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James P. Walker
1/16/79

(Draft of FEIS)

COPY FINAL
ENVIRONMENTAL IMPACT STATEMENT

Bonneville Power Administration

**Proposed Fiscal Year
1980 Program**

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libby planning (final)
frederickson location (final)
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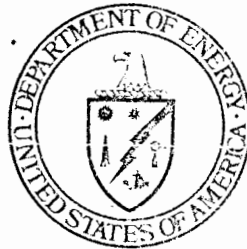
MARCH 1979

U.S. DEPARTMENT OF ENERGY

**FINAL
ENVIRONMENTAL IMPACT STATEMENT**

Bonneville Power Administration

**Proposed Fiscal Year
1980 Program**

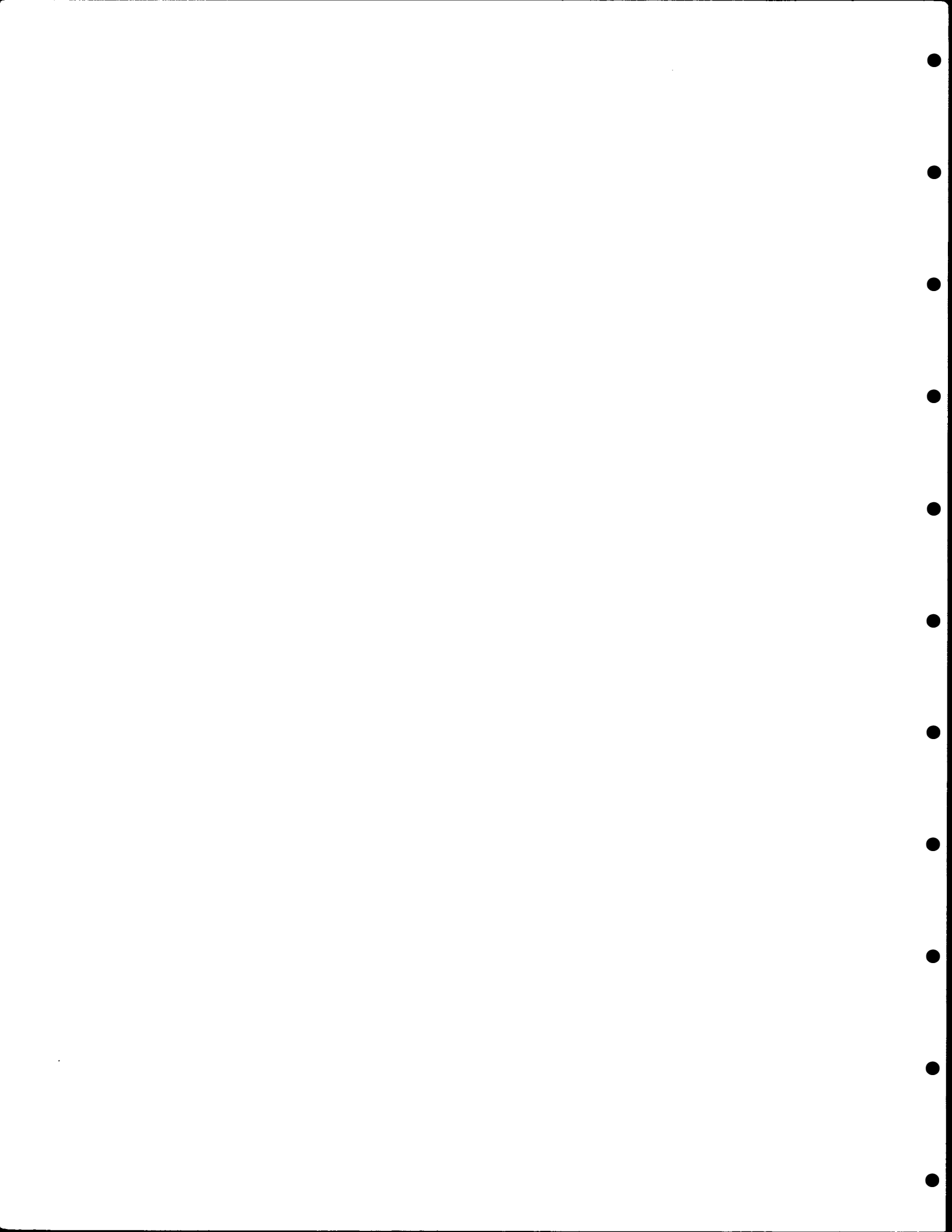


Responsible Official:

U.S. Department of Energy
Washington DC 20545

Ruth C. Clusen
Assistant Secretary for Environment

March 1979



NOTE TO REVIEWERS

This final statement is one of a series prepared annually by BPA on each fiscal year's proposed construction and maintenance program. This statement covers the potential impact of the major new facilities and maintenance programs proposed for fiscal year 1980. It must be reviewed and used in conjunction with the overall programmatic environmental statement entitled "The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System, Including Its Participation in the Hydro-Thermal Power Program: A Program Environmental Statement and Planning Report" (The "Role EIS"), particularly Appendix B--BPA Power Transmission. For convenience, the various components and their relationship are outlined in the chart below.

Environmental Statements 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 1980 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 1980 Proposed Program.
)) Bound Together	
)) in this Document	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 <u>Planning</u> Phase EIS)	
Draft Facility <u>Location</u> Phase EIS	Draft location phase environmental statements are issued separately to facilitate review.	Expands the facility planning phases to include alternative locations for the proposed new facility and environmental impacts associated with each alternative location. These project specific EISs are prepared after public and agency review of the planning phase has been completed and reconnaissance studies have been made.



SUMMARY

() Draft

(X) Final

Environmental Statement

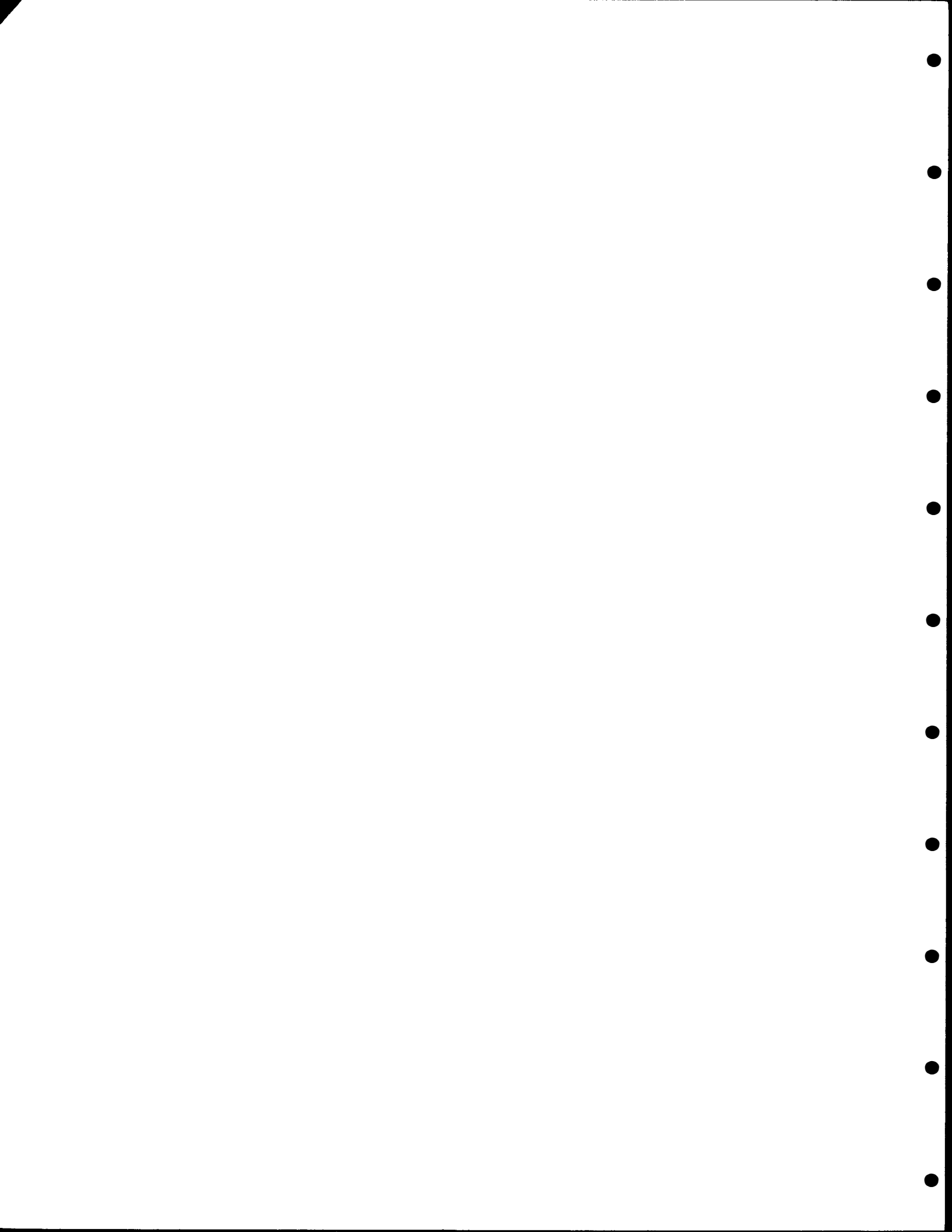
Department of Energy, Bonneville Power Administration

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

2. Brief description of action: Proposed construction of fiscal year 1980 new facility additions and modifications to BPA's electric transmission system including approximately 183-218 miles (295-351 km) of new transmission line; four possible new substations and related structures, including power system control stations; possible equipment additions to six existing substations; maintenance of approximately 13,176 miles (21,204 km) of existing transmission lines including tower structures, conductors, and access roads; control of vegetation of approximately 19,060 acres (7,712 ha) of transmission line rights-of-way and 920 acres (372 ha) of substation property.

3. State and counties involved: Idaho -- Boundary, Bonner, Kootenai, Gem, Teton, Cassia, Minidoka, Clearwater, Latah, Nez Perce, Elmore, Shoshone; Montana -- Deer Lodge, Flathead, Granite, Lake, Lincoln, Mineral, Missoula, Ravalli, Sanders, Pend Oreille, Silver Bow; Oregon -- Marion, Polk, Linn, Benton, Harney, Lake, Umatilla, Union, Wasco, Clatsop, Clackamas, Columbia, Coos, Curry, Douglas, Hood River, Lane, Crook, Lincoln, Multnomah, Tillamook, Washington, Yamhill, Deschutes, Gilliam, Klamath, Sherman, Jefferson; Washington -- Pierce, Kittitas, Benton, Franklin, Klickitat, Skamania, Walla Walla, Yakima, Adams, Chelan, Douglas, Ferry, Garfield, Grant, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Whitman, Clallam, Grays Harbor, Jefferson, King, Kitsap, Lewis, Mason, Pacific, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, Whatcom, Clark, Cowlitz, Columbia.

4. Summary of environmental impact and adverse environmental effects: The Fiscal Year 1980 Proposed Program would result in the diversion of approximately 450 acres (182 ha) of forest land to other land uses compatible with transmission line rights-of-way; the permanent removal of all vegetative cover from approximately 67-77 acres (27-31 ha) as a result of the construction of the new substations and transmission lines; control of all tall woody vegetative species on forest land that would be required for maintenance activities during fiscal year 1980; removal of up to 33 acres (13.3 ha) of cropland from production; vegetative control measures which will reduce vegetative cover on about 19,060 acres (7,712 ha) of existing right-of-way and 920 acres (372 ha) of existing substation property; effects both beneficial and adverse on existing wildlife habitat which would occur as a result of construction and maintenance operations as indicated above; impacts to fishery and aquatic organisms as represented by the waterways or tributary streams that would be crossed during construction; visual impacts to recreational resources; introduction of combustion byproducts into the atmosphere as a result of open burning of slash timber from clearing approximately 450 acres (182 ha) of forest land; resultant soil erosion and losses attributable to the clearing, construction, and maintenance activities involved in the proposed program; audible noise during operation of construction equipment and transmission lines and substations; increased risk of man-caused accidents; and maintenance of a high standard of living and level of productivity for the Pacific Northwest through continued availability of reliable electric service.



5. Alternatives considered: Alternatives that were considered in the development of the Fiscal Year 1980 Proposal include delay or nonconstruction of, facilities; direct-current (d-c) transmission; underground construction of transmission facilities; combustion turbines; incineration of municipal wastes for steam generation; alternative methods of vegetation control on rights-of-way; disposal of slash by methods other than open burning; construction of new transmission facilities on existing rather than new rights-of-way; limiting the consumption of electricity; and alternate locations for individual proposals (to be discussed in the facility location phase environmental impact statements).

6. Agencies requested to comment on Draft Environmental Statement:
See page

7. Date made available to EPA and the public:

Draft Statement: September 27, 1978

Final Statement:

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



I. Introduction

The following final environmental statement describes BPA's proposed program for fiscal year 1980. This proposed program for which BPA is requesting approval consists of the construction of new additions and modifications to its existing transmission system as well as the continued maintenance of existing facilities during the fiscal year. It is essential that these system construction and maintenance activities be planned and carried out on a coordinated basis to preserve system integrity. Therefore, individual proposals cannot be effectively viewed in isolation, but must be considered in the context of the entire proposed program. Further, the impacts of the individual actions are, in many cases, cumulative. Accordingly, we have taken our entire proposed program for fiscal year 1980 as a single major Federal action and have prepared the Fiscal Year 1980 Final Environmental Statement on that basis. 1/

However, BPA also recognizes that decisions on individual components of its proposed program have environmental importance. For this reason, narrative and map data on individual proposed new facilities are provided in that section of this Draft Environmental Statement entitled "Facility Evaluation Appendix" which is an integral part of this statement and is incorporated herein by reference.

This statement was prepared in compliance with the National Environmental Policy Act of 1969 (P.L. 91-190) and follows those guidelines established by the Council on Environmental Quality as published in the Federal Register (38 F.R. 20550-20562), August 1, 1973.

Background

The Bonneville Power Administration, as a Bureau of the Department of the Interior, was established by Congress in 1937 to act as the Federal wholesale marketing agency for electrical energy generated at the Bonneville Dam. Since that time, it has been designated as the marketing agency for electrical power generated at other Federal hydroelectric facilities in the Pacific Northwest--29 of which are existing and 2 more presently under construction. Together with BPA's transmission facilities, these Federal hydroelectric facilities, constructed and operated by the Corps of Engineers and the Bureau of Reclamation, comprise the Federal Columbia River Power System.

1/ For details on construction activities, their sequence and scope, see "Appendix B - BPA Power Transmission" to the draft environmental statement entitled "The Role of The Bonneville Power Administration In The Pacific Northwest Power Supply System, Including Its Participation In The Hydro-Thermal Power Program: A Program Environmental Statement and Planning Report" (The "Role EIS"). As outlined in the "Note to Reviewers," which precedes the title page of this document, Appendix B is a source document describing BPA's overall construction and maintenance program, and serves as a framework for evaluating specific proposals. For this reason, Appendix B should be read in conjunction with this final statement to fully evaluate the proposed program for fiscal year 1980.



To carry out its marketing functions, BPA has designed and constructed a network of high-voltage transmission facilities which serves as the main power grid for the Pacific Northwest, providing approximately 80 percent of the region's bulk power transmission capacity. Over this grid, BPA wholesales electrical power to 153 Pacific Northwest customers including 18 industries in the States of Oregon, Idaho, Washington, parts of Montana and Wyoming west of the Continental Divide, and small parts of northern Utah and California. Those facilities included in the Fiscal Year 1980 Proposed Program are necessary to fulfill BPA's legislative mandate.

To aid the reviewer in evaluating the fiscal year 1980 proposal, we have prepared the following diagram (figure 1) which shows the new major main grid transmission facilities that are projected through the year 1997. It must be noted that this presentation is, by its nature, tentative. The anticipated needs represented in this figure are based upon projections of long-range need, which, in spite of increasingly sophisticated forecasting methodologies are, nevertheless, subject to both human and technological variables.

The actual facilities which would have to be built to meet these forecasted system needs or requirements would be determined on the basis of environmental considerations 2/, system capabilities, and power flow studies.

2/ For an illustration of how BPA's EIS process relates to its decision-making process, refer to page III-1 of the attached Facility Evaluation Appendix.

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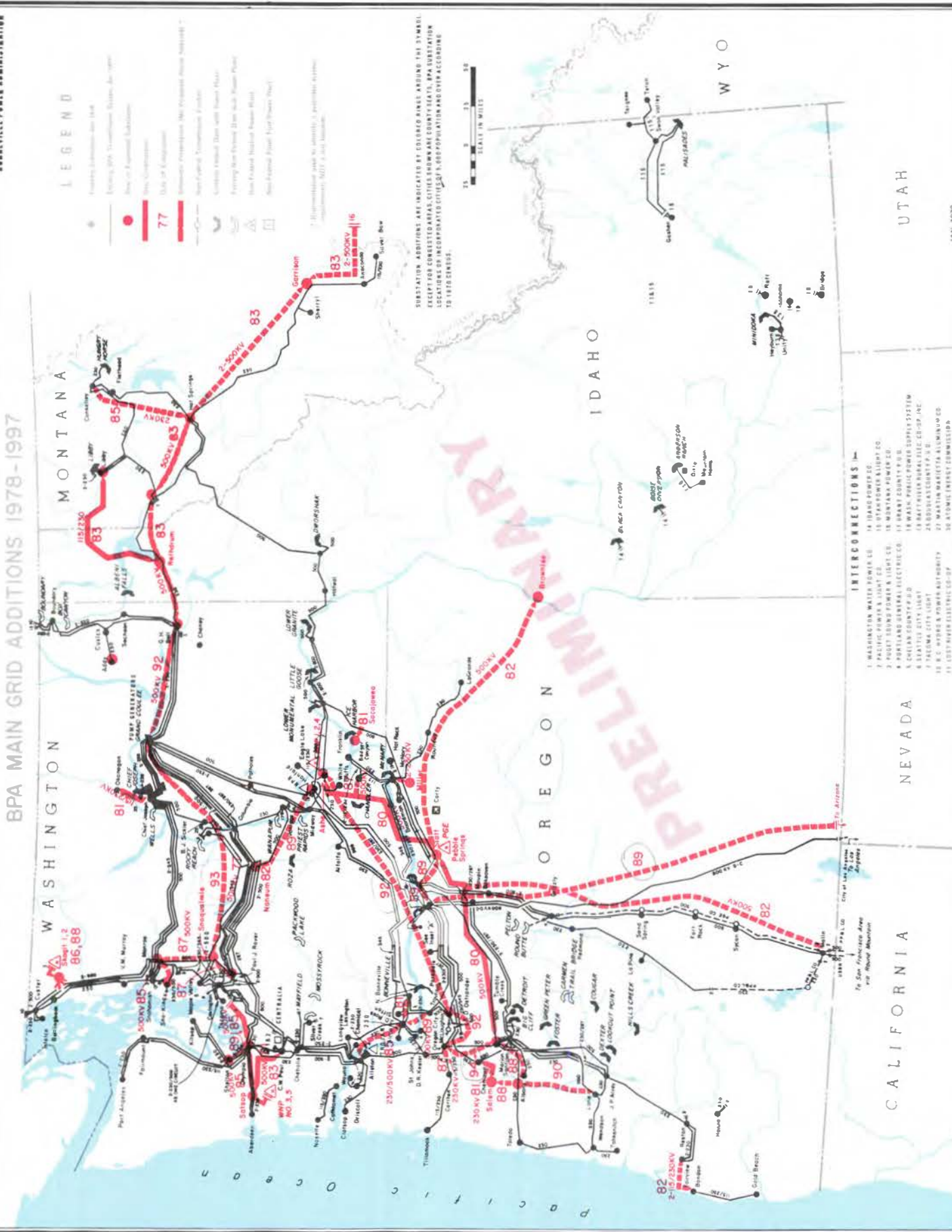


BPA MAIN GRID ADDITIONS 1978-1997

LEGEND

- Existing Substation (1948)
- Existing 1978 Transmittion Station (1978-1997)
- New 500KV Substation
- New 230KV Substation
- New 115KV Substation
- New 69KV Substation
- New 33KV Substation
- New 15KV Substation
- New 4KV Substation
- New 2KV Substation
- New 1KV Substation
- New 0.4KV Substation
- New 0.2KV Substation
- New 0.1KV Substation
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STATION ADDITIONS ARE INDICATED BY COVERED RINGS AROUND THE SYMBOL EXCEPT FOR COVERED RINGS, CITIES SHOWN AND COUNTY SEATS, BPA SUBSTATION LOCATIONS OR INCORPORATED CITIES OF 5,000 POPULATION AND OVER ACCORDING TO 1970 CENSUS.



- INTERCONNECTIONS
- 1 WASHINGTON WATER POWER CO.
 - 2 PACIFIC POWER & LIGHT CO.
 - 3 PORTLAND GENERAL ELECTRIC CO.
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FIGURE 1



II. Description of the Proposed Program

The Fiscal Year 1980 Proposed Program consists of two major components: (A) construction of system additions and modifications necessary to integrate new electric power generation into the system, serve new electrical loads, improve reliability or quality of existing electric service where needed, or maintain electric service at existing levels of reliability or quality; and (B) maintenance of existing facilities necessary to continue service to electrical loads and to prevent damage to equipment. These two programs are described below:

A. Construction of System Additions and Modifications

BPA proposes to begin work on approximately 180-210 miles (290-338 km) of new transmission lines and 4 new substations. In addition, facility additions would be made at 6 existing substations, none of which would require additional land. General locations for the new transmission lines and new substations are indicated in red of the location map (figure 2).

In addition to the new facilities proposed for the first time in the Fiscal Year 1980 Budget, work will continue on approximately 610 structural miles (982 km) of transmission line and 8 substations included in prior fiscal year construction programs.

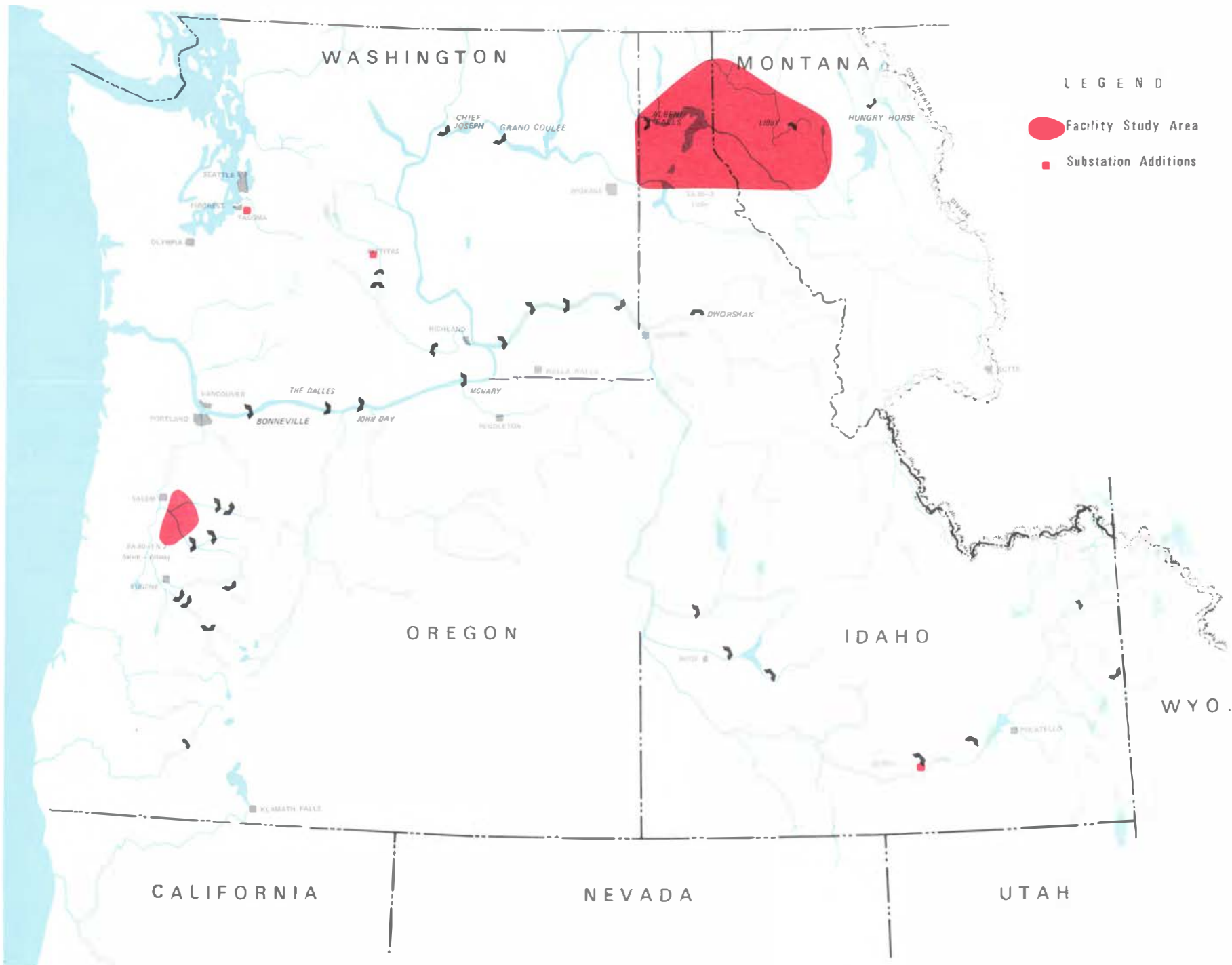
In summary, the Fiscal Year 1980 proposed and ongoing construction programs will involve the transmission facilities shown in Table 2. 3/

3/ Additional information on BPA's program in relation to current and long-range needs for electric energy can be obtained from Part 2 of the "Role EIS" (The Role of BPA). The regional electric power supply system in which BPA operates is covered in detail in Part 1 of the "Role EIS" (The Regional Electric Power Supply System). Projected future transmission requirements over the next 20 years is covered in Chapter IX of Appendix B of the "Role EIS."

*Of this 106-112 replacement
at higher capacity.*



TRANSMISSION & SUBSTATION LOCATION MAP - BPA PROPOSED F.Y. 1980 PROGRAM



LEGEND

- Facility Study Area
- Substation Additions

FIGURE 2

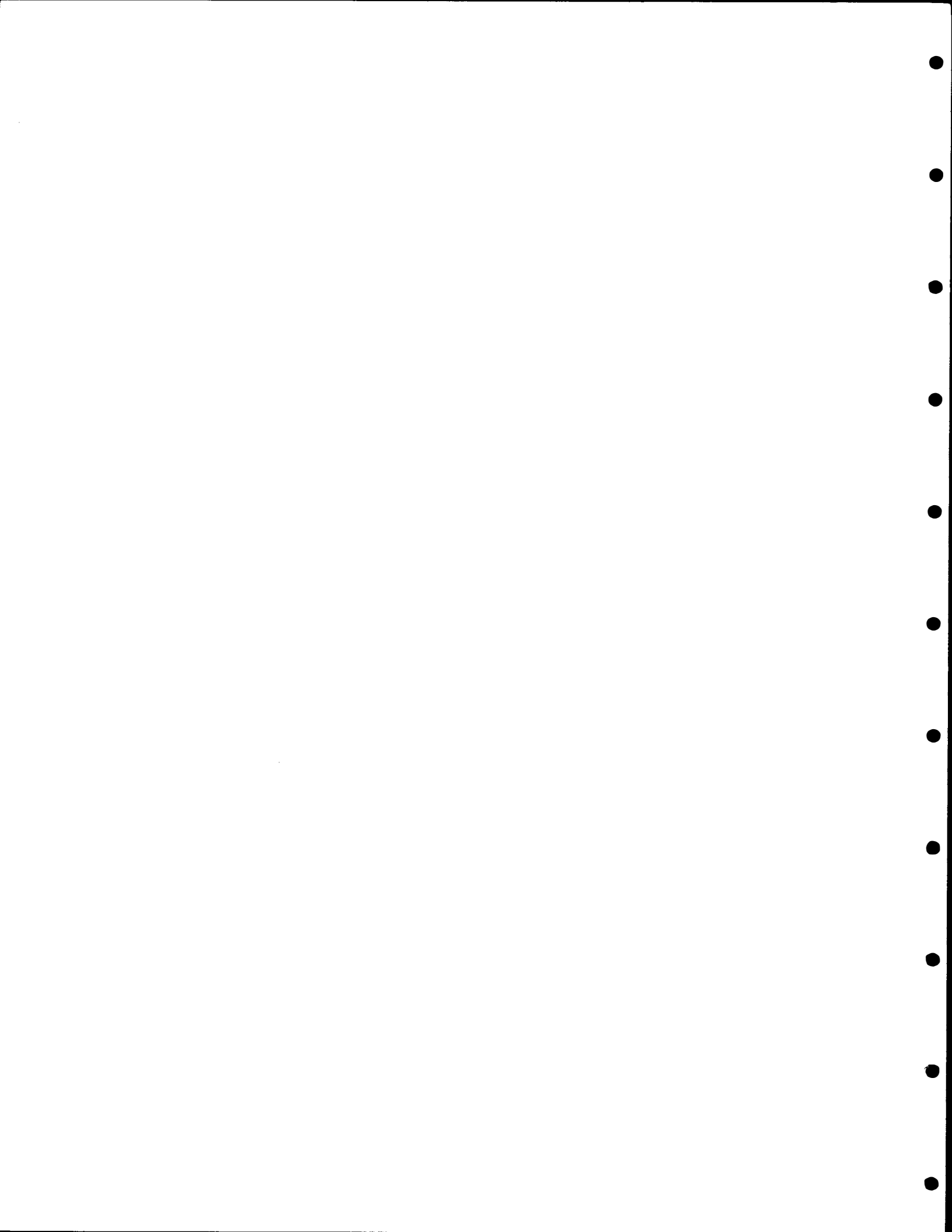


TABLE 1
Fiscal Year 1980 New Facilities Proposals
(see map opposite page)

<u>Appendix Designation</u>	<u>Major Facility Proposals</u>	<u>Energization Date</u>
S.A. 80-1&2	Salem - Albany Area Support	Fall 1981 (Salem) Fall 1982 (Albany)
S.A. 80-3	Libby Integration and Northwest Montana/North Idaho Support	Fall 1983

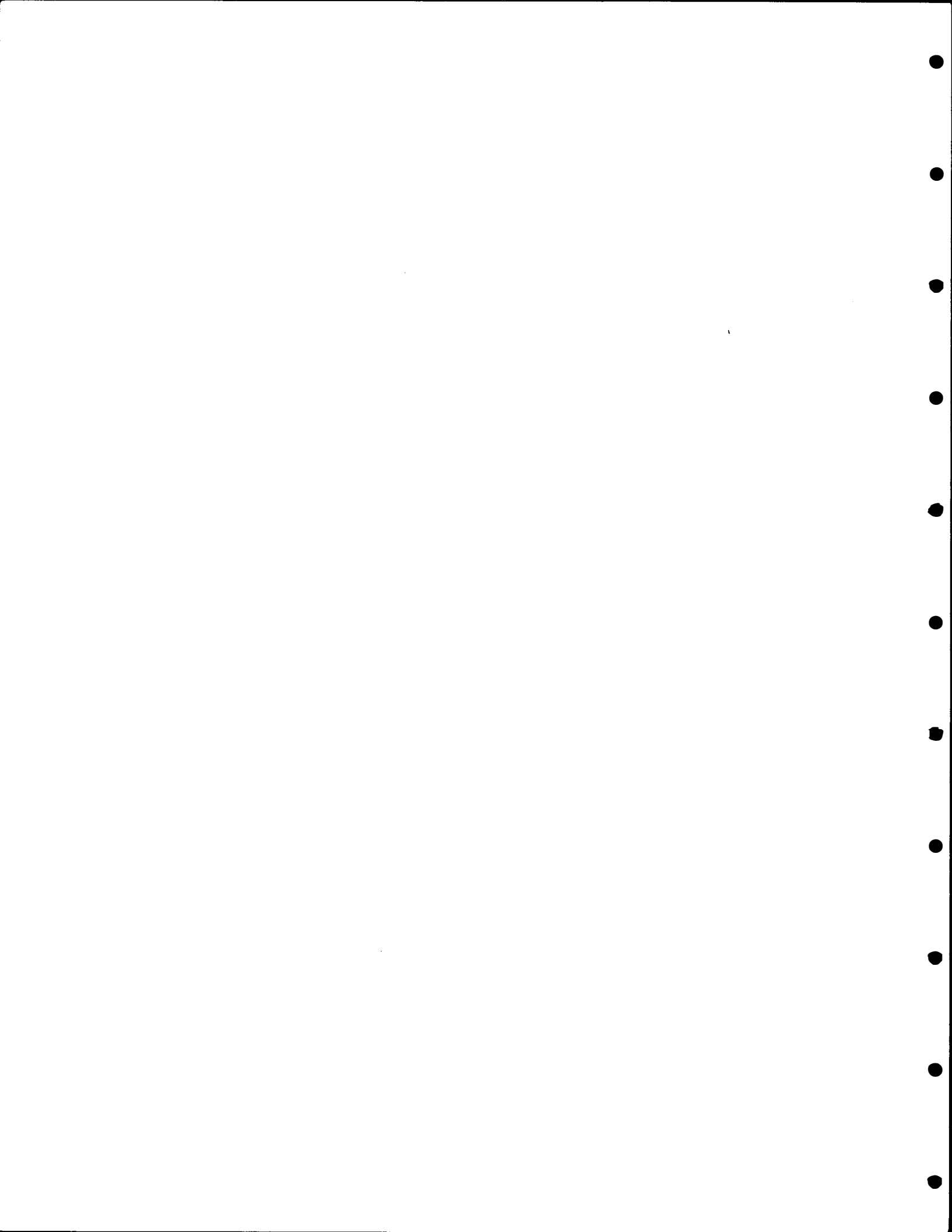


TABLE 2
Transmission Line Miles by Voltage
(Estimated)

	<u>500-kV</u>	<u>230-kV</u>	<u>230/115-kV dbl. cir.</u>	<u>115-kV</u>	<u>Total 5/</u>
FY 1980 New Facilities <u>4/</u>	none	24-52 mi (39-84 km)	141-148 mi (227-238 km)	18 mi (29 km)	183-218 mi (295-351 km)
Programmed in Prior Years (still under construction at end of FY 1979)	748 mi (1204 km)	108 mi (174 km)	none _____	26 mi (42 km)	882 mi (1420 km)
	748 mi (1204 km)	132-160 mi (213-258 km)	141-148 mi (227-238 km)	44 mi (71 km)	1065-1100 mi (1715-1771 km)

Construction of transmission lines involves establishment of temporary construction access roads for movement of materials and heavy erection machinery to construction areas; clearing vegetation, structures, and other obstructions on the rights-of-way that might interfere with construction or operation of the line; burning or otherwise disposing of cleared vegetation; leveling areas necessary for tower sites and tower steel storage and staging areas; excavating for and installing tower footings; erecting transmission towers; stringing and tensioning conductor; construction of permanent maintenance access roads and associated stream crossings on and off the right-of-way as dictated by terrain and other factors; and reseeded or otherwise revegetating disturbed soil areas where appropriate.

Also included in the proposed program is construction of 4 new substations with associated power system control facilities. Work will continue in fiscal year 1980 on 8 substations authorized in prior years but not yet completed, for a total of 12 substations.

4/ The phrases "Fiscal Year 1980 Proposed Construction Program" and the "Fiscal Year 1980 New Facilities" are used interchangeably. Both are used to designate only those facilities proposed for the first time in BPA's Fiscal Year 1980 Proposed Program. Previously authorized proposals (shown as programmed in prior years in the above table), although they may be currently under construction, were discussed in prior annual Environmental Statements.

5/ Figures on miles and kilometers of transmission lines are only estimates based upon assumptions of average or likely requirements.

6/ Includes 8.5 miles (13.7 km) of 35-kV.



Construction of substations and miscellaneous maintenance buildings involves establishing a permanent entrance road, clearing sites ranging in size from 1 to 50 acres (.4-20 ha), constructing a building or control maintenance complex (occupying 150 to 5,000 square feet or 14 to 465 square meters) and a fenced equipment yard, and installing electrical switchgear, line towers, and other support structures.

For details on construction activities, their sequence, and scope, see Chapter V of Appendix B of the Role EIS. ^{7/}

B. Maintenance of Existing Facilities

The proposed program for fiscal year 1980 includes funds for maintenance of BPA's existing transmission facilities which, as of October 1979 will include 13,176 energized circuit miles (21,204 km) of transmission lines, 346 substations, associated maintenance buildings, and other support facilities in Oregon, Washington, Idaho, Montana, and Wyoming. BPA's existing transmission facilities as of January 1978 are shown in the System Map (figure 3).

Activities during the year will include routine and emergency maintenance and repair of electrical equipment, tower structures, aerial and submarine conductors, bridges and culverts, communications equipment, and buildings.

Also included in the program is maintenance of transmission line rights-of-way, substations power system control stations, and permanent access roads. About 19,060 acres (7,712 ha) ^{8/}, of transmission line rights-of-way and access roads, along with approximately 920 acres (372 ha) of substation property, within the States of Idaho, Montana, Oregon, Washington, and Wyoming will require vegetation control during fiscal year 1980. Vegetation control programs are necessary to prevent trees and other tall vegetation from growing up into the conductor and causing outages and possible forest fires. Approximately 1,480 acres (599 ha) of this right-of-way will be cleared utilizing hand and mechanical cutting; 3,990 acres (1,614 ha) of right-of-way will be treated by aerial application of herbicides; and 13,590 acres (5,499 ha) will be controlled utilizing herbicides applied selectively from the ground.

^{7/} Copies of BPA's General Construction and Maintenance Program Statement (FES 74-48), the Wholesale Power Rate Increase Statement (FES 74-46), the Draft Statement on BPA Participation in Regional Interutility Cooperation (DES 75-19), and environmental statements covering the Fiscal Years 1972, 1973, 1974, 1975, 1976, 1977, 1978, and 1979 Programs, and the Role EIS, which are referred to in this statement are available through the Environmental Manager's Office at the address indicated on the summary sheet.

^{8/} BPA currently maintains approximately 200,000 acres (80,920 ha) of transmission line right-of-way.



Details on the kinds of herbicides to be used, the quantities to be applied, and the transmission lines to be treated are included in the attached Vegetation Management Appendix. The information contained therein is the most detailed and accurate possible at this early stage in BPA's planning process. The Vegetation Management Program described is for fiscal year 1980, which does not commence until October 1, 1979. It is possible that some events may transpire between the time that a Vegetation Management Program is identified and its actual implementation that could effect specific components of the program.

Factors which have an effect upon the method and frequency of control include topography, access, adjacent land use, environmental sensitivity, type of vegetation, and climate. Some of these factors can vary unpredictably, thus necessitating some adjustments in the program. For example, such occurrences as unforeseen weed infestations, unusually dry or wet weather, and changes in adjacent land uses make it imperative that the program provide for flexibility. BPA closely coordinates its plans with the plans of land management agencies such as the Forest Service and the Bureau of Land Management to keep them appraised of recent developments. As indicated on page 37, BPA individually notifies private owner/occupants prior to application of herbicides having label restrictions on grazing of animals in treated areas.



III. Description of the Existing Environment

The BPA service area as reflected in the System Map (figure 3) consists of approximately 300,000 square miles (777,000 km²) in the States of Washington, Oregon, Idaho, western Montana, and small sections of Wyoming, Utah, Nevada, and California. Extending from the Pacific Coast inland to the Continental Divide, the service area covers many diverse physiographic regions, each with its unique topographical and climatological characteristics. A generalized description of the character and resources within the region is found in Chapter III of Part I of the Role EIS. A detailed description of the existing environment in the immediate area of the proposed major new facilities is contained in each of the individual final facility planning phase EISs included in the Facility Evaluation Appendix. 9/

9/ The Facility Evaluation Appendix contains both a graphic (map) overview and a narrative evaluation of specific major new construction proposals included as part of BPA's Fiscal Year 1980 Proposed Program.



IV. Probable Impact of the Fiscal Year 1980 Proposed Program on the Environment 10/

The probable impacts of constructing the new facilities proposed as part of the Fiscal Year 1980 Program and the impacts resulting from maintenance activities associated with the upkeep of the existing facilities are summarized below. A detailed description of impacts frequently encountered in construction and future maintenance operations required for facilities of this kind and the mitigation measures normally employed to minimize these impacts can be found in Appendix B of the Role EIS (Chapters VII and VIII respectively). Specific data on regionally significant resources that could be affected is provided for each of the individual facilities in the Facility Evaluation Appendix. 11/

A. Impact on Natural Resources

The impact of the proposed new facilities and maintenance activities on natural resources of regional significance, including hydrologic, mineral, vegetation, fish and wildlife, and scenic resources is summarized below:

1. Hydrologic Resources

Water resources considered in this category are those recognized as having importance because of their use as domestic watersheds, and as a source of irrigation water. Also considered in this category are wetlands, namely, those areas that are inundated by surface or groundwater with such a frequency that vegetative and aquatic lifeforms requiring saturated soil conditions can grow and reproduce.

A review of the fiscal year 1980 new proposals indicate that there will be no physical impact to drainage areas currently being used for formal domestic water supplies such as officially designated municipal watersheds, or to sources of irrigation water.

10/ While preliminary planning has been initiated for the new facilities proposed for the first time in the Fiscal Year 1980 Proposed Program, specific locations for each of these facilities have not yet been determined. Probable impacts and other information in this program statement are based on preliminary planning data, including analysis of typical or likely facility locations.

11/ The acreage and hectare figures cited here and in other places in the text are for those new facilities which are proposed for the first time in the Fiscal Year 1980 Proposed Program as shown in Table 1. For corresponding information on facilities proposed and approved in prior years, see also BPA Environmental Statements covering the Fiscal Years 1972, 1973, 1974, 1975, 1976, 1977, 1978, and 1979 Programs.

1950

At least two of the proposed new facilities associated with the Fiscal Year 1980 Program would have some effect upon identified wetlands. The Salem - Albany Area Support proposal (S.A. 80-1&2) is one of these. A detailed planning level analysis of this project is contained in the Facility Evaluation Appendix attached to this volume. Once alternative and proposed facility and route locations are determined subsequent to reconnaissance, possible impacts to wetlands resulting from the proposed facilities for Salem - Albany Area Support can be more readily evaluated. Another proposal included in the FY 1980 Program, which has not been made the subject of a facility planning phase EIS because of its minimal impact (Kalispell Area Support), will have some minor temporary impact upon identified wetlands.

Control

*20 new units
more than 1000*

*has degraded info
on them*

Pursuant to Executive Order 11990, BPA will avoid undertaking new construction within wetlands, ~~unless there is no practical alternative.~~ ^{ident.} In the event that construction within wetlands proves unavoidable, all practicable measures will be taken to minimize ~~any adverse effects~~ ^{BPA impact} that may result.

Many other water resources that would be involved by the proposed program are considered valuable to the Northwest from a recreational or scenic viewpoint and as such are discussed under those headings.

2. Mineral Resources

Transmission lines can have an impact on deposits of some low-unit value, high-volume mineral resources which can only be extracted economically through surface mining techniques. The most common of these is sand and gravel.

