cannot meet their load growth requirements beyond 1983. However, BPA customers have acquired power from other sources. For instance, Okanogan PUD has acquired power from Wells Dam which would be wheeled over the proposed facilities.

As to your detailing of impacts and costs of Alternate A versus Alternate B, BPA has always been in agreement that Alternate A would have much more impact than Alternate B. Recent successful negotiations with the Confederated Colville Tribes have now allowed us to locate our proposed transmission line across the Colville Reservation thereby avoiding impacts as detailed in your letter.

Rodney Dodge (July 25, 1979)

Comment: You commented on the fact that wildlife, such as geese, would be interfered with, and in this area where it would seem that the towers might come directly across the flyway of the geese up and down the Columbia River. They fly at very low altitudes during the winter because of the fog that settles in there, anywhere from 20 to maybe as much as

200 feet off the ground, so they are quite low. They also use the area near where I understand the tower will go on the west side of the Columbia River for feeding and resting during the fall and winter months.

Response: BPA recognizes the potential for collision impacts to migratory waterfowl from the presence of the new transmission line and is currently working with U.S. Fish and Wildlife Service and Colville Tribal biologists to develop mitigation measures to lessen the potential of collision. One such measure being undertaken is the elimination of the overhead groundwire which has been found to be responsible for most bird strikes. Studies show that while birds did collide with this thin groundwire, there were few collisions with the heavier and more visible conductors of 230-kV and 500-kV transmission lines. It was also found that birds flying in fog may be more susceptible to collision with transmission lines due to reduced visibility but the effect on overall transmission line caused mortality may be small because of reduced flight intensities at line height. Overall, the biological and ecological impact of bird collisions is of little significance.

Rodney Dodge (July 25, 1979)

Comment: Irrigation pipes, the aluminum pipes picked up by hand, are 20 feet in length or so, many of them are 40 feet in length. They could easily hit a line that is as low as 25 feet from the ground, it is possible, it has happened before, and it is relevant.

Response: Great care should be exercised when handling lengths of metallic pipe near any overhead conductors. The pipe should be kept in a horizontal position. In this instance, the big danger near a high-voltage line is the chance that a person may up-end a 40-foot section of pipe into the conductor overhead. Irrigation systems which move on wheels can have a voltage induced if well insulated from ground and stationed parallel to and close to extra-high-voltage transmission lines.

Other systems, such as large circular systems, use an 8-inch diameter pipe carried 12 feet above the soil. Such a system will have a voltage to ground induced in the equipment if insulated from ground. However, it is difficult to get a high degree of insulation in the field. The insulation is influenced by the type of wheels (metal or rubber), moisture conditions in the soil, and other contact points to ground, such as the central pivot point on a circular system.

BPA has produced a special publication entitled, Tips on How to Behave Near High-Voltage Powerlines, which sets forth those safety precautions which should be followed when in the vicinity of transmission lines. The

rules and safety precautions to be followed should pose no hindrance to full use of the land involved, and farming underneath BPA lines is commonplace.

Further information regarding transmission line impacts to irrigated areas may be found in BPA's draft ROLE EIS, Appendix B, Chapters 7 and 8.

Rodney Dodge (July 25, 1979)

Comment: My point is that it is negligence as far as I am concerned if the line is built low over irrigated areas when, indeed, you know you can hit it with a pipe. That, in my view, when you haven't built yet and you have a chance to correct the height of the line would appear to be negligence.

Response: Where agricultural land will be crossed by transmission lines, care is taken to locate the line and individual transmission towers to limit, to the extent practical, the number of towers in cultivated areas. Where towers must be placed in cultivated fields, a variety of techniques are used to minimize the impacts from construction activities and to restore the land to its approximate original condition after construction is completed. When lines traverse existing irrigated farmland, tower sites are chosen which avoid or minimize conflict with the irrigation systems. Where feasible, towers crossing irrigation systems may be designed and/or located so that conductors will span the systems. Normally, in areas such as Okanogan, any conductors spanning orchards will be raised to avoid possible interference with orchard operations.

Ralph Hagy (July 25, 1979)

Comment: How would you compensate me for it (loss of irrigation well), you take my lifetime, and I hope to live for quite a few years, and the dollar return right now, hay is going from $70 to $75 a ton in the Columbia Basin, at those rates and if I had to replace it how would you compensate me?

Response:

In a situation such as this, BPA would hope the well could remain and the operator could continue to irrigate as he presently does. If it were necessary to abandon the well, this would be considered in the appraisal. As an example, if the well is taken and no water is available, the appraisal would first consider the loss in value of the property changing it from irrigated to non-irrigated. Also the "cost to cure" would be investigated, that is, what would it cost to develop a new

well or other irrigation source. However, successful negotiations have been concluded with the Confederated Colville Tribes which allow BPA to route the transmission line across the Colville Reservation thereby avoiding impacts to the above-mentioned property.

William Keron (July 25, 1979)

Comment: I have 32 acres surveyed out in a plat for a homesite for view property. Now if you go through there, which I'm pretty sure you will judging from the survey flags, you would probably place a tower on my place after crossing the river. The question that bothers me is I don't know how you are going through there or how you are going to compensate me.

Response: In the appraisal of right-of-way for transmission lines, the appraisers use the most recent sales they can find in estimating value. If the property is subdivision property, the appraiser would consider how the proposed line would affect the subdivision and the offer would include any loss in value caused by the transmission line.

Rodney Dodge (July 25, 1979)

Comment: The last gentleman referred to the fact that he has view property. Does your lands group have a system where they compensate for loss of visual value to the land, whether he is selling it or whether or not the landowner maintains the land.

Response: The property is appraised for its value at its highest and best use. It is compared to similar property which has recently sold. If the market shows a yearly or monthly increase in real estate value, this is included in valuing the property crossed. The appraiser considers fair market value of the property without the right-of-way, then he considers the fair market value after the right-of-way is imposed. The owner is offered, as a minimum, the difference in value. This should take care of any loss in value of the whole property. As visual considerations are not compensable in that their monetary value is non-quantifiable, we must rely on traditional appraisal methods (fair-market value).

Rodney Dodge (July 25, 1979)

Comment: We do have probably nine at least, and maybe more, but at least nine eagles that nest in this area adjacent to Brewster Bridge and cliffs primarily, and, of course, they feed in the area from Pateros to Brewster and above, these are both bald and golden. I think the ones I have seen

have been bald eagles. These are eagles which hunt ducks and fish and therefore stay close to the water in winter months, and of course, there would be a problem of collision with these smaller animals and even one or two eagles, with the number of eagles left in the United States, it would be quite a loss, and I think it should be considered in your final decision.

Response: Because the bald eagle is a species under protection of the Endangered Species Act, BPA entered into consultation with the U.S. Fish and Wildlife Service concerning the effects of our transmission line on the eagles. Results of those consultations are stated in Fish and Wildlife letter dated September 12, 1979 and included in this document. However, the change in location of the proposal with a new route across the Colville Reservation will avoid all possible impacts to the bald eagle areas near Brewster.

Al Ziontz (July 25, 1979)

Comment: When I asked you about the impacts to game in the Chiliwist Game Area you referred me to the EIS and said the matter was fully covered there. I find it is covered only on page 15 where it says, "BPA will consult the Washington State Game Department prior to surveying and construction to avoid or mitigate impacts in those areas." A similar general statement is made with respect to Alternate B. Apparently, you don't have any specific plans to mitigate, you will rely on the Washington State Game Department to tell you what to do?

Response: BPA is presently working with Colville Tribal biologists and U.S. Fish and Wildlife Service personnel to establish corridor realignments as mitigative measures to insure minimal adverse impacts to big game, upland birds, and birds of prey. In addition, measures such as the elimination of the overhead groundwire have been adopted to minimize the possibility of collision to waterfowl and other birds in the area.

Betty Keron (July 25, 1979)

Comment: Doesn't this area depend on TV reflectors for our TV reception? If the line goes through on Alternate A it is going to affect a lot of us. Will the magnetic field affect our TV reception?

Response: When a line is operating, both electric and magnetic fields are present. The electric field, not the magnetic, is the source of reception interference in cases where it occurs. This 230-kV line is not expected to affect television reception. In our experience with other 230-kV lines like this, no television reception problems have been experienced from the operation of the line.