Known commercial deposits of these low-unit value minerals will be avoided wherever possible when selecting line or route locations. At this time direct impacts to this particular resource as a result of the Fiscal Year 1980 Proposed Program, are not foreseen.

3. Vegetation

Construction of transmission lines and substations requires the removal of native vegetation at tower footings, on access roads, and at substation sites. As a result of the new facilities proposed as part of the Fiscal Year 1980 Program, vegetative growth will be permanently removed from up to 22 acres (9 ha) of land that would be cleared for new substation sites and substation additions. Transmission line tower footings would require the removal



of approximately 45-55 acres (18-22 ha) of vegetation. Permanent access roads, constructed where established access roads do not already exist, could also remove all vegetation from up to 17 acres (6.9 ha). 12/

All tall growing vegetative species must be removed from new rights-of-way constructed as part of the proposed program in order to prevent power outages caused by trees growing into conductors.

The Right-of-Way Management Program for fiscal year 1980 will also affect vegetation. The proposal, as detailed in the attached Vegetation Management Appendix, will result in a temporary reduction in vegetative cover on approximately 19,060 acres (7,712 ha) of right-of-way and the permanent removal of all vegetative cover on approximately 920 acres (372 ha) of substation property scheduled for control. Of this 19,980 acres (8,084 ha) total, about 20 percent or approximately 3,990 acres (1,614 ha) will be controlled aerially; the remainder will be controlled utilizing selective methods of ground application of herbicides on 13,590 acres (5,499 ha) (about 68 percent), and by hand cutting of about 1,480 acres (599 ha) (7.4 percent). With the exception of grasses, forbs, and resistant shrubs, all vegetative growth will be affected to some degree as a result of aerial controlled methods. Only tall growing or target vegetation will be affected by the more selective ground control measures which represent a combined total of nearly 75 percent of the total right-of-way acreage scheduled for fiscal year 1980. The temporary and permanent changes in vegetative cover will in turn affect wildlife as described in section 5 below.

No unique vegetative stands of regional or national importance would be affected as a result of the Fiscal Year 1980 Proposed Program.

4. Fish Resources

In constructing the proposed new facilities, local impacts to fishery resources can be expected to occur as a result of construction and maintenance operations conducted

12/ Variations in the acreages required for construction of access roads are due primarily to the fact that approximately 1.0 to 1.5 linear miles of access road could be required per mile of right-of-way (1.0-1.5 km of access road per km of right-of-way) depending upon the topographic conditions encountered during construction. It is not possible at this time to estimate the precise acreage that would be involved in permanent access roads for fiscal year 1980, since the possibility of paralleling existing transmission or utility lines would allow for the sharing of access roads, thereby avoiding the necessity of constructing many new roads.



adjacent to the major waterways as well as to the numerous smaller streams that would have to be crossed during construction and maintenance operations.

Impacts to waterways can result from the introduction of suspended solids or sediment caused by the disturbance of topsoil resulting from nearby clearing and construction operations. Nutrients leached from disturbed soils may also be introduced to nearby streambeds and result in the stimulation of growth of undesirable aquatic vegetation. Wherever possible, vegetative ground cover which poses no threat to transmission line operation is left intact or protected as much as possible from damage due to construction activities. Special care is taken to maintain as much vegetative cover as possible within 100 feet (30 meters) of a waterway. This protective "buffer strip" effectively serves to minimize sedimentation by entrapping debris that would otherwise enter the aquatic environment.

In addition to the impacts of adjacent construction activities, small streams will also be affected by fording operations. Where nearby roads or bridges are not available, smaller streams encountered will be either forded or culverts will be constructed in order to provide access for construction and maintenance equipment. During construction, streams encountered are often crossed 20 times or more. After construction, transmission lines are inspected on the ground at least once every year in nonmountainous terrain and twice a year in mountainous terrain when all streams would again be crossed. Prior to construction of the new facilities proposed for fiscal year 1980, State officials will be consulted and an agreement will be reached as to which streams may be forded and which will require culverts.

Aside from the fording of streams during construction and maintenance operations, past experience has shown that, although not authorized to do so, hunters and recreationists using 4-wheel drive vehicles also utilize fords established as part of BPA facility construction, causing additional siltation and disturbance of the local aquatic environment.

Although the installation of culverts can effectively reduce stream siltation caused by the crossing of vehicles, these structures can, in themselves, result in a localized increase in water turbulence thereby altering the aquatic environment immediately around the installation.

See 2/5



In addition to the physical disturbance of gravel beds that would be caused by fording, the introduction of suspended solids into an aquatic environment will result in an increase in fish mortality by decreasing the flow of clean, oxygenated water through interstices or spaces in gravel beds. Any decrease in water velocity associated with a decrease in permeability of the gravel bed will directly affect hatching success, growth, and survival of fish fry deposited during spawning. These impacts become increasingly significant when they occur in combination with an increase in water temperature such as that caused by the removal of streamside vegetative cover. Normally, the clearing for transmission lines is not extensive enough to substantially increase water temperatures. High levels of suspended sediment can also be expected to cause some gill damage to resident fish. 13/

Impacts to fishery resources associated with construction are only temporary, and whenever possible construction operations will be scheduled to avoid periods of peak spawning activity. Nevertheless, some short-term localized reduction in fish production can be expected to occur in those streams that are traversed, especially during and immediately after construction activities.

Aside from those impacts that would result from the proposed construction activities, the herbicides to be used during fiscal year 1980 to control vegetation on existing rights-of-way could also have an adverse impact on fishery resources if applied directly to waterways or if significant amounts are carried off as surface runoff into adjacent streams.

Realizing this potential, BPA has developed standards governing the use and application of herbicides. Herbicides are not sprayed directly into streams, rivers, lakes, and other bodies of water. Moreover, aerial application of herbicides is not made within 100 feet (30 m) of a body of water; selective ground application is not made within 10 feet (3 m). Thickeners are used in spray mixtures to minimize drift. The possibility of spray drifting onto nontarget areas is further minimized by avoiding aerial application entirely when the wind velocity is 6 mph (9.6 kph) or greater; ground application is not permitted when the wind velocity is 10 mph (16 kph) or greater.

In order to minimize the concentration of these compounds in surface runoff, only those herbicides which are highly resistant to leaching and which decompose readily within the soil will be used. When applied as directed, there

13/ Warren, Charles E., 1971. Biology & Water Pollution Control. W. B. Saunders Publishing Co., Philadelphia, Pennsylvania, 434 p.



is no current evidence to indicate that the herbicidal compounds to be used will cause any harmful effects to aquatic organisms. 14/

Although, as a matter of policy, the above precautions are employed by BPA to minimize exposure of the aquatic environment to these compounds, the risk of accidents always exists. (See also subsection D, Risk of Accidents.)

A listing of the specific herbicidal compounds that will be used during fiscal year 1980 are included in the attached Vegetation Management Appendix. Label information, registration numbers for each of these compounds as well as findings of studies regarding the physical distribution and persistence of some of the herbicidal compounds used by BPA are included in Appendix B of the Role EIS (Chapter VI, Chapter VII.C.6., and Chapter VIII.C.5.). A continuation report on BPA's Herbicide Residue Monitoring Program is also included as part of the Right-of-Way Management Appendix attached to this document.

5. Wildlife Resources

Construction of the transmission facilities and access roads included in the Proposed Fiscal Year 1980 Program will inevitably have some impacts upon wildlife, especially in forested areas. Impacts in these areas would result from the physical disturbance of wildlife habitat caused by opening up new areas to hunting pressures, the operation of heavy equipment routinely used in the construction of transmission facilities, increased human activity, noise, and dust, all of which could affect existing wildlife distribution patterns.

The greatest impact to wildlife can be expected to occur as a result of construction operations in previously inaccessible habitat. Where habitat is suddenly opened up by rights-of-way, resident wildlife populations will be subjected to increased exposure from predators, including man. Resultant increases in predation or hunting pressure could have long-term impacts on population levels and, if severe enough, certain species may even leave the area. Those Fiscal Year 1980 Proposals requiring new right-of-way in farmland and other previously disturbed areas would have minimal impact to wildlife.

The clearing of the rights-of-way which includes the construction of access roads where none are available will also reduce the total amount of cover available to resident species of wildlife. This consideration is

14/ Mullison, W. R., 1970. Effect of Herbicides on Water and Its Inhabitants, Weed Science, Vol. 18, No. 6, pp. 738-750.



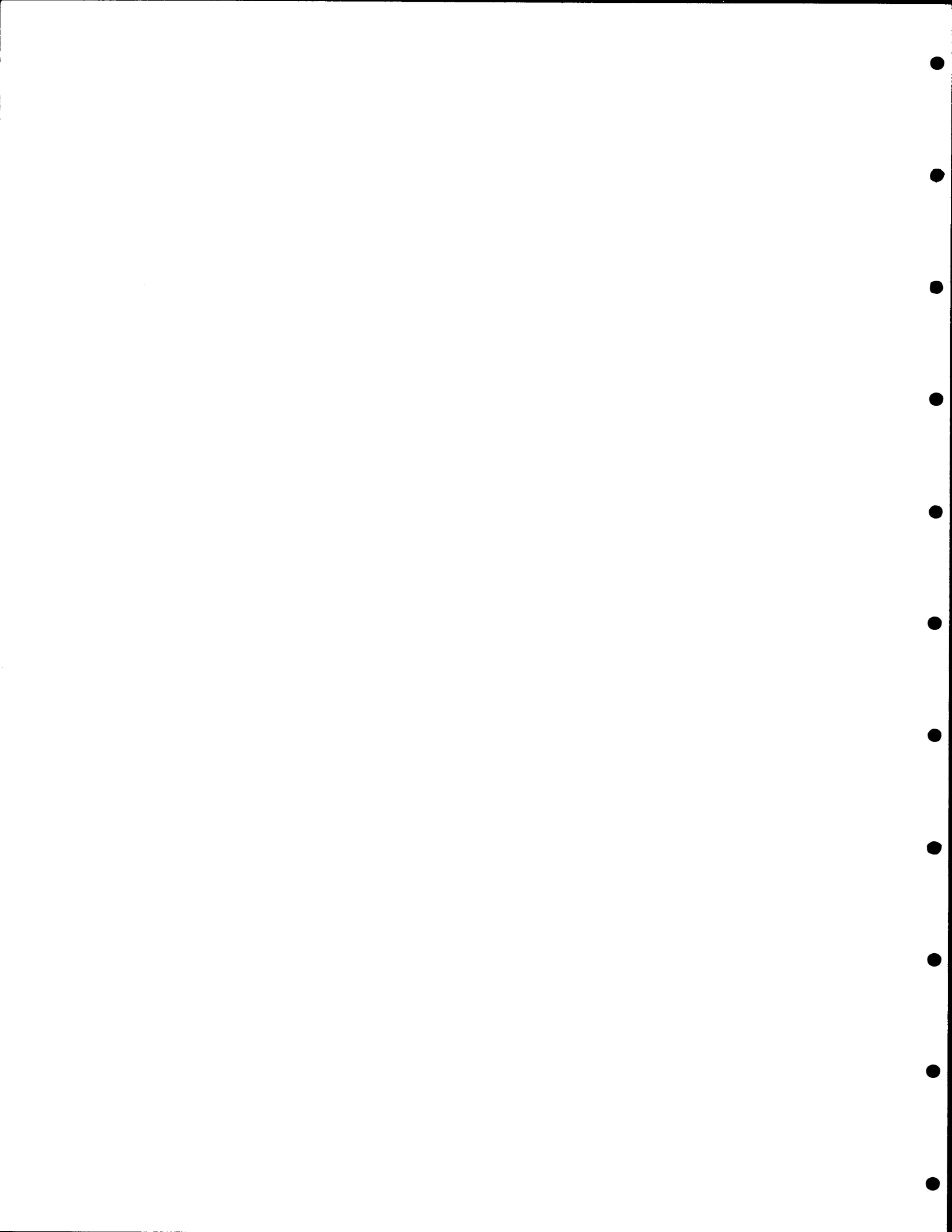
especially significant in those areas where available cover is limited. However, in forested areas, clearing of the right-of-way during line construction and maintenance will usually result in an increase in the growth of available forage utilized by many of the larger herbivores. This particular impact is becoming increasingly beneficial, especially in light of the growing decrease in available big game winter range associated with widespread fire suppression techniques and timber management practices. 15/ On BPA rights-of-way, for example, it has been found that big game species, such as deer, elk, and bighorn sheep, will utilize forage on the right-of-way. There is apparently no difference in animal use of transmission line rights-of-way as opposed to natural clearings. Both natural and man-made clearings in forested areas contain a greater percentage of understory vegetation than the surrounding forest. 16/ The clearing of rights-of-way can have a beneficial effect on wildlife by increasing the "edge effect" which results in an increased mixture or juxtaposition of the various vegetative or habitat types, thereby providing a beneficial diversity of both food and cover preferred by wildlife species in general. However, the clearing of new right-of-way through old growth timber, while benefiting numerous herbivores, as well as species benefiting from the increased "edge effect"; would be detrimental to species such as the cougar, wolverine, and northern spotted owl, which are more dependent on old growth habitat.

The human activity, noise, dust, and other disturbance associated with construction activities could result in the dispersion of many of the wildlife species found in the area. This type of effect is expected to be temporary and most of the resident populations of larger wildlife species, especially deer and elk, should reestablish themselves once construction operations have been completed.

It is possible that resident populations of many of the smaller animals including rodents, rabbits, and other mammals may be affected to a greater degree. In this latter situation, the survival of individual animals will be noticeably decreased. This in turn could have a temporary effect on the density of these local populations but should not have any long-term (more than 2 years) effect upon these population levels, because of the recuperative ability of these smaller animals due to their generally higher reproductive potential.

15/ Leege, Thomas A., 1975. Question: Timber or Elk in Northern Idaho. Idaho Wildlife Review. Vol. XXVII, No. 4, Jan.-Feb. 1975.

16/ Goodwin, John G. Jr., 1975. A 500-kV Transmission Line and Elk Movement. Unpublished Report



Transmission line towers, conductors, and overhead ground-wires can affect bird flight behavior and birds at times collide with such structures. Few studies have been done to determine the significance of these kinds of effects on birds. As a result, some differences of opinion exist among biologists as to whether transmission lines are a problem to birds. The subject gained national attention as a result of the controversy surrounding the proposal by Pacific Power & Light Company to construct a 500 kV transmission line across the Klamath Basin in Southern Oregon 17/. The basin is used by millions of waterfowl during annual migration.

In October 1977 a study began to obtain information on the effects of BPA transmission lines on birds. 18/ This study, which was one of the first designed to provide comprehensive data on this subject is expected to be completed shortly. In early 1978 the U.S. Fish and Wildlife Service sponsored a workshop on "Impact of Transmission Lines on Migratory Birds." The proceedings of the workshop are to be published by the Oak Ridge Associated Universities sometime in 1978. The proceedings will represent state-of-the-art knowledge on the subject. One of the basic conclusions reached by some participants during the workshop was that the effects of transmission lines on birds have not been shown to represent a biological problem although a potential for such a problem may exist in certain situations. Research is needed to further clarify the nature and significance of the problem. Regarding existing information on bird collisions with transmission lines, one speaker at the workshop 19/ reported finding only four references dealing with "transmission lines," four with "powerlines," nine with "distribution" lines and five which did not distinguish between "power" and "communication" lines. Lee concluded that based on preliminary data no situations had been identified where a BPA transmission line posed a significant avian mortality factor.

One of the proposed new facilities associated with the Fiscal Year 1980 Program (Salem-Albany Area Support, SA 80-1&2) would impact the Ankeny National Wildlife Refuge. The nature of this impact is discussed in detail in Facility Evaluation Appendix attached to this volume. Discussions are currently underway with the U.S. Fish and

17/ Bureau of Land Management (BLM) 1977. Final EIS, PP&L's Proposed 500 kV Powerline, Midpoint-Medford, Portland, Oregon.

18/ Lee, J. M. Jr., 1978. Effects of Transmission Lines on Bird Flights. Paper presented at Oak Ridge, Tennessee, Workshop on Jan. 31-Feb. 2, 1978.

19/ Ibid.



Wildlife Service as to the nature of the impact as well as proper mitigation measures.

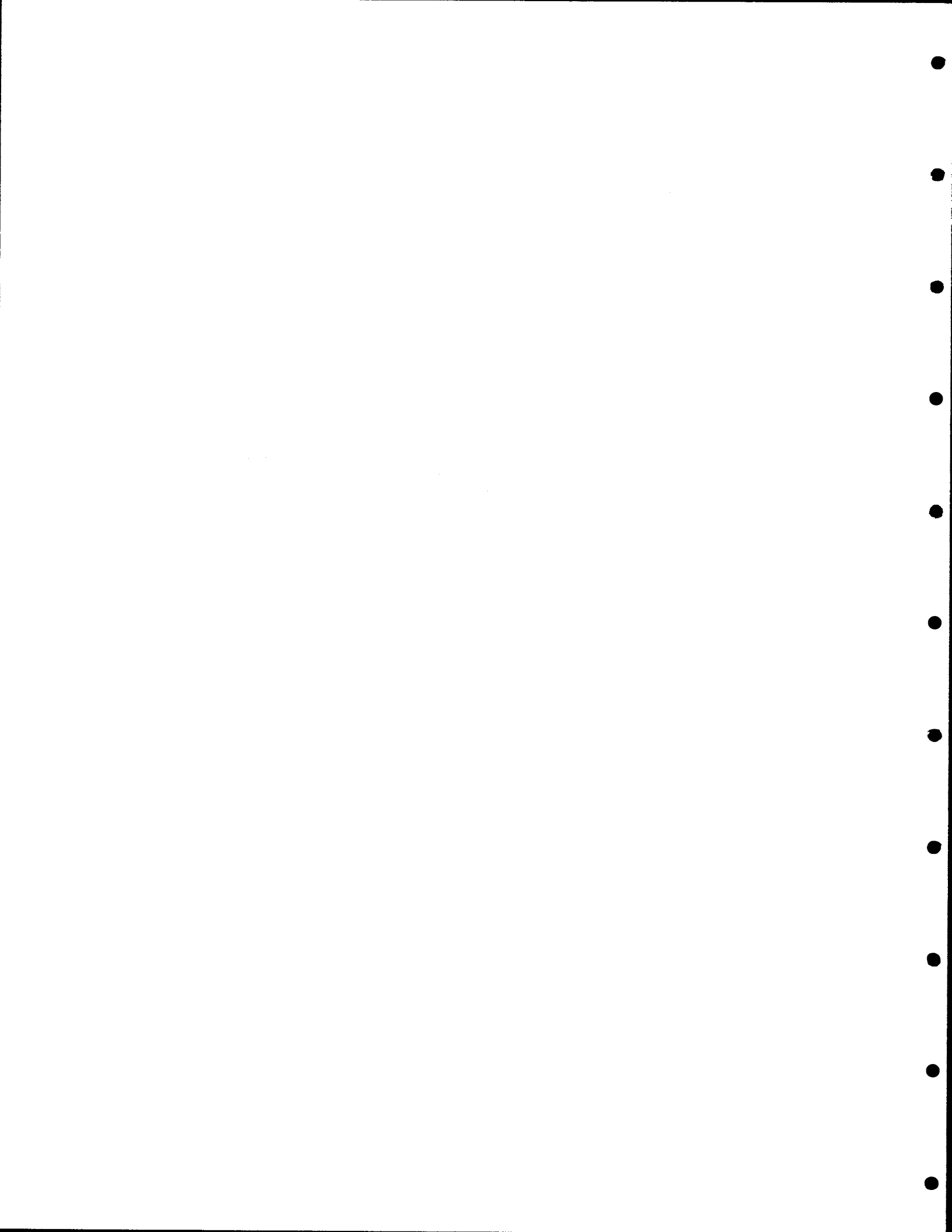
Some reduction in wildlife habitat will result from the periodic vegetation control measures necessary to prevent interference of tall vegetation with line operation and maintenance access. In addition to approximately 1,480 acres (599 ha) of right-of-way which will be controlled by hand or mechanical cutting where only target plants are affected, herbicides will be used to maintain an estimated 16,580 acres (7,113 ha) of transmission line rights-of-way during fiscal year 1980. The extent to which trees and brush on the treated right-of-way will be either killed or defoliated varies according to the treatment technique utilized, such as selective ground spraying or broadcast aerial delivery of herbicides, and the susceptibility of the various vegetative species to the particular herbicide that is used. During fiscal year 1980 all woody species will be defoliated on approximately 3,990 acres (1,614 ha) to be treated by helicopter application of herbicides, with the herbaceous plants, including grasses and forbs, and resistant shrubs remaining. An additional 1,480 acres (599 ha) are scheduled for hand cutting with 13,590 acres (5,499 ha) scheduled for selective ground application of herbicides. However, nontarget vegetation, valuable as wildlife forage, will be minimally affected by these more selective delivery techniques, thereby limiting impacts to wildlife.

Impacts to wildlife habitat associated with the aerial application of herbicides will be similar to those resulting from construction operations, in that they both result in the temporary removal of forage and cover. In areas where either forage or cover may happen to be in short supply, any further reduction in availability could result in increased competition for the remaining habitat resulting in a corresponding increase in the level of stress. Significant increases in stress, especially in conjunction with a limited food supply or availability of cover, could result in an increase in individual animal mortality. However, since BPA's right-of-way management is concerned with the maintenance of existing transmission facilities, new or additional impacts to wildlife habitat and/or mortality rates are not expected to occur.

*Added impact on
endangered species*

B. Impact on Socioeconomic Resources

The improvement, expansion, and maintenance of BPA's transmission facilities provide significant diverse social and economic benefits to the Pacific Northwest and to the entire nation, through the resulting contribution to an abundant, reliable regional power supply. As a member of the cooperative regional power program, BPA



provides approximately 80 percent of the region's bulk power transmission capacity. The regional power program, which is based on close participation and coordination by Federal power-related agencies and the region's utilities, is designed to provide regional power requirements with the minimum investment of resources and the minimum impact on the environment.

The most important single benefit of an adequate, reliable regional power supply is its contribution to a relatively high regional standard of living. Generally speaking, there is a strong positive correlation between per capita energy consumption and per capita income. However, factors other than energy consumption can also be important determinants of per capita income. ^{20/} Because of the Pacific Northwest's greater dependency upon electricity relative to other regions of the country, an adequate supply of electricity is important to various economic sectors which provide employment as well as goods and services for the region's inhabitants.

While the availability and reliability of the power supply does not itself cause residential, commercial, or industrial development, nor the resulting economic growth and population concentration, the lack of electric energy may inhibit these activities. In other words, the role of electricity can be considered permissive in that it allows growth to occur if conditions are otherwise favorable, and limiting in that it imposes a relative ceiling on the level of economic activity which can be conducted.

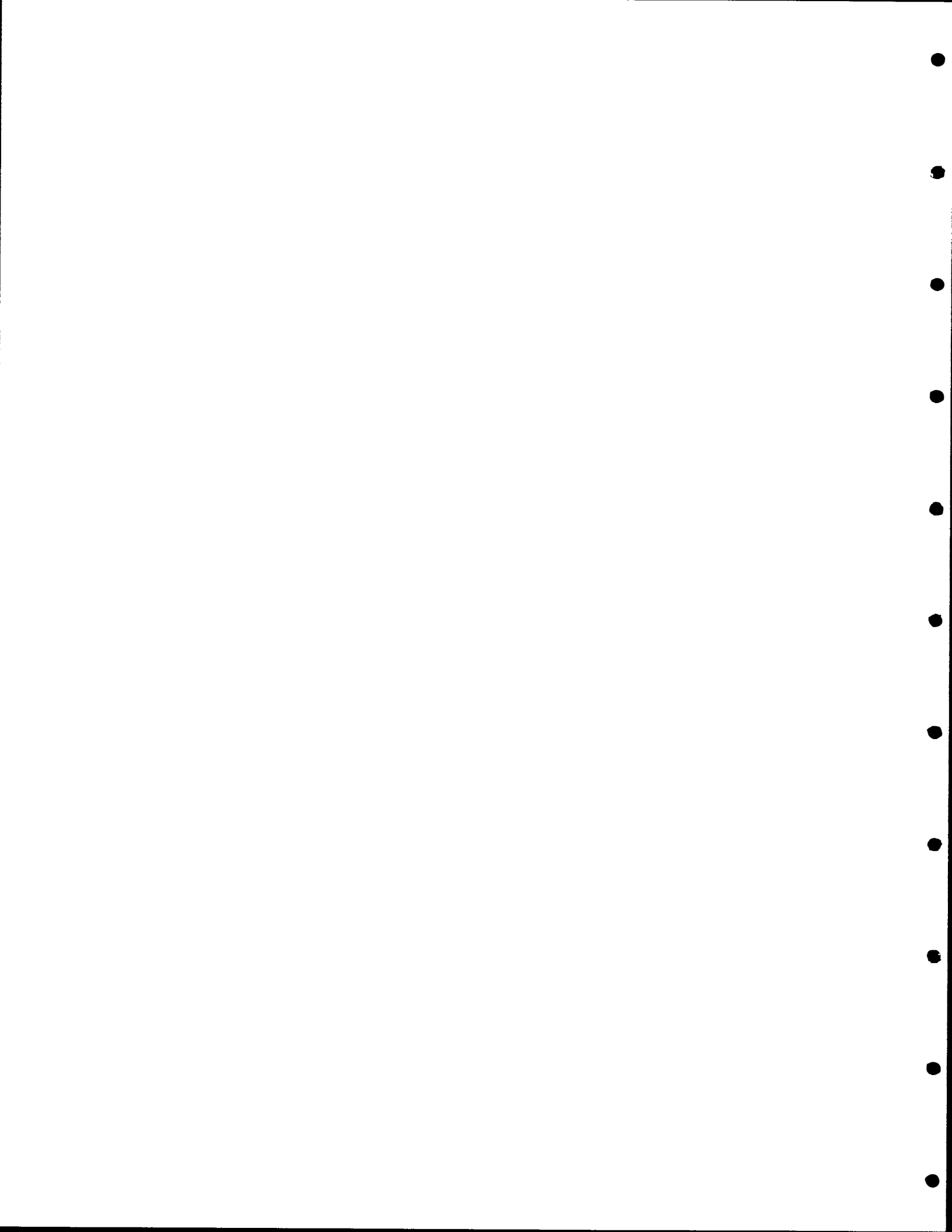
Therefore, depending on a variety of factors other than the availability of reliable electric energy, construction of transmission facilities may eventually be accompanied by various kinds of development and growth. New commercial and industrial construction may occur which will have direct impacts on the environment. This may in turn lead to undesirable impacts on land use, increased solid waste production, increased liquid waste and sewage disposal problems, increased air pollution, and increases in local traffic associated with population concentration in areas of new or improved electric service where industrial or commercial development occurs. In some locations, population concentration and expanded public services could ultimately lead to recreational development in previously undeveloped areas, with attendant environmental impacts.

Impacts resulting from the line construction activities themselves primarily affect the local communities surrounding the construction site, especially since the specialized construction methods used usually makes it necessary for contractors to bring in a labor force from outside the area. The extent of these impacts to the community are

^{20/} Ernst and Ernst, 1976. Energy-Economy Relationships, prepared for Bonneville Power Administration, June 1976.

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determined by the type and size of the construction project and the size of the existing community.

For example, if we examine the construction schedule for two transmission lines, a 10-mile (16 km) segment of a small capacity 115-kV line and a 100-mile (161 km) section of a high-capacity 500-kV line, we find that the former construction time may be as little as 4-1/2 months with a maximum workforce of about 20 men; whereas with the larger project, construction may take as long as 20 months, requiring a peak workforce of as many as 170 workers.

It can be expected that impacts to the surrounding community resulting from construction of the smaller line would be minor and of a short duration. Similar impacts involving the need for housing for the construction workers, increases in road traffic and noise levels, etc., would occur during the construction period for the larger project, but these impacts could potentially affect a larger number of communities for a longer period of time.

Similarly, with the construction of a substation, impacts to adjacent communities would also vary depending upon the construction workforce involved, which could be from 12 to 30, depending upon size and the duration of the construction period. The construction period could vary from less than 2 months to almost 8 months.

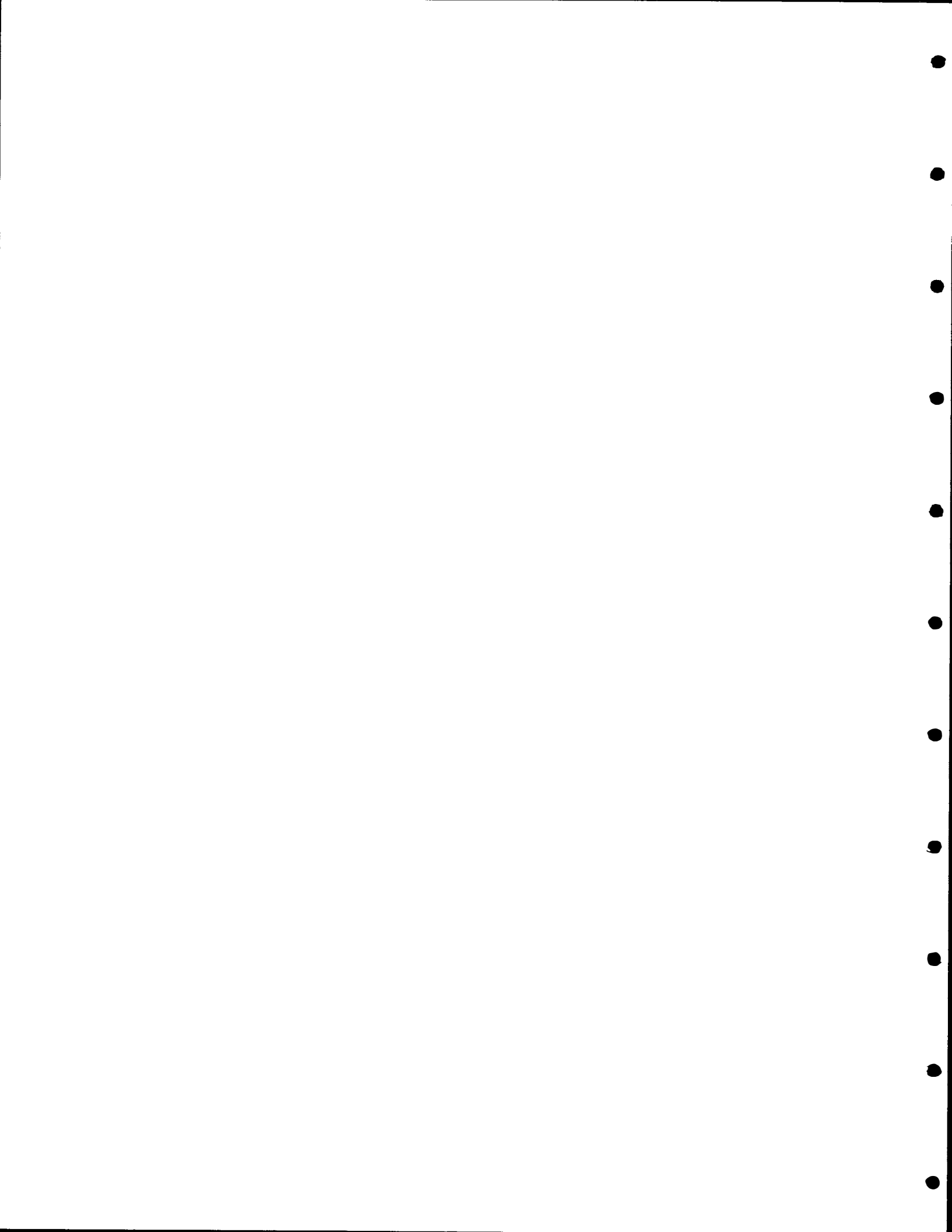
1. Land Use

The transmission lines, substations, switchyards, and related facilities in the proposed program will have an impact on the use of the land they occupy and, to a lesser extent, on adjacent lands. The nature and scope of this impact depends upon the type of facility and the existing and potential uses of the land involved.

Substations - The 4 new substations and associated switchyards included in the proposed program, together with additions at existing substations, will occupy up to approximately 22 acres (9 ha) of land.

This 22 acre (9 ha) figure consists largely of rangeland, and agricultural land.

Since substation sites represent a single-purpose or dominant use, the total of approximately 22 acres (9 ha) involved in the Fiscal Year 1980 Program will be removed from their existing use for the life of the facilities. In addition, some substations, by nature of their location, may serve as a focal point



for future transmission lines and, as such, represent a potential impact greater than that resulting from the substation itself.

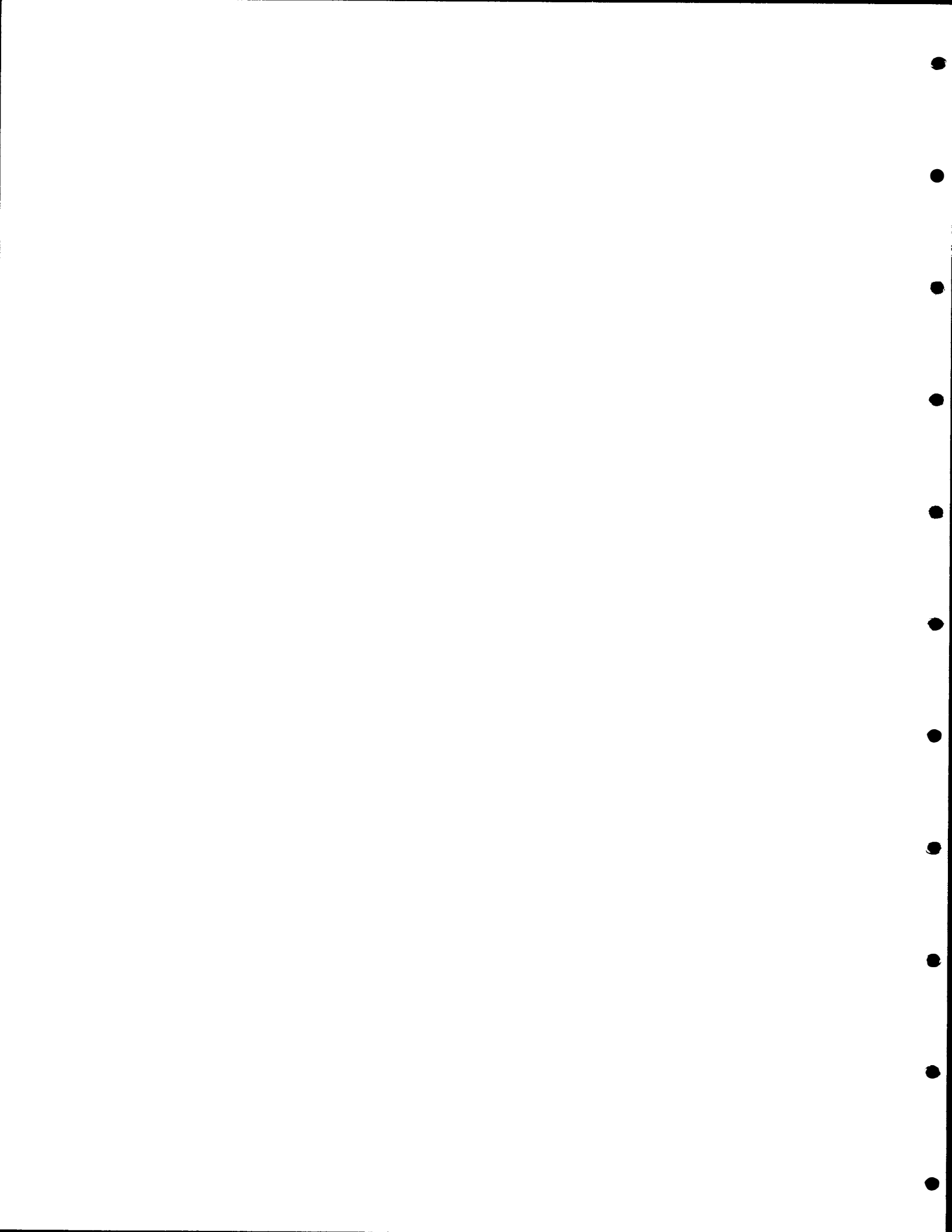
Transmission Lines - Existing land uses that would be affected by typical transmission routes for the fiscal year 1980 new transmission line proposals will depend on the type of land use as described below. For a more detailed breakdown of the impacts to the various land uses and natural resources for the individual facilities, please refer to the attached final facility planning phase EISs.

a. Forest Land

The Fiscal Year 1980 Proposals will require approximately 50 linear miles (80 km) of new and parallel right-of-way through existing forest land, involving approximately 600 acres (243 ha) of right-of-way. Except where the lines span canyons or other areas where vegetation cannot grow tall enough to interfere with the lines overhead, tall-growing trees and brush are removed from the right-of-way to allow for construction, operation, and maintenance of the new transmission facility. Commercially valuable timber is removed and sold, in some cases before the timber has reached maturity. Because much of the new transmission line to be constructed in forested areas would be entirely upon existing easements, the facilities associated with the Fiscal Year 1980 Proposed Program would require the clearing of approximately 450 acres (182 ha) of forest.

After construction is complete, the right-of-way is maintained to prevent regrowth of tall-growing vegetation for the life of the new facility. In addition, timber immediately adjacent to the cleared rights-of-way may also be adversely affected in that it may be subject to an increased chance of wind throw and sun scald.

As discussed in Appendix B of the Role EIS, the rights-of-way involved are sometimes suitable for other economic uses such as cattle range, crop production, and Christmas tree farming. However, they may become idle except for use by certain species of wildlife including the larger herbivores which may benefit from the increase in "edge" caused by the clearing operations.



Where existing access roads in forested areas cannot be used for construction and maintenance, temporary and permanent access roads are built, thereby imposing an additional impact. These roads, which are normally about 14 feet wide, can usually be located within the cleared right-of-way. However, additional access roads are sometimes necessary from the right-of-way to the nearest existing commercial roads to allow access around steep slopes and other natural obstructions on the right-of-way.

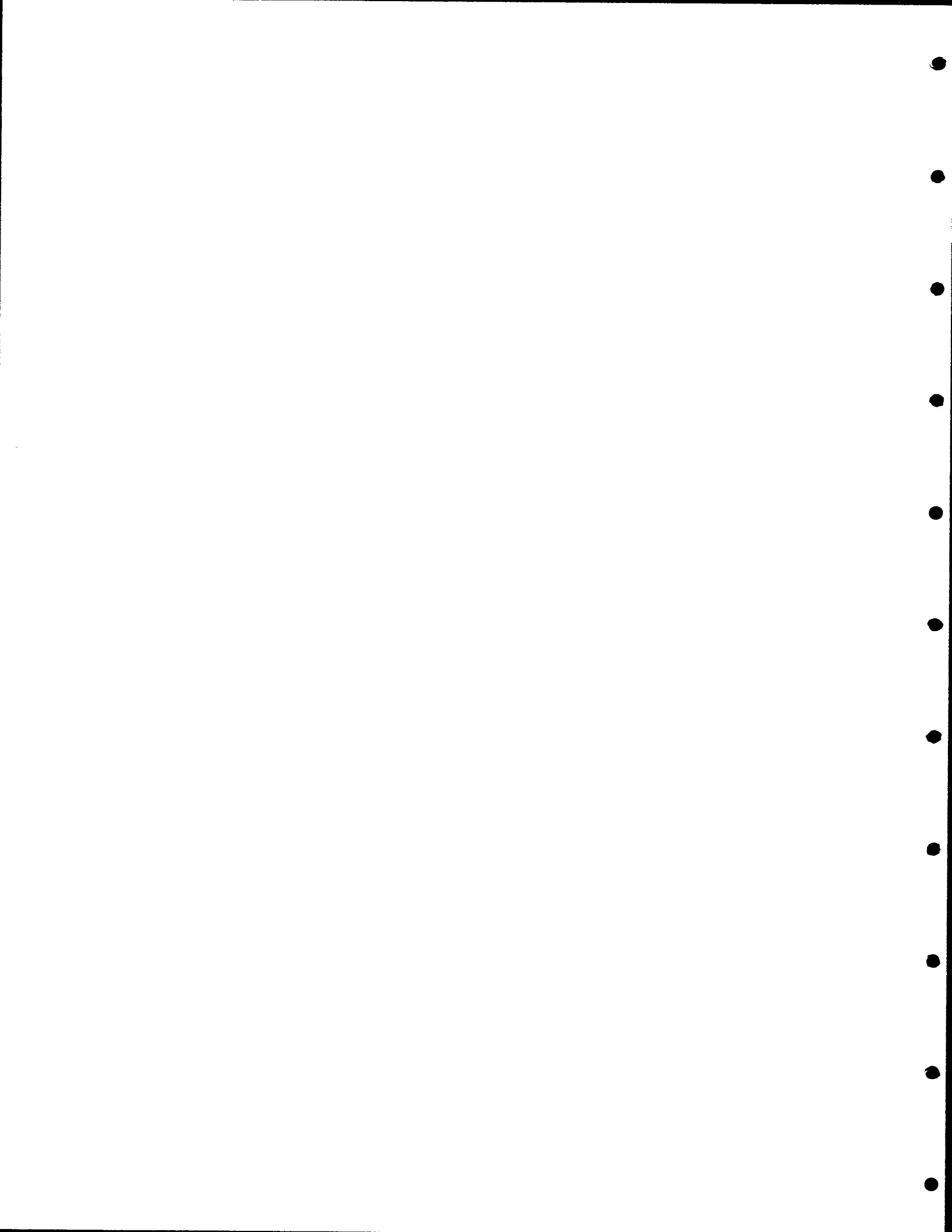
Although, as previously mentioned, a precise figure cannot be given at this time, it is expected that the total acreage requirements for permanent access roads through forest land would be approximately 20 acres.

b. Cropland

Transmission lines for the Fiscal Year 1980 Proposals could cross approximately 40-70 linear miles (64-113 km) of cropland. Impacts to cropland would occur as land occupied by tower bases is removed from production. In addition, decreased crop production may occur in the immediate vicinity of tower sites.

Preliminary design plans for fiscal year 1980 indicate that wood poles could be utilized as support structures over 10 miles (16 km) of the 40-70 mile (64-113 km) total. The remaining 30-60 miles (48-97 km) would employ the use of steel towers.