Rodney Dodge (July 25, 1979)

Comment: Do transmission lines affect radio transmission with aircraft? This is the point, because in winter flying here quite often you are right down on the ground, quite close, and still within regulations. If you are trying to communicate with the Brewster Airfield, for example, possibly you'd be down low enough that conceivably you might have a problem.

Response: No interference with aircraft radio transmission is expected. We are not aware of any case where BPA transmission lines have caused interference to aircraft radio communications. The planes and helicopters operated by BPA use the standard aircraft VHF bond. Although they often fly along the transmission lines, communications are not affected.

Rodney Dodge (July 25, 1979)

Comment: Would this be an appropriate time for you to answer the question regarding the BPA's ability of eminent domain over the Colville Tribes should they refuse to--(grant BPA permission to build the transmission line across Reservation land).

Response: Since publication of the draft EIS, BPA and the Confederated Colville Tribes have reached an agreement authorizing BPA's use of Alternate B as its proposal. The line will therefore be built across the Colville Reservation.

Rodney Dodge (July 25, 1979)

Comment:

Would the BPA look at the possible alternative which I mentioned in my statement, that the congressmen from this area be appraised of the situation and be requested to look into the possibility of legislation to get the line across (the Colville Reservation).

Response: See previous response to Rodney Dodge.

INDEX OF COMMENT LETTERS

OKANOGAN AREA SERVICE

L-S-76-1

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION
7150 Cleanwater Lane, Olympia, Washington 98504
206/753-5755

June 21, 1979

35-2650-1820
Draft Supplement to FEIS
Bonneville Power Administration
Proposed Fiscal Year 1976
Program Facility Location
(E-1668)

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

Gentlemen:

The staff of the Washington State Parks and Recreation Commission has reviewed the above-noted document and does not wish to make any comment.

Thank you for the opportunity to review and comment.

Sincerely,

David W. Heiser

David W. Heiser, E.P., Chief
Environmental Coordination

DWH/PJP:jc

L-3-76-2

STATE OF WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION KF-01

Highway Administration Building, Olympia, Washington 98501 206/753-6005

June 29, 1979

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

Bonneville Power Administration
Proposed Fiscal Year 1976 Program
Facility Location: Okanogan Area Service
Draft Supplement to Final Environmental
Impact Statement

Dear Mr. Kiley:

We have reviewed the subject document and have no comments to offer regarding the proposal.

Thank you for the opportunity to review this information.

Sincerely,

ROBERT S. NIELSEN
Assistant Secretary
Public Transportation and Planning

By: WM. P. ALBOHN
Environmental Planner

RSN:cm
WPA/WBH

cc: D.P. Swanson
R. Albert
Environmental Section

L-S-76-3

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION
7150 Cleanwater Lane, Olympia, Washington 98504
206/753-5755

July 10, 1979

35-2650-1820
Draft Supplement FEIS -
Bonneville Power Administration
(E-1697)

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

Gentlemen:

The staff of the Washington State Parks and Recreation Commission has reviewed the above-noted document and agrees that the proposed action (Alternative A) has no impact on properties owned or controlled by the Washington State Parks and Recreation Commission. Alternative B however, would have aesthetic impacts on users in Bridgeport State Park. We request that detailed specifics delineating what those specific aesthetic impacts would be should be provided in a revised EIS by the BPA if alternative B becomes the preferred alternative.

Thank you for the opportunity to review and comment.

Sincerely,

David W. Heiser, E.P., Chief
Environmental Coordination

DWH/PJP:jc

cc: Mike Mills, Office of Financial Management

JOHNNY APPLESEED CO. GROWER, PACKER AND SHIPPER OF WASHINGTON FRUITS

TELEPHONE (AC 509) 422-2960 · POST OFFICE BOX 21 · MALOTT, WASHINGTON 98829

July 18, 1979

Spokane Area Manager
Bonneville Power Administration
Room 561, U.S. Court House
W. 920 Riverside Avenue
Spokane, Washington 99201

Gentlemen:

We at Johnny Appleseed Company are in favor of Alternate B. This route would affect the least amount of orchard land. A power line would disrupt the orchards and hinder application of pesticides, but Alternate B covers mostly air ranged land.

Johnny Appleseed Company is adamantly opposed to Alternate A. This route would disrupt our orchard operations and air application of pesticides. It would also create a high danger to planes landing at the Johnny Appleseed airstrip which is a vital part of our operation.