The total acreage of cropland permanently removed from production for tower footings would be approximately 9-16 acres (3.6-6.5 ha). New substations and substation additions located in cropland could remove as much as 17 acres (6.9 ha) from production. The remainder of the right-of-way would be compatible with crop production, although some adverse impacts such as the overworking of soil, seed loss, over-fertilization, overlapping coverage of weed control chemicals, and harvest losses may occur immediately around the tower. This could result in an additional reduction in crop yield. The extent of any adverse effects adjacent to towers will depend upon the type of

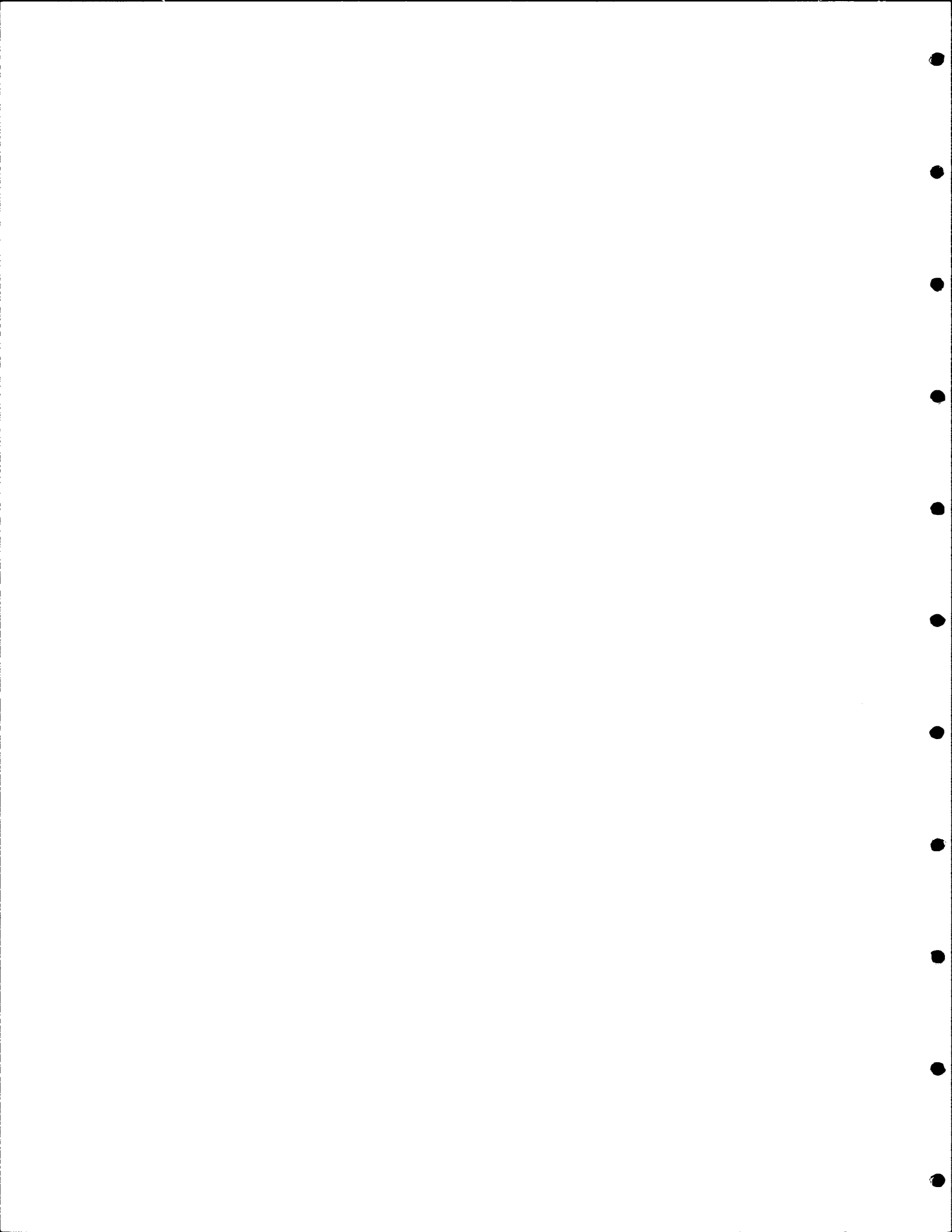


crop grown and the farming practices followed, as well as the kind of equipment used for cultivating, planting, irrigation, pest and disease control, and harvesting. The total amount of cropland to be traversed by new right-of-way easements would be approximately 70 acres (28 ha).

In general, the area of the right-of-way between the towers can continue to be used for crop production. However, where towers or poles are in the path of cultivation, some inconvenience and additional operator time may result, especially where large equipment such as wheat combines are utilized. As a result, operators might choose not to bring new land on the right-of-way under cultivation, although experience indicates that land presently under cultivation will continue to be farmed.

Depending upon their final locations, the facilities proposed as part of the Fiscal Year 1980 Proposed Program may permanently impact approximately 10-17 acres (4-7 ha) of irrigated farmland for substation construction. In addition, approximately 15-30 miles (6-12 ha) miles of transmission line will be rebuilt through irrigated farmland. As this will be primarily a replacement of existing structures and/or line, impact would be temporary. Normally, when lines traverse existing irrigated farmland, tower sites are chosen which minimize conflicts with existing irrigation system(s). In some instances, realignment of the irrigation pattern may be required to obtain maximum use of the remainder of the field. However, opportunities for changes in the irrigation pattern may be limited by the existence of the towers in adjacent land. Towers are not usually located within fields being irrigated by circular sprinkler systems.

The above effects on agricultural land use are long term. There will also be some unavoidable short-term effects as a result of construction access, tower assembly, erection, and stringing of the conductor. A temporary construction access road is often needed. Where the tower erection area is on cultivated land, loss of production from staging areas and access roads



will result if construction is carried on during the crop season. However, construction can usually be completed in one growing season. A small reduction in crop yield in the years following construction may result from the temporary effects of soil compaction and disturbance.

The landowner is compensated on an individual basis for the land occupied by the tower sites, for the right-of-way easement, and for any crop damage that occurs. Actual compensation depends upon the extent and duration of any damage and the type of crop under cultivation.

Since access is usually available along the right-of-way in cropland, permanent access roads in these areas are not normally established.

c. Rangeland

Approximately 4 linear miles (6.4 km) of rangeland vegetation could be crossed in the construction of the Fiscal Year 1980 Proposals depending on final location. Since only that land actually occupied by the tower footings will be removed from production, a total of less than 1 acre (less than .4 ha) of rangeland would be permanently affected by the proposed program. In addition, approximately 6-7 acres (2.4-2.8 ha) of rangeland would be permanently removed due to the construction of a substation.

The remainder of the right-of-way would generally be compatible with range activities, although some clearing of brush and trees may be necessary to provide access for the heavy construction equipment.

Since access roads on rangeland are temporary and are generally seeded or allowed to grow over with natural vegetation after construction, no additional grazing land would be permanently removed from production by these roads.



d. Other

(1) Major Urban and Residential Areas

The only major urban or residential area that may be affected by construction activities in the Fiscal Year 1980 Program are various residences in the vicinity of the study areas for Salem-Albany Area Support (SA 80-1&2).

The presence of transmission lines or substations in such areas could have an impact upon the suitability of adjacent land for future land uses. Adjustments may have to be made in plot layout patterns and residential lot sizes to reflect the presence of the new facilities.

At this time, we are not aware of any existing or proposed Federal, State, or local land use plans which would be affected by the proposed facilities. State and local agencies are being contacted regarding the compatibility of the various facilities included in the Fiscal Year 1980 Program. We will be examining the possibility of conflicts with land use plans in more detail when alternative locations have been identified and the results of these evaluations will be included in the facility location phase EISs when they are issued.

On the basis of preliminary planning data it does not appear that any residences or buildings would need to be removed as a result of the Fiscal Year 1980 Program. Should it later be determined that removal of existing residences is required, procedures specified in the Uniform Relocation and Assistance and Land Acquisitions Policies Act of 1970 will be followed.

(2) Recreation Lands

Because of the scenic and diverse character of the Pacific Northwest and the variety of recreational resources that exist in this region, it is inevitable that some of



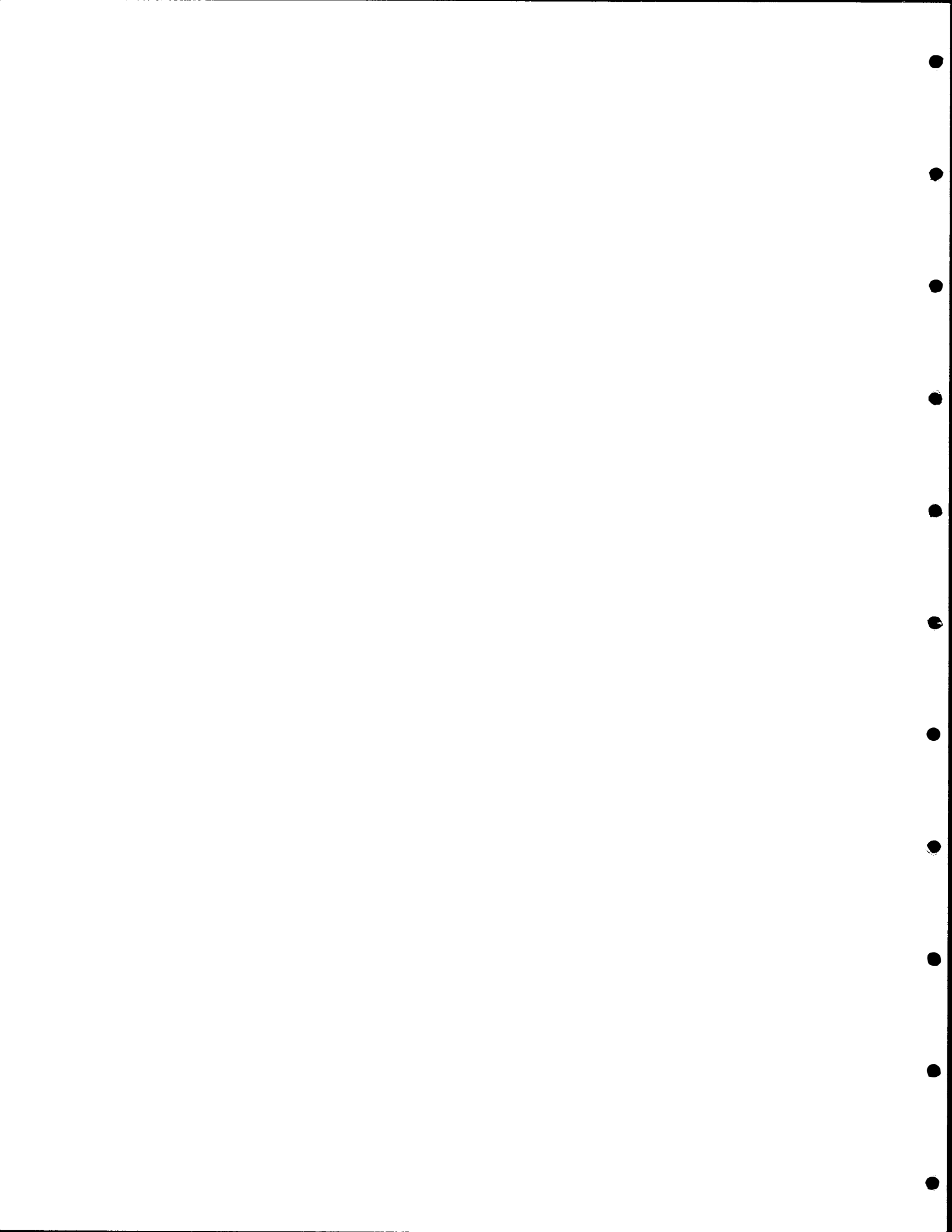
the new facilities proposed in fiscal year 1980 will pass near existing recreational areas. Some of the new proposals will also pass through locations identified as having potential recreation use. In either situation, transmission lines, substations, and power system control stations can be expected to have an adverse visual impact upon the natural scenic character of the area, and since this character is frequently a factor contributing to an area's importance as a recreational resource, any visual impact could potentially affect its recreational value.

Much of the public demand for recreation within the region is centered around scenic lakes, streams, and rivers. Therefore, transmission lines and associated electrical facilities affecting these types of resources would have an impact upon the quality of many recreational uses.

Even though the actual impact of the proposed new facilities on recreational resources will ultimately depend upon the final transmission line location or crossing, it can be assumed that the transmission lines, tower structures, and associated clearings would be visible to recreationists using these resources. Depending upon the degree to which structures will intrude upon the scenic attributes of these areas, the quality of the recreational experience otherwise available would be reduced.

Transmission line rights-of-way and their associated access roads are often used for various types of recreational activities such as bicycle trails, horse trails, snowmobile routes, and off-road vehicle access. Since transmission line rights-of-way are held in easement by BPA, rather than fee-ownership, recreational use depends upon the landowner or land managing agency in question.

Use of transmission line rights-of-way by snowmobiles and off-road vehicles can and



has resulted in detrimental effects, including increased erosion, wildlife disturbance, increased fire hazards, and streambed disturbance. BPA cooperates with landowners and land managing agencies in preventing unauthorized use of rights-of-way and access roads by installing gates and locks. Pursuant to Executive Order 11989, BPA will cooperate with Federal land management agencies whenever the latter determines that the use of off-road vehicles in particular areas must be controlled or prohibited in order to prevent additional adverse effects.

PARS II

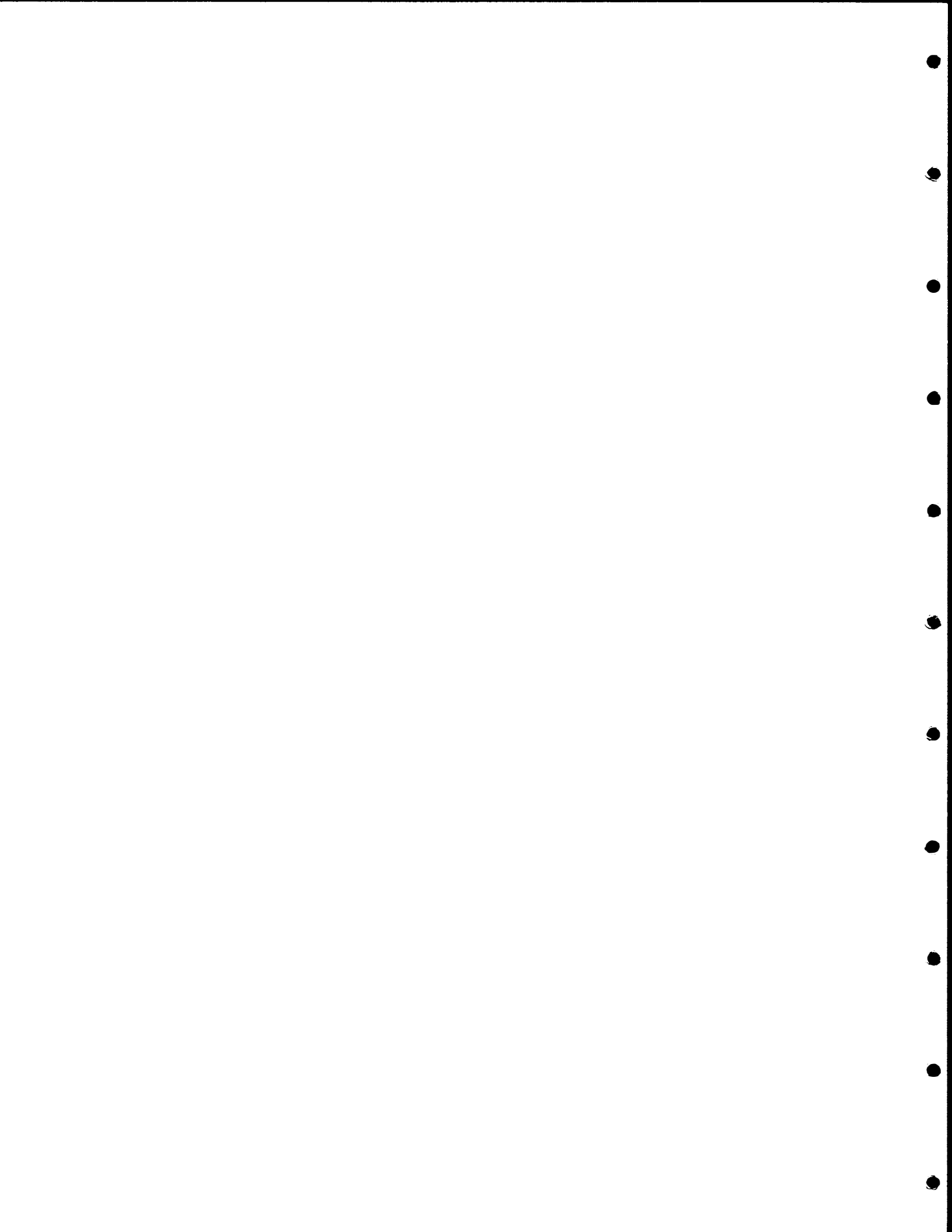
(3) Scenic Resources

Substations, transmission lines, and associated access roads that are part of the Fiscal Year 1980 Program Proposal represent a potential impact on the natural beauty of the scenic areas they traverse.

A few of the facility proposals could affect certain scenic resources that exist within their respective study areas. In such situations visual impacts result from the clearing of right-of-way which, in addition to disrupting the existing vegetative pattern, can result in undesirable visual effects such as "skylining" where transmission towers are set in relief, making them visible for long distances.

Each of the resources mentioned above will be affected to varying degrees depending upon site location and any mitigation measures that would normally be employed as part of the facilities' design.

Guidelines relative to various screening and design measures have been established and are applied wherever appropriate (see Chapter VIII.B.2. of Appendix B of the Role EIS, and Environmental Criteria for Electric Transmission Systems published by USDI/USDA).



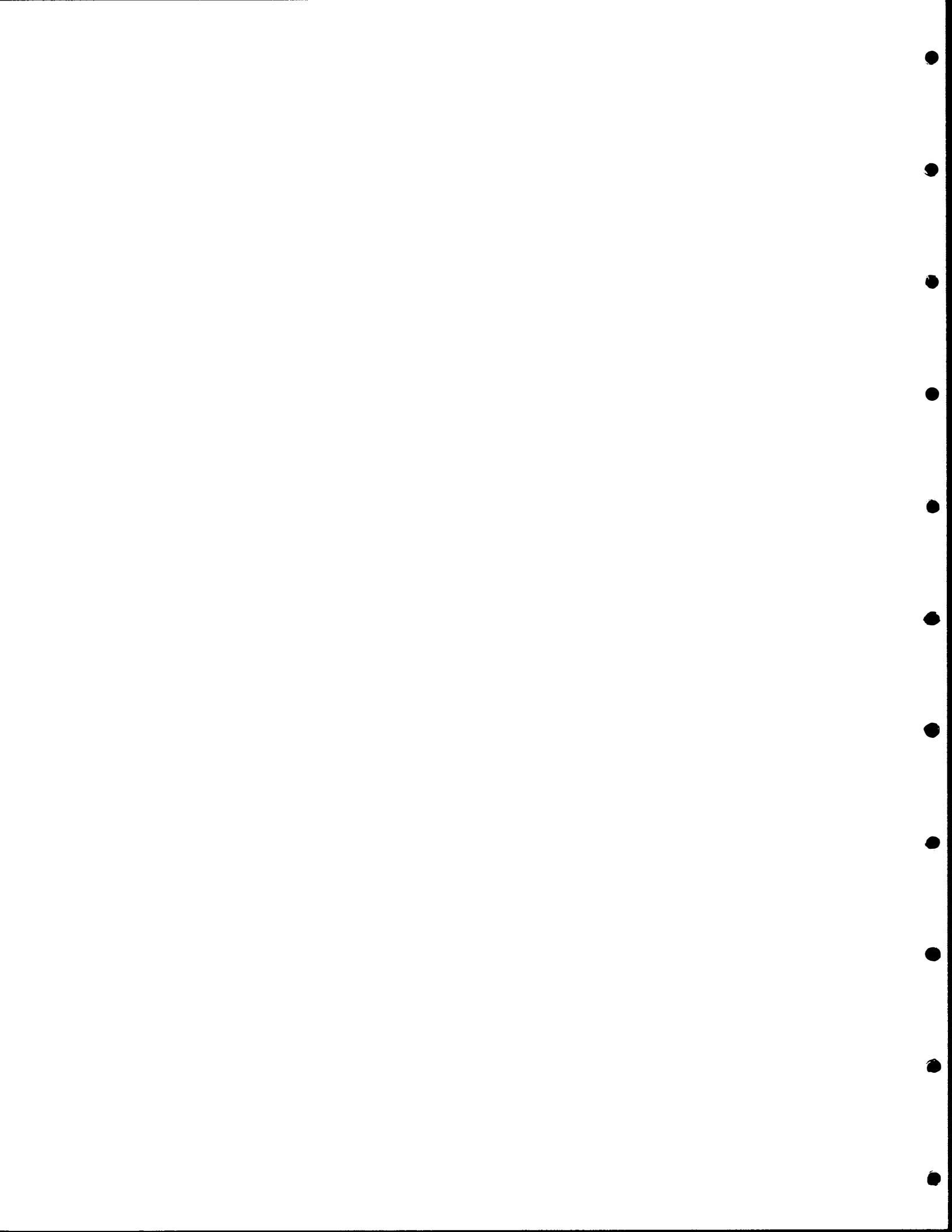
(4) Cultural Resources (Historical, Architectural, and Archeological)

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An examination of the National Register of Historic Places (including lists published in the Federal Register, Vol. 43, No. 26, on February 7, 1978, and in subsequent monthly addenda) has revealed that, with the possibility of very minor short-term visual effects on National Register properties in the vicinities of Sandpoint, Rathdrum, Booners Ferry, and Murray, Idaho (see Final Facility Planning Phase EIS for Libby Integration, p 49), no sites listed in or eligible for nomination to the National Register will be affected by the various facilities included in the Fiscal Year 1980 Proposed Program.

In addition to examining the National Register and contacting State Historic Preservation Officers, BPA is soliciting comments from local and/or regional historical and archeological authorities relative to the completeness and accuracy of BPA's analysis of these resources. Comments and information obtained as a result of these consultations will be included in the final facility planning phase EIS. Of course, the extent to which any cultural resource could be impacted depends upon final line or facility locations, which have not yet been determined. If, during the location and design phase, it appears that a historical or archeological site listed in or eligible for nomination to the National Register could be affected by any of the fiscal year 1980 proposals, BPA will comply with the procedures required by the National Historic Preservation Act of 1966 (P.L. 89-665) as well as the requirements of Executive Order 11593, as outlined in Section XII (Historical and Archeological Appendix).

In compliance with the Wild and Scenic Rivers Act (P.L. 90-542) and the National Trail Systems Act (P.L. 90-543) BPA has examined all known sections of rivers and trails belonging to the national system as



they apply to the Fiscal Year 1980 Proposed Program and has determined that there will not be a potential impact to any such resource.

In order to further assure compliance with each of these two Acts, BPA will forward copies of draft location phase EISs on its Fiscal Year 1980 Proposed Program to both the Bureau of Land Management and the Heritage Conservation and Recreation Service for their review and comment.

(5) Natural Landmarks

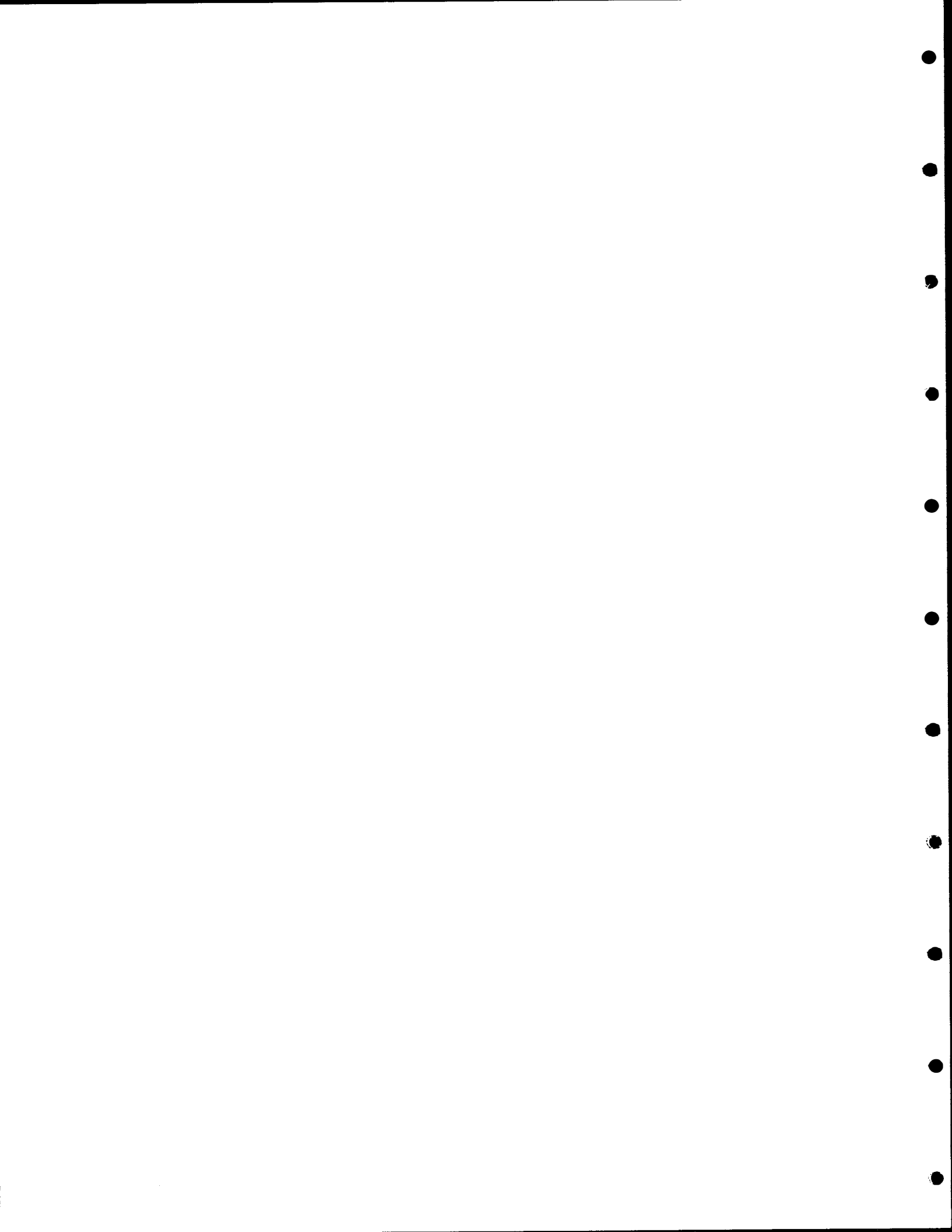
As outlined in the Federal Register (F.R. Vol. 40, No. 87, May 5, 1975), the National Park Service has established a natural areas program which includes those sites identified in the National Register of Natural Landmarks. No listed sites will be affected by the Fiscal Year 1980 Proposed Program in either that listing nor supplementary addenda as of January 1977 (F.R. Vol. 42, No. 2, January 4, 1977).

C. Impacts on Physical Environment

1. Air Quality

As previously mentioned, the Fiscal Year 1980 Proposed Program would involve clearing activities on some forest lands. Unmerchantable trees and brush cleared from this acreage during construction and maintenance operations will be disposed of. Historically, open burning has been regarded as the standard method of disposal for this type of debris. Where permissible by local regulations and State and Federal law, BPA will allow contractors to continue to use open burning during the construction of those facilities included in the Fiscal Year 1980 Program. This burning will result in the introduction of combustion byproducts, including particulates and gasses, into the atmosphere. (See Section IX.B.6. of this statement for additional information.)

With increasing frequency, county and State air pollution control regulations are requiring improved disposal methods, such as forced-air burning which, although effective in reducing particulate emissions, involves considerable expense. In disposing of slash and unmerchantable timber cleared from forested land during fiscal year 1980, BPA's contractors will consult with the State



and local authorities regarding permissible techniques and will follow all applicable regulations governing burning methods and times permissible.

Since new substations and maintenance buildings constructed as part of the Fiscal Year 1980 Proposed Program will be heated and cooled electrically, there will be no air emissions from these sources.

2. Water Quality

The Fiscal Year 1980 Program may require the fording of numerous small or intermittent streams or waterways.

The disturbance of topsoil and removal of vegetative ground cover associated with these construction and maintenance operations will result in an increase in erosion and subsequent introduction of suspended solids, including organic debris and nutrients, into the aquatic environment. These effects will result in short to moderate term increases in turbidity, increased growth of undesirable aquatic vegetation, and reduction in the dissolved oxygen concentration of the water, rendering the aquatic habitat less suitable for fish life during this period. The fording of smaller streams will result in similar effects as well as cause a physical disturbance of the streambed.

The removal of vegetative cover along riverbanks can increase the exposure of the water surface to sunlight which would result in a localized increase in water temperature. ^{21/} Increase in water temperature can result in a decreased level of dissolved oxygen. Since transmission lines are usually constructed perpendicular to major waterways and since vegetative "buffer strips" are normally left intact, impacts associated with the clearing of streamside vegetation will be negligible.

3. Noise

Operation of high-voltage transmission lines, particularly those above 345 kV, results in some radio, television, and audible noise interference immediately adjacent to the right-of-way. As previously mentioned no 500-kV lines are included in the Fiscal Year 1980 Program. Notwithstanding the absence of such lines in the Fiscal Year 1980 Program, the audible noise level of a 500 kV line incorporating BPA's new triple-bundle conductors measured at the edge of the right-of-way averages 47 decibels (equivalent to the noise of light highway traffic at 100 feet). The major impact to local residents resulting

^{21/} Brown, George W., & James T. Krygier, 1967. Changing Water Temperatures in Small Mountain Streams, J. Soil Water Conserv. 22(6): 242-244.



from the operational noise of these transmission lines is annoyance. Reactions to this impact vary depending upon the actual level of noise, distance from the line, and individual or subjective sensitivities. 22/

Noise from substations consists primarily of a low-level hum from transformer equipment and corona noise associated with the incoming lines. Impacts from these sources will be similar to those resulting from operation of transmission lines. Automatic circuit breakers in substations, which are activated during circuit failures and in switching operations, can produce a noise pulse of up to 100 decibels. Substations included in the Fiscal Year 1980 Program are not expected to be located close enough to any existing private residences to cause adverse noise impacts.

Pursuant to the Noise Control Act of 1972, State governments have developed and implemented noise control regulations. It is the intent of the Noise Control Act and Executive Order 12088 that Federal agencies comply with substantive state and local noise standards and limitations.

Realizing its obligations, Bonneville contracted the services of a consultant, Bolt, ~~Brannick~~^{Baranek} and Newman, to determine the status of BPA facilities in terms of their compliance with noise standards within the State of Oregon. As a result of this survey, it was determined that there existed at least 4 BPA substation facilities in Oregon that did not comply with the State's standards. Those identified were:

1. McLoughlin Substation located in Oregon City, Clackamas County.
2. Alvey Substation located in Eugene, Lane County.
3. Gold Beach Substation located in Gold Beach, Curry County.
4. Keeler Substation located in Portland, Washington County.

The Gold Beach and Keeler Substations exceed Oregon State standards by 2dB with the Alvey Substation exceeding state standards by 4dB. These are considered to be very minor violations and no remedial action is planned at this time.

However, the violation at McLoughlin Substation was felt to be substantially above the levels established by the State of Oregon. In order to reduce the level of noise emissions, acoustical barriers were constructed on the west, south, and east sides of the existing 500 kV, 900 MVA transformer bank. These barriers were completed on June 1, 1978, and are expected to achieve an immediate



reduction of 10dB in the adjacent area currently occupied by residences. The cost of this mitigation measure is \$150,000. Although the construction of these barriers substantially minimizes the violation, it will not bring the substation into full compliance with the standards established by the State of Oregon.

An additional proposed mitigation measure intended to achieve additional noise reductions involves the replacement of the existing transformer bank with a 500 kV 1,600 MVA bank. Sound level requirements will be achieved by a combination of low sound level transformers and external sound attenuation. This transformer replacement is included in the Fiscal Year 1980 Proposed Program, and has an estimated total cost of \$4.9 million.

Numerous discussions have taken place between BPA, EPA, and the Oregon Department of Environmental Quality with respect to noise standards. Specifically, these discussions have concerned the desirability and feasibility of requiring BPA to adhere to local standards which differ widely from state to state. The problem here, from BPA's point of view, is the practicality of building electrical facilities to different noise standards depending upon the state involved. An alternative, which Bonneville is suggesting, is the adoption of uniform standards that can be applied throughout the whole region.

Another source of noise expected to occur in conjunction with the Fiscal Year 1980 Program arises from the use of helicopters in patrolling transmission lines, in the aerial application of herbicides, and sometimes in tower construction. Other sources of noise emission are the use of heavy construction equipment and occasional blasting during construction operations. Noise levels resulting from these operations, which are described in Appendix B of the Role EIS (Chapter VII.C.1.), will temporarily disturb nearby residents.

D. Risk of Accidents and Hazards Effects

Transmission line failures resulting from an energized conductor falling to the ground can occur as a result of intentional vandalism, such as rifle fire, or as the result of natural calamities such as severe storms and landslides. In either case, when a line drops to the earth, it is usually switched off in less than $\frac{1}{2}$ of a second. For this duration, a voltage would appear in the vicinity of the tower involved, resulting in a localized hazard.



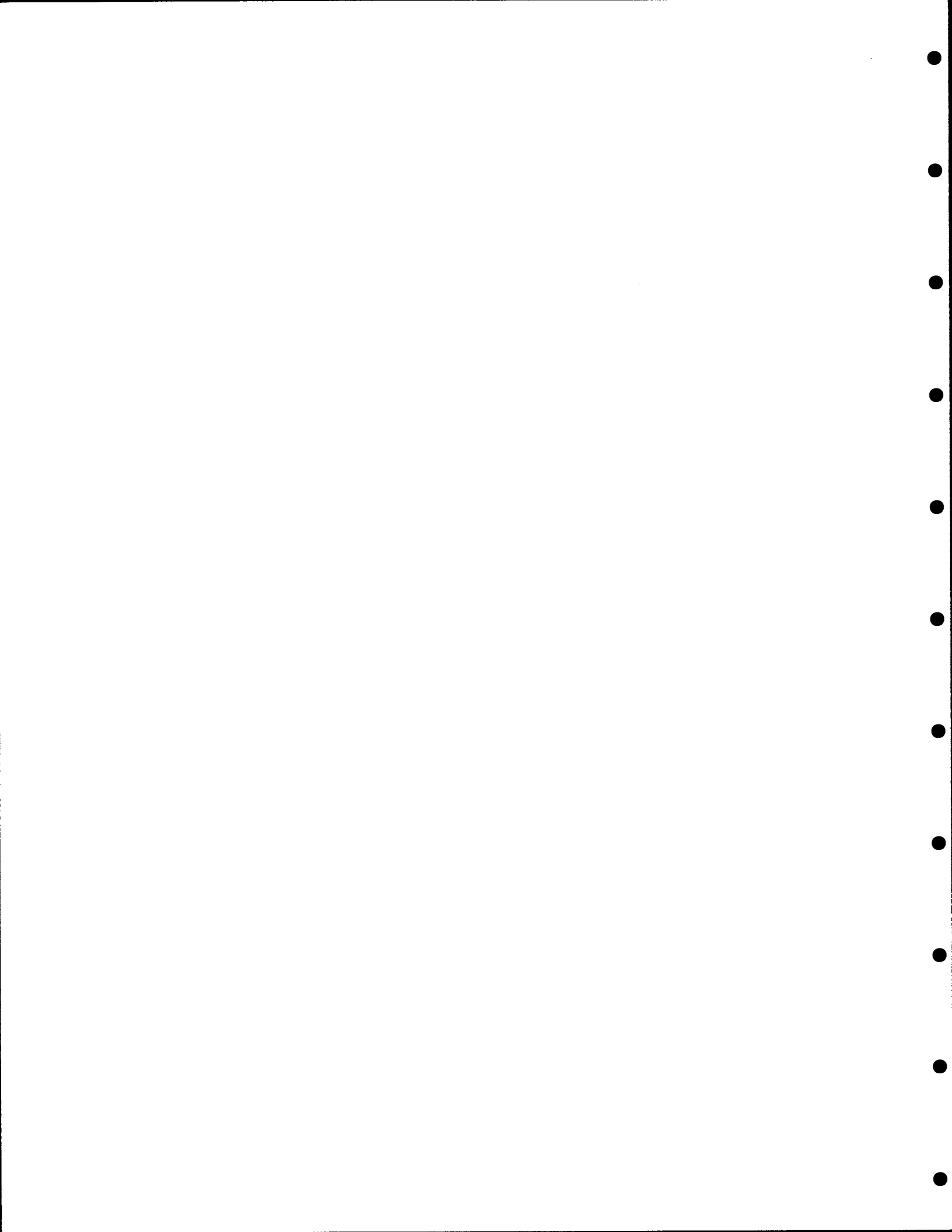
All electric transmission lines, including approximately 183-218 miles (295-351 km) of overhead transmission line proposed for fiscal year 1980 pose an inherent hazard if objects such as irrigation pipe or construction booms are brought in contact with the conductor. Because conductor height from the ground increases with voltage, the probability of such accidents is much smaller with the higher voltage lines of the type built by BPA. However, construction of any transmission line across agricultural land does create a hazard, and farm operators must observe basic precautions in their activities underneath and immediately adjacent to the lines. In an effort to minimize the possibility of accidents, BPA has published a brochure entitled "Tips on How to Behave Near High-Voltage Power Lines." ^{23/} As is demonstrated by the frequent occurrence of farming underneath existing BPA lines, these rules should pose no additional hindrance to use of agricultural land occupied by the new facilities constructed as part of the Fiscal Year 1980 Program.

Accidents associated with the maintenance of existing transmission lines are always a possibility. The greatest risk is of the misapplication of herbicides as the result of human error. Additional impacts could occur from the inadvertent application or drift of herbicides off of the right-of-way affecting nontarget vegetation.

One of the principal chemicals used by BPA to control vegetation on rights-of-way is Tordon (picloram and 2,4-D). This is one of the approved herbicides which will effectively control coniferous species, particularly when applied aerially. The effectiveness of Tordon is attributed to the relative persistence of its main ingredient, picloram, which is slow acting and continues to be absorbed by vegetation for 1 to 2 years after application. Although Tordon is slow acting and consequently reduces the brownout effect it is classified as persistent, and does, therefore, represent a potential for long-term nonselective setback of vegetation on the rights-of-way where it is used.

Monitoring studies, including soil sample analyses on treated rights-of-way, have indicated that Tordon remains in the uppermost layers of the soil where it is degraded through natural processes. Other tests indicate that there is no significant movement of the herbicide off the right-of-way through water runoff. (Copies of test reports are available by request by writing to BPA at the address indicated on the Summary Page to this document. A continuation report covering BPA's herbicide monitoring

^{23/} Bonneville Power Administration. Nov. 1973. Tips on How to Behave Near High-Voltage Power Lines.



program for the period August 2, 1975, through October 15, 1976, is included as part of the Vegetation Management Appendix to this statement.)

The herbicides used by BPA are very low in toxicity to animals and humans. Because these herbicides are used in diluted form, potential hazards are further minimized. Studies have indicated that 2,4-D and picloram are readily excreted by animals and no accumulation in the food chain will result. 24/ 25/

*added page
have a note*

The electrostatic and electromagnetic fields associated with the high-voltage lines proposed as part of the Fiscal Year 1980 Program can induce voltage and currents in metallic structures and equipment near the line. The magnitude of the induced voltage and associated ground-discharge current due to the electrostatic field depends upon the line voltage, the size of the object being charged, and the object's distance from the line conductors. The magnitude of induced current due to the electromagnetic field depends upon the load current in the conductors, the orientation and length of the object, and its distance from the conductors. Procedures for grounding metal structures and equipment along with other precautions used by BPA substantially eliminate the potential hazard and nuisance associated with this phenomenon.

E. Flood Hazards

BPA has reviewed the new facilities in the Fiscal Year 1980 Program with respect to floodplain management. At least two of the proposed new facilities associated with the Fiscal Year 1980 Program would involve some construction within 100 year floodplains. The Salem-Albany Area Support proposal (SA 80-1&2) is one of these. A detailed planning level analysis of this project is contained in the Facility Evaluation Appendix attached to this volume. Once alternative and proposed facility locations are determined subsequent to reconnaissance, possible impacts to and within floodplains resulting from the proposed facilities for Salem-Albany Area Support can be more readily evaluated. Another proposal included in the Fiscal Year 1980 Program, which has not been made the subject of a facility planning supplement because of its minimal impact (Kalispell Area Support), will have some minor temporary impact to and within a 100 year floodplain. Generally speaking, transmission facilities are not

24/ Montgomery, Marvin L., 1968. Physical and Chemical properties of Herbicides; paper presented at Oregon State University Forestry Symposium, OSU Press, 1968.

25/ Norris, Logan A., 1971, Chemical Brush Control: Assessing the Hazard, Journal of Forestry, Vol. 69, No. 10.



located within floodplains in order to avoid the possibility of flood damage. Facilities that must necessarily be constructed in flood plains would be provided maximum flood protection.

Pursuant to Executive Order 11988, BPA will evaluate the potential effects of any actions it may undertake in a floodplain. Unless there is no practicable alternative, actions undertaken within floodplains will be avoided. In the event that the siting of a facility within a floodplain proves unavoidable, the action will be modified and designed so as to minimize potential harm to or within the floodplain.

new stuff -



V. Mitigating Measures Included in the Fiscal Year 1979 Program

Measures specifically employed to lessen the potential adverse impacts of transmission lines are of two basic types: (1) those measures that are incorporated into the location or design of a transmission facility, and (2) those which are utilized subsequent to the construction of the facility. Both types will be utilized during the development of the Fiscal Year 1980 Proposals and during the maintenance operations scheduled for fiscal year 1980.

A. Construction

A description of the standard mitigation measures that are routinely used during construction operations to lessen the previously identified impacts to the natural, cultural, and socioeconomic resources can be found in Appendix B of the Role EIS (chapter VIII). In addition to Appendix B, the publication entitled "Environmental Criteria for Electric Transmission Systems" jointly published by the Departments of Agriculture and Interior summarizes the measures normally used to lessen visual impacts of transmission lines. This latter document is intended to serve primarily as a guideline in the development of mitigation measures that are broadly applicable to transmission facilities in general. Not all the criteria discussed in this document would have applicability to the specific proposals contained in the Fiscal Year 1980 Proposed Program, but every consideration will be given to incorporate these measures into the ultimate design of the Fiscal Year 1979 Proposals where feasible.

In developing a detailed plan of service for the new facilities, two key mitigation measures that will receive consideration are the paralleling of existing transmission lines and the upgrading of lower voltage lines to higher capacities.

1. Paralleling

Preliminary planning indicates that approximately 20 miles (32 km) of new transmission line right-of-way required for the Fiscal Year 1980 new facilities could be located parallel to existing transmission right-of-way.

Where new rights-of-way must be utilized, careful consideration will be given to compatibility of the new right-of-way with current and potential future uses of the land. Special consideration will be given to the actual line location in order to avoid direct physical impacts to significant regional resources.



2. Upgrading of Existing Lines

Historically, Bonneville has adopted technological advancements in electrical transmission which increases the efficiency of its transmission system. With projected peakloads estimated to more than double within the next 20 years (assuming a 4.4 percent annual increase in peak demand as shown in the most recent PNUCC forecast for the West Group Area) ^{26/} substantial amounts of additional right-of-way will be required to provide adequate service. Realizing this, BPA is making every effort practicable to minimize additional right-of-way that would otherwise be required by replacing existing lower voltage transmission lines with lines of higher capacity.

Consistent with this policy, the upgrading or replacing of existing low-voltage lines will be a primary consideration for the various facilities included in the Fiscal Year 1980 Proposed Program. The Fiscal Year 1980 Proposed Program involves the replacement of approximately 106-112 miles (170-180 km) of transmission line with new transmission line of higher capacity using essentially the same right-of-way. Also included in the Fiscal Year 1980 Proposed Program is the reconductoring of approximately 11-52 miles (18-84 km) of transmission line conductors with conductor cable of higher capacity.