Johnny Appleseed Company represents 900 acres of orchard and 2000 acres of land which would be affected by Alternate route A. We are opposed to it.

Sincerely,

Steven L. Weaver
Manager

PSC #1, Box 3585
APO San Francisco, 96286

25 July 1979

District Manager
Bonneville Power Administration
Room 314, U.S. Federal Building
301 Yakima Street
P.O. Box 741
Wenatchee, Washington 98801

Dear Sir:

Ref: OOT

This letter is to acknowledge the receipt of Mr. Donald H. Wilkerson's correspondence dated 18 July 1979 informing me, as a landowner, that our property may likely be affected by the construction of transmission facilities by the Bonneville Power Administration.

This letter is to serve as our official objection to the proposed transmission facilities being constructed on or over our property since no mention was made in Mr. Wilkerson's letter of our receiving any monetary compensation for the devaluation these facilities may bring to our property. The proposed construction would not only affect the scenic aspect of our property, but the building flexibility as well.

Sincerely,

Clarence E. Hinch

Clarence E. Hinch

Janet L. Hinch

Janet L. Hinch

JUL 22, 1977

DEAR SIRS

I RECEIVED YOUR LETTER of JUL 18, 1977 ENCLOSING A COPY of NOTICE OF PUBLIC MEETING DOE BPA OKANOGAN AREA SERVICE.

I WOULD LIKE A COPY of THE DRAFT ENVIRONMENTAL IMPACT STATEMENT YOU MENTION IN YOUR LETTER.

WOULD THE TRANSMISSION LINES BE ROUTED IN VICINITY of WHAT IS KNOWN AS BREWSTER RANCH PROPERTIES? UNDER ANY of THE ALTERNATIVES IF SO WHAT IF ANY WOULD THE REIMBURSEMENT BE TO THE PROPERTY OWNER THE LINES ~~AA~~ WERE ROUTED OVER.

THANK YOU

WJ LEONARD
7006 CHILETT ST
SPRINGFIELD, VA.
22151

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX C-3755
SEATTLE, WASHINGTON 98124

NPSEN-PL-ER

31 JUL 1979

John E. Kiley, Environmental Manager
Bonneville Power Administration
Post Office Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

We have reviewed the draft facility location supplement to the final environmental impact statement for the Fiscal Year 1976 Program, Okanogan Area Service with respect to the U.S. Army Corps of Engineers' areas of responsibility for flood control, navigation, and regulatory functions.

We should like to advise you that a Department of the Army permit is required for overhead power transmission lines over navigable waters of the United States unless those lines are part of a water power project subject to the Federal Power Commission.

Thank you for the opportunity to comment on this statement. If you have any questions, please contact Dr. Steven F. Dice, telephone (206) 764-3624, of my staff.

Sincerely,

Peter P. Denny

[illegible] SELLEVOLD, PE
[illegible] Engineering Division

August 1, 1979

Spokane Area Manager
Bonneville Power Administration
Room 561, U.S. Court House
West 920 Riverside Avenue
Spokane, WA 99201

Your Reference OKE

Dear Sir: Re: Property - NW SW S2 T34 R26
Parcel Number 3426023004

My husband (now deceased) and I have owned the property described above in the Omak area for 50 years. It has recently increased substantially in value. The potential for development in the near future has become apparent. Crossing of the property with power transmission lines does not appear to me to enhance its value and if feasible to place the line elsewhere, I would favor that action.

My attorney has suggested that I request a copy of the Environmental Impact Statement as it pertains to this property. Please send this to me if possible so I can determine what steps to take, to maximize the value of the property in the future.

Sincerely yours,

Gladis Leber

Gladis Leber
24309 Crystal Lake Road
Woodinville, WA 98072

cc: Jack Allen

July 31, 1979

Department of Energy
Bonneville Power Administration
Spokane Area Office
Room 561, U.S. Court House,
West 920 Riverside Avenue
Spokane, Washington 99201

Gentlemen:

After attending a public meeting last week at the Brewster Grange Hall and a study of the Final Environmental Impact Statement, May 1977, I request that you would finalize plans to construct the new power line Alternate B across the reservation. All things considered, this would be the best route besides being less expensive.

I own five acres of land on the Douglas County side of the river that has been in the family for many years and is now taxed as orchard land. My son, who is a career Navy man, has expressed a desire to put a small orchard and home on the acreage when he retires. I feel the lines would be a hazard to orchard workers besides being unsightly.

The Brewster area already has one group of lines crossing the river which disrupt the landscape and a second group would be just that much more unsightly. Many homes have been built in Brewster to take advantage of the view and I feel these towers and power lines would ruin their view.

All things taken into account, I request that the route of Alternate A be deleted and all steps be taken to use the Alternate B route.

Sincerely,

Dorothy M. Kline

Dorothy M. Kline
Box 245
Brewster, Wash. 98812

P.O. Box 577
Methow, WA 98834
August 1, 1979

Joseph J. Anderson
Wenatchee District Manager

Dear Mr Anderson:

I strongly oppose the suggested plan that locates the BPA transmission line from Chief Jo. to Okanogan approximately one(1) mile downriver from Brewster.

It is not only biologically unsound but financially extremely expensive. That particular part of the river is a wide spot where many families live or recreate. Brewster and Pateros families swim, boat, fish and ski there. Homes and land would be greatly devalued by the line and accompanying towered. Orchard land would be

taken out of production. Views for those living along the river as well as those traveling the river would be destroyed. It is also an additional hazard for pilots, many of whom travel the river to the Brewster Airport. The close proximity of the lines to homes, existing road and possibly existing water, would or could be an additional danger.

Extensive bargaining with the Colville Confederated Tribes is only practical and National on the matter. If that is futile, another route less obtrusive should be found.

Sincerely,

Cara F Anders

AUG 3. 1979
BREWSTER, WA.

DEAR MR. ANDERSEN

I AM WRITING IN REGARD TO THE PROPOSED POWER LINE THAT WILL CROSS THE COLUMBIA RIVER ABOUT ONE MILE SOUTH of BREWSTER AND THE EXISTING POWER LINE.

I UNDERSTAND THAT A FORMAL HEARING WAS HELD SOME TIME LAST MONTH, I WAS NOT NOTIFIED of IT, EITHER BEFORE OR AFTER, IT WAS HELD, BY YOUR AGENCY, IN SPITE of THE FACT THAT THE PROPOSED LINE WILL BE WITHIN 300 FEET of MY PROPERTY. ALSO I ATTENDED THE INFORMAL MEETING AT THE BREWSTER GRANGE AND LEFT MY NAME AND ADDRESS THERE.

THIS PROPOSED LINE, IF BUILT WHERE THE MAP INDICATED AT THE INFORMAL HEARING WOULD GREATLY DECREASE THE VALUE of MY HOME, BOTH TO ME

AND TO ANY PERSPECTIVE BUYER, NOT ONLY BECAUSE THE LINE ITSELF IS AN EYE SORE BUT BECAUSE IT WOULD TOTALLY RUIN AN EXISTING BEAUTIFUL VIEW. FURTHER MORE, I HAVE A SEAPLANE, AND YOUR PROPOSED POWER LINE WOULD CREATE AN EXTREME HAZARD TO ME AND ANY PASSENGERS I MIGHT CARRY. I VERY STRONGLY PROTEST THIS PROPOSED LINE AND INTEND TO USE EVERY LEGAL RESOURCE OPEN TO ME (IF THERE ARE ANY) TO PREVENT ITS CONSTRUCTION AT THE PROPOSED LOCATION.

Respectfully,

STAN ALLEN
RT 1 BOX 11 C
BRIDGESTER, WA
98812

Larry Lowe
P.O. Box 1046
Okanogan, WA.
98840

Mr. Ronald Wilkerson
Bonneville Power Administration
Spokane, WA.

Dear Mr. Wilkerson,

I like many involved in this power line proposal would like to voice my overwhelming approval of Alternate B as the route that should be taken. I emphasize this with the many reasons you give, in most every category examined, throughtout the Environmental Impact Statement prepared.

I would alsc like to compliment you on the excellent job done throughout the statement. But in my limited involvement in the controversy there are two major area that I feel you have not examined enough.

The first area, concerning Alt. B, is the fact that the Colville Confederated Tribes is going to need power for the Mt. Tolman Project. This as I'm sure you realize, gives you a powerfull arguement for the use of Alt B. Again my vote goesfirst to Alt B, the easiest and most logical alternate: Across reservation land.