Research by BPA on 1200-kV transmission (see BPA's FY 1975 Environmental Statement) indicates that electricity may be transmitted at a much higher capacity than possible with 500-kV. This technology could substantially reduce the amount of land dedicated to new rights-of-way. Ongoing research on UHV technology sponsored by BPA also includes investigations into short and long-term biological and physical effects of electro-magnetic fields. (See Appendix B., Chapter VII of BPA's Draft Role EIS.)

3. Other

Specific mitigation measures to be employed during the construction operations of major Fiscal Year 1980 Proposals will be covered in facility location phase EISs once a proposed route has been selected. Appendix B of the Role EIS does contain a description of those mitigating measures that are generally used in construction operations.

B. Maintenance

Mitigation measures that will be employed during the proposed maintenance activities are primarily those concerned with the use of herbicides in BPA's program of vegetation management. In order to improve right-of-way appearance and decrease the

^{26/} PNUCC, 1978, Long Range Projection of Power Loads and Resources for thermal Planning, 1978-79 through 1997-98, April 1978.



impact on adjacent lands, BPA has (1) reduced the use of herbicides, resulting in a decreased reliance upon aerial spraying and an increase in more selective spraying techniques, (2) emphasized development of compatible and mutually beneficial uses of the right-of-way by landowners, (3) improved access road design and maintenance practices, and (4) developed and implemented a tree removal program which has been effective in reducing adverse effects associated with maintenance clearing operations, by permitting certain stable 27/ trees to remain adjacent to the right-of-way.

Alternative methods of vegetation control are discussed in pages 46-47 of this volume. Basically, the alternatives to aerial broadcast application consist of selective ground application and hand cutting. While these methods do result in a net reduction in the total amount of herbicides introduced into the environment, this can be offset by their increased dependency on access and commensurate increases in impacts resulting from the construction of needed access roads. Alternative methods of vegetation control are discussed more thoroughly in Chapter X.E. of Appendix B of the "Role EIS."

In those cases where it is determined that aerial application of herbicides is appropriate, special measures, including the use of thickeners in the spray mixture, limiting application operations to the early morning hours when the air is still, and termination of aerial application when wind speed exceeds 6 miles per hour will be followed. These measures will afford an increased control over the dispersion of the herbicidal compounds. In addition, no herbicidal compound will be aerially applied within 100 feet (30 meters) of a stream, river, or lake.

In conjunction with an ongoing program initiated in July 1970, Bonneville is utilizing the services of a consultant to monitor and investigate herbicide residues in soil, water, and vegetation resulting from chemical brush control activities. 28/

Water samples taken in the course of the herbicide residue monitoring program have shown the presence of herbicides at

27/ Any stable tree outside of the immediate right-of-way which does not come closer than the minimum safe working distance from the outside conductor when displaced to its maximum design swing is allowed to remain. Unstable trees which, when falling, would strike the outside conductor when in a static condition are removed. Unstable trees include decayed, insect-infested, leaners, and burn-damaged trees.

28/ Norris, Logan A., Herbicide Residues in Soil and Water from Bonneville Power Administration Transmission Line Rights-of-Way. Reports of 8-24-71, 5-19-72, 2-14-73, 5-9-74, 8-25-75, and 11-17-76.



very low levels. The observed levels diminish rapidly with the passage of time until they approach minimum levels of detection. These observations are consistent with other studies on forest lands, and they show the effectiveness of retaining buffer strips adjacent to bodies of water and other mitigation measures such as those mentioned above.

Transmission line structures in certain parts of BPA's service area provide ideal nesting places for large birds of prey. When nests are built directly over an insulator string, there is a danger that bird excrement deposited on or close to the insulators could result in a flashover and subsequent line outage. Another cause of line outage is that long pieces of debris used by the birds in building a nest can drop and make contact with the conductor.

In the past, nests were completely removed from structures. Recently, however, BPA has adopted a policy of not destroying nests. Nests are left intact unless they are located directly over an insulator string. When nests are situated directly over a string of insulators, maintenance personnel are instructed to move the nest intact to a distance midway between phases on single circuit structures, or toward the center of the tower on double circuit structures. Experience has shown that birds will remain in relocated nests and will not build a new nest at the previous location.

All rights-of-way to be aerielly sprayed with herbicides are preflown by the contractor with a BPA inspector prior to application to identify areas not to be sprayed (i.e., residences, watercourses, recreation areas, rangeland). This is done so that people and livestock are not inadvertently exposed.

When herbicides are to be used that contain label restrictions on grazing of meat and dairy animals in treated areas, BPA contacts and owner/occupants of the areas to be treated. Every owner or occupant in areas where evidence of grazing exists is personally notified of any pending application of herbicides with grazing restrictions. This is accomplished by having BPA personnel contact owner/occupants personally. Once personal contact has been made a completed and signed "door hanger" notice is left as a reminder. When personal contact cannot be made a completed "door hanger" notice is left at the residence, attached to the door. If after a week no response is received, an additional effort is made to contact the owner/occupant.

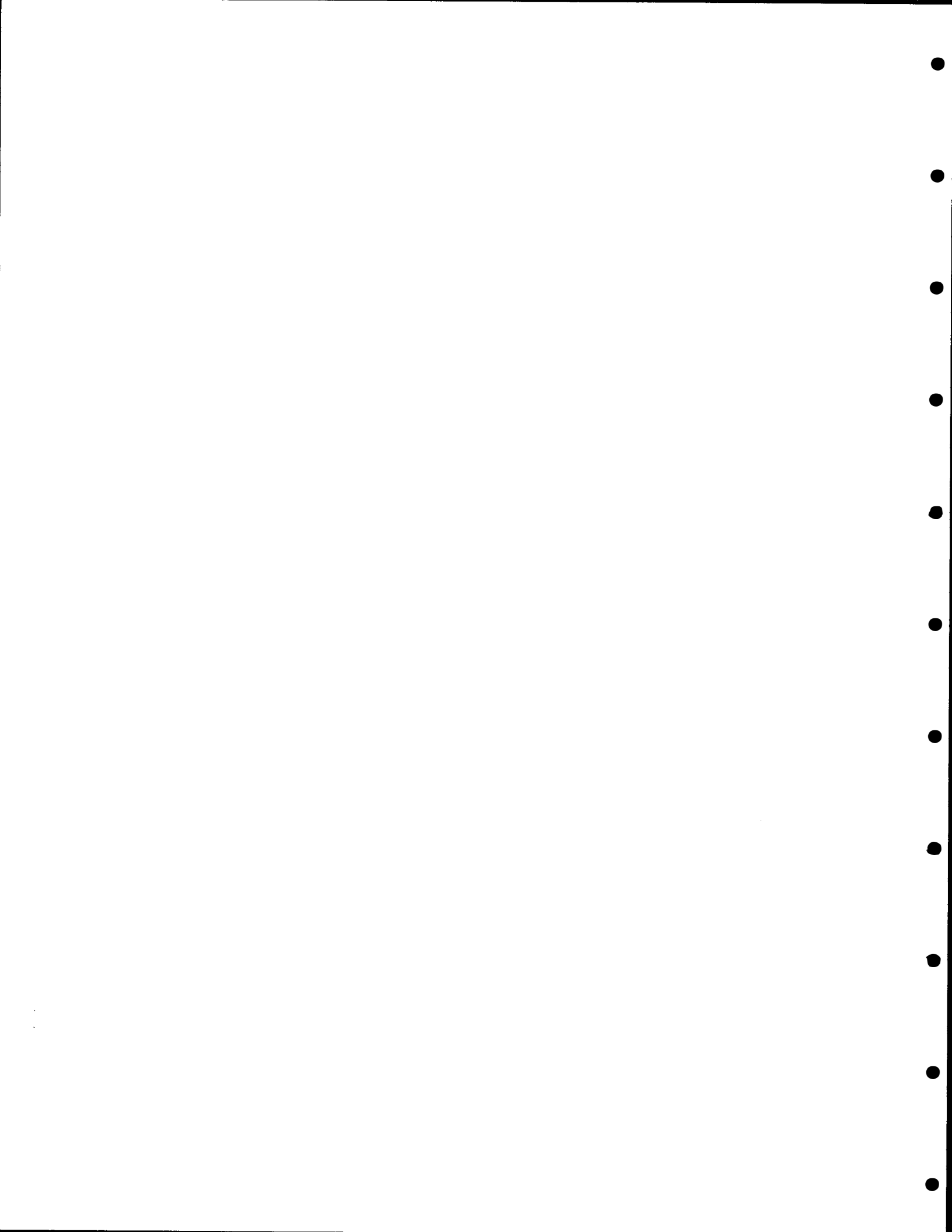
Owner response is required to confirm that the "door hanger" notice was received. A self-addressed envelope is attached with the "door hanger" to facilitate this. No application of herbicides with grazing restrictions will be made where personal owner/occupant contact has not been made.



VI. Unavoidable Adverse Environmental Impacts

The unavoidable impacts to natural resources and land uses as a result of the Fiscal Year 1980 Proposed Program are similar to those as previously discussed under Section IV. Included in this category are the following:

- permanent removal of all vegetative cover from approximately 67-77 acres (27-31 ha) as a result of the construction of the new substations and transmission lines.
- control of all tall woody vegetative species on forest land that would be required for maintenance activities during fiscal year 1980.
- removal of up to 33 acres (13.3 ha) of cropland from production.
- vegetative control measures which will reduce vegetative cover on about 19,060 acres (7,712 ha) of existing right-of-way and 920 acres (372 ha) of existing substation property.
- effects both beneficial and adverse on existing wildlife habitat which would occur as a result of construction and maintenance operations as indicated above.
- impacts to fishery and aquatic organisms as represented by the waterways or tributary streams that would be crossed during construction.
- visual impacts to recreational resources.
- introduction of combustion byproducts into the atmosphere as a result of open burning of slash timber from clearing approximately 450 acres (182 ha) of forest land.
- resultant soil erosion and losses attributable to the clearing, construction, and maintenance activities involved in the proposed program.
- introduction of herbicides into the Pacific Northwest environment as a result of vegetation control by means of aerial broadcast application and ground application.



VII. Relationship Between Local Short-Term Uses of the Environment and Long Term Productivity

The high-voltage facilities proposed for construction have an expected average useful life of 50 years for transmission lines with steel or concrete supporting towers and for associated substations. Wood-pole lines have an expected useful life of 35 years.

Some of the environmental consequences associated with creation of the facility can be considered short term. These are primarily associated with construction activity itself, and vary in duration. Construction activity interferes with the use of the land within the corridor while construction is underway (generally 3 months to 2 years for a specific location), and may also result in a disturbance to nearby wildlife and residents because of noise, dust, and visibility of men and equipment. Some construction impacts may also extend for a short term beyond the actual construction period. These are principally associated with the disturbance of vegetation by construction activities. Included among these are changes of habitat for certain wildlife species within the corridor, increased erosion, and resultant siltation, and they generally end with the regrowth of natural or introduced vegetation. Short term impacts are covered in more detail in Section IV, Probable Impact of the Proposed Program on the Environment.

The 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 productivity resulting from the use of the 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.

If changes in technology make a transmission line obsolete, it can be dismantled and removed, although experience in past years indicates that corridors are usually upgraded to higher capacity as technology advances, rather than being entirely removed from service. Retirement would permit substantial return of the area to its natural state (vegetative regrowth may take several years), which will terminate any adverse impact on land and its productivity directly created by the line, and would also terminate the benefits to productivity resulting from the availability of the power provided. Retirement and removal of the line would make the corridor available for a full range of uses. However, if adjacent land use patterns (at the time of dismantling) have been modified by the existence of the line, the economic uses of the corridor may continue to be limited after removal of the line. No other direct long term impacts on productivity have been identified.



VIII. Irreversible and Irretrievable Commitments of Resources

Construction and maintenance of facilities included in the Fiscal Year 1980 Proposed Program will require clearing and disposal of approximately 450 acres (182 ha) of timber from forested land. This land will be committed to other uses such as agriculture, range, or recreation for the life of the transmission facilities, or it may become unused except by wildlife. If the new transmission facilities are eventually retired, a return to the original forested state will be possible. This would take from approximately 20 to 50 years, depending upon location, although tree growth will begin to provide substantial ground cover after about 5 years. In addition, approximately 40-50 acres (16-20 ha) of agricultural, range, and other land will be occupied by construction of towers, substations, and other types of structures which represent comparatively permanent uses of the land.

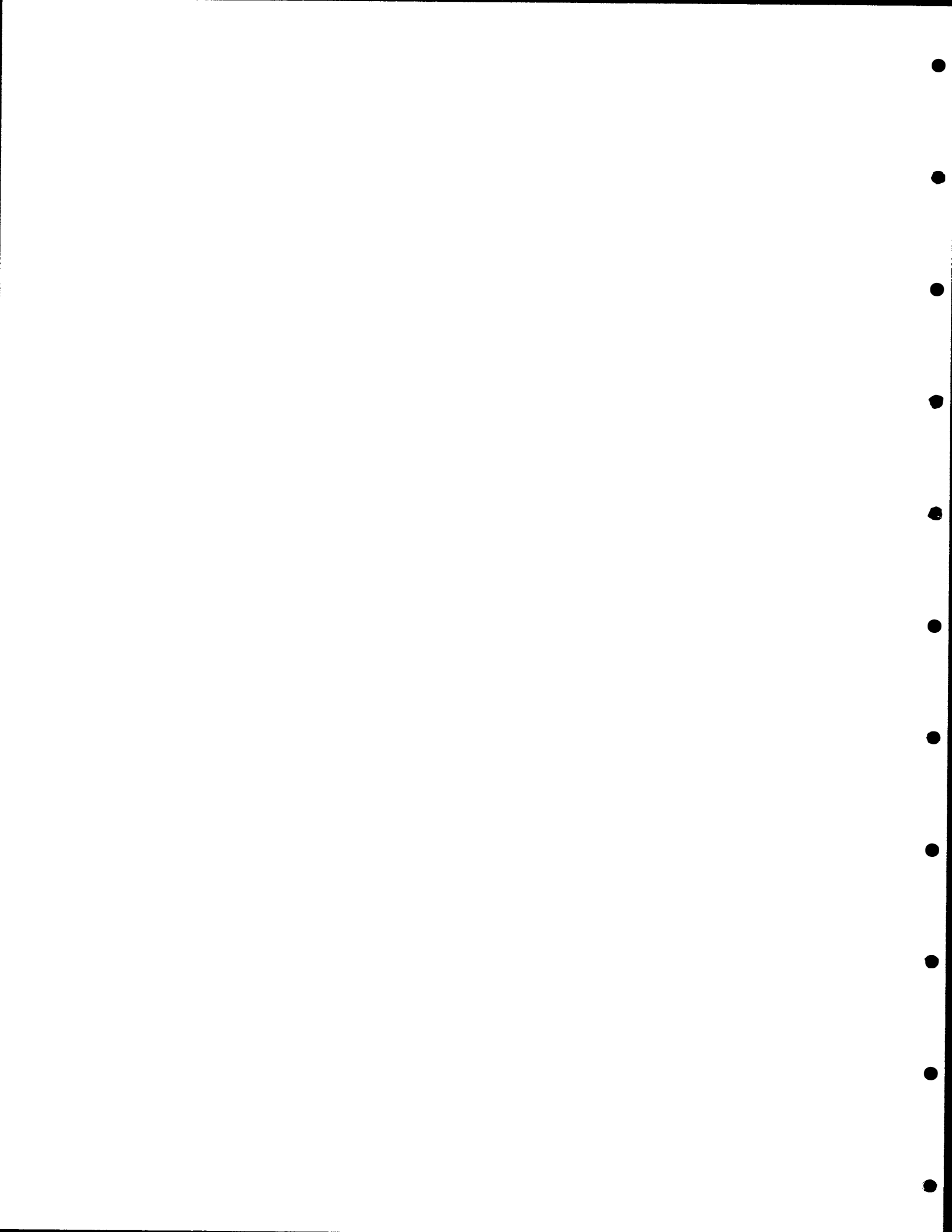
Soil lost as a result of increased erosion during construction and maintenance operations will be irretrievably lost.

In addition to the commitment of land resources, approximately 11,000 tons (10,000 metric tons) of steel and 3,000 tons (2,700 metric tons) of aluminum required for the manufacture of the tower structures and conductor will be irreversibly committed to transmission uses. ^{29/} If any of this equipment should later be retired, materials used in their construction can normally be reused elsewhere or recycled.

During the life of the facilities certain uses of the land will be restricted, limiting the range of beneficial uses of the land involved. 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 suitable lands are generally available nearby.

Also, certain types of agricultural activities, such as wheel and circular irrigation, dependent on large areas of unobstructed access, may be affected. In areas where these activities are practiced, construction of the proposed facilities may necessitate adjustments in crop layout to obtain optimal use of the land and small portions of a holding may, in some cases, become uneconomic to farm. Where these situations occur, the landowner will be compensated.

^{29/} These figures are those based upon average conditions. The actual design of individual facilities will depend upon topography, soil characteristics, meteorological conditions, and the tower configurations utilized.



IX. Alternatives

A. Alternatives to the Program

1. Delay

The environmental impacts of the proposed new facilities will not vary significantly with time of construction, except that certain construction activities should and will be timed to occur during certain seasons. Except for corresponding delays in the impacts associated with the facilities, delaying construction of the proposed new facilities would be of environmental benefit if technological improvements made it possible to reduce impacts, or if these improvements or changes in local or regional power demand would avoid the necessity of building the proposed facilities.

No such changes are anticipated. Lead time necessary to incorporate new technological improvements preclude the possibility of utilizing any such development in time to meet projected loads and scheduled energization dates. Currently projected loads or demands are increasing at an annual rate of about 4.2 percent, about 800 MW in average energy demand per year (1250 MW yearly increase in peaking demand) in the Pacific Northwest. It is unlikely that changes in projected demands, which these new facilities are designed to serve, would obviate the construction of the Fiscal Year 1980 Proposals.

2. Nonconstruction

Cancellation of the Fiscal Year 1980 Program would most likely have only marginal, and probably adverse, impacts on the physical environment, since the chances are extremely high that the electric utilities in the Northwest would individually construct any transmission facilities that would be necessary to meet their utility obligations. BPA's proposals are the minimum necessary to meet forecasted load estimates, and are developed jointly with the electric utilities; consequently, any program undertaken by the utilities on an individual basis would be at least equal to and more probably would exceed the size, cost, and environmental impact associated with BPA's proposed plans.

If neither BPA nor the Northwest utilities decide to provide new or additional service to an area, it would only be possible to speculate on the impact of such a decision. However, it is most reasonable to believe that general economic development would continue and electrical demand would rise until, in certain periods of high peak



demand, the system would be overloaded, resulting in repeated power failures. Those businesses or industries that critically rely on continuous electrical service might decide to relocate in an area where reliable service is available. This would mean some people will move out to follow that business employment. However, other businesses that do not rely critically on continuous electrical service would probably take its place, and the electricity demand would continue to push up against the maximum allowed by the existing system capacity. Voluntary rationing systems, switching to alternate energy sources where available and applicable, and simply living at lower per capita energy consumption levels are all ways in which the population could continue to increase, despite the lack of larger electricity supplies.

The lower reliability of electric service could present hardships or even physical hazards to many people in situations dependent upon electricity. Undoubtedly the population would be considered to be at a lower "standard of living." Secondary impacts on the environment brought about by population concentration would probably be less than if abundant supplies of electricity were available. The additional secondary impacts that could have been imposed on this area, had adequate electricity supplies been available, would be shifted to other areas that would consequently become more populated.

B. Alternative Methods of Carrying Out the Program

1. Direct-Current (d.c.) Transmission

Direct-current (d.c.) transmission lines have been used for purposes of moving large amounts of electricity over long distances. Because of the high cost associated with conversion from a.c. to d.c., direct-current transmission only becomes economical at line lengths of 400-600 miles (644-966 km) or greater. At such distances, the economic advantages of d.c. offset the high cost of building converter stations at both ends of the line.

Environmental impacts associated with d.c. transmission lines are virtually the same as those of a-c lines. D.C. lines require only 2 conductors; accordingly, less tower steel and conductor cable, as well as fewer acres of right-of-way, are required for a d.c. line than an a.c. line of comparable capacity.

For the Fiscal Year 1980 Proposals, d.c. transmission is not considered a feasible alternative since it would not



offer any environmental advantage for any of the new proposals included as part of the program, and the economic costs would be substantially greater. One minor proposal in the FY 1980 Program would involve the uprating of the existing high voltage d.c. transmission line between Celilo, Oregon, and Sylmar, California, from 800 kV to approximately 1,000 kV.

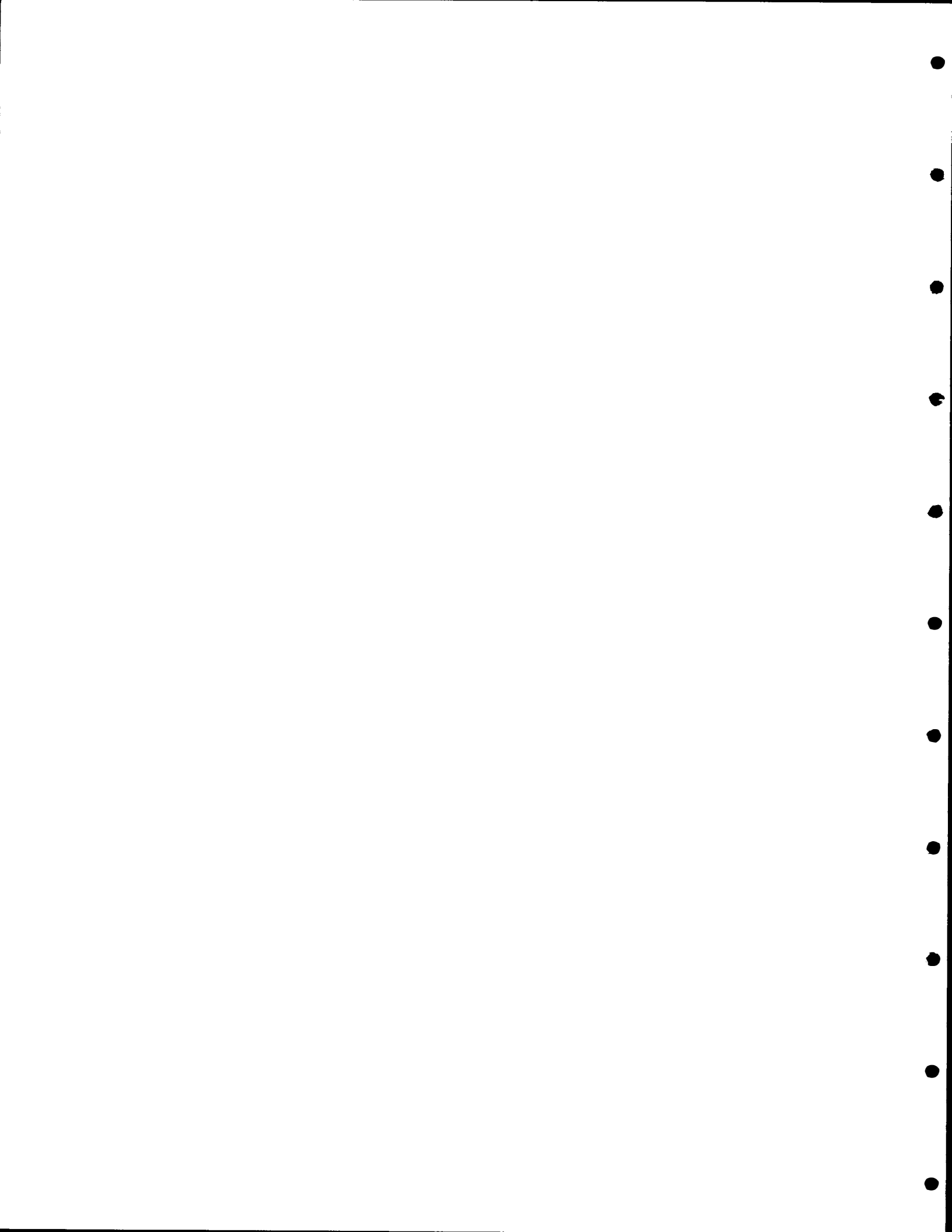
The Pacific Northwest-Pacific Southwest D.C. intertie is 846 miles (1,361 km) long. It was the first such line to be constructed in this country and was built jointly by BPA and the Los Angeles Department of Water and Power. The D.C. intertie has a rated capacity of 1,440 MW and is used to move large blocks of power north or south. In the summer, when streamflows are high and surplus power is available in the Pacific Northwest, the excess power is transmitted to the southwest. In the winter, when northwest streamflows are low and energy demands are high, energy flows to the northwest from the southwest.

BPA evaluated the consequences of uprating the existing d.c. intertie in an environmental assessment and has concluded that there would be no significant environmental impact.

There are no physical impacts associated with the uprating of the d.c. interties. The only direct physical manifestation of the uprating will be some equipment modifications and replacements at the Celilo Converter Station near The Dalles, Oregon and at the Sylmar Converter Station, near Los Angeles, California. The Los Angeles Department of Water and Power will undertake the necessary modifications at the Sylmar station.

Although ground level electric field strengths would be increased as a result of the uprating, they would still be many times below the minimum perception level. Furthermore, BPA is not aware of any evidence indicating that the electrical fields experienced under the uprated d.c. line would result in any long term biological effects. Potential field effects of transmission facilities, including d.c. transmission, are discussed in detail in Chapter VII.C. of Appendix B of the "Role EIS."

The uprating will increase the power-carrying capacity of the D.C. intertie by 25 percent to 33 percent (from an existing capacity of 1,440 MW to approximately 1,800-1,920 MW). No additional sales or exchanges are presently contemplated based solely on this increase in line capacity. The uprating would increase the ability of the intertie to ship more surplus power. A consequence of this would be a minimization of the need to spill water during heavy spring runoff. The additional revenue obtained from surplus power sales would, in turn, help to offset rate



increases within BPA's service area. Surplus power sales displaces thermal power generation in the southwest, which helps to conserve scarce fossil fuels. For example, from December 1973 through August 1974, Pacific Northwest utilities shipped nearly 10 billion kilowatthours of surplus energy to Southwest utilities, saving the burning of 16.5 million barrels of oil. The increased ability to send surplus power south over the d.c. intertie, made possible by the uprating, would have no effect on the use of the Federal Columbia River Power System to serve regional peak loads.

2. Underground Construction of Transmission Facilities

Undergrounding of transmission lines would reduce the visual impact associated with overhead transmission lines, although a corridor would still be visible in timbered areas because of the clearing necessary to bury underground lines. Widths of right-of-way cleared for underground facilities (approximately 50 feet or 15 meters) would average less than the 50 to 165 feet (15-50 meters) required for aboveground construction, and the impact on existing land use would be reduced correspondingly.

Aside from the disadvantage of its considerable cost (which is generally in excess of 10 times that of equivalent overhead transmission lines), present technology imposes severe limitations on undergrounding with respect to maximum line length and carrying capacity. Underground lines cannot be as easily tapped or modified as overhead lines; and, while line outages are expected to be less frequent, undergrounding would likely jeopardize system reliability because underground failures are much more difficult to locate and repair.

Underground construction is an alternative to the normal aboveground techniques primarily at lower voltages where existing technology can satisfactorily overcome the problems inherent in underground cables. Undergrounding, despite its high costs and technological limitations, is frequently the only alternative in highly congested urbanized areas such as New York City, where overhead rights-of-way may simply be unobtainable.

Underground transmission lines also create their own environmental impact. The trenching operations required to bury cables, and to gain access for repair of underground cables in case of failure, may disturb natural drainage systems and cause increased erosion. In rocky areas, excavation may require extensive blasting. Once the trench is backfilled, heat generated by underground cables has a drying effect on surrounding soil and will affect vegetation in the immediate cable area, and longitudinal erosion may occur in steep terrain. In



addition, high-voltage underground transmission cables require installation of shunt reactors at frequent intervals which themselves create an additional impact upon land use.

A detailed description of the technological and economic constraints involved in undergrounding can be found in Appendix B of the "Role EIS" (chapter X.B.2.).

3. Combustion Turbines

One alternative method which has been used to meet limited localized peaking power needs on an interim basis is the installation of a combustion turbine in the immediate area of the load. Combustion turbines can also be used for meeting forced outage reserve capacity, thereby maintaining adequate system reliability without requiring additional transmission lines. This, of course, would eliminate the need for long-distance transmission lines, although some local distribution lines would still be required.

Presently BPA markets bulk electrical energy and does not have Congressional authority to own, operate, or install generating facilities, including turbines, except in some emergency situations. A change in BPA's current mandates would be necessary before BPA could take any action toward the installation of generation facilities in the Northwest. In some instances, however, BPA's utility customers can and have considered installing their own local generation as an alternative for their power demands.

Impacts resulting from the use of a combustion turbine include exhaust emissions, principally oxides of nitrogen and sulfur dioxide, in addition to sizeable consumption of increasingly scarce petroleum-based fuels. Of course, if fossil fuel oils are used as a fuel, then oil spills are always a danger. An additional factor of increasing public concern, especially since these units would be located in or adjacent to population or load centers, is the noise levels, both audible as well as infrasonic emissions, associated with these facilities.

A limitation affecting the applicability of turbines is that all combustion turbines, though they may not be used as such, are designed and manufactured to serve peaking power requirements and therefore should not be considered a source for firm or base power requirements.



However, an advantage made obvious by past sabotage attempts on BPA's transmission facilities is that local generation facilities, including combustion turbines, can be more easily safeguarded than can long distance transmission lines. For a more complete discussion of local combustion turbine generators as a substitute for new transmission facilities, see Appendix B of the "Role EIS" (chapter X.A.1-2.).

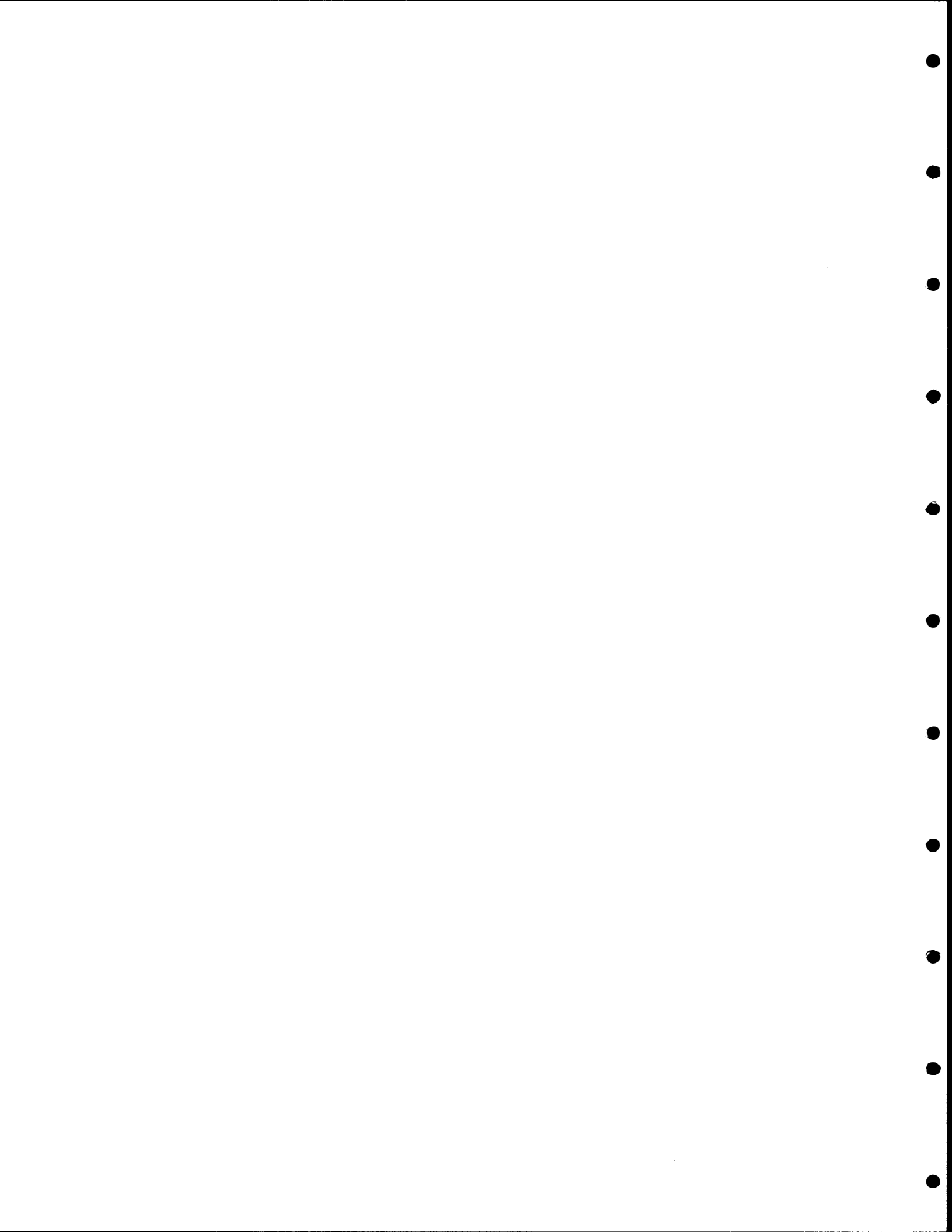
4. Incineration of Municipal Wastes for Steam Generation

The use of municipal refuse as a source of fuel for local generation has been implemented in several communities throughout the nation. Net power output obtained from these operations is limited because of the extreme heterogeneous composition of refuse and the necessity of processing refuse in order to convert it to usable fuel. In addition to that energy required to collect and transport these wastes to processing centers, the conversion processes currently in use require relatively large amounts of electricity needed to separate combustibles from non-combustibles, and then to shred the combustible material to facilitate its handling and to reduce it to a high surface fuel. As demonstrated at the Union Electric Company's plant in St. Louis, Missouri, even after this relatively energy-intensive processing, successful incineration of municipal wastes is limited to use only as a supplemental fuel 30/ (usually 10 percent waste to 90 percent pulverized coal); and although it may be lower in sulfur, when compared to coal, high concentrations of nitrogen oxides and particulate emissions are associated with refuse-derived fuel. 31/

As a result of these energy expenditures, the primary benefit obtained from these programs, therefore, is the disposal of municipal wastes. However, this benefit alone can be of particular value in areas where incineration can replace long-distance hauling or expensive landfill areas. Accordingly, local generation derived from the incineration of municipal wastes has not been developed to the point where it could serve as an alternative to the facilities proposed in the Fiscal Year 1980 Construction Program.

30/ Tillman, David A., 1975. Fuels from Recycling Systems. Environmental Science & Technology. Vol. 9, No. 5, May 1975, pp. 418-422.

31/ Schulz, Helmut W., 1975. Cost/Benefits of Solid Waste Reuse. Environmental Science & Technology. Vol. 9, No. 5, May 1975, pp. 423-427.



5. Methods of Vegetation Control

For fiscal year 1980 a total of about 19,980 acres ^{32/} (8,084 ha) will require vegetation control at substations and on rights-of-way. Of this total, about 13,590 acres (5,499 ha) will be treated utilizing selective ground application of herbicides, about 3,990 acres (1,614 ha) will be controlled by herbicides applied by helicopter, and about 1,480 acres (599 ha) will be cleared by hand or mechanical cutting.

The only significant alternative to this control program would be to substitute either ground application of herbicides or hand and mechanical cutting for the helicopter application. In addition to reducing the total amount of herbicidal compounds introduced into the environment, this would lessen damage to nontarget vegetation and minimize the possibility of accidental damage due to drift.

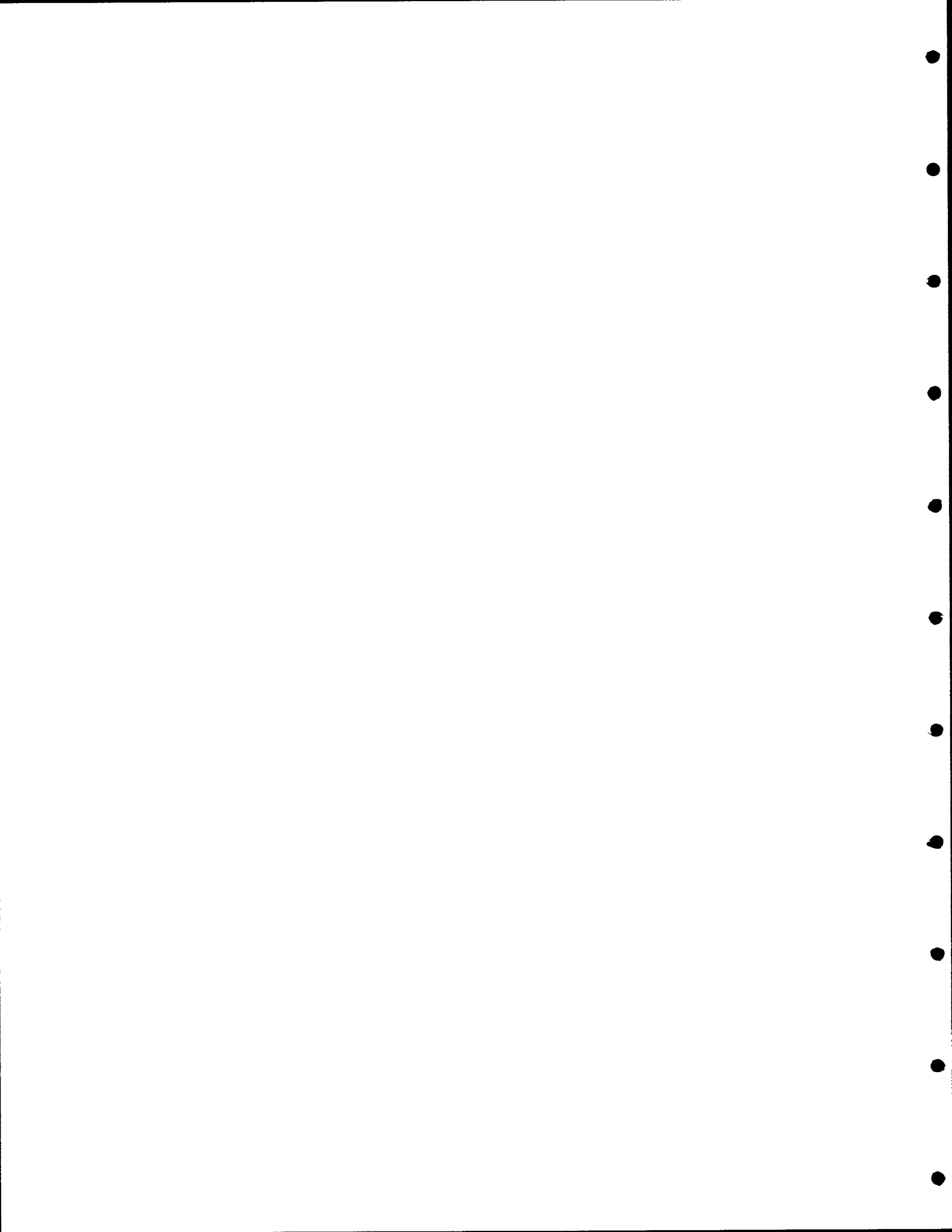
The use of hand or mechanical cutting or the ground application of herbicides has the additional advantage over helicopter application in that both methods allow for a greater selectivity and result in little or no damage to nontarget or low-growing vegetation. It is usually the nontarget vegetation which provides the bulk of the forage for herbivorous wildlife.

However, hand or mechanical cutting as well as the ground application of herbicides does require the construction of and use of access roads. Where an extensive system of access roads does not already exist, the construction of these roads would have impacts, including increased disturbance to both wildlife and the physical environment which could overshadow the adverse effects associated with aerial spraying. Access roads have been shown to be a major cause of erosion and a contributing factor to increased turbidity and sediment loads in waterways, ^{33/} ^{34/} and in this regard they can result in impacts in excess of all other activities in forested areas, especially

^{32/} Includes 920 acres (372 ha) of weed control at existing substation sites.

^{33/} Lantz, Richard, 1971. Guidelines for Stream Protection in Logging Operations, A Report of the Research Division, Oregon State Game Commission.

^{34/} Dyrness, C. T., 1967. Mass Soil Movements in the H. J. Andrews Experimental Forest, Pacific Northwest Forest & Range Exp. Sta., USDA, Forest Service Res. Paper PNW-42, 12 pp., illus.



in areas of steep topography 35/. For example, sediment concentrations in runoff after the first rainstorms can be as much as 250 times that in adjacent undisturbed areas. 36/

As discussed in Section IV, Fish Resources and Water Quality, the introduction of suspended solid and organic debris into an aquatic environment will result in adverse impacts to these resources.

6. Alternative Methods for Disposal of Slash and Timber During Construction Operations

During fiscal year 1980, natural draft open burning will be the primary method used to dispose of slash and unmerchantable timber which must be removed from the right-of-way during construction and operations.

BPA activities during the construction periods will result in some adverse air quality impacts from the combustion by products during burning. Open burning of vegetation introduces combustion by products including water vapor, particulates, hydrocarbons, carbon monoxide, and carbon dioxide into the atmosphere. Relatively high concentrations of these products near fire sites decreases rapidly to ambient levels in all directions. Most of the impacts from burning are short term, and virtually all of the impacts on the atmosphere stop when the impact activity ceases because the atmosphere has the ability to regenerate or cleanse itself.

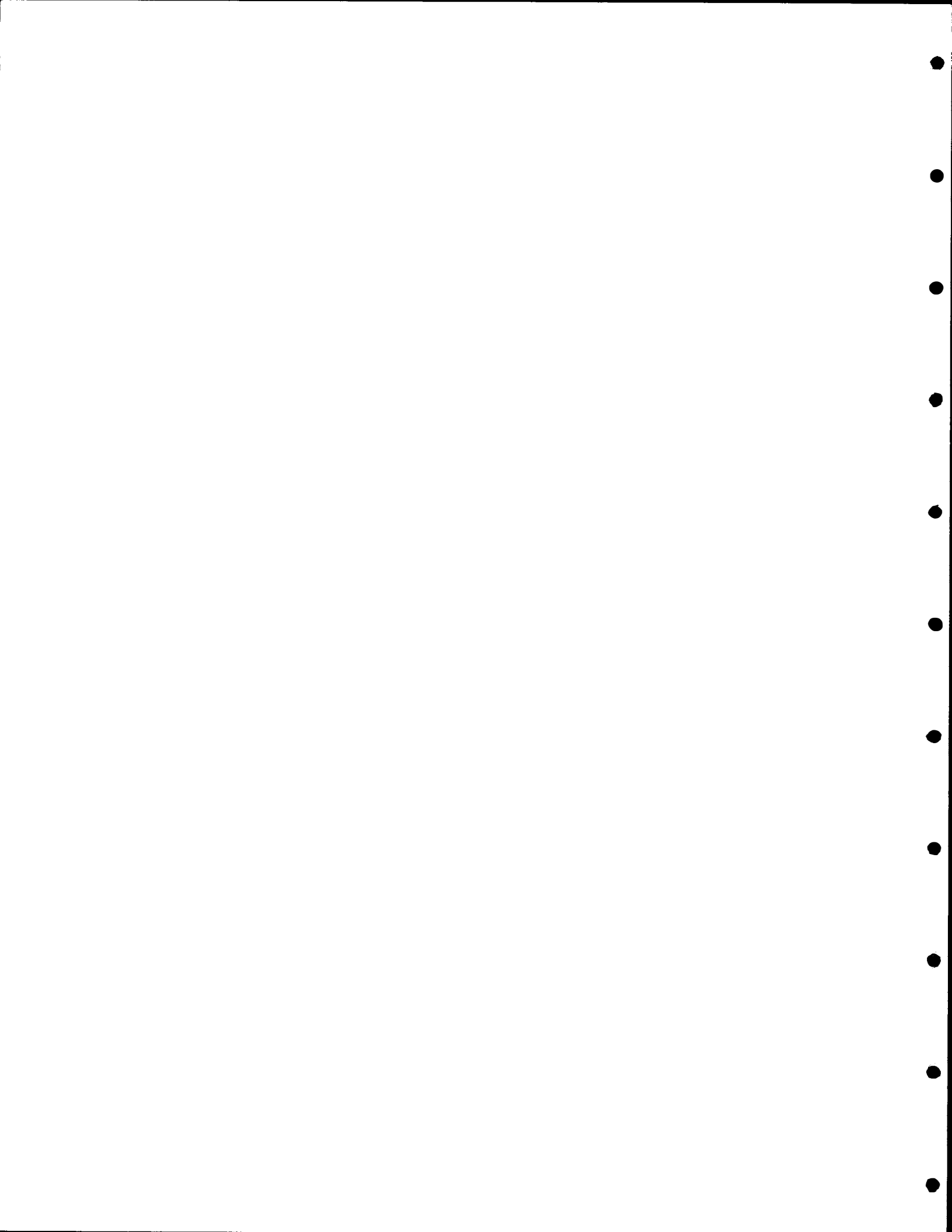
Because of the cost of alternative methods of disposal, and some environmental trade-offs, natural draft open burning remains the primary disposal method and is used where local air pollution regulations permit. However, where proximity to population centers, or when conditions including winds, dryness of vegetation, atmospheric inversions, and temperature preclude open burning, alternative methods of slash disposal are utilized.

The two techniques most frequently proposed as alternatives to natural-draft open burning are chipping and controlled or forced air burning.

The use of chipping as an alternate to open burning would eliminate the introduction of particulates and other combustion byproducts into the atmosphere. Since chipping requires the operation of large equipment, a substantial

35/ Rothacher, Jack, 1969. Managing Forest Land for Water Quality. pp. 232-244. In Proc. of Joint FAO/USSR International Symp. on Forest Influences and Watershed Mgmt., Moscow, USSR.

36/ Fredriksen, R. L. 1965. Sedimentation after Logging Road Construction in a Small Western Oregon Watershed, pp. 56-59. In. Proc. Fed. Inter-agency Sedimentation Conf., 1963, USDA Misc. Pub. 970.



amount of road would have to be built to provide access for the machinery. Operation of these chipping machines would also require fossil fuels which, in addition to being both expensive and currently in short supply, would also add characteristic pollutants associated with internal combustion engines. In addition to being a very slow process, chipping can be three to four times as costly as burning.

The overall environmental impact of burying or scattering chips has not yet been fully determined, although there appears to be some adverse environmental effects associated with the trenching necessary for burying chips, and nitrogen depletion of soils may present a problem if chips are scattered.

A variety of controlled burning techniques are currently available which offer the advantage of incineration at higher temperatures than that obtainable with natural draft open burning. The Camran burner is one device which promotes a hotter burn. Higher temperatures provide for better combustion with resultant decrease in air emissions. Combustion emissions are reduced by up to 80 percent utilizing this method, provided the unit operates at peak efficiency. ^{37/} However, observations by BPA and Oregon State Department of Environmental Quality staff indicate operational problems with the unit, including achieving optimum combustion temperature. In addition to operational problems, the method is significantly slower and more expensive than open burning. Extensive access roads are also required for the Camran burner, as its design limits it to surfaced or high grade roads with wide radius curves for transport.

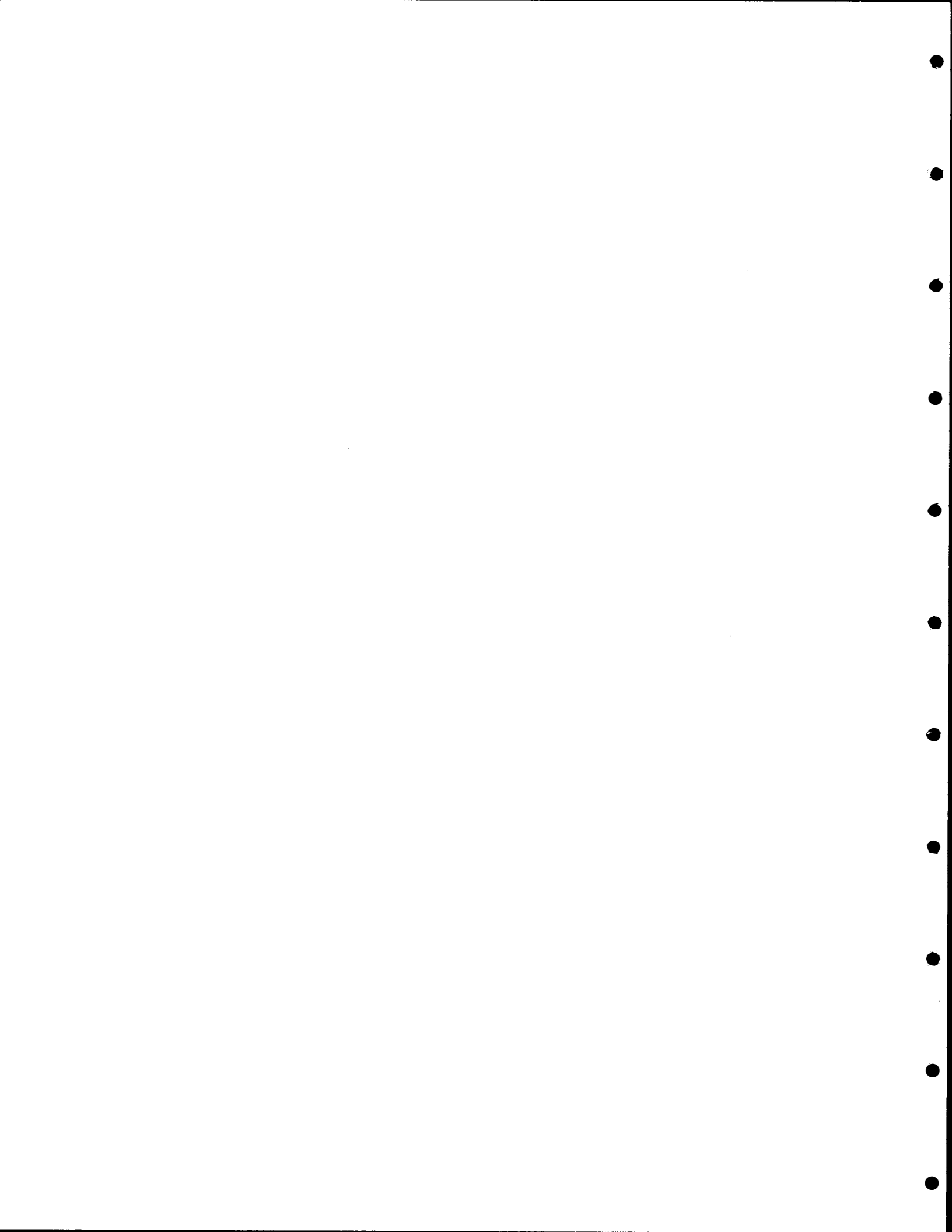
*Subsiding
ground?*

The high-stacking method is used where possible and can reduce the amount of emissions by as much as 50 percent as compared to open burning. In this procedure, the material is stacked into a pile the height of which is greater than the diameter. This eliminates much of the dirt and other incombustible material. Greater combustion temperatures and more efficient burning is achieved, and smoldering piles of dirt and debris are reduced. Officials from the Oregon Forestry Department favorably compare this method with air curtain incineration. ^{38/}

Pit burning methods have also been advocated and can be expected to bring corresponding reduction in particulate emissions but with some local soil disturbance associated with trenching operations.

^{37/} Washington State Department of Ecology, 1975. Environmental Impact Statement, Proposed Certification of the Camran Burner, pp. 18-19.

^{38/} Ibid. pp. 16-17.



In some cases, limited amounts of slash are left in small piles as cover for wildlife. This method is used where permitted by the landowner or land agency, and where this method will not present a fire hazard.

BPA will allow contractors to use controlled open burning to dispose of slash and unmerchantable timber where permitted by Federal, State, and local regulations. Contractors are required to obtain approval from State or local air pollution control agencies for open burning and to cooperate in State and local smoke abatement programs. Contractor burning operations are supervised by BPA to assure compliance.

As in the past, BPA contractors will consult with local air pollution control authorities and, when required, will utilize recommended disposal methods for slash associated with the Fiscal Year 1980 construction and maintenance program.

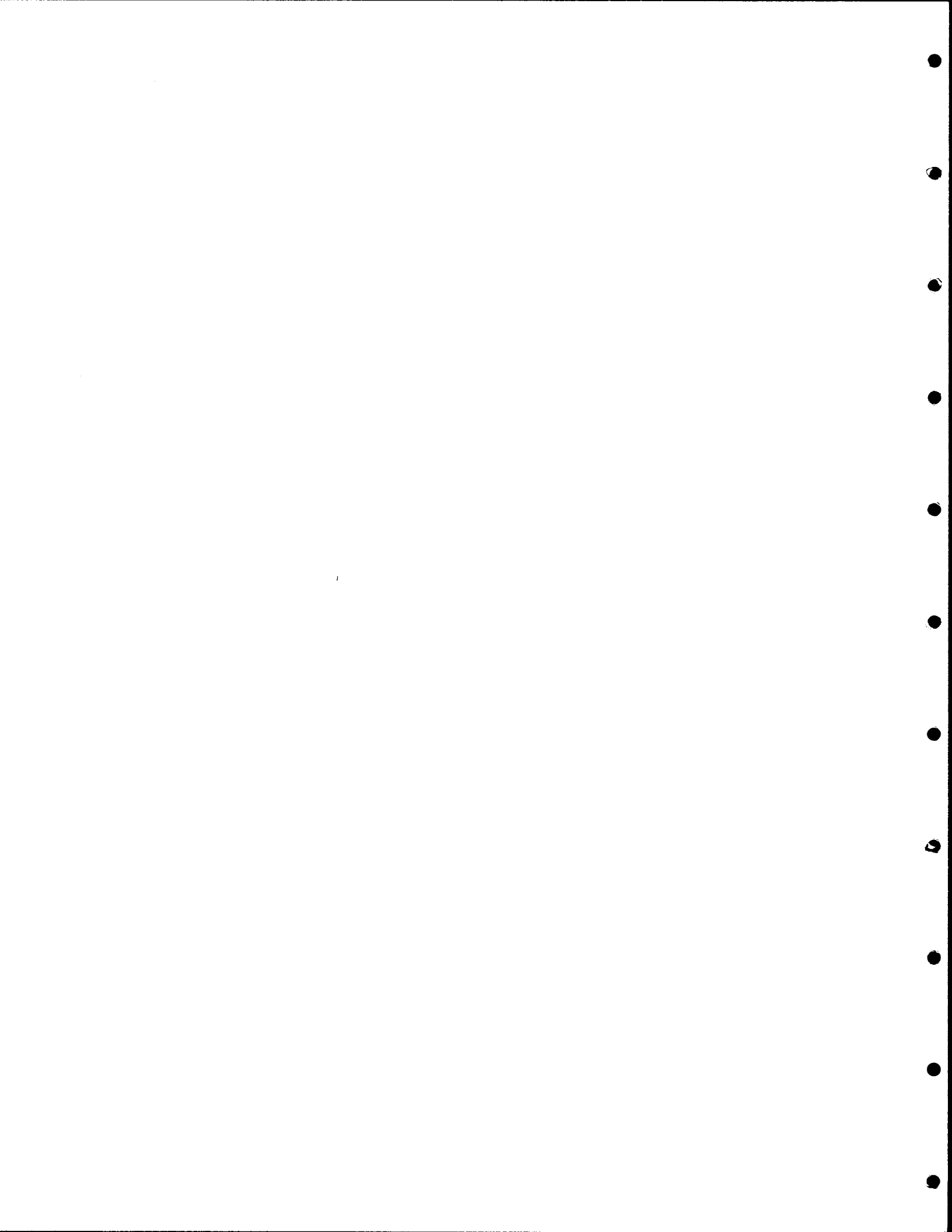
7. Construction of New Transmission Facilities on Existing Rights-of-Way Rather Than on New Rights-of-Way

In evaluating the possible alternatives to meeting the Fiscal Year 1980 system requirement, one of the first considerations is the possibility of serving the increasing loads through the greater utilization of rights-of-way currently under easement. This could be accomplished either by (1) the replacement of lower voltage lines with lines of a higher capacity, or (2) by constructing the new transmission lines alongside or parallel to existing lines.

a. Replacement of Existing Transmission Lines

The possibility of replacement or upgrading of lower-voltage lines to a higher capacity during Fiscal Year 1980 is available for a total of approximately 117-164 miles (188-264 km) of existing transmission facilities.

Although replacement would usually eliminate the need for any new right-of-way, there are constraints limiting the practical applicability of this method. In addition to technological constraints, the main limitation affecting the use of replacement is the need to remove existing lines from service to allow for rebuilding.



Impacts resulting from operations conducted during the upgrading of existing transmission lines are those associated with the movement of heavy equipment along existing rights-of-way, including the fording of streams and disturbances due to noise, dust, and increased human activity.

b. Paralleling Existing Transmission Lines

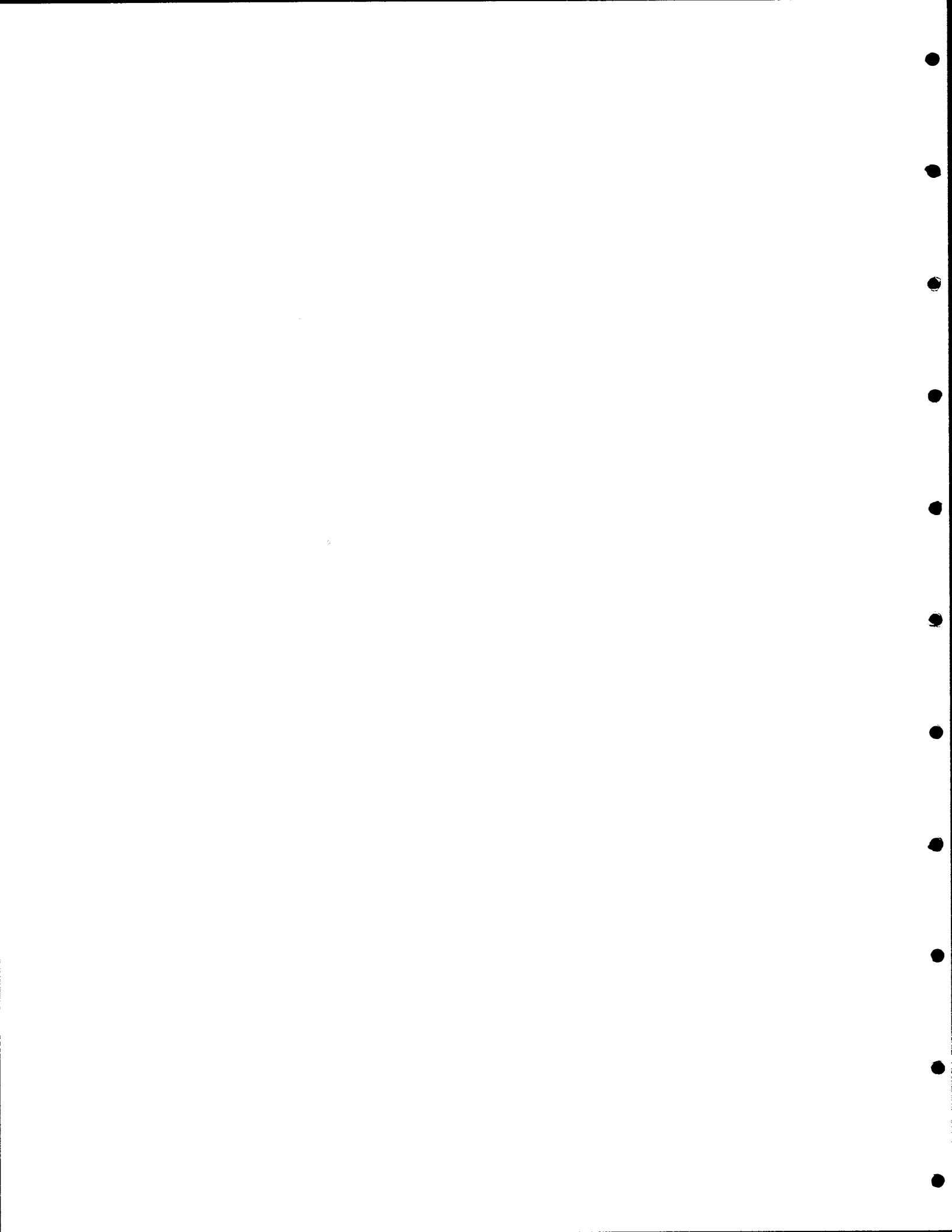
Where replacing an existing line with one of a higher capacity is not appropriate, consideration can then be given to meeting the system requirements by paralleling an existing right-of-way. Where this alternative can be use, it would result in a net reduction of up to 20 feet (6 meters) of the new right-of-way that would be required, depending upon the design of the line and the topographical conditions encountered.

In designing a plan of service to meet future system requirements, it is usually possible to parallel existing rights-of-way for at least a portion of the required distance. However, unless there already exists a route directly between the point of availability of generation and the load, a parallel route could easily result in a significantly longer line, requiring more total right-of-way with a resultant increase in adverse effects over that resulting from a more direct route or line location.

Otherwise, paralleling existing rights-of-way will result in impacts identical to the construction of new lines, except that they will not occur in previously undisturbed areas.

Conditions affecting the Fiscal Year 1980 Program allow paralleling of existing rights-of-way for approximately 20 miles (32 km) of the estimated new linear right-of-way that would normally be required to meet the Fiscal Year 1980 system requirements.

Reliability criteria are the principal restrictions limiting the implementation of paralleling. By grouping several transmission lines within a restricted area, the possibility of a simultaneous outage arising from a natural calamity such as a windstorm or snowslide, or from sabotage attempts, is greatly increased. Such an outage would result in a total loss of service to those areas where other sources of power might not be available.



8. Conservation of Electricity (As an Alternative to the FY 1980 Program)

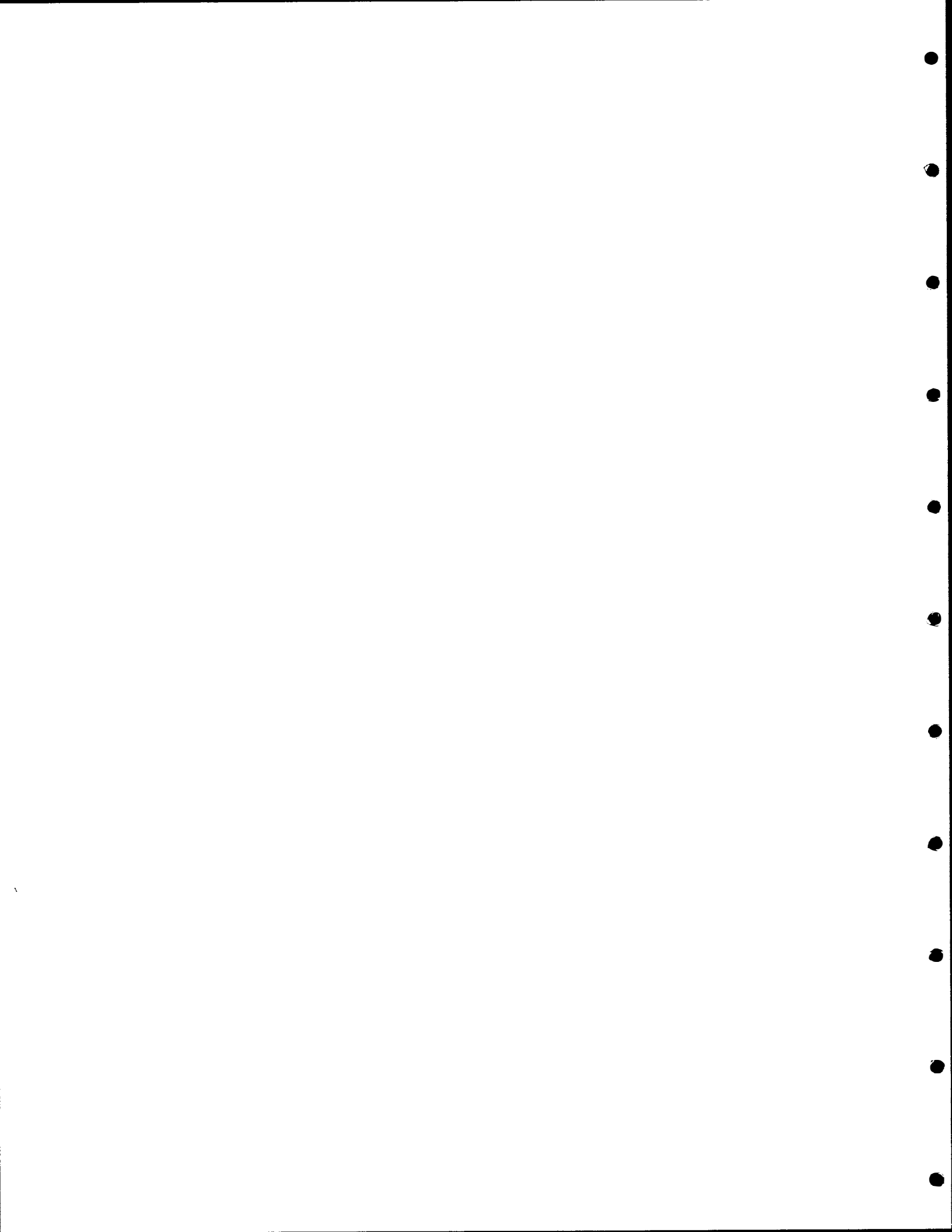
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Another alternative to building new transmission facilities would be conservation of electricity. To the extent that a reduction in electric energy consumption could also reduce the peak demand, either on the entire BPA transmission system or on its individual parts, new facilities could be deferred for an undetermined length of time, depending on the magnitude of the reduction. A large enough reduction in demand could, in theory, eliminate the need for some facilities entirely. Specific proposals that have been made which are intended to reduce consumption include voluntary consumer constraint, rationing, utility or Government regulation, price mechanisms and other incentives which encourage conservation, and load management.

Prompted by concern about the hydroelectric power supply situation in the region, and National problems arising from the shortage of most types of fossil fuels, voluntary reductions in consumption of electric energy have already occurred in the Pacific Northwest. Although the effect on peakloads is hard to determine, it is estimated that the peakloads are also lower than they otherwise would have been, due to voluntary conservation.

BPA has had an active energy conservation program since 1973 when a drought precipitated an electric energy supply crisis in the Northwest. BPA has endeavored to set an example in its own operations, and has provided leadership and assistance to utilities and power consumers in order to bring about voluntary reductions in energy demand. Furthermore, BPA has reduced energy use in its own buildings and vehicle fleet significantly since inaugurating its energy conservation program. BPA has an extensive building insulation retrofit program underway and has asked the General Services Administration to take similar actions in buildings occupied by BPA. New energy audits of BPA's buildings are planned to identify additional cost-effective insulation and energy conservation design standards in future BPA buildings. Energy conservation information is routinely provided to BPA employees as part of the energy conservation program. BPA also continues to make energy conservation information available to its customers.

In conjunction with local utilities, BPA has conducted aerial infrared thermographic pilot projects in several communities of the region during FY 1977 and 1978 to determine the feasibility of this technique for analyzing heat losses from buildings. Participating utilities shared the costs of the project with BPA. Associated



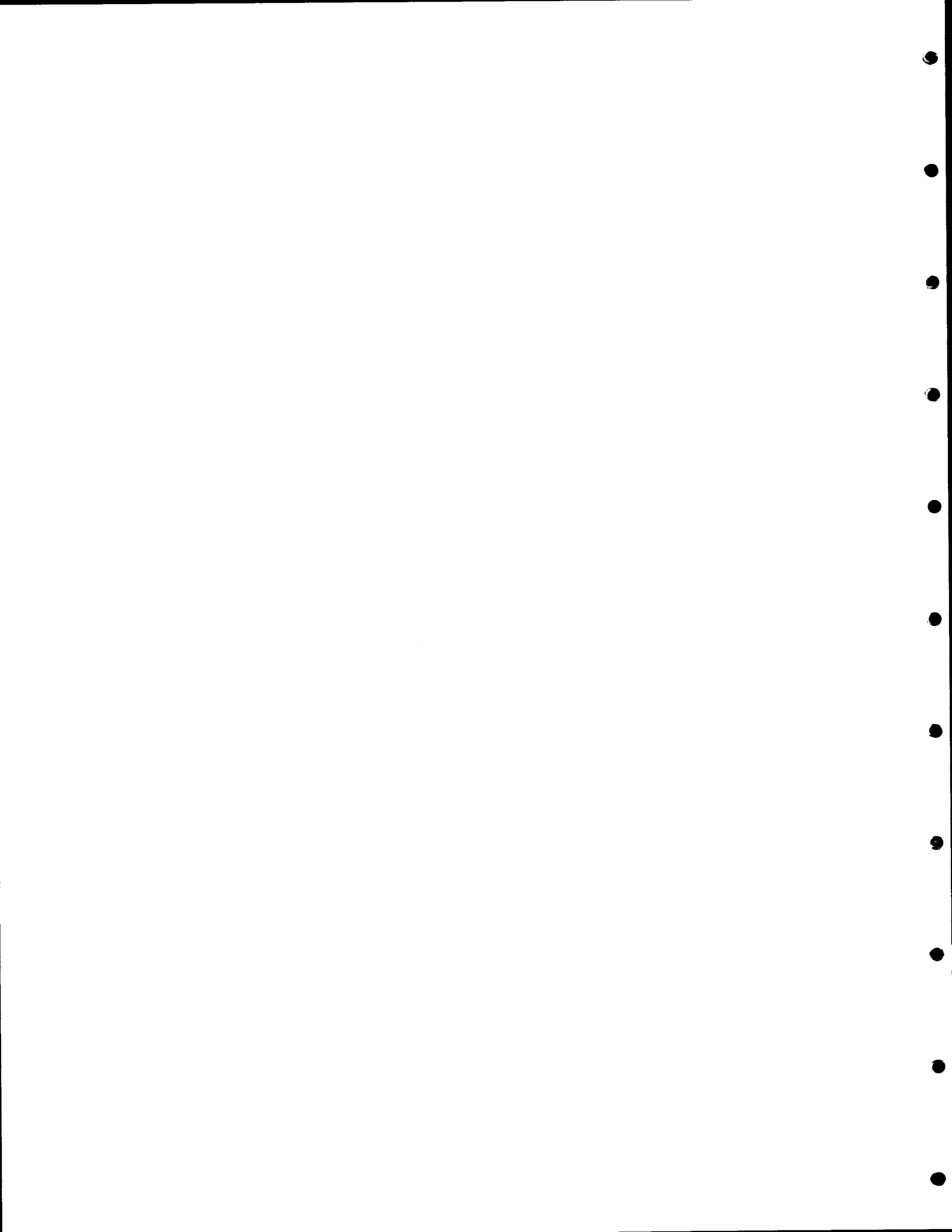
with this project, BPA purchased portable infrared viewers to be used for obtaining on-the-spot thermal images of buildings. Results of the aerial project are available to the public to promote awareness of energy efficiency of individual buildings and motivation to improve that efficiency through insulation. Onsite energy audits are available through the individual utilities. The portable viewers are available for use by utilities in conjunction with their energy audits.

In addition to its ongoing energy conservation program, BPA is currently developing new program proposals and investigating their potential for implementation in cooperation with interested utility customers and others. Many of the programs being explored entail various economic incentives. Generally speaking, incentive programs are designed to bring about adoption of conservation measures by providing economic encouragement. Incentives can be positive, providing rewards for the adoption of conservation measures; or negative, providing penalties for failing to adopt conservation measures. BPA's incentive programs could be extremely weak, providing only token rewards, or they could be extremely strong, providing more generous rewards and/or severe penalties.

A disadvantage of extremely weak incentives is that they are not likely to result in the adoption of potentially beneficial conservation measures. Strong incentive measures, on the other hand, may impose unacceptable hardships on some energy consumers. The effectiveness and the likely consequences of various incentive programs will be thoroughly investigated before any are adopted. The kind of incentive programs BPA will be evaluating for potential implementation include the use of wholesale power rates, allocation of Federal power, conservation provisions in contracts with customers and vendors, and financial assistance for adoption of conservation measures.

Utilizing rate schedules, structured in such a way that the price for electricity would discourage its consumption, could possibly reduce peakloads enough to permit the deferral of some transmission facilities. However, the earliest date at which a new rate structure developed immediately could be implemented is December 1979 ^{39/}, and the full impact (on consumption) on rates designed to

^{39/} BPA has prepared an Environmental Impact Statement on its Proposed 1979 Wholesale Rate Increase. This EIS examines a number of alternative rate structures and was filed with EPA as a draft on August 24, 1978.



People have already purchased appliances

Accumulative

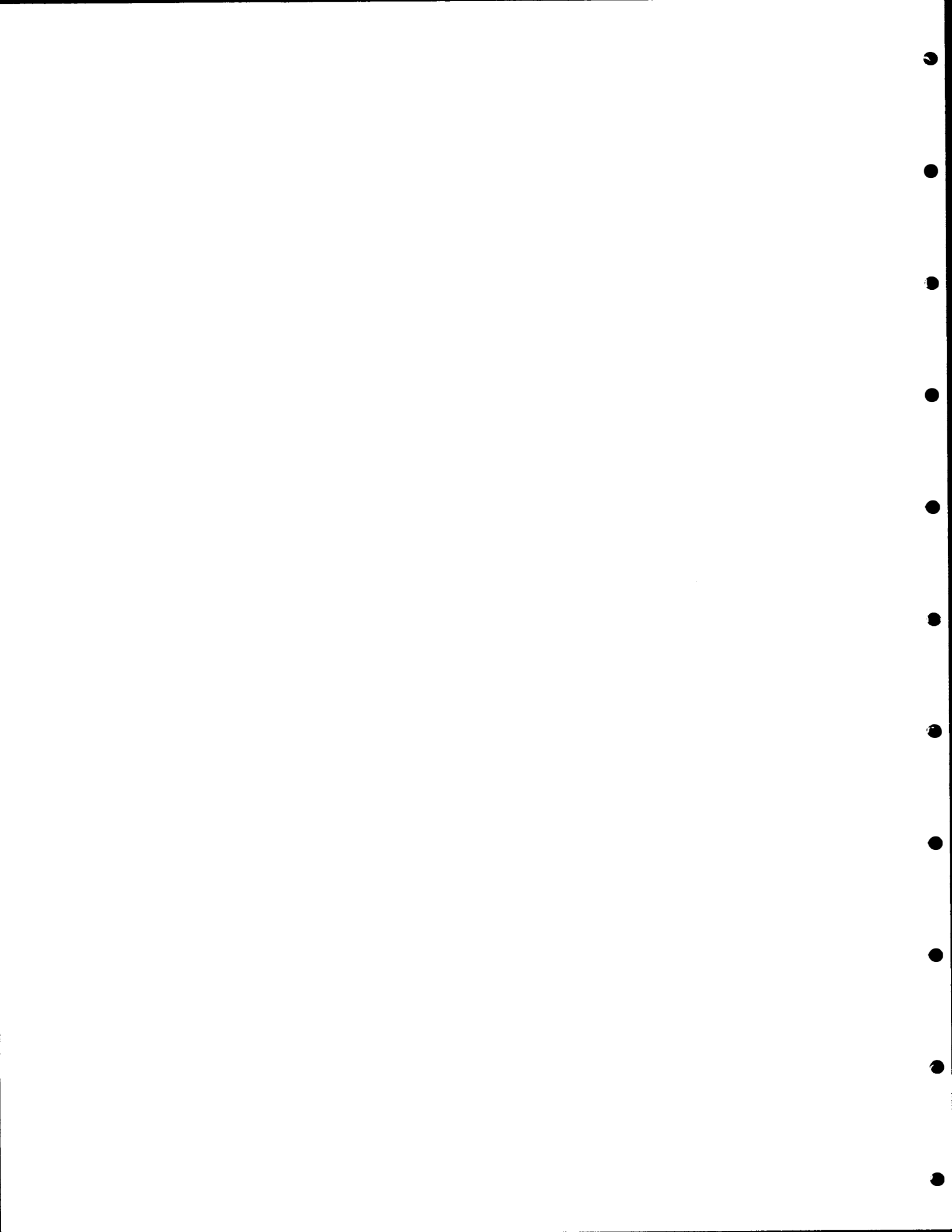
discourage consumption are not realized until many years after they are implemented. The full impact on consumption resulting from a rate structure implemented in 1979 would not be felt until sometime after 1990, much too late to affect the need for the facilities included in the Fiscal Year 1980 Proposed Program. 40/

The subject of alternative rate structures and their probable consequences, including effects upon the consumption of electricity, was discussed in the environmental impact statement on BPA's proposed wholesale rate increase. The final statement was filed with the Council on Environmental Quality on August 15, 1974 (FES 74-46). A detailed discussion of BPA's current policies related to the determination of wholesale and retail rates is included in Chapter II of Appendix C of the "Role EIS," Sections B.3. and B.5., respectively. Alternative wholesale power rate concepts and designs, including those aimed at encouraging energy conservation, are discussed in Chapter III.B.3. of Appendix C. Alternative BPA policies with respect to the determination of retail power rates, including the use of retail rate structures to foster conservation, are discussed in Chapter III.B.5. of Appendix C.

Electrical load management could also be used to bring about reductions in electrical consumption. Planned or rotating outages could obviate the need for new facilities, although at the expense of great inconvenience to users of electricity. Dual metering, off peak pricing, and other mechanisms aimed at leveling off peak loads would reduce the need for new facilities intended for meeting peaking requirements. BPA's present power curtailment policies are discussed in Chapter II.B.7. of Appendix C of the "Role EIS." Alternatives with respect to power curtailment, including voltage reductions and rotating blackouts, are discussed in Chapter III.B.7. of Appendix C. An extended discussion of load management is included in Chapter IV of Appendix A (Power Resources, Acquisitions, Planning, and Operation).

Although such measures may be applicable in developing a long range program of energy conservation, they are not, generally speaking, applicable as alternative considera-

40/ See Chapter IV, Social and Economic Impacts on Ultimate Consumers, in BPA's Final EIS on the 1974 Wholesale Power Rate Increase, U.S.D.I. FES 74-46, August 15, 1974. The Conservation study undertaken by Skidmore, Owings, and Merrill referred to previously examined means of bringing about conservation of electricity within the residential, commercial, and industrial sectors of the region's economy. The implementation programs investigated included educational programs, economic incentives, and mandatory programs. The study revealed that most savings in all sectors would be realized by 1995, assuming that implementation begins by 1980 (see pages 71, 119, and 184).



tions to the facilities proposed for fiscal year]980, some of which are required to be energized as soon as 1981. In order to meet these scheduled energization dates, therefore, system plans of service must be finalized now so that alternative facility locations can then be developed and presented in subsequent facility location supplements. Any delay in these leadtime requirements would result in a subsequent delay in construction, resulting in slippages from the energization dates.

The general topic of energy conservation, including the use of various strategies, technologies, practices, and institutional arrangements is covered in some detail in Chapter IV.B. of Part 1 of the "Role EIS" (Conservation and Other Potential Load Reduction Measures). This chapter was based on a study prepared under contract for BPA by Skidmore, Owings, and Merrill ^{41/}, which demonstrated the potential for conservation of electricity in the Pacific Northwest. A discussion of BPA's current policies relating to energy use and conservation is included in Chapter II.B.6. of Appendix C (Power Marketing) of the "Role EIS." Alternative policies concerning electric energy use and conservation are discussed in Chapter III.B.6. of Appendix C.

9. Reductions in the Quality of Electrical Service (As an Alternative to the FY 1980 Program)

Another alternative to building new transmission facilities would be to accept a reduction in the quality of service provided to the region. Reductions in the quality of electrical service involves such measures as reduced reliability standards with consequent increased likelihood of loss of load. Reduced reliability criteria would not necessarily result in reduced consumption of electricity, however, although it could delay the need for new transmission facilities. The general topic of transmission reliability, including alternative reliability criteria and their impacts or consequences, is covered in chapter III of Appendix B of the "Role EIS."

A reduction in the quality of service that could be correlated with reduced consumption of electricity would be a reduction in voltage levels. Estimates in the past have indicated that a 5 percent reduction in distribution system voltage would result in a 3 percent to 4 percent savings in regional energy consumption, and a reduction in peak demand of as much as 6 percent or 7 percent. These potential savings would allow a corresponding reduction in the need for additional facilities; however,

^{41/} Skidmore, Owings, and Merrill, July 1976, Bonneville Power Administration Electric Energy Conservation Study.



the reduction in facilities would be achieved at the cost of a reduction in the useful life of some types of motor-operated electrical appliances. In addition, voltage reductions to industrial customers could lead to reduced production and possibly even some unemployment.



X. Consultation and Coordination With Others

A. Consultation and Coordination in the Development of the Proposal

The Fiscal Year 1980 Final Program Statement covers those new facilities proposed for the first time as part of BPA's Fiscal Year 1980 Proposed Program.

These proposals are currently in the initial planning stages and represent identified system needs or requirements rather than facility locations. BPA has consulted with various Federal, regional, and local planning agencies in the development of these proposed plans of service.

Since specific facility locations have not yet been identified for the new proposals, BPA will continue to consult with Federal, State, and local agencies throughout the developmental process as part of its public and agency review process. BPA has held local public information meetings in connection with the Fiscal Year 1980 new proposals. Comments obtained as a result of this public and agency review process will be utilized in identifying subsequent alternative site locations for the proposals which will be presented in subsequent facility location phase environmental statements.

B. Coordination in the Review of the Draft Program Statement

The Fiscal Year 1980 Draft Environmental Statement was sent to Federal agencies, State and regional clearinghouses, and to local and metropolitan 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 the availability of the draft statement was placed in the Federal Register and was also published in local news media in advance of the public information meetings. A notice of availability of the final statement is also being placed in the Federal Register.

Agencies Requested to Comment on the Draft Program Statement

An asterisk (*) indicates that comments were received.