The second area is that of stretching a high voltage wire 124feet in the air where the line sould "turn due east and follow a ½ section line across Pogue Flat to the Omak Substation." Although I realize that this does not concern the FAA now for those of us that are someday looking forward to regularly scheduled air flight into the area this poses a great problem. When from the hill behind my house I watch those fire fighting planes skim above the orchards and then try to imagine a 124 foot tower in their path it scares me.

Living on the fringe of Alt A-2 I do have some questions and comments on it also.

You mentioned on Page 1 of the Impact Statement that even if Alt A-2 is used that a " tap line" would be needed to put in. What does a tap line consist of?

If Alt. A-2 is seriously being considered I want you to know that it could be negotiated to where you could even put a tower on the hill behind my house if necessary.

I would also like to know more on the feasibility of maybe putting a substation somewhere in Alt A-2. This might ease the conflict involved with Alt A and the many people involved?

In any event my cooperation is yours, as yours has been mine. Thank you

Larry Lowe

Brewster Wn
8-1-79

Dept of Energy
Bonneville Power Administration
Spokane Wn.

Dear Sir;
We Object to Plan A. as
the lines go over a parcel of
land (33 acres) we have
surveied out to sell & have
listed for sale. as vacant property.
Your landed by plane on the
back side of this property &
set a flag - with out permision
from us - the result of this is
we have lost 3 sales of said
Property - as no one wants
these power lines over or
close to them. I even object

I'd hating them this close to my own home - no matter what your (Specialist) may say. it is not safe. when wires are very long - (over 100 feet from Pillar to Pillar. if some thing unfor seen happens and whips them around - it is not safe, use common sence tell us this -

Mr William E. Keran
Mrs Betty M. Keran
Box 958
Brewster. Wash.
98812

Aug. 6, 1979
Omak, Wash.
98841.

Gentlemen:

I object to the transmission lines being placed in my area.

Yours truly,
Grace MacKenzie

United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

ER-79/607

LATE LETTER

AUG 22 1979

Mr. Sterling Munro, Administrator
Bonneville Power Administration
Department of Energy
Post Office Box 3621
Portland, Oregon 97208

Dear Mr. Munro:

The Department of the Interior has completed its review of the draft supplement to the final environmental statement for Facility Location, Okanogan Area Service, Washington. We have the following comments listed by our areas of jurisdiction and special expertise.

Recreation and Aesthetics

Our primary concern is that the proposal will result in adverse impacts to recreation and visual resources as described in the draft supplement. The draft does not provide convincing evidence that viable alternatives with less adverse impact do not exist. For example, maps in the document show an existing 115-kV line from Brewster to Okanogan and another from Brewster to the Bridgeport area. The final supplement should thoroughly discuss the practicality and relative environmental impacts of utilizing this and other existing corridors. Less ecologically disruptive methods to cross rivers should be explored such as combining powerlines with bridges and using underwater crossings.

The draft does not provide enough information to give readers a clear understanding of visual impacts. We suggest the final supplement contain photographs of visually sensitive areas along the route, preferably with artist's renderings of proposed transmission facilities. This should be done for the preferred alternative and also for other viable alternatives having less adverse impacts on recreation and visual resources. The final supplement should also specifically describe recreation and visual resources of the Chiliwist Wildlife Recreation Area and probable impacts on these resources.

LATE LETTER

Cultural Resources

The draft provides a fairly thorough presentation of cultural resources and intended compliance with 36 CFR Part 800. The final supplement should be strengthened by inclusion of correspondence from the State Historic Preservation Officer reflecting consultation as required by the above regulation (as amended in the Federal Register, January 30, 1979). These requirements include consultation on: the need for and type of survey(s) to identify historic and archeological properties eligible for inclusion in the National Register, survey boundaries, application of National Register criteria to identified properties, determination of effect of the proposal on National Register or eligible properties, and other 36 CFR Part 800.4 procedures if such properties will be affected.

Fish and Wildlife Resources

Since Section 7 consultation is presently under way and a field inspection has been held (but no conclusions drawn), we offer the following general comments concerning fish and wildlife resources. In the near future we will supplement these comments with a detailed letter based upon the various consultations.