Federal Agencies

- *U.S. Department of the Interior
- *Fish and Wildlife Service
- Bureau of Mines
- *Bureau of Indian Affairs
- *Bureau of Land Management
- National Park Service



Geological Survey
Bureau of Reclamation
*Heritage Conservation and Recreation Service

U.S. Department of Transportation
*U.S. Coast Guard
*Federal Aviation Administration

U.S. Department of Energy
Federal Energy Regulatory Commission

*U.S. Department of Agriculture
*Forest Service
Soil Conservation Service

*U.S. Department of Housing and Urban Development

*U.S. Environmental Protection Agency

Advisory Council on Historic Preservation

*U.S. Department of the Army
Corps of Engineers

State Agencies

*State of Oregon
State of Washington
*State of Montana
State of Idaho

Local Agencies

OREGON

Blue Mountain Intergovernmental Council
Columbia Region Association of Governments
Mid-Columbia Economic Development District
East Central Oregon Association of Counties
Mid-Willamette Valley Council of Governments
Linn County Planning Commission
Benton County Planning Commission
Marion County Planning Commission
Polk County Planning Commission
District 4 Council of Governments
Clatsop-Tillamook Intergovernmental Council
Coos-Curry Council of Governments
Central Oregon Intergovernmental Council
Umpqua Regional Council of Governments
Klamath Lake Planning and Coordinating Council
Lane Council of Governments
Southeast Oregon Council of Governments



WASHINGTON

Grant-Lincoln-Adams Conference of Governments
Asotin County Planning Commission
Benton-Franklin Governmental Conference
Chelan County Regional Planning Council
Clallam County Governmental Conference
*Regional Planning Council of Clark County
Walla Walla Regional Planning Commission
Cowlitz-Wahkiakum Governmental Conference
Douglas County Regional Planning Commission
TRICO Economic Development District
Grays Harbor Regional Planning Commission
Jefferson-Port Townsend Regional Council
Kittitas County Conference of Governments
Klickitat County Regional Planning Council
Lewis Regional Planning Commission
Mason Regional Planning Council
Okanogan County Regional Planning Commission
Pacific County Regional Planning Council
San Juan County Planning Department
Skagit Regional Planning Council
Skamania Regional Planning Council
Spokane Regional Planning Conference
Thurston Regional Planning Council
Whatcom County Council of Governments
Whitman County Regional Planning Council
*Puget Sound Governmental Conference
Yakima County Conference of Governments

IDAHO

Teton County Commission
Panhandle Planning and Development Council
Clearwater Economic Development Association
Magic Valley Association of Governments
Ida-Ore Regional Planning and Development Association
Minidoka County Planning Commission

MONTANA

Lake County Commission
Lincoln County Commission
Flathead County Planning Board
Deer Lodge City-County Planning Board
Granite County Commissioners
Mineral County Commission
Missoula City-County Planning Board
Butte-Silver Bow City-County Planning Board
Ravalli County Commission
Sanders County Commission

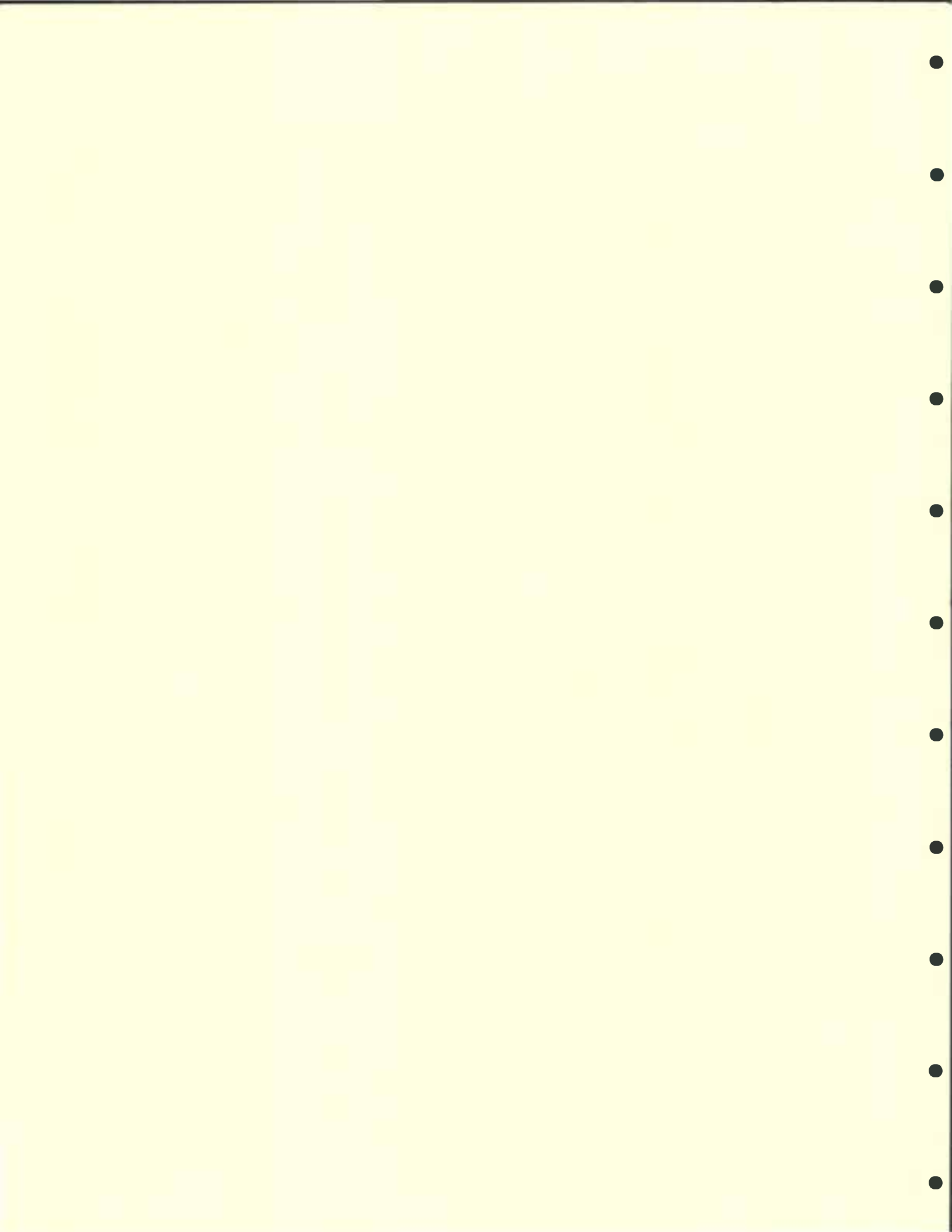


Others

Oregon Environmental Council
Washington Environmental Council
Idaho Environmental Council
Western Montana Environmental Protective Association
National Wildlife Federation
Montana Wildlife Federation
Oregon Wildlife Federation
Idaho Wildlife Federation
Federation of Western Outdoor Clubs
Friends of the Earth, Northwest Coordinator
Natural Resources Defense Council (Palo Alto Office)
The Wilderness Society (Western Regional Office)
Montana Wilderness Association
Sierra Club, Northwest Representative
 Rocky Mountain Chapter
 Pacific Northwest Chapter
Idaho State Historical Society
Pacific Northwest Conservation Council
East Sound, Washington Planning Commission
Ellensburg, Washington Planning Commission
Washington State Advisory Council on Historic Preservation
Washington Archaeological Research Center
Environmental Defense Fund, Rocky Mountain Office,
 Washington, D.C.
Western Montana Scientists Committee for Public Information
Natural Resources Law Institute
North Cascades Conservation Council
Oregon State Historic Preservation Office
Museum of Natural History, University of Oregon
Idaho State Historic Preservation Officer
Idaho State University Museum
Montana State Historic Preservation Officer
Montana Statewide Archaeological Survey
Montana Power Company
*Montana Historical Society
Flathead Electric Cooperative
Pacific Power and Light
Rural Electric Company
Idaho Power Company
Town of Fircrest, Washington
Tacoma City Light
Portland General Electric
Salem Electric Cooperative
Consumers Power Inc.
Wah Chang Oregon Metallurgical Corp.
City of Monmouth
Puyallup Tribal Council
Kootenai Tribal Council
Kalispell Business Community
Confederated Salis-Kootenai Tribes
Northern Idaho Agency
Spokane Agency
Flathead Agency
*Northwest Citizens for Wilderness



XI. Right-of-way Management Appendix



STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF IDAHO

SPOKANE AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Bonner	Albeni Falls	.8/ .32	Pramitol 5PS		160/ 73
	Priest River	.5/ .20	"		100/ 45
	Samuels	.4/ .16	"		80/ 36
	Sandpoint	.5/ .20	"		100/ 45
	Newport	.8/ .32	"		160/ 73
Boundary	Bonnors Ferry	1.0/ .40	"		200/ 91
Clearwater	Dworshak	10.0/ 4.05	"		2000/ 907
Kootenai	Athol	.3/ .12	"		60/ 27
	Prairie	.4/ .16	"		80/ 36
Nez Perce	Hatwai	17.0/ 6.88	"		3400/1542
	Lewiston Complex	2.0/ .81	"		400/ 181

FY 1980

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF IDAHO		WALLA WALLA AREA			
<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Cassia	Albion	0.1/.04	Ureabor		30/13.6
Cassia	Bridge	1.1/.44	Ureabor		300/136.1
Cassia	Raft	1.5/.61	Ureabor		300/136.1
Minidoka	East End	0.1/.04	Ureabor		50/22.7
Cassia	Declo	0.1/.04	Ureabor		30/13.6
Cassia	Newcomb	0.5/.20	Ureabor		150/68.0
Cassia	Idahome	0.5/.20	Ureabor		150/68.0
Cassia	East Hills	1.0/.41	Ureabor		300/136.1

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF IDAHO

SPOKANE AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Nez Perce	Lewiston	5/ 2 ² / ₁	Telvar		10/ 2

FY 1980

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF MONTANA

SPOKANE AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Deer Lodge	Anaconda	4.0/ 1.62	Pramitol 5PS		800/ 363
Flathead	Columbia Falls	2.0/ .81	Pramitol 5PS		400/ 181
	Conkelley	9.0/ 3.65	Pramitol 5PS		1800/ 816
	Flathead	1.8/ .73	Pramitol 5PS		360/ 163
	Kalispell	1.5/ .61	Pramitol 5PS		300/ 136
Granite	Sherryl	1.3/ .53	Pramitol 5PS		260/ 118
	Sherryl Tap	.5/ .20	Pramitol 5PS		100/ 45
Lake	Elmo	.3/ .12	Pramitol 5PS		60/ 27
	Kerr	.8/ .32	Pramitol 5PS		160/ 73
Lincoln	Libby	4.0/ 1.62	Pramitol 5PS		800/ 363
	Libby (Const.)	.4/ .16	Pramitol 5PS		80/ 36
	Trego	.5/ .20	Pramitol 5PS		100/ 45
	Troy	.4/ .16	Pramitol 5PS		80/ 36
	Yaak	.3/ .12	Pramitol 5PS		60/ 27
Mineral	Tarkio	.3/ .12	Pramitol 5PS		120/ 54
Missoula	Frenchtown	.3/ .12	Pramitol 5PS		60/ 27
Ravalli	Stevensville	.2/ .08	Pramitol 5PS		40/ 18
Sanders	Hot Springs	13.5/ 5.47	Pramitol 5PS		2700/1225
Silver Bow	Silver Bow	2.0/ .81	Pramitol 5PS		200/ 91

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION
 SPOKANE AREA

STATE OF MONTANA	Station	Acres/Hectares	Herbicide	Gal./Liter per Station	Lbs./Kg per station
<u>County</u>	Hot Springs	3/ 1 2/	Telvar		60/ 27
Sanders					

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF OREGON		PORTLAND AREA			
<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
BENTON	Adair	.6/ .24	Pramitol 5PS		140/ 64
	Wren	.7/ .28	Pramitol 5PS		160/ 73
CLATSOP	Clatsop	3.5/1.42	Pramitol 5PS		800/ 363
	Driscoll	2.5/1.01	Pramitol 5PS		550/ 249
	Knappa Tap	--	--		--
	Naselle Tap	.2/ .08	Pramitol 5PS		25/ 11
	Wauna	2.0/ .81	Pramitol 5PS		450/ 204
CLACKAMAS	McLoughlin	--	--		--
	Oregon City 500	7.5/3.04	Pramitol 5PS		1650/ 748
	Ostrander	17.7/7.16	Pramitol 5PS		3900/1769
COLUMBIA	Allston	21.0/8.50	Pramitol 5PS		4620/2096
	Clatskanie	.5/ .20	Pramitol 5PS		110/ 50
	Warren	.3/ .12	Pramitol 5PS		70/ 32
COOS	Bandon	1.7/ .69	Pramitol 5PS		375/ 170
	Coos	1.0/ .40	Pramitol 5PS		220/ 100
	Fairview	5.5/2.23	Pramitol 5PS		1210/ 549
	Hauser	.8/ .32	Pramitol 5PS		180/ 82
	Norway	.6/ .24	Pramitol 5PS		140/ 64
CURRY	Geisel Monument	--	--		--
	Gold Beach	.5/ .20	Pramitol 5PS		110/ 50
	Langlois	.5/ .20	Pramitol 5PS		110/ 50
	Port Orford	.8/ .32	Pramitol 5PS		180/ 82
DOUGLAS	Drain	2.0/ .81	Pramitol 5PS		440/ 199
	Gardiner	1.0/ .40	Pramitol 5PS		220/ 100
	Hanna	2.0/ .81	Pramitol 5PS		440/ 199
	Lookingglass	1.0/ .40	Pramitol 5PS		220/ 100
	Reedsport	1.2/ .49	Pramitol 5PS		270/ 122
	Reston	5.0/2.02	Pramitol 5PS		1100/ 499
	Tahkenitch	4.8/1.94	Pramitol 5PS		1060/ 481

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF OREGON

PORTLAND AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
HOOD RIVER	Cascade Locks	.7/ .28	Pramitol 5PS		160/ 73
LANE	Alvey	16.0/6.48	Pramitol 5PS		3520/1597
	Blue River	1.0/ .40	Pramitol 5PS		220/ 100
	Cottage Grove	.1/ .04	Pramitol 5PS		15/ 7
	Cougar	.3/ .12	Pramitol 5PS		70/ 32
	Dexter	.8/ .32	Pramitol 5PS		180/ 82
	Dorena	1.2/ .49	Pramitol 5PS		270/ 122
	Eugene	5.0/2.02	Pramitol 5PS		1100/ 499
	Fern Ridge	1.6/ .65	Pramitol 5PS		360/ 163
	Florence	1.0/ .40	Pramitol 5PS		220/ 100
	Hills Creek	.1/ .04	Pramitol 5PS		15/ 7
	Junction City	2.1/ .85	Pramitol 5PS		470/ 213
	Lane	16.0/6.48	Pramitol 5PS		3520/1597
	Lookout Point	1.3/ .51	Pramitol 5PS		290/ 132
	Mapleton	1.2/ .49	Pramitol 5PS		270/ 122
	Martin Creek	5.0/2.02	Pramitol 5PS		1100/ 499
	Oakridge	1.0/ .40	Pramitol 5PS		220/ 100
	Parker	--	--		--
	Pleasant Hill Tap	--	--		--
	Rainbow Valley	.5/ .20	Pramitol 5PS		110/ 50
	Springfield	1.0/ .40	Pramitol 5PS		220/ 100
	Walton	.5/ .20	Pramitol 5PS		110/ 50
	Wendson	5.0/2.02	Pramitol 5PS		1100/ 499
LINCOLN	Burnt Woods	.5/ .20	Pramitol 5PS		110/ 50
	Toledo	3.5/1.42	Pramitol 5PS		800/ 363
LINN	Albany	5.0/2.02	Pramitol 5PS		1100/ 499
	Foster	--	--		--
	Froman	--	--		--
	Green Peter	--	--		--
	Harrisburg	.5/ .20	Pramitol 5PS		110/ 50
	Lebanon	2.0/ .81	Pramitol 5PS		440/ 200
	Santiam	14.0/5.67	Pramitol 5PS		3080/1397

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF OREGON

PORTLAND AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
MARION	Chemawa	9.5/3.85	Pramitol 5PS		2190/ 993
	Detroit	1.5/ .61	Pramitol 5PS		330/ 150
	Marion	19.0/7.69	Pramitol 5PS		4180/1896
	Salem Alumina	.8/ .32	Pramitol 5PS		180/ 82
	Tumble Creek	.8/ .32	Pramitol 5PS		180/ 82
MULTNOMAH	St. Johns	6.7/2.71	Pramitol 5PS		1475/ 669
	Troutdale	12.0/4.86	Pramitol 5PS		2640/1198
POLK	Brush College	1.5/ .61	Pramitol 5PS		330/ 150
	Monmouth	.5/ .20	Pramitol 5PS		110/ 50
	Salem	4.5/1.82	Pramitol 5PS		990/ 449
TILLAMOOK	Beaver	.5/ .20	Pramitol 5PS		110/ 50
	Garibaldi	.5/ .20	Pramitol 5PS		110/ 50
	Hebo	.5/ .20	Pramitol 5PS		110/ 50
	Mohler	.5/ .20	Pramitol 5PS		110/ 50
	Tillamook	2.5/1.01	Pramitol 5PS		550/ 249
WASHINGTON	Forest Grove	1.5/ .61	Pramitol 5PS		330/ 150
	Gales Creek	--	--		--
	Keeler	20.0/8.10	Pramitol 5PS		4400/1996
	Oregon City 115	3.5/1.42	Pramitol 5PS		800/ 363
	Thatcher Junction	1.0/ .40	Pramitol 5PS		220/ 100
	Timber	.5/ .20	Pramitol 5PS		110/ 50
YAMHILL	Carlton	2.5/1.01	Pramitol 5PS		550/ 249
	McMinnville	3.0/1.21	Pramitol 5PS		660/ 299
	Walnut City	1.0/ .40	Pramitol 5PS		220/ 100
	Windishar	--	--		--

FY 1980

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION
WALLA WALLA AREA

STATE OF OREGON

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Harney	Harney	1.0/.41	Pramitol 5PS		200/90.7
Lake	Sycan	2.5/1.01	Pramitol 5PS		500/226.8
Umatilla	McNary	7.0/2.84	Pramitol 25E	105/396.9	
Umatilla	Roundup	4.0/1.62	Pramitol 25E	60/226.8	
Union	LaGrande	1.0/.41	Pramitol 25E	15/56.7	
Wasco	Bakeoven	10.0/4.05	Pramitol 5PS		2000/907.2
Wasco	Big Eddy	11.0/4.46	Pramitol 5PS		2200/997.9
Wasco	Celilo	15.0/6.08	Pramitol 5PS		3000/1360.8
Wasco	Celilo	2.0/.81	Telvar		60/27.2
Wasco	Chenoweth	1.5/.61	Pramitol 5PS		300/136.0

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF WASHINGTON

PORTLAND AREA

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
CLARK	Alcoa	4.0/1.62	Pramitol 5PS		880/ 399
	Camas	.5/ .20	Pramitol 5PS		110/ 50
	Carborundum	.5/ .20	Pramitol 5PS		110/ 50
	Chelatchie	.7/ .28	Pramitol 5PS		160/ 73
	Evans Tap	--	--		--
	Fishers Road	.5/ .20	Framitol 5PS		110/ 50
	Mill Plain	1.3/ .53	Pramitol 5PS		290/ 132
	Ross	12.0/4.86	Pramitol 5PS		2640/1198
	Sifton	5.3/2.15	Pramitol 5PS		1170/ 531
	Vancouver Shipyard	1.2/ .49	Pramitol 5PS		270/ 122
	Woodland Tap	.5/ .20	Pramitol 5PS		110/ 50
COWLITZ	Cardwell	1.1/ .45	Pramitol 5PS		250/ 113
	Chemical	--	--		--
	Cowlitz	1.1/ .45	Pramitol 5PS		250/ 113
	Lexington	4.5/1.82	Pramitol 5PS		990/ 499
	Longview	21.6/8.74	Pramitol 5PS		4760/2155
SKAMANIA	Cape Horn	.8/ .32	Pramitol 5PS		180/ 82
	Carson	.5/ .20	Pramitol 5PS		110/ 50
	North Bonneville	5.0/2.02	Pramitol 5PS		1100/ 499
	Stevenson	.5/ .20	Pramitol 5PS		110/ 50
WAHKIAKUM	Cathlamet	.5/ .20	Pramitol 5PS		110/ 50

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION
SPOKANE AREA

STATE OF WASHINGTON

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Okanogan	Brewster	.8/ .32	Pramitol 5PS		160/ 73
	Goose Lake	.4/ .16	"		80/ 36
	Lone Pine	.2/ .08	"		40/ 18
	Nespelem	.6/ .24	"		120/ 54
	Okanogan	2.3/ .93	"		460/ 209
	Omak	.5/ .20	"		100/ 45
	Oroville	.5/ .20	"		100/ 45
	Tonasket	.9/ .36	"		180/ 82
	Winthrop	.5/ .20	"		100/ 45
Pend Oreille	Boundary	5.0/ 2.03	"		1000/ 454
	Cusick	.5/ .20	"		100/ 45
	Metaline Falls	.8/ .32	"		160/ 73
	Sacheen	3.3/ 1.34	"		660/ 299
Spokane	Bell	17.0/ 6.88	"		3400/1542
	Bell-Storage Yard	8.0/ 3.24	"		1600/ 726
	Bigelow	.4/ .16	"		80/ 36
	Cheney	.6/ .24	"		120/ 54
	Deer Park	.6/ .24	"		120/ 54
	Four Lakes	.5/ .20	"		100/ 45
	Green Bluff	.3/ .12	"		60/ 27
	Hangman	.4/ .16	"		160/ 73
	Springhill	1.0/ .40	"		200/ 91
	Trentwood	12.5/ 5.06	"		2500/1134
	Valley Way	.5/ .20	"		100/ 45
Vera	.6/ .24	"		120/ 54	
Stevens	Addy	4.0/ 1.62	"		800/ 363
	Colville	2.0/ .81	"		200/ 91
Whitman	Chambers	.4/ .16	"		80/ 36
	Clarkston	.4/ .16	"		80/ 36
	Colfax	.7/ .28	"		140/ 64
	Little Goose	10.0/ 4.05	"		2000/ 907
	Riparia	.3/ .12	"		60/ 27

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STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

SPOKANE AREA

STATE OF WASHINGTON

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Adams	Hatton	.5/ .20	Pramitol 5PS		200/ 91
	Ritzville	.5/ .20	"		200/ 91
	Schrag	.5/ .20	"		200/ 91
Chelan	Valhalla	12.0/ 4.86	"		2400/1089
Douglas	Chief Joseph	12.9/ 5.22	"		2580/1170
	Columbia	12.2/ 4.94	"		2440/1107
	Eastmont	1.0/ .40	"		200/ 91
	Foster Creek	.3/ .12	"		60/ 27
	Nilles Corner	.3/ .12	"		60/ 27
	Orondo	.5/ .20	"		100/ 45
	Rocky Reach	2.5/ 1.01	"		500/ 227
	Sickler	8.0/ 3.24	"		1600/ 726
Ferry	Republic	.5/ .20	"		100/ 45
Garfield	Lower Granite	7.0/ 2.84	"		1000/ 454
	Pomeroy	.7/ .28	"		140/ 64
Grant	Potholes	3.4/ 1.38	"		680/ 308
	Vantage	17.0/ 6.88	"		3400/1542
Kittitas	Compressed Gas Ins. Trans. Sys.	.5/ .20	"		150/ 68
	East Ellensburg	.4/ .16	"		80/ 36
	Ellensburg	1.3/ .53	"		260/ 118
Lincoln	Creston	.9/ .36	"		180/ 82
	Odessa	.5/ .20	"		100/ 45
	Wagner Lake	.4/ .16	"		80/ 36

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

SPOKANE AREA

STATE OF WASHINGTON

<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Grant	Grand Coulee	.35/ 0 ² / ₁	Telvar		5/ 2.

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

WALLA WALLA AREA

STATE OF	WASHINGTON				
<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>	<u>Herbicide</u>	<u>Gal./Liter per Station</u>	<u>Lbs./Kg per station</u>
Benton	Angus	0.5/.20	Pramitol 25E	5/18.9	
Benton	Badger Canyon	4.6/1.86	Pramitol 25E	25/94.5	
Benton	Hedges	0.9/.364	Pramitol 25E	10/37.8	
Benton	Ledbeder	0.7/.28	Pramitol 25E	5/18.9	
Franklin	Connell	0.9/.36	Pramitol 25E	10/37.8	
Franklin	Franklin	8.5/3.4	Pramitol 25E	30/113.4	
Franklin	Franklin	0.3/.12	Pramitol 5PS		100/45.4
Franklin	Glade	0.3/.12	Pramitol 5PS		100/45.4
Franklin	Levey	0.3/.12	Pramitol 25E	5/18.9	
Franklin	Ringold	0.6/.24	Pramitol 25E	10/37.8	
Franklin	Sagehill	0.6/.24	Pramitol 25E	5/18.9	
Franklin	Taylor Flats	0.6/.24	Pramitol 25E	5/18.9	
Klickitat	Bingen	0.8/.32	Pramitol 5PS		160/72.6
Klickitat	Gilmer	0.3/.12	Pramitol 5PS		60/27.2
Klickitat	Spearfish	0.5/.20	Pramitol 5PS		100/45.4
Skamania	Underwood	0.5/.20	Pramitol 5PS		100/45.4
Walla Walla	Sun Harbor	0.5/.20	Pramitol 25E	5/18.9	
Yakima	Grandview	1.9/.77	Pramitol 25E	15/56.7	
Yakima	Grandview	0.3/.12	Pramitol 5PS		100/45.4
Yakima	Midway	10.0/4.05	Pramitol 5PS		2000/907.2

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FY 1980

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION
SEATTLE AREA

STATE OF WASHINGTON					Gal./Liter per Station	Lbs./Kg per station
<u>County</u>	<u>Station</u>	<u>Acres/Hectares</u>		<u>Herbicide</u>		
Clallam	Port Angeles	6.28/	2.54	Ureabor		2500/1134
	Sappho	2.09/	.85	Ureabor		850/385
Grays Harbor	Aberdeen	4.2/	1.70	Ureabor		1700/771
	Cosmopolis	2.6/	1.05	Ureabor		1050/476
Jefferson	Duckabush	.61/	.25	Ureabor		250/113
	Fairmount	3.73/	1.51	Ureabor		1500/680
King	Covington	29.75/	12.05	Ureabor		11900/5398
	Maple Valley	17.3/	7.01	Ureabor		6900/3130
	Raver	19.8/	8.02	Ureabor		7900/3583
	Microwave Sta.	.5/	.20	Ureabor		200/91
Kitsap	Bremerton	.73/	.30	Ureabor		300/136
	Kitsap	5.65/	2.29	Ureabor		2250/1020
Lewis	Centralia	.49/	.20	Ureabor		200/91
	Chehalis	9.30/	3.77	Ureabor		3700/1678
	Morton	.27/	.11	Ureabor		100/45
	Paul, C.W.	13.11/	5.31	Ureabor		5200/2359
	Pel Eli	.67/	.27	Ureabor		250/113
	Silver Creek	1.86/	.75	Ureabor		750/340
Microwave Sta.	.20/	.08	Ureabor		50/23	
Mason	Bayshore	.53/	.21	Ureabor		200/91
	Belfair	.65/	.26	Ureabor		250/113
	Kamilche	.50/	.20	Ureabor		200/91
	Mason	.26/	.10	Ureabor		100/45
	Potlatch	.88/	.36	Ureabor		350/159
	Shelton	5.85/	2.37	Ureabor		2350/1066

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FY 1980

STATION WEED CONTROL PROGRAM BY STATE, COUNTY, AND STATION

STATE OF WASHINGTON		SEATTLE AREA				
County	Station	Acres/Hectares		Herbicide	Gal./Liter per Station	Lbs./Kg per station
Pacific	Holcomb	.57/	.23	Ureabor		200/91
	Long Beach	.73/	.30	Ureabor		300/136
	Naselle	1.95/	.79	Ureabor		800/363
	Raymond	1.89/	.76	Ureabor		750/340
	Willapa River	.60/	.24	Ureabor		250/113
Pierce	So. Tacoma Sub.	3.0/	1.22	Ureabor		1200/544
	Tacoma	9.89/	4.00	Ureabor		3950/1792
	Microwave Sta.	.50/	.20	Ureabor		200/91
San Juan	Lopez	.50/	.20	Ureabor		200/91
Skagit	Fidalgo	.57/	.23	Ureabor		150/68
Snohomish	Monroe	25.8/	10.45	Ureabor		10300/4672
	Murray	2.6/	1.05	Ureabor		1040/472
	Snohomish	.18.3/	7.42	Ureabor		7300/3311
	SnoKing	6.7/	2.72	Ureabor		2700/1225
	Microwave	1.2/	.49	Ureabor		500/227
Thurston	Olympia	20.60/	8.35	Ureabor		8250/3742
Wahkiakum	Svenson	.23/	.09	Ureabor		100/45
Whatcom	Bellingham	4.5/	1.82	Ureabor		1800/816
	Custer	15.50/	6.28	Ureabor		6200/2812
	Intalco	10.00/	4.05	Ureabor		4000/1814

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BPA's FY 19 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF IDAHO

SPOKANE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
	acres/ha.	acres/ha.	acres/ha.			
BONNERS						
Albeni Falls-Bonnors Ferry			100/ 40.5 ^{2/}	Banvel 4WS	100.0/	378
Bell-Noxon			100/ 40.5 ^{2/}	Tordon 101	200.0/	757
BOUNDARY						
Albeni Falls-Bonnors Ferry			100/ 40.5 ^{2/}	Tordon 101	200.0/	757
Bonnors Ferry-Troy	6/	2.4 ^{1/}		Banvel 720	1.0/	4
CLEARWATER						
Dworshak-Orofino	1/	.4 ^{1/}		Tordon 101	1.0/	4
Dworshak-Powerhouse	1/	.4 ^{1/}		Tordon 101	1.0/	4
LATAH						
Dworshak-Hot Springs	24/	10.8 ^{1/}	100/ 40.5 ^{2/}	Tordon 101	200.0/	766
NEZ PERCE						
Hatwai-Dworshak			100/ 40.5 ^{2/}	Tordon 101	300.0/	1135
SHOSHONE						
Dworshak-Hot Springs	24/	10.8 ^{1/}	100/ 40.5 ^{2/}	Tordon 101	200.0/	757

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BPA's FY 19 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

SPOKANE AREA

STATE OF MONTANA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.				

DEER LODGE

Hot Springs-Anaconda

200/ 81^{2/}

Tordon 101 400.0/1514

Telvar

20/ 75

FLATHEAD

Flathead-Hot Springs

10/ 4.0^{1/}

Tordon 101 1.0/ 4

Columbia Falls-Trego

30/ 12.1^{1/}

Tordon 101 3.0/ 11

LAKE

Kalispell-Kerr

36/ 14.6^{1/}

Tordon 101 3.6/ 14

LINCOLN

Libby Pwr. House # 1

1/ .4^{1/}

Tordon 101 .1/ 4

MINERAL

Dworshak-Hot Springs

20/ 9.0^{1/}

Tordon 101 .2/ 8

MISSOULA

Hot Springs-Anaconda

10/ 4.0^{1/}

200/ 81^{2/}

Tordon 101 1.0/ 4

Telvar

20/ 75

SANDERS

Bell-Noxon

10/ 4.0^{1/}

Tordon 101 1.0/ 4

Dworshak-Hot Springs

50/ 20.2^{1/}

Tordon 101 5.0/ 19

Noxon-Hot Springs

65/ 26.3^{1/}

Tordon 101 6.5/ 25

Hot Springs-Anaconda

10/ 4.0^{1/}

Tordon 101 1.0/ 4

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF OREGON

PORTLAND AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting 1/ acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

BENTON

Santiam-Toledo	3/1.7	232/ 90.4	13/ 5.3	Weedone 170 Tordon 101 2,4-D Amine Tordon 101 Tordon 10K	12/ 46 464/1756 116/ 439 26/ 98	300/136
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CLACKAMAS

Big Eddy-Oregon City			100/ 40.5 ^{2/}	Banvel 720	100/ 379	
Big Eddy-Troutdale			60/ 24.3 ^{2/}	Banvel 720	60/ 227	

CLATSOP

Allston-Clatsop			66/ 26.7	Banvel 720	132/ 500	
Longview-Astoria	5/2.0		386/156.3	Banvel 520 Banvel 720 Tordon 10K	10/ 38 772/2922	100/ 45

COLUMBIA

Allston-Clatsop			47/ 19.0	Banvel 720	94/ 356	
Keeler-Allston	6/2.4	301/121.9	51/ 20.7	Weedone 170 Tordon 101 2,4-D Amine Banvel 720 Tordon 10K	12/ 45 602/2279 150/ 568 102/ 386	300/136

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
 COUNTY AND TRANSMISSION LINE

PORTLAND AREA

STATE OF OREGON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting 1/	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.				

COLUMBIA

Longview-Astoria	4/1.6		386/156.3	Banvel 520 Banvel 720 Tordon 10K	8/ 30 772/2922	100/45
Trojan-Allston #1 & 2	7/2.8		80/ 32.4	Weedone 170 Tordon 101 Tordon 10K	14/ 53 160/ 606	50/23

COOS

Coos Tap to Reedsport-Fairview	2/0.8		30/ 12.2	Weedone 170 Tordon 101	8/ 30 60/ 227	
Reedsport-Fairview	7/2.8		392/158.8	Weedone 170 Banvel 720 Tordon 10K	28/ 106 784/2968	100/45

DOUGLAS

Lane-Tahkenitch #1	2/0.8		68/ 27.5	Weedone 170 Tordon 101 Tordon 10K	8/ 30 136/ 515	200/91
Reedsport-Fairview	2/0.8		86/ 34.8	Weedone 170 Banvel 720 Tordon 10K	8/ 30 172/ 651	100/45

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF OREGON

PORTLAND AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting 1/ acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			
<u>LANE</u>						
Albany-Eugene	2/0.8		35/14.2	Weedone 170 Tordon 101	8/ 30 70/ 265	
Eugene-Alvey	5/2.0		95/38.5	Weedone 170 Tordon 101	20/ 76 190/ 719	
Lookout Point-Alvey	7/2.8		133/53.9	Weedone 170 Tordon 101	28/ 106 266/1007	
Rainbow Valley Tap			17/ 6.9	Tordon 101	34/ 129	
Santiam-Alvey	5/2.0		95/38.5	Weedone 170 Tordon 101 Tordon 10K	20/ 76 190/ 719	50/23
Toledo-Wendson	3/1.2		48/19.4	Weedone 170 Tordon 101 Tordon 10K	12/ 45 96/ 363	50/23
<u>LINCOLN</u>						
Santiam-Toledo		168/68.0	9/ 3.6	Tordon 101 2,4-D Amine Tordon 101 Tordon 10K	336/1272 84/ 318 18/ 68	100/45

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF OREGON

PORTLAND AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting 1/ acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

LINCOLN

Toledo-Wendson	2/0.8			Weedone 170	8/ 30	
		47/ 19.0		Tordon 101	94/ 356	
				Tordon 10K		100/ 45

LINN

Big Cliff-Detroit	3/1.2			Tordon 101	1/ 4	
		23/ 9.3		Banvel XP		6000/2722
Detroit-Santiam	13/5.3			Banvel 520	39/ 148	
		244/ 98.8		Tordon 101	488/1847	
				Tordon 10K		300/136
Marion-Alvey #1	5/2.0			Banvel 520	15/ 57	
		423/171.3		Banvel 720	846/3203	
				Tordon 10K		200/ 91
Santiam-Alvey		140/ 56.7		Banvel 720	280/1060	
				Tordon 10K		50/ 23
Santiam-Toledo	7/2.8			Weedone 170	28/ 106	
		80/ 32.4		Tordon 101	160/ 606	
				Tordon 10K		50/ 23
Albany-Eugene	4/1.6			Weedone 170	16/ 61	
		75/ 30.4		Tordon 101	150/ 568	

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF OREGON

PORTLAND AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting <u>1</u> / acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

LINN

Albany-Lebanon	1/0.4		Weedone 170	4/ 15	
		29/11.7	Tordon 101	58/220	

MARION

Big Cliff-Detroit		2/ 0.8	Banvel 520	6/ 23	
			Tordon 10K		50/23
Detroit-Santiam	3/1.2		Banvel 520	9/ 34	
		60/24.3	Tordon 101	120/454	
			Tordon 10K		50/23
Marion-Alvey #1		22/ 8.9	Banvel 720	44/167	
Marion-Santiam		7/ 2.8	Tordon 101	14/ 53	

MULTNOMAH

Ross-St. Johns	1/0.4		Banvel 520	2/ 8	
		8/ 3.2	Banvel 720	16/ 61	
Big Eddy-Troutdale		40/16.2 <u>2</u> /	Banvel 720	40/151	

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF OREGON

PORTLAND AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting <u>1</u> / acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

WASHINGTON

Keeler-Allston	2/0.8			Weedone 170	8/ 30	
		129/52.2		Tordon 101	258/977	
				2,4-D Amine	65/246	
			21/ 8.5	Banvel 720	42/159	
				Tordon 10K		100/45
Timber Tap to Forest Grove-Tillamook			115/46.6	Banvel 720	230/871	

YAMHILL

Forest Grove-McMinnville			34/13.8	Banvel 720	68/257	
Walnut City Tap	1/0.4			Weedone 170	4/ 15	
				8/ 3.2	Tordon 101	16/ 61

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
 COUNTY AND TRANSMISSION LINE
 WALLA WALLA AREA

STATE OF OREGON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. 1/	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			
<u>Deschutes</u>						
Redmond-Yamsay		40/ 16.2		Tordon 10K		600/272
Celilo-Sylmar		3/ 1.2		Telvar		45/ 20
<u>Gilliam</u>						
Lower Monumental-John Day		15/ 6.1		Telvar		225/102
<u>Hood River</u>						
Bonneville-The Dalles	20/ 8.1		30/ 12.2	Tordon 10K		600/272
Big Eddy-Troutdale	25/10.1		125/ 50.6	Tordon 101	250/ 945	
<u>Klamath</u>						
Redmond-Yamsay		30/ 12.2		Telvar		450/204
<u>Lake</u>						
Celilo-Sylmar		15/ 6.1		Telvar		225/102

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

SEATTLE AREA

STATE OF WASHINGTON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
	acres/ha. <u>1</u> /	acres/ha.	acres/ha.			

Chelan

Chief Joseph-Monroe	10/4.1		Banvel 4 WS	10/38
		100/40.5	Banvel 4 WS 2,4-D Amine	50/189 100/379

Clallam

Fairmount-Port Angeles No. 2	20/8.1		Banvel 4 WS	20/76
		200/80.9	Banvel 4 WS 2,4-D Amine	100/379 200/757
Olympia-Port Angeles No. 1	8/3.2		Banvel 4 WS	8/30
		80/32.4	Banvel 4 WS 2,4-D Amine	40/151 80/303
Port Angeles-Sappho No. 1	10/4.1		Banvel 4 WS	10/38
		100/40.5	Banvel 4 WS 2,4-D Amine	50/189 100/379

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
Transmission Line	acres/ha. <u>1/</u>	acres/ha.	acres/ha.			

Cowlitz

Lexington-Longview No. 1	4/1.6			Banvel 4WS	4/15
			40/16.2	Banvel 4WS 2,4-D Amine	20/76 40/151
			80/32.4 ^{2/}	Banvel 4WS 2,4-D Amine	20/76 40/151
Longview-Chehalis No. 1	2/0.8			Banvel 4WS	2/8
			20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76
			120/48.6 ^{2/}	Banvel 4WS 2,4-D Amine	30/114 60/227
Paul-Allston No. 2	20/8.1			Banvel 4WS	20/76
			200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757
			200/80.9 ^{2/}	Banvel 4WS 2,4-D Amine	50/189 100/379

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. <u>1/</u>	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Grays Harbor

Olympia-Aberdeen No. 3	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757
		280/113.3 ^{2/}	Banvel 4WS 2,4-D Amine	70/265 140/530
Olympia-Cosmopolis No. 1	7/2.8		Banvel 4WS	7/27
		70/28.3	Banvel 4WS 2,4-D Amine	35/142 70/265
Raymond-Cosmopolis	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76

Jefferson

Fairmount-Port Angeles No. 2	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76
Olympia-Port Angeles No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379

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BPA's FY 19 80RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
acres/ha. <u>1/</u>	acres/ha.	acres/ha.				

King

Chief Joseph-Monroe No. 1	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757
Covington-Columbia No. 3	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757
		80/32.4 ^{2/}	Banvel 4WS 2,4-D Amine	20/76 40/151
Covington-Duwamish	10/4.1		Banvel 4 WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
Covington-Maple Valley No. 2	6/2.4		Banvel 4WS	6/23
		60/24.3	Banvel 4WS 2,4-D Amine	30/114 60/227
Covington-White River No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379

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BPA's FY 19 80 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. <u>1/</u>	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

King (Cont.)

Grand Coulee-Raver No. 1 & 2	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76
Raver-Covington No. 1 & 2	9/3.6		Banvel 4WS	9/34
		90.36.4	Banvel 4WS 2,4-D Amine	45/170 90/341
Raver-Monroe No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
		180/72.9 ^{2/}	Banvel 4WS 2,4-D Amine	45/170 90/341
Raver-Paul No. 1		180/72.9 ^{2/}	Banvel 4WS 2,4-D Amine	45/170 90/341
Sickler-Raver No. 1	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
Transmission Line	acres/ha. <u>1/</u>	acres/ha.	acres/ha.			

King (Cont.)

Tacoma-Raver No. 1 & 2	6/2.4		Banvel 4WS	6/23
		52/21.0	Banvel 4WS	26/98
			2,4-D Amine	52/197
		100/40.5 ^{2/}	Banvel 4WS	25/95
			2,4-D Amine	50/189

Kitsap

Kitsap-Bremerton	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS	5/19
			2,4-D Amine	10/38
Olympia-Kitsap No. 3	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS	50/189
			2,4-D Amine	100/379

Kittitas

Covington-Columbia No. 3	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS	5/19
			2,4-D Amine	10/38
Grand Coulee-Raver No. 1 & 2	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS	10/38
			2,4-D Amine	20/76

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BPA's FY 19 80 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

SEATTLE AREA

STATE OF WASHINGTON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. <u>1/</u>	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Lewis

Chehalis-Centralia No. 1	4/1.6			Banvel 4WS	4/15
		36/14.6		Banvel 4WS 2,4-D Amine	18/68 36/136
Chehalis-Mayfield	8/3.2			Banvel 4WS	8/30
		80/32.4		Banvel 4WS 2,4-D Amine	40/151 80/303
		80/32.4 ^{2/}		Banvel 4WS 2,4-D Amine	20/76 40/151
Chehalis-Olympia	8/3.2			Banvel 4WS	8/30
		80/32.4		Banvel 4WS 2,4-D Amine	40/151 80/303
		60/24.3 ^{2/}		Banvel 4WS 2,4-D Amine	15/57 30/114
Chehalis-Raymond	10/4.1			Banvel 4WS	10/38
		100/40.5		Banvel 4WS 2,4-D Amine	50/189 100/379
Mossyrock-Chehalis No. 1	1/0.4			Banvel 4WS	1/4
		10/4.1		Banvel 4WS 2,4-D Amine	5/19 10/38

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
	acres/ha. <u>1/</u>	acres/ha.	acres/ha.			

Lewis (Cont.)

Paul-Allston No. 2	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS	100/379
			2,4-D Amine	200/757
		800/323.8 ^{2/}	Banvel 4WS	200/757
			2,4-D Amine	400/1514
		100/40.5 ^{2/}	Banvel 4WS	25/95
			2,4-D Amine	50/189
Paul-Olympia		100/40.5 ^{2/}	Banvel 4WS	25/95
			2,4-D Amine	50/189
Silver Creek-Leonard Rd.	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS	5/19
			2,4-D Amine	10/38
Silver Creek-Morton No. 1	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS	5/19
			2,4-D Amine	10/38

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
Transmission Line	acres/ha. <u>1/</u>	acres/ha.	acres/ha.			

Mason

Olympia-Kitsap No. 3	20/8.1			Banvel 4WS	20/76
		200/80.9		Banvel 4WS 2,4-D Amine	100/379 200/757
Olympia-Port Angeles No. 1	10/4.1			Banvel 4WS	10/38
		100/40.5		Banvel 4WS 2,4-D Amine	50/189 100/379
		100/40.5 ^{2/}		Banvel 4WS 2,4-D Amine	25/95 50/189

Pacific

Cathlamet-Naselle No. 1	2/0.8			Banvel 4WS	2/8
		20/8.1		Banvel 4WS 2,4-D Amine	10/38 20/76
Chehalis-Raymond	20/8.1			Banvel 4WS	20/76
		200/80.9		Banvel 4WS 2,4-D Amine	100/379 200/757
		60/24.3 ^{2/}		Banvel 4WS 2,4-D Amine	15/57 30/114

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha.1/	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Pacific (Cont.)

Holcomb-Naselle No. 1	5/2.0		Banvel 4WS	5/19
		50/20.2	Banvel 4WS 2,4-D Amine	25/95 50/189
		40/16.2 ^{2/}	Banvel 4WS 2,4-D Amine	10/38 20/76
Naselle-Long Beach No. 2	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
Raymond-Cosmopolis	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76
Raymond-Raymond Tide Flats	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38
Raymond-Willapa No. 1	3/1.2		Banvel 4WS	3/11
		30/12.1	Banvel 4WS 2,4-D Amine	15/57 30/114

BPA's FY 19 80 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. <u>1/</u>	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Pierce

Covington-White River No. 1	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38
Olympia-White River No. 1	6/2.4		Banvel 4WS	6/23
		60/24.3	Banvel 4WS 2,4-D Amine	30/114 60/227
		200/80.9 ^{2/}	Banvel 4WS 2,4-D Amine	50/189 100/379
Raver-Paul No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
		600/242.8 ^{2/}	Banvel 4WS 2,4-D Amine	150/568 300/1136
Tacoma-Cowlitz Tap to the Chehalis-Covington	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38
		50/20.2 ^{2/}	Banvel 4WS 2,4-D Amine	13/49 25/95

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
 COUNTY AND TRANSMISSION LINE

SEATTLE AREA

STATE OF WASHINGTON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
	acres/ha. 1/	acres/ha.	acres/ha.			

Pierce (Cont.)

Tacoma-Cowlitz Tap to the Olympia-White River	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38
		50/20.2 ^{2/}	Banvel 4WS 2,4-D Amine	13/49 25/95
Tacoma-Raver No. 1 & 2	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38

Skagit

Monroe-Custer No. 1	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38
Monroe-Custer No. 2	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
acres/ha.1/	acres/ha.	acres/ha.				

Snohomish

Chief Joseph-Monroe No. 1	10/4.1			Banvel 4WS	10/38
		100/40.9		Banvel 4WS 2,4-D Amine	50/189 100/379
Chief Joseph-Snohomish No. 3 & 4	1/0.4			Banvel 4WS	1/4
		10/4.1		Banvel 4WS 2,4-D Amine	5/19 10/38
Jim Creek Service	4/1.6			Banvel 4WS	4/15
		40/16.2		Banvel 4WS 2,4-D Amine	20/76 40/151
Monroe-Custer No. 1	2/0.8			Banvel 4WS	2/8
		20/8.1		Banvel 4WS 2,4-D Amine	10/38 20/76
Monroe-Custer No. 2	2/0.8			Banvel 4WS	2/8
		20/8.1		Banvel 4WS 2,4-D Amine	10/38 20/76

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BPA's FY 19 80RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

SEATTLE AREA

STATE OF WASHINGTON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha.1/	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Snohomish (Cont.)

Monroe-Snohomish No. 1 & 2	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
Raver-Monroe No. 1	8/3.2		Banvel 4WS	8/30
		80/32.4	Banvel 4WS 2,4-D Amine	40/151 80/303
Snohomish-Bothell No. 1	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38

Thurston

Chehalis-Olympia No: 1	4/1.6		Banvel 4WS	4/15
		40/16.2	Banvel 4WS 2,4-D Amine	20/76 40/151
Olympia-Aberdeen No. 3	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. 1/	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Thurston (Cont.)

Olympia-Grand Coulee No. 1	2/0.8			Banvel 4WS	2/8
			20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76
Olympia-Port Angeles No. 1	4/1.6			Banvel 4WS	4/15
			40/16.2	Banvel 4WS 2,4-D Amine	20/76 40/151
Olympia-White River No. 1		100/40.5 ^{2/}		Banvel 4WS 2,4-D Amine	25/95 50/189
Paul-Olympia No. 1	10/4.1			Banvel 4WS	10/38
			100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
			200/80.9 ^{2/}	Banvel 4WS 2,4-D Amine	50/189 100/379
Raver-Paul No. 1	7/2.8			Banvel 4WS	7/27
			70/28.3	Banvel 4WS 2,4-D Amine	35/132 70/265
			300/121.4 ^{2/}	Banvel 4WS 2,4-D Amine	75/284 150/568

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF Washington

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha. 1/	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

Wahkiakum

Cathlamet-Naselle No. 1	16/6.5		Banvel 4WS	16/61
		164/64.8	Banvel 4WS 2,4-D Amine	82/310 164/620

Whatcom

Custer-Ingledow No. 1 & 2	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
Custer-Intalco No. 1	3/1.2		Banvel 4WS	3/11
		30/12.1	Banvel 4WS 2,4-D Amine	15/57 30/114
Custer-Intalco No. 2	3/1.2		Banvel 4WS	3/11
		30/12.1	Banvel 4WS 2,4-D Amine	15/57 30/114
Monroe-Custer No. 1	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38

BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SEATTLE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
	acres/ha. <u>1/</u>	acres/ha.	acres/ha.			

Whatcom (Cont.)

Monroe-Custer No. 2	4/1.6		Banvel 4WS	4/15
		40/16.2	Banvel 4WS	20/76
			2,4-D Amine	40/151

- 1/ Requires stump treatment of resprouting species.
2/ Weed control. This includes noxious weed control on right-of-way and weed control around structures in agricultural land.

BPA's FY 19 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SPOKANE AREA

County	Transmission Line	Area of each Management Method			Herbicide	Application per Line	
		Hand Cutting	Herbicide			gal/liter	lb/kg
			Aerial	Selective			
		acres/ha.	acres/ha.	acres/ha.			
CHELAN	Grand Coulee-Raver Corridor			200/ 81.0 ^{2/}	Tordon 101	400.0/1514	
COLUMBIA	Little Goose-Lower Granite			100/ 40.5 ^{2/}	Tordon 101	200.0/ 757	
DOUGLAS	Grand Coulee-Okanogan # 1			124/ 50.2 ^{2/}	Tordon 101	250.0/1012	
					Telvar		20/ 91
	Grand Coulee-Okanogan # 2			99/ 40.0 ^{2/}	Tordon 101	200.0/ 757	
GRANT	Grand Coulee-Hanford	4/ 1.6 ^{1/}		100/ 40.5 ^{2/}	Tordon 101	200.0/ 757	
					Telvar		20/ 91
	Waluke Tap	1/ .4 ^{1/}			Tordon 101	1.0/ 4	
KITTITAS	Covington-Columbia	3/ 1.2 ^{1/}			Tordon 101	3.0/ 11	
	Grand Coulee-Raver Corridor			200/ 81.0 ^{2/}	Tordon 101		
	Rocky Reach-Maple Valley	12/ 4.9 ^{1/}			Tordon 101	1.0/ 4	
	Vantage-Raver	5/ 2.2 ^{1/}			Tordon 101	1.0/ 4	

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BPA's FY 19 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

SPOKANE AREA

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			
LINCOLN Grand Coulee-Bell 1 thru 5	33/ 13.4 ^{1/}	1/ .4 ^{2/}		Telvar	20/ 76	
				Tordon 101	1.0/ 4	
OKANOGAN Okanogan-Oroville	2/ .8 ^{1/}			Tordon 101	.2/ 1	
Winthrop Tap		100/ 40.5 ^{2/}		Tordon 101	200.0/ 757	
PEND OREILLE Bell-Boundary # 1 & 2	45/ 18.2 ^{1/}			Tordon 101	1.8/ 7	
Boundary-Waneta	3/ 1.2 ^{1/}			Tordon 101	.1/	
Sacheen-Albeni Falls	5/ 2.0 ^{1/}			Tordon 101	.5/ 2	
SPOKANE Bell-Boundary # 1 & 2	25/ 11.2 ^{1/}			Tordon 101	2.5/ 9	
Bell-Trentwood # 1 & 2	6/ 2.0 ^{1/}			Tordon 101	.6/ 2	
Four Lakes Tap	1/ .4 ^{1/}			Tordon 101	.1/	
Grand Coulee-Bell 1 thru 5	90/ 36.4 ^{1/}			Tordon 101	.9/ 3	
Vera Tap	1/ .4 ^{1/}			Tordon 101	.1/	
STEVENS Addy-Cusick	4/ 1.6 ^{1/}	100/ 40.5 ^{2/}		Tordon 101	200.0/ 757	

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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
 COUNTY AND TRANSMISSION LINE

WALLA WALLA AREA

STATE OF WASHINGTON

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting	Herbicide			gal/liter	lb/kg
		Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.				

Yakima

Big Eddy-Midway	5/	2.0	Telvar	75/	34
Hanford-John Day	15/	6.1	Telvar	225/	102

Walla Walla

Lower Monumental-John Day	10/	4.0	Telvar	150/	68
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BPA's FY 1980 RIGHT OF WAY MANAGEMENT PROGRAM BY
COUNTY AND TRANSMISSION LINE

STATE OF WASHINGTON

PORTLAND AREA OFFICE

County Transmission Line	Area of each Management Method			Herbicide	Application per Line	
	Hand Cutting 1/ acres/ha.	Herbicide			gal/liter	lb/kg
		Aerial acres/ha.	Selective acres/ha.			

CLARK

Ross-Lexington	3/1.2	198/80.2	Banvel 520 Banvel 720 Tordon 10K	6/ 23 396/1499	100/45
Ross-St. Johns		5/ 2.0	Banvel 720	10/ 38	
Ross-Vancouver Shipyard		6/ 2.4	Banvel 720	12/ 46	
Troutdale Tap to North Bonneville-Ross #1		51/20.7	Banvel 720	102/ 386	

COWLITZ

Ross-Lexington		199/80.6	Banvel 720 Tordon 10K	398/1507	100/45
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1/ Requires stump treatment of resprouting species

2/ Weed control

3/ Access roads

4/ Structure weed control

BPA's FY 19 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT

SPOKANE AREA
 Region No. 1

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

FLATHEAD National Forest

TALLY LAKE District

Line Name

Columbia Falls-Trego

10/ 4 ¹/₄

Tordon 101

1/ 4

LOLO National Forest

SUPERIOR District

Line Name

Dworshak-Hot Springs

20/ 9 ¹/₄

Tordon 101

2/ 8

ST. JO National Forest

ST. MARIES District

Line Name

Dworshak-Hot Springs

24/ 10.8 ¹/₄

Tordon 101

2.4/ 9

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BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT
 WALLA WALLA AREA

Region No. 4

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

Targhee Natl. Forest
Idaho Falls District

Line Name

Swan Valley-Teton	3/1.2		Tordon 101	0.25/ 1
Palisades-Goshen No. 1	1/0.5			

Targhee Natl. Forest
Island Park District

Line Name

Drummond-Macks Inn	3/1.2	15/ 6.1	Tordon 101	4. / 15
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SEATTLE AREA

BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
BY NATIONAL FOREST AND DISTRICT

SEATTLE AREA

Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha. 1 /	acres/ha.	acres/ha.			

Olympic National Forest

Quilcene Ranger District

Olympia-Port Angeles No. 1	5/2.0		Banvel 4WS	5/19
		50/20.2	Banvel 4WS 2,4-D Amine	25/95 50/189

Solduc Ranger District

Port Angeles-Sappho No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379

Snoqualmie National Forest

North Bend Ranger District

Covington-Columbia No. 3	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757

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BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT
 SEATTLE AREA

Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha. 1/	acres/ha.	acres/ha.			

Snoqualmie National Forest

North Bend Ranger District (Cont.)

Sickler-Raver No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379
Olympia-Grand Coulee No. 1	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757

Skykomish Ranger District

Chief Joseph-Monroe No. 1	20/8.1		Banvel 4WS	20/76
		200/80.9	Banvel 4WS 2,4-D Amine	100/379 200/757

Wenatchee National Forest

Cle Elum Ranger District

Covington-Columbia No. 3	1/0.4		Banvel 4WS	1/4
		10/4.1	Banvel 4WS 2,4-D Amine	5/19 10/38

BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT

SEATTLE AREA
 Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

Wenatchee National Forest

Cle Elum Ranger District (Cont.)

Grand Coulee-Raver No. 1 & 2	2/0.8		Banvel 4WS	2/8
		20/8.1	Banvel 4WS 2,4-D Amine	10/38 20/76

Lake Wenatchee Ranger District

Chief Joseph-Monroe No. 1	10/4.1		Banvel 4WS	10/38
		100/40.5	Banvel 4WS 2,4-D Amine	50/189 100/379

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BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT
 PORTLAND AREA
 Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting <u>1</u>	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

SIUSLAW NATIONAL FOREST

Waldport Ranger District

Toledo-Wendson

25/10.1

Tordon 101

50/189

Mapleton Ranger District

Toledo-Wendson

40/16.2

Tordon 101
Tordon 10K

80/303

50/23

BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT
 WALLA WALLA AREA

Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

Deshcutes Natl. Forest
Crescent District

Line Name

Redmond-Yamsay 12/ 4.9 Tordon 10K 180/82

Mt. Hood Natl. Forest
Columbia Gorge District

Line Name

Bonneville-The Dalles 5/2.0 5/ 2.0 Tordon 10K 75/34

Mt. Hood Natl. Forest
Hood River District

Line Name

Big Eddy-Troutdale 10/4.1 30/12.2 Tordon 101 60. /227
 Bonneville-The Dalles 8/3.2 20/ 8.1 Tordon 10K 200/91

Wallowa-Whitman Natl. Forest
LaGrande District

Line Name

Roundup-LaGrande 10/ 4.0 Tordon 10K 100/45

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BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM
 BY NATIONAL FOREST AND DISTRICT
 WALLA WALLA AREA

Region No. 6

Area of each Management Method			Herbicide	Application per line	
Hand Cutting	Herbicide			gal./liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

Gifford Pinchot Natl. Forest
Wind River District

Line Name

McNary-Ross

5/2.0

BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM BY
BLM DISTRICT AND WORK UNIT

Salem Area
State of OREGON

Area of each Management Method			Herbicide	Application per Line	
Hand Cutting <u>1</u> / acres/ha.	Herbicide			gal/liter	lb/kg
	Aerial acres/ha.	Selective acres/ha.			

Keeler-Allston

73/29.6

Tordon 101
2,4-D Amine

146/553
36/136

BPA's FY 19 80 RIGHT-OF-WAY MANAGEMENT PROGRAM BY
BLM DISTRICT AND WORK UNIT

Eugene Area
State of OREGON

Area of each Management Method			Herbicide	Application per Line	
Hand Cutting 1/	Herbicide			gal/liter	lb/kg
	Aerial	Selective			
acres/ha.	acres/ha.	acres/ha.			

Santiam-Alvey

25/10.1

Tordon 101
Tordon 10K

50/189

20/9

BPA's FY 1980 RIGHT-OF-WAY MANAGEMENT PROGRAM BY
BLM DISTRICT AND WORK UNIT

Coos Bay Area

State of OREGON

Area of each Management Method			Herbicide	Application per Line	
Hand Cutting <u>1</u> / acres/ha.	Herbicide			gal/liter	lb/kg
	Aerial acres/ha.	Selective acres/ha.			

Reedsport-Fairview

6/2.4

Banvel 720

12/45

1/ Requires stump treatment of resprouting species

HERBICIDE RESIDUES IN SOIL AND WATER FOR
BONNEVILLE POWER ADMINISTRATION TRANSMISSION LINE RIGHTS-OF-WAY

Logan A. Norris

November 17, 1976

This is a report of our continuing herbicide residue monitoring program in connection with chemical brush control activities on Bonneville Power Administration transmission line rights-of-way. This program was initiated in July, 1970. Introductory and background information on monitoring sites, sampling, and analytical procedures are in the August 24, 1971, report which covered samples analyzed through June, 1971. Other reports were issued on June 9, 1972; February 20, 1973; June 6, 1974; and August 28, 1975. These reports covered samples analyzed between July 1, 1971, and May 1, 1972; May 2, 1972, and February 1, 1973; February 2, 1973, and May 1, 1974; and May 2, 1974, and August 1, 1975.

This report covers samples analyzed between August 2, 1975, and October 15, 1976. Included are results from analyses of soil samples collected approximately 50 months postspray at one long term site established in 1971 and soil samples collected 40 months postspray at one long term study site established in 1972. Also included are results of analyses of a number of water samples from small streams crossing treated rights-of-way in the state of Washington. Results of analyses of a large number of special samples are also included.

LONG TERM STUDY SITES ESTABLISHED IN 1971

One study site established in 1971 is still being actively sampled. The results of analyses of soils collected at that site 7, 14, and 26 months postapplication were reported previously. This report contains results of analyses of soil samples collected 50 months postspray at the Big Cliff-Detroit site.

Site 4. Big Cliff-Detroit near tower 19

Spray History: 1.5 gallon Tordon 101, 3 pounds 2,4-D, and 3 pounds 2,4,5-T (brush killer) per acre
9/17/67
1.5 gallon Tordon 101 and 2 pounds 2,4,-D per acre 8/13/71

Sampled: 6/23/71 (prespray)
3/23/72 (7 months postspray)
10/20/72 (14 months postspray)
10/11/73 (26 months postspray)
10/20/75 (50 months postspray) data below

<u>Sample No.</u>	<u>Location</u>	<u>Depth</u> inches	<u>2,4-D</u> -----ppm-----	<u>Picloram</u>
1062	North	0-6	.04	0 ^{1/}
1063		6-12	0	0
1064	Center	0-6	.03	0
1065		6-12	0	0
1066	South	0-6	.02	0
1067		6-12	0	0

^{1/} 0 means less than 0.01 ppm

These results are quite similar to the results from samples collected 26 months postspray with the exception that picloram has totally disappeared from the site. The apparent residues of 2,4-D in the 0-6 inch portion of the soil profile may be disconcerting since we normally think of 2,4-D as being very short in persistence. However, I believe these residues represent chemical which is very tightly bound to adsorbing materials and are not available or of

biological significance to any system we are familiar with. No further sampling at the Big Cliff-Detroit site is necessary.

LONG TERM STUDY SITES ESTABLISHED IN 1972

One set of soil samples from one of the long term study sites established in 1972 was collected and analyzed in this reporting period. The results of analyses of samples collected 10.5 and 28 months postspray were reported previously.

Site 1. Redmond Yamsey near structure 73/6

Spray History: Estimated 0.8-2.5 gallons Tordon 101 per acre ground application summer, 1961
2 gallons Tordon 101 per acre 6/23/72

Sampled: 5/8/73 (10.5 months postspray)
10/24/74 (28 months postspray)
10/24/75 (40 months postspray) data below

Sample No.	Location	Depth inches	2,4-D -----ppm-----	Picloram -----ppm-----
1076	East	0-6	0.01 _{1/}	0.01
1077		6-12	0 _{1/}	0
1078	Center	0-6	0.02	0.01
1079		6-12	0	0
1080	West	0-6	0.03	0.02
1081		6-12	0	0

1/ 0 means less than 0.01 ppm

There has been little or no change in residues at this site since the 28 month postspray sampling. These data illustrate the slow rate of herbicide decline as residue levels approach the minimum level of detection. The levels of herbicide at this site are not of biological significance and are probably not available to biological systems. Further sampling at this site is not necessary.

LONG TERM SOIL SAMPLING SITE ESTABLISHED IN 1976

A long term soil sampling site was established on the McNary-Santiam line as representative of a high altitude, cold climate site. The study site location is near structure 149/5. The area was treated with 5% Tordon 101 mixture in water by high pressure hose to scattered stands of lodgepole pine. The actual rate of deposition on the ground is not known. This same area was treated by helicopter in June, 1972, with 8 pounds 2,4-D and 1 pound picloram per acre. Prespray soil samples are as follows:

Sample No.	Location	Depth inches	2,4-D -----ppm-----	Picloram
1147	Not specified	litter	0.33	0.20
1148	" "	0-6	0.01	0.02
1149	" "	6-12	0.07	0.04

The apparent residues in prespray samples resulted from a previous application on this site, contamination of the sample area by nearby spray operations, contamination of samples at the time that they were collected, or a combination of these. An allowance for this background value would have to be made in reporting data for this site in the future. The residues of picloram and 2,4-D in the litter must be tightly bound to persist at this site for 4 years. Of course, the rate of litter decomposition at relatively cool, dry sites is slow. Herbicide persistence, therefore, should be longer. The residues detected are apparently not biologically available. Evaluation of background residue levels and uncertainty about the degree and extent of herbicide

application in the area has led to the conclusion to abandon this site.

WATER SAMPLES

Data for water samples collected at three long term water sampling sites are included in this report.

OLYMPIA-ABERDEEN LONG TERM WATER SAMPLING SITE

This study site is in the Olympia-Aberdeen transmission corridor approximately 20 miles west of Olympia near the community of Malone. 2,4-D amine and dicamba (4 pounds per gallon formulations) at 2 quarts and 1 quart per acre, respectively, were applied in 5 gallon water per acre by helicopter. Application was made between 0530 and 0830 on June 10, 1975. Lo-Drift was used as a drift control agent and a 40 foot conventional bloom was used on the helicopter. An area map, strip map, and profile are in Appendix 1.

The automatic water sampler was located approximately 100 yards south of the south edge of the right-of-way between structures 19/5 and 19/6. The sampler was separated from the right-of-way by a fringe of alder trees. The stream is approximately 10 feet wide and 1 foot deep. The instructions to the pilot included leaving a 100 foot buffer zone on either side of the creek. The right-of-way is 335 feet wide at this point and required five passes of the helicopter to accomplish full coverage.

The precipitation record for Elma, Washington, is in Appendix 2. The following are the results of analyses for samples from this site:

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u> -----ppm-----	<u>Dicamba</u>
1005 (prespray)	6/9/75	< 0.001	< 0.001
1006	6/9/75	0 ^{1/}	0 ^{1/}
1007	6/10/75		
1008	6/11/75	0	0
1009	6/12/75		
1010	6/13/75	0	0
1011	6/14/75		
1012	6/15/75	0	0
1013	6/16/75		
1014	6/17/75	0	0
1015	6/18/75		
1016	6/19/75	0	0
1017	6/20/75		
1018	6/21/75	0	0
1019	6/22/75		
1020	6/23/75	0	0
1021	6/24/75		
1022	6/25/75	0	0
1023	6/26/75		
1024	6/27/75	0	0
1025	6/28/75		
1026	6/29/75	0.020	0
1027	6/30/75		
1028	7/1/75	0.003	0
1029	7/2/75		
1030	7/3/75	0	0
1031	7/4/75		
1032	7/5/75	0	0
1033	7/6/75		
1034	7/14/75	0	0
1035	7/15/75		
1036	7/16/75	0	0
1037	7/17/75		
1038	7/18/75	0	0
1039	7/19/75		
1040	7/20/75	0	0
1041	7/21/75		
1042	7/22/75	0	0
1043	7/23/75		
1044	7/24/75	0	0
1045	7/25/75		
1046	7/26/75	0	0
1047	7/27/75		
1048	7/28/75	0	0
1049	7/29/75		
1050	7/30/75	0	0
1051	7/31/75		

^{1/} Zero means individual components of composite contained less than 0.002 ppm.

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u> -----ppm-----	<u>Dicamba</u> -----ppm-----
1052	8/1/75		
1053	8/2/75	0	0
1054	8/3/75		
1055	8/4/75		
1056	8/5/75	0	0
1057	8/6/75		
1058	8/7/75		
1059	8/8/75	0	0
1060	8/9/75		
1061	8/10/75		
1082	9/13/75	0.008	0.008
1083	9/14/75	0.003	0.003
1084	9/15/75	0.018	0.022
1085	9/16/75	0.005	0.005
1086	9/17/75	0.002	0.002
1087	9/18/75	0.002	0.002
1088	9/19/75	0.007	0.007
1089	9/20/75	0.002	0.002
1090	9/21/75	0.001	0.002
1091	9/22/75	0.008	0.010
1092	9/23/75	0.007	0.009
1093	9/24/75	0.003	0.002
1094	9/25/75	0.004	0.004
1095	9/26/75	0.003	0.003
1096	9/27/75	0.002	0.002
1097	9/28/75	0.005	0.006
1098	9/29/75	0.004	0.006
1099	9/30/75	0.003	0.005
1100	10/1/75	0.001	0.001
1101	10/2/75	0.003	0.003
1102	10/3/75	0.002	0.002
1103	10/4/75	0.002	0.002
1104	10/5/75	0.004	0.005
1105	10/6/75	0.003	0.002
1106	10/7/75	0.008	0.006
1107	10/8/75	0.004	0.003
1108	10/9/75	0.007	0.010
1109	10/10/75	0.002	0.003
1110	1/12/76	< 0.001	< 0.001
1111	1/12/76	< 0.001	< 0.001

Trace levels of herbicide (less than 0.002 ppm) were detected in daily samples collected between application (June 10) and June 30, indicating there was some stream contamination from drift or direct application to the stream surface. More than 1.25 inches of rain

fell between June 23 and June 27 at nearby Elma, Washington, and trace levels of herbicide were found in the stream until 3 days later when the composite sample showed 0.02 ppm. Analysis of the individual components showed 0.055 ppm in sample 1029 but less than 0.002 ppm in the others. The source of this residue is not known but could conceivably represent mobilization of surface residues from the relatively flat, marshy area near the sampled stream.

Trace residues were detected in samples collected between July 6 and August 10 when the sampler was due for servicing, but only 0.3 inches of rain fell during this time. Failure to service the sampler until September 13, 1975, resulted in no sampling during a period when more than 4.5 inches of rain fell. The next full set of samples all contained herbicide. No rain fell for nearly a month after the 4.5 inch deluge in late August. However, it is possible that the herbicide in samples collected between September 13, and October 10 resulted from outflow from the marshy area because of the rise in water level after the August rain. No samples were collected between October 11 and January 12. No residues were detected in two samples collected January 12, 1976, no further samples were collected.

The actual source of herbicide in the samples from this site is uncertain. The size of the stream suggests dilution would be so large that the likelihood of detecting herbicide would be remote considering the fact that only a small portion

of land near the stream was treated. On the other hand, I have studied only two other areas for herbicide runoff where a high water table was evident. In both cases, the residue levels were high and prolonged. It is also possible the herbicide was from some upstream source or the samples were contaminated.

The level of herbicide was not great enough to cause harm to stream organisms or downstream water users. However, because of the possibility that these data reflect long term outflow of herbicide from a marshy area, I feel such areas should be identified in advance of spraying, and special precautions made to avoid them. Perhaps single stem chemical treatments, hand cutting, or some other method of vegetation control should be used on these areas.

MONROE-CUSTER #1 LONG TERM WATER SAMPLING SITE

This site is on the Monroe-Custer #1 transmission line opposite tower 6/3, approximately 9 miles east of Snohomish, Washington. The portion of the right-of-way adjacent to the stream being sampled was treated with a mixture of 1 pound of dicamba and 2 pounds of 2,4-D per hundred gallons of water applied with truck mounted high pressure hoses to the foliage on the afternoon of September 23, 1975. Area map and strip map are in Appendix 3 and precipitation record is in Appendix 4. The results of analyses are reported below.

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u> -----ppm-----	<u>Dicamba</u> -----ppm-----
1068	9/16/75 (prespray)	0 ^{1/}	0 ^{1/}
1069	9/17/75 (prespray)		
1070	9/18/75 (prespray)		
1071	9/19/75 (prespray)		
1072	9/20/75 (prespray)		
1073	9/21/75	< 0.001	< 0.001

^{1/} Zero means individual components of composite contained less than 0.002 ppm.

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u>	<u>Dicamba</u>
		-----ppm-----	
1074	9/22/75	< 0.001	< 0.001
1075	9/23/75	< 0.001	< 0.001
1112	11/6/75	0	0
1113	11/7/75		
1114	11/8/75	0	0
1115	11/9/75		
1116	11/9/75	0	0
1117	11/10/75		
1118	11/11/75	0	0
1119	11/12/75		
1120	11/13/75	0	0
1121	11/14/75		
1122	11/15/75	0	0
1123	11/16/75		
1124	11/17/75	0	0
1125	11/18/75		
1126	11/19/75	0	0
1127	11/20/75		
1128	11/21/75	0	0
1129	11/22/75		
1130	11/23/75	0	0
1131	11/24/75		
1132	11/25/75	0	0
1133	11/26/75		
1134	11/27/75	0	0
1135	11/28/75		
1136	11/29/75	0	0
1137	11/30/75		

Equipment malfunction resulted in loss of samples between September 23 and October 16. Difficulty in scheduling installation of new equipment at the site resulted in no samples being collected between mid-October and early November. The automatic water sampler worked well between November 6 and November 30, but the sampler was not serviced again until early January resulting in a loss of approximately 6 weeks' worth of samples. Due to the erratic servicing schedule, the sampler was removed from the site on January 12. The data that was collected at the site is identical

with data from several other locations where we found that there is little or no measurable residues of herbicide which occur in streams flowing across treated power line rights-of-way.

JOHN DAY-MARION LONG TERM WATER SAMPLING SITE

The John Day-Marion water sampling site is located approximately 25 miles southeast of Estacada, Oregon, on the John Day-Marion 500 kv right-of-way. The sampler is half way between towers 87/2 and 88/1 approximately 300-400 feet to the north of the edge of the treatment area. The area map and strip chart for this site are in Appendix 5 and the precipitation records are in Appendix 6. The area was treated with 6 pounds 2,4-D amine and 1 pound picloram on July 30, 1976. The results of analysis are as follows:

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u>	<u>Picloram</u>
		-----ppm-----	
1138	6/29/76 (prespray)		
1138A	6/29/76 (prespray)		
1139	7/30/76 (prespray)	< 0.003 ^{1/}	< 0.006
1140	7/30/76 + 5 minutes	0 ^{1/}	0
1141	7/30/76 + 15 minutes	0	0
1142	7/30/76 + 30 "	0.044	0.015
1143	7/30/76 + 45 "	0.029	0.009
1144	7/30/76 + 60 "	0.013	0.006
1145	7/30/76 + 90 "	0.003	0
1146	7/30/76 + 120 "	0	0
1150	7/30/76		
1151	7/31/76	0	0
1152	8/1/76		
1153	8/2/76		
1154	8/3/76		
1155	8/4/76		
1156	8/5/76	0	0
1157	8/6/76		

^{1/} Zero means an individual component of the composite sample contains less than 0.003 ppm.

<u>Sample No.</u>	<u>Date</u>	<u>2,4-D</u> -----ppm-----	<u>Picloram</u>
1158	8/7/76		
1159	8/8/76	0	0
1160	8/9/76		
1161	8/10/76		
1162	8/11/76		
1163	8/12/76		
1164	8/13/76	0	0
1165	8/14/76		
1166	8/15/76		
1167	8/16/76		
1168	8/17/76	0	0
1169	8/18/76		
1170	8/19/76		
1171	8/20/76		
1172	8/21/76	0	0
1173	8/22/76		
1174	8/23/76		
1175	8/24/76	0	0
1176	8/25/76		
1177	8/26/76		
1178	8/27/76		
1179	8/28/76	0	0
1180	8/29/76		
1181	8/30/76		
1182	8/31/76		
1183	9/1/76		
1184	9/2/76	0	0
1185	9/3/76		
1186	9/4/76		
1187	9/5/76		
1188	9/6/76	0	0
1189	9/7/76		
1190	9/8/76		
1191	9/9/76		
1192	9/10/76	0	0
1193	9/11/76		
1194	9/12/76		
1195	9/13/76		
1196	9/14/76	0	0
1197	9/15/76		
1198	9/16/76		
1199	9/17/76	0	0
1200	9/18/76		
1201	9/19/76		
1202	9/20/76		
1203	9/21/76	0	0
1204	9/22/76		

These data are entirely consistent with results of tests we conducted for several years in Oregon forests being treated with herbicides by aerial application. A peak of contamination occurred shortly after the application but it diminished to less than detectable levels within a matter of hours. The magnitude of contamination at the sampling site is not excessive and would not be expected to cause significant impact on aquatic organisms. The evidence is clear that long term runoff of herbicide residues into the stream did not occur at detectable levels at this location.

SPECIAL SAMPLES

Results of special samples through number 164 were reported previously. This report covers special samples 165 through 255.

SAMPLE NUMBER

DISCUSSION AND REMARKS

165

Sample of bean leaves from a garden of Mrs. Robert Sturdevant near Brinnon, Washington. Property is located between structures 60/3 and 61/1 on the Olympia-Port Angeles #1 transmission line. The results of analysis showed approximately 0.04 ppm 2,4-D and a possible trace of dicamba. Lack of control samples makes me uncertain as to the significance of the apparent level of 2,4-D. The lack of effects on vegetation between the right-of-way and Mrs. Sturdevant's garden makes it unlikely that herbicide from the right-of-way was responsible for the damage to vegetables or larger woody plants. Full report on this sample is in Appendix 7.

166

Sample of fir foliage (ornamental) from the Goldendale substation. The ornamental trees are in poor shape possibly because of poor cultural technique or herbicide residues. The substation yard had been treated with Rack and Pramitol approximately 18 months earlier. This sample was not analyzed because of the large

number of herbicides involved and the difficulty of relating cause and affect in this case. (Appendix 8).

167 - 171

Various samples of chips, limbs, bark, and vegetation from lodgepole pine, Douglas-fir, and Western Larch collected on the Albeni Falls-Bonnors Ferry transmission line in the vicinity of structures 57/3 through 57/7. These samples were not analyzed because they were the wrong type of material and sample size was too small. Report on these samples in Appendix 9.

172, 173,
183 - 188

Samples of vegetation and water from the property of Frank Wascher on the Shelton-Fairmount line in Washington. Results showed a substantial concentration of both 2,4-D and dicamba in the vegetation but only small amounts in the water. The property owner contends the herbicide contaminated his water supply. Additional special samples (183-188) were collected at the site and analyzed. The results of the analysis of these samples showed that neither the water nor the soil at this site contained significant residues of either 2,4-D or dicamba. Therefore, the possibility that Mr. Wascher's water supply is contaminated is not likely. The results of these analysis are in Appendix 10.

174

Special sample 174 is samples of round steak and hamburger from animals slaughtered sometime after they had been grazing on land reportedly treated by BPA with a mixture of 2,4-D and dicamba. The consumers of the meat report an off-flavor and are concerned about herbicide residues. The samples were analyzed for residues of 2,4-D and dicamba as well as dichlorolphenol (a possible degradation product of 2,4-D). The results of analysis indicates residues were not sufficiently high in any case to contribute to either odor or taste. A flavor test conducted by Professor Louis McGill, Oregon State University, showed the steak and the hamburger contained an odor and flavor which makes the meat undesirable for consumption. Results of the analyses and tests are in Appendix 11.

175 - 182,
201 - 243,
246 - 252

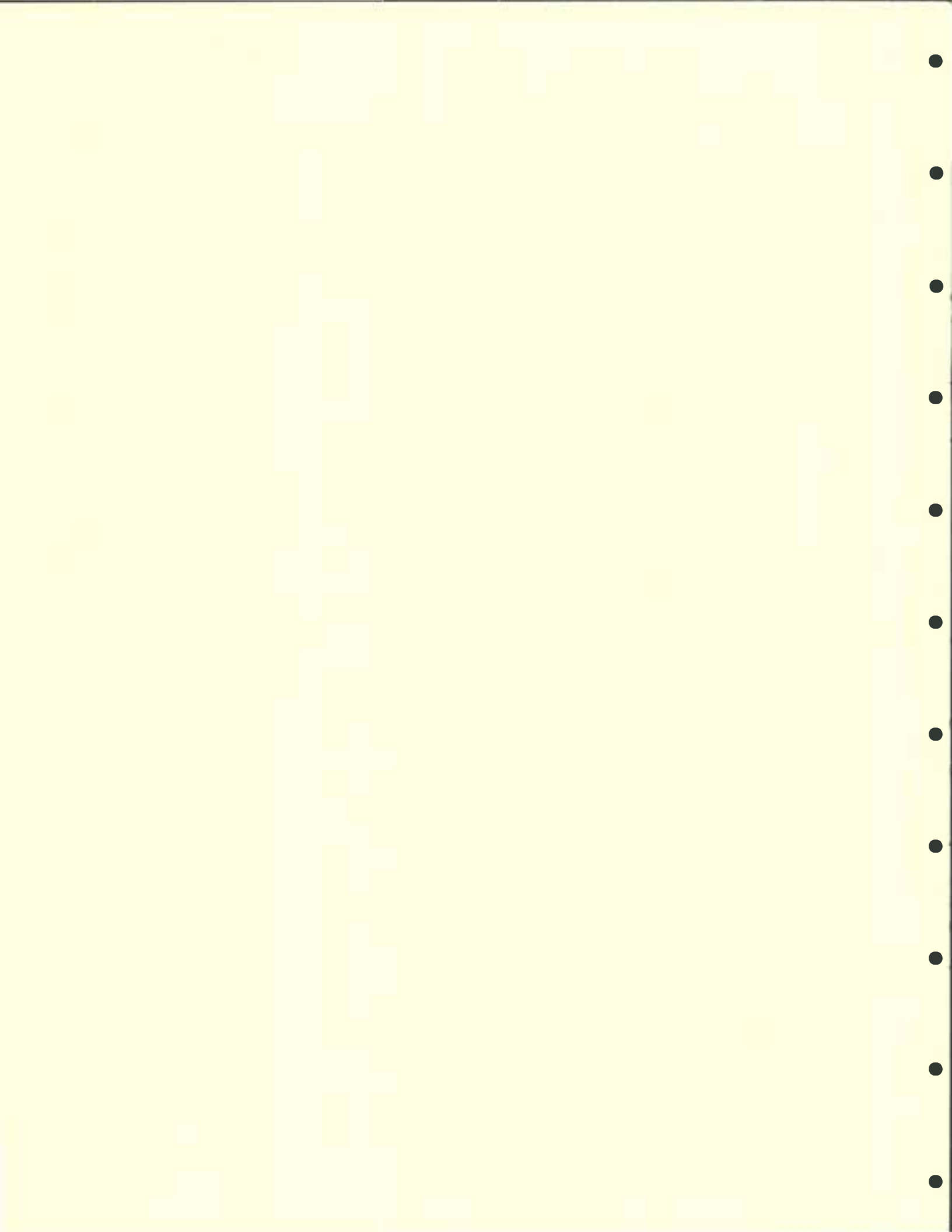
These special samples are from the Bill Ellis property on or adjacent to the Bonner's Ferry-Troy right-of-way between miles 7 and 8. There is evidence of herbicide residues in numerous samples of vegetation indicating that at least some of the tree damage and mortality was caused by herbicide. Results of analysis of these samples and an extensive analysis of their meaning is included in Appendix 12.

189 - 200,
244, 245,
253 - 255

These special samples are from the Tordon spill site adjacent to the Iverson property in Washington. Generally, the results of these analyses show that picloram residues continue to be present in Iverson well water but that they can be effectively removed through the use of a charcoal filter. The results of analysis and comments are included in Appendix 13.



XII. Historical and Archeological Appendix



XII. Historic and Archeological Appendix

As mentioned in Section IV.B.1.d(4) of the preceding, BPA will comply with both the Historic Preservation Act of 1966 and E.O. 11593 following those procedures outlined below:

The Historic Preservation Act of 1966

In compliance with those regulations issued by the Advisory Council on Historic Preservation (36 C.F.R. Part 800) BPA has:

1. Identified all known cultural resources listed in the National Register of Historic Places and addenda through December 1978 as they pertain to the planning study areas for the Fiscal Year 1980 Proposed Program. All such sites, either listed in the National Register or nominated as eligible for inclusion, have been identified in the planning evaluation.
2. The Draft Fiscal Year 1980 Program Statement, including draft planning supplements, was circulated to the State Historic Preservation Officers for all the states in the BPA service area. These individuals have been asked to review and comment on the statement's completeness and to provide us with any additional information on possible impacts to historical, architectural, or archeological sites of national significance that may result from the construction of these new facilities. Similar consultation was solicited from local and regional historical and archeological organizations which have been identified in the individual planning supplements.

Further investigations will occur as facilities included in the Fiscal Year 1980 Proposed Program reach the facility location phase (see chart included in Introduction to Facility Evaluation Appendix). Measures that will be employed by BPA at the facility location phase include:

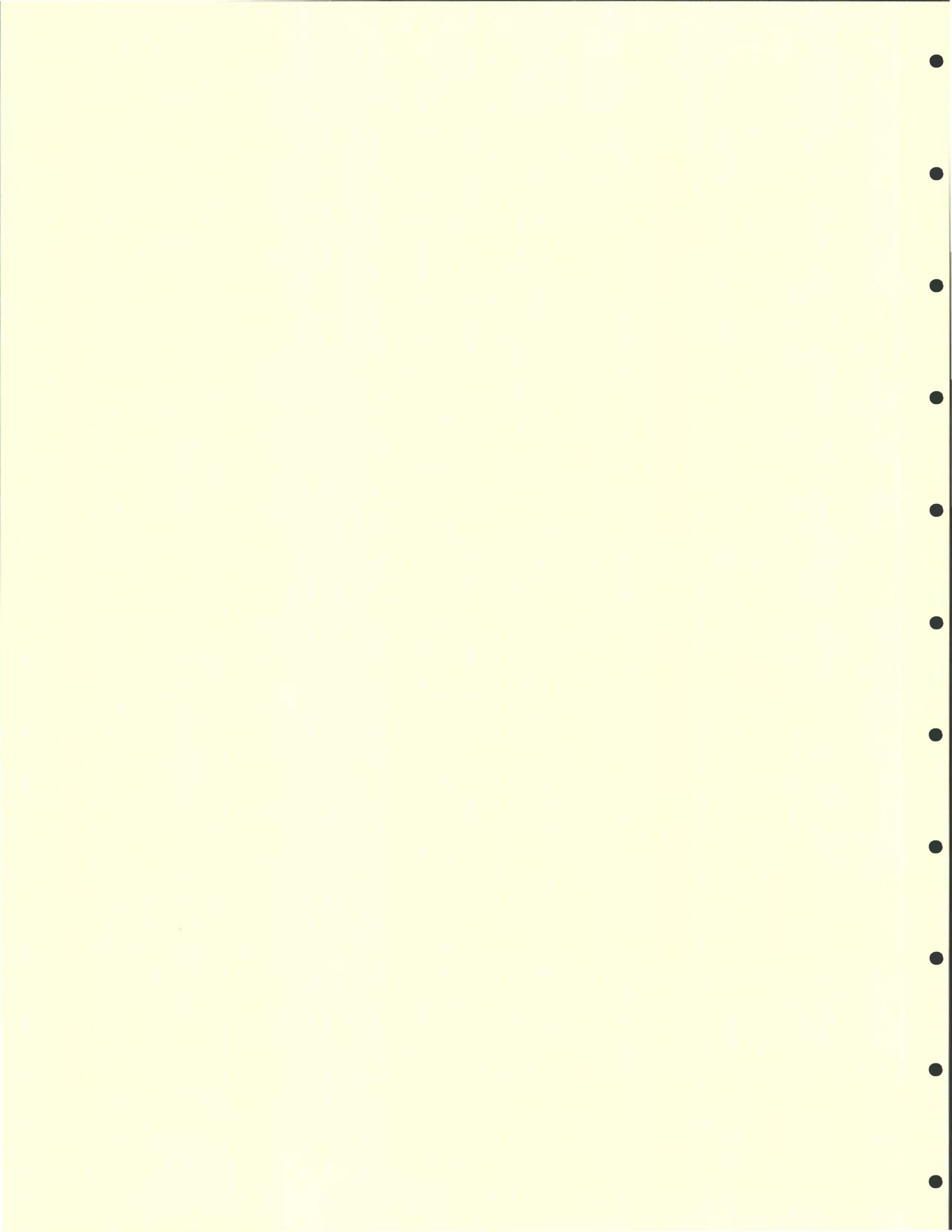
1. Continued consultation with local, state, and regional historical and archeological authorities.
2. State Historic Preservation Officers will be provided copies of the draft location phase EISs for their review and comment. By so doing they will be able to examine and comment upon the consequences of the various alternative facility locations, and to suggest other known or potential sites within the study areas which might be eligible for nomination to the National Register.
3. Where sites which are believed to be eligible for inclusion in the National Register are identified within the study areas, documentation regarding such sites will be forwarded to the National Park Service for a determination of eligibility.

Executive Order 11593

In compliance with Executive Order 11593 of May 13, 1971 (36 F.R. 8921 et seq.), BPA will:

1. Systematically survey all lands affected by the proposed facility site or route location as it appears in a final facility location phase EIS in order to locate and inventory all cultural sites not previously identified.
2. For all sites identified as a result of the survey, and which would be affected by its proposed facility, BPA will apply the criteria of the National Park Service and the Advisory Council on Historic Preservation to determine if they are significant enough for inclusion in the National Register.
3. Information regarding any such potential sites, the significance of which is questionable, will be forwarded to the National Park Service for a formal determination of eligibility.
4. If any site is determined eligible for inclusion in the National Register, mitigative measures will be taken in consultation with the Advisory Council and State Historic Preservation Officer.
5. During the interim period and until inventories and evaluations required by Executive Order 11593 are completed, BPA will exercise caution so as to not inadvertently transfer, sell, demolish, or substantially alter questionable sites. If questionably sensitive cultural sites are located, work crews are instructed by contract to notify their contracting officers and to suspend operations in the vicinity of such a site until told to proceed. All potentially significant sites will be referred to the National Park Service for a determination regarding the property's eligibility for inclusion in the National Register. If appropriate, BPA will enter into discussions with the Council to discuss mitigating measures for any nationally significant property affected by the proposal.