Proceeding north, then west along the south side of the Columbia River, the Route A corridor will cross a major roosting area for wintering bald eagles immediately across Wells Reservoir from the mouth of the Okanogan River and the town of Brewster, Washington. Judging by the language of the document, considerable scarification and modification of soils and vegetation will be required to provide clearance for transmission towers and lines. From all appearances the loss of snags, perching trees, and the eminent threat of bird strikes with towers and high voltage lines may occur. This matter is currently being addressed through Section 7 consultation under the Endangered Species Act by the Department's Fish and Wildlife Service (FWS) as requested by the project sponsor (BPA). A clear interpretation and review of FWS findings should be included in the final document prior to issuance of that document and any permits and approvals required by appropriate Federal and State agencies having jurisdiction over lands and waters affected by the project.

LATE LETTER

Route A will also cross the Columbia River at Brewster before continuing north to Omak and Tonasket. The Columbia is a major flyway route for eagles and migratory waterfowl in this area. Bird strikes and interference with movement up and downstream would be expected. We do not believe these areas of impact have been adequately addressed nor do we see evidence of specific amelioratory measures to preclude or minimize these impacts included in the document.

Route B will cross the west portion of the Colville Indian Reservation in an area where numerous wetlands, ponds, lakes, and small marshes attract heavy concentrations of migratory waterfowl and birds of prey. In some cases, larger waterfowl such as Canadian geese have established a small flight corridor between grainfields and forage areas to the east of the project and surface waters to the west. This increases the likelihood of bird strikes and alteration of bird movements during critical winter months when food supplies are low and flight conditions (visibility, etc.) are poor. Secondary impacts of noise, air pollution, land scarification, and presence of humans are suspected which, while mentioned, are not discussed in adequate detail.

Further north, the transmission corridor crosses through areas heavily used by big game, upland birds, and birds of prey which are of concern to Indian Tribal biologists. Project construction is expected to adversely impact these resources but these impacts have not been adequately discussed in the document. We believe there are a number of minor corridor realignments and mitigative schemes possible which could minimize these effects. Field coordination and project review will be conducted by Tribal and FWS personnel to evaluate possible mitigation and compensation measures.

Finally, Route B will also cross the Okanogan River near Omak and Tonasket, thereby posing additional threats to migratory bird movement up and down the Okanogan Valley. Major Canada goose production and movement also occur in this area and impacts may be significant unless powerline placement is designed to minimize bird interference.

When the FWS field inspection of each transmission corridor and coordination with BPA and Tribal personnel have been completed, we will provide a supplementary letter detailing our concerns and identifying mitigation measures we believe necessary to minimize project impacts.

LATE LETTER

National Park System

No existing or potential unit of the National Park System will be affected either directly or indirectly by the proposed action.

Geology and Topography

We believe the draft supplement should more adequately document efforts that have been made to secure right-of-way across lands of the Colville Indian Reservation, inasmuch as that route (Alternative B) would not only cost $3.6 million less to construct, but would result in significantly less environmental impact than the proposed route (Alternative A). Particularly with regard to potential impacts related to geology, soils, and topographic alteration, we are concerned that the presently proposed route would result in much greater adverse impacts as a result of requirements for more extensive access roads and would result in significantly greater potential for soil erosion (page 34).

Ecological Monitoring

The supplement should indicate plans for monitoring the fate of herbicides after spills. Research has demonstrated that degradation of the herbicide 2,4-D, for example, is influenced by concentration, type of soil, rainfall, herbicide mobility, temperature, and other factors (Ou, Li-Tse, Rothwell, D.F., Wheeler, W.B., and Davidson, J.M., 1978, The effect of high 2,4-D concentrations on degradation and carbon dioxide evolution in soils: J. Environ. Qual., vol 7, no. 2, pages 241-246).

Mineral Resources

A search of the Department's Bureau of Mines Mineral Industry Location System (MILS) revealed that 27 mines or mineral prospects are near the proposed transmission line corridor. Nearly half of the properties have been developed for construction materials (crushed stone and sand and gravel). Other commodities reported included copper, dolomite, gold, lead, manganese, mica, platinum, silver, and zinc. Only sand and gravel and stone have been commercially mined near the proposed project.

LATE LETTER

Inasmuch as the Bonneville Power Administration has stated that the transmission line will be located to avoid mining operations, we anticipate no adverse impacts to mineral resource availability.

We hope these comments will be of assistance in completing the final supplement.

Sincerely,

Larry E. Meierotto
Assistant SECRETARY

LATE LETTER Seoul, Korea
9/20/79

OKE
Dept of Energy

Today I received a letter from your office relative to the Okanogan Area Service project. The letter was dated July 18, 1979.

Although I was not able to make any meetings or have facility to review available info. as you listed I am interested in:

① Knowing the results of meetings.
② decisions made on route of power lines.
③ impacts on rearing of the transmission lines over private property.

My property is identified by the Okanogan county assessor as parcel #3124010055 and 3124010054 — 18.5 acres each.

Reply to:

Eugene A Fried Box 41
Seoul Amer. Hi School
APO 96301 SF Cal

Thank you
Gene Fried

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Area Office
2625 Parkmont Lane
Olympia, WA 98502

LATE LETTER

September 12, 1979

MEMORANDUM

TO : Regional Environmental Officer, USDI, Portland, Oregon

FROM : Area Manager, U.S. Fish and Wildlife Service, Olympia, WA

SUBJECT: Final letter of comment, Draft Supplement to Final Environmental Statement, Proposed FY 76 Okanogan Area Service, Okanogan County, Washington (ER 79/607)

In response to your recent telecon with Olympia, Ecological Services, attached are our comments on the subject EIS. Many of the transmission corridor impact problems with migratory waterfowl, bald eagles, and resident wildlife on the Colville Reservation will be avoided through agreed changes in transmission tower site changes worked out between BPA and ES personnel in the field. Field coordination will continue as project implementation proceeds. Therefore, we believe no further comments on the subject EIS are necessary.

Joseph R. Blum
Area Manager

Attachment

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

United States Department of the Interior

FISH AND WILDLIFE SERVICE

LATE LETTER

September 12, 1979

MEMORANDUM

TO : Regional Administrator, Bonneville Power Administration, Portland, Oregon

FROM : Regional Environmental Officer, Office of the Secretary, USDI, Portland, Oregon

SUBJECT: Supplementary Comments, Draft Supplement to Final Environmental Statement, Proposed FY 76 Okanogan Area Service, Okanogan County, Washington (ER 79/607)

Pursuant to the results of field coordination with the BPA project engineer, the Colville Tribes and the results of a biological opinion obtained through Section 7 Consultation of the Endangered Species Act relative to bald eagles in the project area of concern, the Fish and Wildlife Service will have no further comments on the subject Draft Supplement to the Final Environmental Statement, Okanogan Area Service.

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

STATE OF
WASHINGTON

Dixy Lee Ray
Governor

OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION
111 West Twenty First Avenue, Olympia, Washington 98504 206/753-4011

LATE LETTER

October 5, 1979

Re: 67-F-BPA-05

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

Dear Mr. Kiley:

We are in receipt of the Draft Supplement Final EIS for Bonneville Power Administration's Proposed Fiscal Year 1976 Program Facility Location, Okanogan Service Area. We note BPA's commitment to identify cultural resources which may be present and to evaluate potential impact to these resources. We will reserve further comment until such studies are undertaken.

Thank you for this opportunity to comment.

Sincerely,

JEANN M. WELCH, Deputy State
Historic Preservation Officer

Sheila A. Stump, Archaeologist

lre

United States Department of the Interior

OFFICE OF THE SECRETARY

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

LATE LETTER

October 19, 1979

ER-79/607

Mr. Sterling Munro, Administrator
Bonneville Power Administration
Department of Energy
P. O. Box 3621
Portland, Oregon 97208

Dear Mr. Munro:

This is in regard to Assistant Secretary Meierotto's letter of August 22, 1979, concerning the Draft Supplement to the Final Environmental Statement for Facility Location, Okanogan Area Service, Washington.

Pursuant to the results of field coordination with the BPA project engineer, the Colville Tribes, and the results of a biological opinion obtained through Section 7 Consultation of the Endangered Species Act relative to bald eagles in the project area of concern, the Department of the Interior will have no further comments on the subject document.

Sincerely yours,

Charles S. Polityka
Regional Environmental Officer