XIII. Comments Received on Fiscal Year 1980
Program Statement



COMMENTS RECEIVED DURING THE REVIEW PROCESS

State of Montana, Department of Fish and Game (Nov. 3, 1978)

Comment:

Within the Right-of-Way Management Appendix (page 3 of 33) "Spokane Area" is listed the management program for Flathead-Lake-Lincoln-Mineral and Sanders Counties. All acreages are shown under the Hand Cutting category yet Tordon 101 is shown as being used in each County also. Why?

Response:

The Tordon 101 is to be used for stump treating resprouting species. The footnotes explaining the numbers 1/, 2/, 3/, and 4/ were inadvertently left out of the draft. This will be corrected in the Final EIS.

Comment:

On page 15, E.I.S., first paragraph, last sentence, is a statement on "edge effect." The statement is true only if you don't eliminate by spraying, the vegetation that comes into the corridor following clearing.

Response:

The Right-of-Way Management Standard stipulates that vegetation on the outer third of a R/W can be permitted to grow an additional height of 5 feet before some form of control is required. This, along with the transitional aspects of forest-clearing relationships should produce an excellent edge effect.

Comment:

On page 16, E.I.S., first paragraph, is shown the acreages that will be controlled chemically and by hand-cutting. While the majority of the acres will be sprayed selectively, from the ground, I have less faith than they, on all the good things that will be saved for wildlife forage. They take credit for creating and then methodically try to eliminate.

Response:

We feel we can take credit for attempting to create a wildlife habitat within the right-of-way and we do not methodically try to eliminate that habitat. We feel that selective vegetation management with herbicides or other methods of control is conducive to maintaining a productive habitat. The last sentence of the first paragraph on page 16 will be changed to reflect the fact that wildlife forage will be minimally impacted.

Comment:

Maintenance roads along power line corridors also add to the problem of excessive hunter access in Region One where we are trying to talk land managers into closing roads.

Response:

Maintenance of transmission lines and rights-of-way, both routine and emergency, requires access at all times. BPA will cooperate with agencies and landowners in efforts to limit use of access. We do not consider permanent closure as the solution, but will cooperate in locating effective sites and installation of gates or other effective methods of road control.

Regional Planning Council of Clark County (Nov. 16, 1978)

Comment:

We would like to see an expanded section included in the EIS addressing the qualities and hazards associated with each of the herbicides used by BPA. We noted that the contents, manufacturers, and a brief explanation of the effects were listed in Appendix B of the Draft Role EIS; however, not enough information was provided about the significant properties of each of the herbicides.

Response:

BPA feels that the text of the Role EIS and the program data in the 1980 EIS adequately addresses the question of herbicides used by BPA and their environmental impact. It should be remembered that all herbicides have the potential of being hazardous if not used in accordance with label requirements. Also, that all herbicides have the planned capability of controlling the growth of various types of vegetation, and this is the sole purpose in their use, needs to be taken into consideration.

Comment:

We would like to see a more detailed location map indicating the stations and right-of-way locations and the relative areas of each type of management program. Were this information provided, we would be more able to assist in identification of areas of special concern or of potential significance that might otherwise be overlooked.

Response:

The annual use of herbicide within the BPA system is spread over 5 states. To effectively identify this program on a meaningful map would require a great number of maps and is considered too costly. Such detailed information is available upon request.

U.S.D.A. - Forest Service, Region 6 (Nov. 24, 1978)

Comment:

The EIS proposes that some right-of-way areas within the boundaries of National Forests in the Pacific Northwest Region of the Forest Service be treated with herbicides. Before such areas can be treated, site specific conditions must be considered and a site specific assessment must be prepared. You may find it appropriate to include such site specific data in the Final EIS, or you may wish to provide it through coordination between our respective field units.

U.S.D.A. - Forest Service, Region 1 (Dec. 14, 1978)

Comment:

Herbicide Use Along Transmission Lines - Proposals to use herbicide for right-of-way management purposes will be jointly developed in individual right-of-way management plans. Prior to actual herbicide application, BPA will be required to furnish specific herbicide and application data to the Forest Service for project approval.

U.S.D.I. (December 8, 1978)

Comment:

The tables in Section XI.A showing herbicide work planned on transmission line rights-of-way crossing lands administered by the Department's Bureau of Land Management (BLM) are not site specific as regards areas to be treated. It is not shown whether all BLM land on the particular transmission line is to be treated or only portions of the line, and if the latter, which portions. This comment is true also of the National Forest lands and of the private lands. We feel this additional information should be shown.

Response:

The coverage of the environmental impact resulting from BPA's Vegetation Management Program contained in the FY 1980 Program EIS is adequate in our estimation. It should be pointed out here that BPA views its entire construction and maintenance program for FY 1980 as a single major Federal action significantly affecting the quality of the human environment. Accordingly, a programmatic EIS has been prepared and distributed.

A programmatic EIS is in order because the individual components of our FY 1980 Program, including the various components of BPA's Vegetation Management Program for that fiscal year, cannot be effectively viewed in isolation, but must be considered in context with BPA's entire program. Furthermore, the impacts of the individual actions are, in many cases, cumulative. In addition, many of the various components of our Vegetation Management Program are repetitive in nature and, therefore, lend themselves well to a programmatic discussion.

It should be pointed out that the subject environmental statement covering BPA's Vegetation Management Program has been prepared at the earliest

possible stage in our planning process. The subject EIS describes BPA's Vegetation Management Program for FY 1980 which commences on October 1, 1979. It should be recognized that certain events may transpire between now and then which could affect the program. Factors typically affecting the method and frequency of vegetation control measures employed by BPA include topography, access within the right-of-way, adjacent land use, environmental sensitivity, type and density of vegetation, and climate. Many of these factors can vary considerably and some cannot be accurately predicted. Accordingly, a certain degree of flexibility in the program is essential in order to deal with such eventualities as unforeseen weed infestations, unusually dry or wet weather, and sudden changes in land use patterns.

Notwithstanding the problems inevitably encountered in trying to describe a problem and its impacts up to 2 years prior to its implementation, we find it desirable to do so both for purposes of early notification and for identifying impacts as early as possible. We do recognize a need to set forth as accurately as possible at this stage in our planning process, a description of the various components of BPA's program. For this reason, the EIS includes a "Right-of-Way Management Appendix" (pp XI-1 through XI-75) which describes each component of the program in terms of management practices employed, herbicides to be used, quantities applied, and transmission lines treated. A breakdown of the program is given for each affected County in the service area. A breakdown of the program by National Forest and District, and BLM District and Work Units is also included.

In addition to its annual program environmental statements, BPA has prepared an overall programmatic environmental statement entitled the "Role EIS." Appendix B of this EIS describes in some detail the environmental impacts that typically occur from transmission line construction and maintenance activities, including right-of-way management. Appendix B provides a framework for evaluation of specific proposals such as BPA's Proposed Program for FY 1980.

We believe that the FY 1980 EIS, when read in conjunction with Appendix B, adequately describes the impacts of BPA's Vegetation Management Program. The description of the program appearing in the "Vegetation Management Appendix" is the most accurate available at this stage in our planning process. BPA is currently discussing with various Federal land management agency officials the possibility of providing even more detailed information immediately prior to implementing particular components of our Vegetation Management Program. BPA has existing Memoranda of Understanding with both the Bureau of Land Management and the U.S. Forest Service. These agreements provide for close coordination of BPA's Right-of-Way Management Plans with the plans and programs of the Forest Service and BLM. BPA is always receptive to any suggestions as to how coordination of its plans and programs might better be coordinated with the plans and programs of other agencies.

BPA also undertakes additional actions to insure that sensitive areas are not inadvertently sprayed and that owners and/or occupants of private land are sufficiently notified. As indicated on page 37 of the Draft

FY 1980 Program Statement, all rights-of-way to be aerially sprayed are preflown prior to application to identify areas not to be sprayed. We have also instituted a program of contacting and informing owner/occupants in areas where grazing is evident of BPA's intentions prior to application of any herbicides bearing grazing restrictions.

U.S.D.I. - Heritage Conservation and Recreation Service (Nov. 24, 1978)

Comment:

The Draft states on page 24 that most transmission line rights-of-way are held in easement by BPA, and public access for recreation is subject to permission of the landowner or managing agency. Environmental statements for facility location supplements should discuss the potential of rights-of-way for recreation from the standpoint of terrain, scenery, recreation attractions, etc., irrespective of ownership. Ownership should be discussed as it effects recreation potential and, where it acts as a constraint, the feasibility of fee simple or easement acquisition should be treated.

Response:

BPA encourages multiple use of rights-of-way and cooperates with the underlying fee owner or governmental agencies in developing recreational uses. In the acquisition of the rights-of-way, it is the Federal Government's policy to take only the estate sufficient for project purposes. Therefore, a transmission line easement is acquired, and the remaining rights and uses are left to the fee owner. Transmission lines offer very little constraint on recreational uses, and the presence of a transmission line would not change recreational use regardless of ownership.

U.S.D.O.T. - Federal Aviation Administration (Nov. 27, 1978)

Comment:

We request Notice of Proposed Construction or Alterations (FAA Form 7460-1) be prepared at least 30 days prior to the start of construction on projects which meet filing requirements of Federal Air Regulations, Part 77.13, Objects Affecting Navigable Airspace.

Response:

This is regularly done on all line construction projects undertaken by BPA.

U.S. Environmental Protection Agency (Nov. 21, 1978)

Comment:

However, you should note that Executive Order 11752, referenced on page 29, has been replaced by a new Executive Order that reflects the new amendments to the Clean Air Act and the Federal Water Pollution Control Act (now known as the Clean Water Act). This new Executive Order appeared

in the Federal Register on October 13, 1978. You may wish to modify your environmental statement's discussion to reflect the changes made in the new Order.

Response:

The Draft EIS was written prior to the issuance of Executive Order 12088. The text in the Final EIS has been revised to reflect this change.

State of Oregon - Water Resources Department (Nov. 21, 1978)

Comment:

What does the dashed black line(s) on Figure 3 of the Draft FY 1980 Program EIS represent?

Response:

The dashed lines on Figure 3 denote transmission lines owned by other utilities, in this case Pacific Power and Light (PP&L) and Portland General Electric (PGE). BPA facilities are shown as solid lines.

Comment:

On page 9 of the Program Statement under "Hydrologic Resources," the text should mention irrigation water uses because of the farmland involved in the right-of-way.

Response:

The text has been revised to accommodate this suggestion.

Comment:

On page 32 it is indicated that the Salem-Albany Area Support proposal would involve some construction within 100 year flood plains. There is floodway data available for Marion County.

Response:

BPA has obtained necessary data regarding the extent of flood plains in Marion County, primarily from the U.S. Army Corps of Engineers, the U.S. Geologic Survey, and various local planning agencies. A list of cited references appears at the end of the Salem-Albany Area Support Final Planning Phase EIS (pp 26-7) in the Facility Evaluation Appendix.

State of Oregon - Forestry Department (Nov. 21, 1978)

Comment:

The draft environmental impact statement is written in such nonspecific terms that precise comments about FY 1980 BPA activities affecting

forest land in Oregon are impossible. Pages 19 and 20 contain reference to forest activities anticipated for the entire Pacific Northwest, but even these leave the reader unsure if plans will remove 600 acres or 1,070 acres from production. In order to conduct any sort of analysis of the impacts on Oregon's forests we must know how many forested acres BPA construction activity will remove from production in Oregon alone-- not the entire region. Each of our neighboring States would no doubt also like to see such impact data for their forest lands as well.

Response:

At this stage in our planning process, it is not possible to be any more precise regarding the actual acreages committed to new transmission corridors. As indicated in the "Note to Reviewers" at the beginning of the text and in the description of BPA's "Planning and Design Process" appearing at the beginning of the Facility Evaluation Appendix (pp II-1 to II-2), BPA's project specific environmental statements go through two distinct phases, facility planning and facility location. The facility location phase takes place after actual alternative site and routes have been identified. As a consequence, the information contained in location phase EIS's is more detailed and precise than that appearing in the preceding planning phase EIS. Location phase EISs on FY 1980 new start projects will be provided to the same reviewers that received the planning phase EISs as soon as they (location phases) become available.

U.S.D.I. (December 8, 1978)

Comment:

Clearing of new right-of-way during line construction in old growth timber areas may benefit some herbivores, as stated on page 15. However, such clearing would be greatly detrimental to wilderness species such as the cougar, wolverine, and the northern spotted owl. Species such as the northern spotted owl could be displaced due to loss of old growth Douglas fir habitat.

Response:

The text has been revised to accomodate this suggestion.

Comment:

Another impact to wildlife, not mentioned in the statement, is the possibility of collisions of birds with the power lines and towers.

Response:

The statement has been revised to discuss the possibility of birds colliding with power lines (Chapter IV.A.5).

Comment:

The statement does acknowledge (on page 37) that large birds of prey often use transmission line structures as nesting sites. It also describes BPA's policy of not destroying such nests. The final statement should recognize the possible electrocution loss to those raptors.

Response:

Reports have been made of large birds being killed by contacting energized lines and hardware on transmission lines. These reports are primarily limited to lower voltage lines where the spacing between conductors and tower hardware is small enough to be spanned by the wings of large birds. BPA lines are, for the most part, constructed at higher voltages which require greater spacing. No significant impact of this type is anticipated.

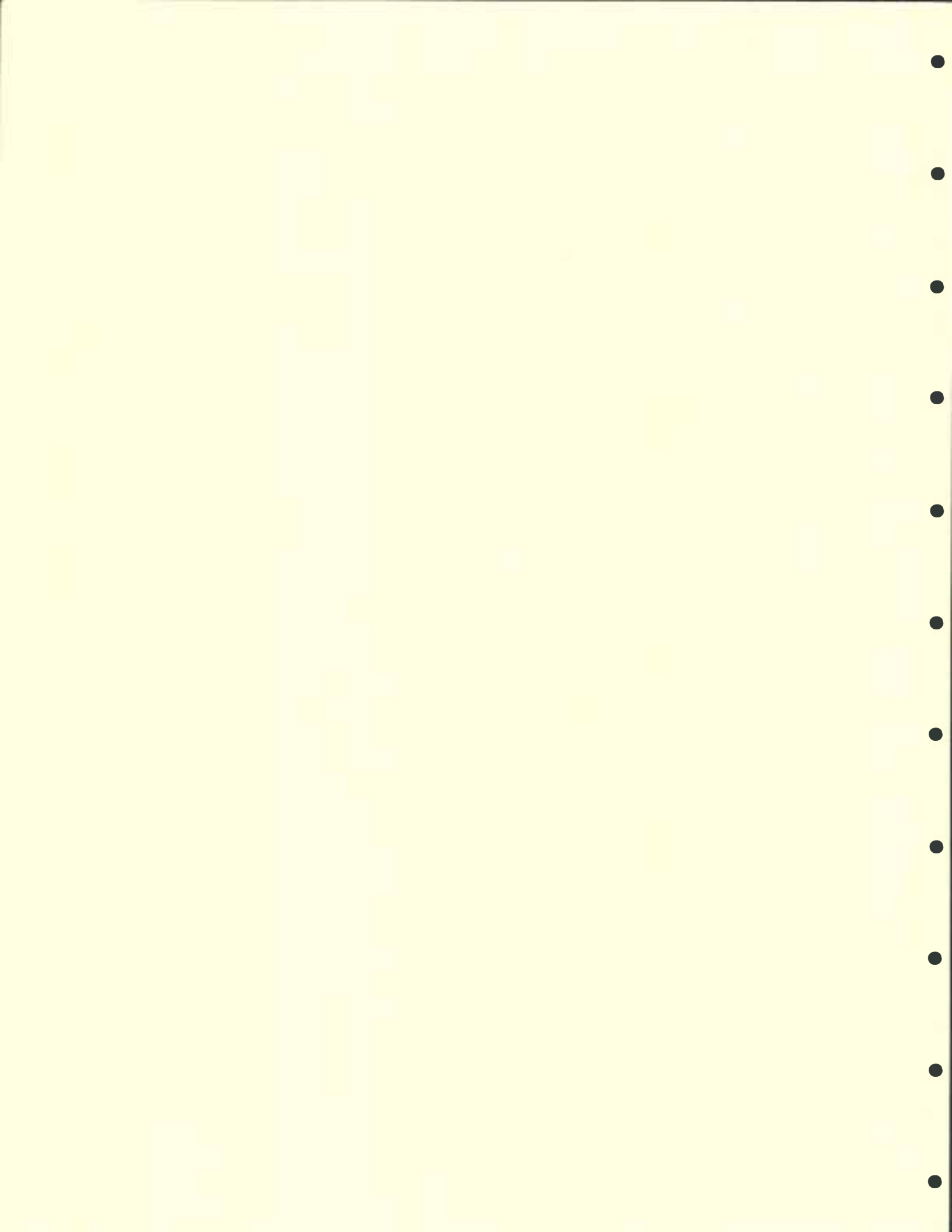
Comment:

On page VI-1 of the Facility Evaluation Appendix, we note that fish and wildlife are not included in the listing of important resources. The final statement will be more comprehensive if these resources are added.

Response:

The section referred to discusses resources and values in a very general sense. Fish and wildlife are an implicit part of items 2 and 3 on page VI-2. In that particular context, we did not deem it necessary to mention those resources explicitly. Fish and wildlife are covered explicitly elsewhere in the text.

XIV. Letters Received on Fiscal Year 1980
Proposed Program and Facility Planning
and Location Phases



INDEX OF COMMENT LETTERS
FY 1980 Proposed Program

<u>Page</u>	<u>Individual/Organization</u>	<u>EIS/Planning Phase EIS Referenced in Letter*</u>
XIV-1	U.S. Bureau of Land Management, Denver, CO	Program
XIV-2	Oregon State Intergovernmental Relations Division, Salem, OR	Program
XIV-3	Montana Historical Society, Helena, MT	Program
XIV-4	Oregon State Intergovernmental Relations Division, Salem, OR	Program
XIV-5	U.S. Dept. of Housing and Urban Development, Seattle, WA	Program
XIV-6	Puget Sound Council of Governments, Seattle, WA	Program
XIV-7	Montana Dept. of Fish and Game, Helena, MT	Program
XIV-11	Oregon State Forestry Dept., Salem, OR	Program
XIV-13	U.S. Bureau of Land Management, Cheyenne, WY	Program
XIV-14	Regional Planning Council of Clark County, Vancouver, WA	Program
XIV-15	U.S. Feritage Conservation and Recreation Service, Seattle, WA	Program
XIV-16	U.S. Environmental Protection Agency, Seattle, WA	Program
XIV-17	U.S. Coast Guard, Washington, D.C.	Program
XIV-18	U.S. Army Corps of Engineers, Portland, OR	Program
XIV-19	U.S. Forest Service (Region 6), Portland, OR	Program
XIV-21	Oregon State Intergovernmental Relations Division, Salem, OR	Program/Salem-Albany
XIV-31	**U.S. Federal Aviation Administration, Seattle, WA	Program/Salem-Albany
XIV-32	**Oregon Dept. of Fish and Wildlife, Portland, OR	Program/Salem-Albany
XIV-33	**U.S. Dept. of Interior, Office of the Secretary, Washington, D.C.	Program/Salem-Albany
XIV-37	**U.S. Forest Service (Region 1), Missoula, MT	Program
XIV-33	**U.S. Forest Service (Region 4), Ogden, UT	Program

COMMENT LETTERS RECEIVED ON
***LIBBY INTEGRATING TRANSMISSION LOCATION PHASE
(Fiscal Year 1980 Proposed Program)

XIV-39	Daniel Rix, Sandpoint, ID	Libby
XIV-40	U.S. Bureau of Indian Affairs, Portland, OR	Libby
XIV-42	Cesar Hernandez, Noxon, MT	Libby
XIV-44	Northwest Citizens for Wilderness, Noxon, MT	Libby
XIV-45	U.S. Environmental Protection Agency Seattle, WA	Libby
XIV-50	Michael Czerwinski, Trout Creek, MT	Libby
XIV-51	St. Regis Paper Co., Libby, MT	Libby

COMMENT LETTERS RECEIVED ON
***LIBBY INTEGRATING TRANSMISSION LOCATION PHASE
(Fiscal Year 1980 Proposed Program) - (Cont'd)

<u>Page</u>	<u>Individual/Organization</u>	<u>EIS/Planning Phase EIS Referenced in Letter*</u>
XIV-53	Montana Dept. of Natural Resources and Conservation, Helena, MT	Libby
XIV-56	Carl Fawcett, Federal Way, WA	Libby
XIV-58	Mrs. John R. Hennessy, Libby, MT	Libby
XIV-59	Brael Black, Libby, MT	Libby
" "	Stu Swenson, Libby, MT	Libby
" "	Lynn Robson, Libby, MT	Libby
XIV-60	Glenda Marita, Libby, MT	Libby
" "	Mih Deh	Libby
" "	Gary Morton	Libby
XIV-61	Lyle Olson, Libby, MT	Libby
" "	**Ann Guhman, Libby, MT	Libby
XIV-62	**Barbara Ann Roy, Libby, MT	Libby
XIV-63	**U.S. Dept. of Agriculture, Office of the Secretary, Washington, D.C.	Libby
XIV-67	**Steven Rogers, Libby, MT	Libby
" "	**Richard Springer, Libby, MT	Libby
XIV-68	**U.S. Fish and Wildlife Service, Denver, CO	Libby
XIV-71	**Don Vance, Tucson, AZ	Libby
XIV-72	**W. B. Larson, Troy, MT	Libby
XIV-73	**Thomas Graham, Troy, MT	Libby

COMMENT LETTERS RECEIVED ON
FRANKLIN AREA SYSTEM REINFORCEMENT
(Fiscal Year 1979 Proposed Program)

<u>Page</u>	<u>Individual/Organization</u>	<u>Location Phase EIS Referenced in Letter*</u>
XIV-74	Benton-Franklin Governmental Conference, Richland, WA	Franklin
XIV-75	Oregon State Intergovernmental Relations Division, Salem, OR	Franklin
XIV-76	Washington State Dept. of Transportation, Olympia, WA	Franklin
XIV-78	USDA Soil Conservation Service, Spokane, WA	Franklin
XIV-79	Advisory Council on <u>Historic Preservation</u> , Washington, D.C.	Franklin
XIV-80	Oregon State Preservation Office, Salem, OR	Franklin
XIV-81	Benton-Franklin Governmental Conference, Richland, WA	Franklin
XIV-82	U.S. Bureau of Indian Affairs, Portland, OR	Franklin
XIV-83	Washington State Dept. of Ecology, Olympia, WA	Franklin
XIV-84	U.S. Coast Guard, Washington, D.C.	Franklin
XIV-85	U.S. Army Corps of Engineers, Walla Walla, WA	Franklin
XIV-86	Oregon State Intergovernmental Relations Division, Salem, OR	Franklin
XIV-88	U.S. Forest Service (Region 6), Portland, OR	Franklin

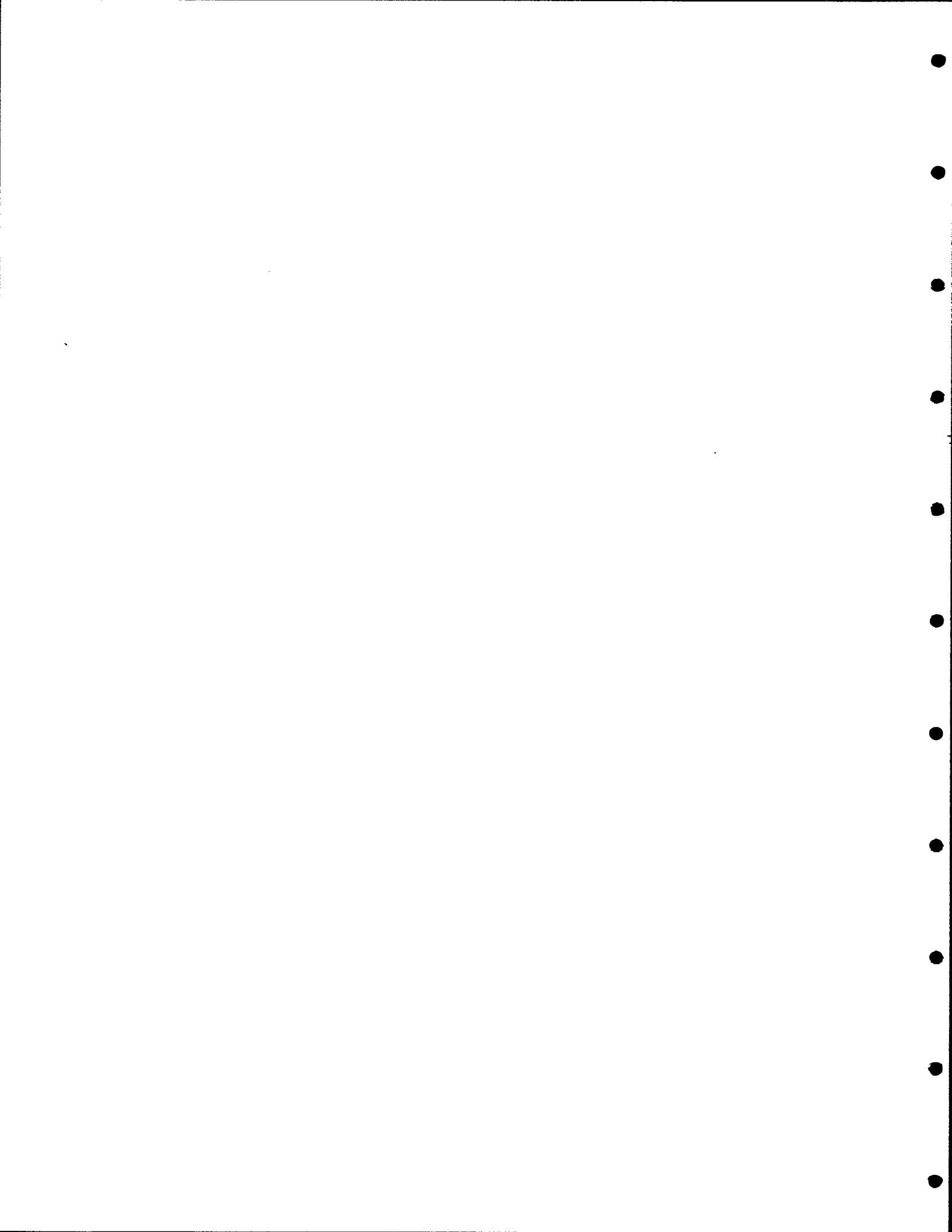
COMMENT LETTERS RECEIVED ON
FRANKLIN AREA SYSTEM REINFORCEMENT
(Fiscal Year 1979 Proposed Program) - (Cont'd)

<u>Page</u>	<u>Individual/Organization</u>	<u>Location Phase EIS Referenced in Letter*</u>
XIV-89	Washington State Office of Financial Management, Olympia, WA	Franklin
XIV-90	Washington State Parks and Recreation Commission, Olympia, WA	Franklin
XIV-91	U.S. Dept. of Interior, Office of the Secretary, PNW Region, Portland, OR	Franklin
XIV-94	**U.S. Army Corps of Engineers, Ice Harbor Dam	Franklin
XIV-95	**U.S. Environmental Protection Agency, Seattle, WA	Franklin
XIV-96	Columbia Rural Electric Association, Inc., Dayton, WA	Franklin

*Those letters containing substantive comments are responded to at the end of the appropriate section of this environmental statement. For example, substantive comments on the FY 1980 Program are addressed at the end of the program statement itself (Section XIV). Substantive comments on the specific major new facilities are addressed at the end of the appropriate facility planning phase EIS in the Facility Evaluation Appendix.

**Late letter; received after end of review period.

***Libby Integrating Transmission (SA 80-3) was deferred from the FY 1979 Program to the FY 1980 Program; letters received during the review of the FY 1979 Program Statement that commented on Libby Integrating Transmission are again reproduced in this statement along with letters received on the FY 1980 Program.





United States Department of the Interior

IN REPLY REFER TO

1793 (D-380)

BUREAU OF LAND MANAGEMENT
DENVER SERVICE CENTER
DENVER FEDERAL CENTER, BUILDING 50
DENVER, COLORADO 80225

OCT 6 1978

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

Gentlemen:

This letter is in response to your request for comments on the draft ES for BPA's FY 1980 Proposed Program.

We feel it more appropriate for specific comments to be provided from the BLM offices located in the states with direct management authority for public lands. By copy of this memorandum, we are requesting these states to provide appropriate comments on the ES which you have provided to them.

Sincerely,

Acting

Director, Denver Service Center

cc: State Directors, Montana, Idaho
Oregon, Wyoming



XIV-1

Save Energy and You Serve America!



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
ROOM 306 Salem, Oregon 97310
STATE LIBRARY-BUILDING Phone: 378-3732

PROJECT ACKNOWLEDGEMENT

APPLICANT: BPA
PROJECT TITLE: 1980 Proposed Program
DATE RECEIVED: October 9, 1978
PNRS #: 7810 4 170

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

- Initial 30-day State Clearinghouse review of your Notice of Intent began on the above date.
- The 30-day State Clearinghouse review of your final application began on the above date.
- Initial 30-day State Clearinghouse review of this HUD Housing project began on the above date.
- Initial 30-day State Clearinghouse review of your Direct Federal Development project began on the above date.
- The 30-day State Clearinghouse review of your final Environmental Impact Statement began on the above date.
- Initial 45-day State Clearinghouse review of your draft Environmental Impact Statement began on the above date.
- The 45-day State Clearinghouse review of your State Plan/Amendment began on the above date.

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



MONTANA HISTORICAL SOCIETY

225 NORTH ROBERTS STREET • (406) 449-2694 • HELENA, MONTANA 59601

October 9, 1978

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

Re: FY80 Draft Program
Environmental Statement

Dear Sir:

Thank you for your draft statement on Environmental Impacts of your program in 1980. The procedures as outlined on Page 26, and Appendix XII, in consultation with this office, and the Advisory Council on Historic Preservation when applicable, will constitute compliance with the Historic Preservation Act.

Thank you.

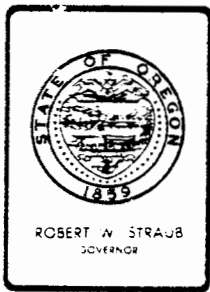
Sincerely,



Ken Korte

State Historic Preservation Officer

KK:EV:rgh



Executive Department

INTERGOVERNMENTAL RELATIONS DIVISION

ROOM 306, STATE LIBRARY BLDG., SALEM, OREGON 97310

October 16, 1978

OFFICIAL FILE COPY	
No.	Date
	OCT 17 1978
Referred To:	
A	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY.
By	Date

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

Dear Mr. Munro:

RE: 1980 Proposed Program
7810 4 170

The Oregon State Clearinghouse requests that the review period for the above project be extended to December 24, 1978.

Seventeen state agencies will be reviewing this Environmental Impact Statement. Initially we received only one copy. Fifteen more copies were requested and only seven were available. Therefore, the review process will be delayed as the agencies share the available copies; Your favorable consideration to this request will be appreciated.

Sincerely

Martin W. Loring,
Manager
Grants Coordination &
Management Section

MWL:wb



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL OFFICE
ARCADE PLAZA BUILDING, 1321 SECOND AVENUE
SEATTLE, WASHINGTON 98101
October 24, 1978

REGION X

IN REPLY REFER TO:
10C

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

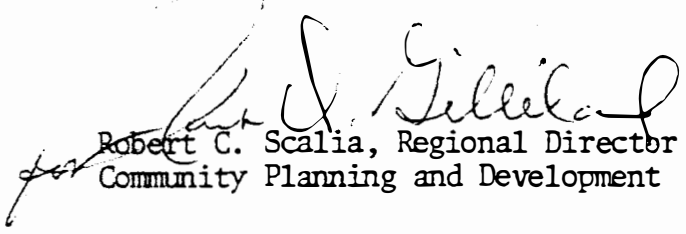
Gentlemen:

We have reviewed the statement submitted with your September 28, 1978 letter.

We have no constructive comments on your proposed program at this time. We will be interested in the facility location supplement, especially those located in or near urban areas. Our concerns will be potential impacts of noise, adverse land use and possible impacts on local aesthetic values.

Thank you for the opportunity to comment.

Sincerely,


Robert C. Scalia, Regional Director
Community Planning and Development

XIV-5

November 6, 1978

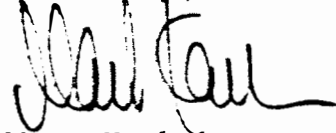
John Kiley, Environmental Manager
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208

RE: DEIS on Proposed FY 1980 Program

Dear Mr. Kiley:

Thank you for the opportunity to review the DEIS on BPA's proposed FY 1980 program. The PSCOG will reserve the opportunity to comment on individual facilities upon completion and distribution of follow-up location supplements. We have no comments to offer at this time.

Sincerely,



Mart Kask
Executive Director

STATE OF MONTANA

E-8-10-01



DEPARTMENT OF

FISH AND GAME

Helena, MT 59601


November 3, 1978

Montana State Clearinghouse
Office of Budget and Program Planning
Capitol Building
Helena, MT 59601

Dear Sirs:

The Montana Department of Fish and Game has reviewed the draft EIS for the Bonneville Power's 1980 Program. The review was conducted by our regional office in Kalispell and attached for your use is a copy of their memo drafted subsequent to that review. I assume our comments will be used to compile a state comment after other agencies submit their individual analysis. If this is not the case, please forward our correspondence to the Environmental Manager, Bonneville Power Administration, P.O. Box 3621, Portland, Oregon 97208.

Sincerely,


James A. Posewitz, Administrator
Ecological Services Division

JAP/gk

cc: Tom Hay
Environmental Quality Council

STATE OF MONTANA
DEPARTMENT OF FISH AND GAME
HELENA, MONTANA

E-8-10-01

RECEIVED
OCT 31 1978
MINERAL RESOURCES

Office Memorandum

TO : Robert F. Wambach Attn: Jim Posewitz DATE: Oct. 30, 1978
FROM : Tom Hay
SUBJECT: Bonneville Power's 1980 Program --- Draft E.I.S.

Within the Right-of-Way Management Appendix (page 3 of 33) "Spokane Area" is listed the management program for Flathead-Lake-Lincoln-Mineral and Sanders Counties. All acreages are shown under the Hand Cutting category yet Tordon 101 is shown as being used in each county also. Why?

On Page 15 E.I.S. first paragraph, last sentence is a statement on "edge effect". The statement is true only if you don't eliminate by spraying, the vegetation that comes into the corridor following clearing. On Page 16 E.I.S., first paragraph, is shown the acreages that will be controlled chemically and by hand cutting. While the majority of the acres will be sprayed selectively, from the ground, I have less faith than they, on all the good things that will be saved for wildlife forage. They take credit for creating and then methodically try to eliminate.

Maintenance roads along power line corridors also add to the problem of excessive hunter access in Region One where we are trying to talk land managers into closing roads.

Tom Hay
Tom Hay

TH/ea

ENVIRONMENTAL IMPACT STATEMENT ASSESSMENT FORM

Request for Environmental Impact Statement Review

TO: *Montana Dept of Livestock*

FROM: Montana State Clearinghouse
Office of Budget and Program Planning
Room 221, Capitol Building
Helena, Montana 59601

Environmental Impact Statement Title: *Draft EIS Bonneville Power Admin. Proposed Facility for 1980 Program*

Clearinghouse File Number: E-8-10-01

EIS Agency Sponsor: Dept of Energy

SPONSOR ADDRESS: Bonneville Power Administration
PO Box 3621, Portland, Oregon 97208

CONTACT PERSON: Environmental Mgr.

COMMENTS DUE BY: November 24, 1978

RECEIVED
OCT 5 1978
OBPP A-95

The Above Named EIS Statement

- is enclosed for your review and comment
- should have been received by your Agency from the sponsor
- is available at the Clearinghouse Office for review (only one copy was received).

Please evaluate the EIS for its consistency and fulfillment of statewide and local objectives related to:

1. The environmental impact of the proposed action.
2. Any adverse environmental effects which cannot be avoided should the proposal be implemented.
3. Alternatives to the proposed action.
4. The relationship between local short-term uses of man's environment and maintenance and enhancement of long-term productivity.
5. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

IF YOUR AGENCY HAS COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT, PLEASE SEND THE COMMENTS DIRECTLY TO THE EIS AGENCY SPONSOR AND FORWARD A COPY OF THE COMMENTS TO THE STATE CLEARINGHOUSE.

IF YOUR AGENCY DOES NOT INTEND TO COMMENT, PLEASE CHECK THE BOX BELOW AND RETURN THIS FORM TO THE STATE CLEARINGHOUSE.

NO COMMENT

Reviewer's Signature *Carl [Signature]*

Title *Administrative Officer* Date *11-24-78*

ENVIRONMENTAL IMPACT STATEMENT ASSESSMENT FORM

Request for Environmental Impact Statement Review

TO:

Montana
Dept of Highways

FROM:

Montana State Clearinghouse
Office of Budget and Program Planning
Room 221, Capitol Building
Helena, Montana 59601

Environmental Impact Statement Title: Draft EIS Bonneville Power Admin.

Proposed Fiscal Year 1980 Program

Clearinghouse File Number: E-8-10-01

EIS Agency Sponsor: Dept of Energy

SPONSOR ADDRESS: Bonneville Power Administration
PO Box 3621, Portland, Oregon 97208

CONTACT PERSON: Environmental Mgr.

COMMENTS DUE BY: November 24, 1978

RECEIVED
OCT 5 1978
OBPP A-95

The Above Named EIS Statement

- is enclosed for your review and comment
- should have been received by your Agency from the sponsor
- is available at the Clearinghouse Office for review (only one copy was received).

Please evaluate the EIS for its consistency and fulfillment of statewide and local objectives related to:

1. The environmental impact of the proposed action.
2. Any adverse environmental effects which cannot be avoided should the proposal be implemented.
3. Alternatives to the proposed action.
4. The relationship between local short-term uses of man's environment and maintenance and enhancement of long-term productivity.
5. Any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

IF YOUR AGENCY HAS COMMENTS ON THE ENVIRONMENTAL IMPACT STATEMENT, PLEASE SEND THE COMMENTS DIRECTLY TO THE EIS AGENCY SPONSOR AND FORWARD A COPY OF THE COMMENTS TO THE STATE CLEARINGHOUSE.

IF YOUR AGENCY DOES NOT INTEND TO COMMENT, PLEASE CHECK THE BOX BELOW AND RETURN THIS FORM TO THE STATE CLEARINGHOUSE.

NO COMMENT

Reviewer's Signature _____

Title _____ Date _____



Forestry Department

OFFICE OF STATE FORESTER

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

OFFICIAL FILE COPY	
No.	Date
	NOV 13 1978
Referred To	
Action Taken	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY
By	Date

November 8, 1978

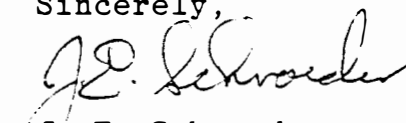
Mr. Sterling Munro, Administrator
U.S. Department of Energy
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208

Dear Mr. Munro:

Thank you for the opportunity to review your Draft EIS for the Bonneville Power Administration Proposed FY 1980 Program.

Our Plans and Programming section has reviewed the plan and has come up with a few points which it feels are in need of clarification. We are hopeful that these comments will be considered in preparation of the final plan.

Sincerely,


J. E. Schroeder
State Forester

JES:zs

Attachment

cc: Board Members
Executive Staff
John Wilkinson
Dan Goldy
Janet McLennan
State Clearinghouse (PNRS #7810 4 170)

Response to Draft EIS:

Bonneville Power Administration,
Proposed Fiscal Year 1980 Program

The draft environmental impact statement is written in such nonspecific terms that precise comments about FY 1980 BPA Activities effecting forest land in Oregon are impossible. Pages 19 and 20 contain reference to forest activities anticipated for the entire Pacific Northwest, but even these leave the reader unsure if plans will remove 600 acres or 1,070 acres from production.

In order to conduct any sort of analysis of the impacts on Oregon's forests we must know how many forested acres BPA construction activity will remove from production in Oregon alone--not the entire region. Each of our neighboring states would no doubt also like to see such impact data for their forest lands as well.

The nation generally, and Oregon in particular, are facing a serious timber supply shortage. It has already started, and will become only worse into the next century. Any future removals of forest lands from production must therefore be done only after careful consideration and painstaking weighing of all alternatives. According to Appendix B of BPA's Role EIS (Table IX-2) sizeable amounts of timberland are permanently removed from production for each mile of right-of-way constructed.

The Oregon State Forestry Department urges that forest land impacts be identified as specifically as possible in the BPA's proposed fiscal year program documents, and quite precisely, in the succeeding EIS documents relating to each project undertaken during the year.



United States Department of the Interior

IN REPLY REFER TO

1793 (922)

BUREAU OF LAND MANAGEMENT

State Office

P. O. Box 1828

Cheyenne, Wyoming 82001

NOV 9 1978

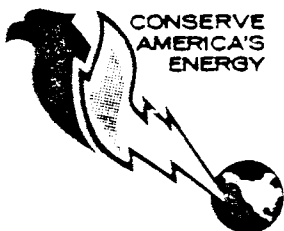
Environmental Manager
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208

Dear Sir:

In response to your request for specific comments on the Draft ES for BPA's FY 1980 Proposed Program, no public lands under BLM jurisdiction in Wyoming will be affected. Therefore, we have no comments to offer.

Sincerely yours,

Daniel P. Baker
State Director



XIV-13

Save Energy and You Serve America!



**REGIONAL PLANNING COUNCIL
OF CLARK COUNTY**

1408 Franklin St. p.o. box 5000
Vancouver, Wash. 98663
phone 1 206 699-2361

Executive Director
Richard T. Howsley

November 16, 1978

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

Dear Sir:

We have reviewed the Draft EIS for the proposed Fiscal Year 1980 Program and have the following comments:

1. We would like to see an expanded section included in the EIS addressing the qualities and hazards associated with each of the herbicides used by BPA. We noted that the contents, manufacturers, and a brief explanation of the effects were listed in Appendix B of the Draft Role EIS; however, not enough information was provided about the significant properties of each of the herbicides.
2. We would like to see a more detailed location map indicating the stations and right-of-way locations and the relative areas of each type of management program. Were this information provided, we would be more able to assist in identification of areas of special concern or of potential significance that might otherwise be overlooked.

We appreciate this opportunity to comment on this Draft EIS.

Sincerely,

Terry V. Oliver
Planner

TVO:jh

cc: Board of County Commissioners
PUD of Clark County



XIV-14



United States Department of the Interior

HERITAGE CONSERVATION AND RECREATION SERVICE
NORTHWEST REGION
SEATTLE, WASHINGTON 98174

IN REPLY REFER TO:

ER-7

NOV 24 1978

OFFICIAL FILE COPY	
No.	Date
	NOV 27 1978
Referred To:	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY
3y	Date

Memorandum

To: Regional Administrator, Bonneville Power Administration

Attention: Environmental Manager

From: Regional Director, Northwest Region, Heritage Conservation and Recreation Service

Subject: Review of Draft Environmental Impact Statement, Proposed Fiscal Year 1980 Program, Bonneville Power Administration

We have reviewed the subject DES and are sending you our comments as requested in your September 28, 1978 memorandum. Because of the general nature of the DES, we will reserve our detailed comments for review of draft environmental statements for facility location supplements.

We are pleased that BPA intends to consider paralleling and upgrading existing transmission lines when planning new facilities (pages 34 and 35). This type of development in most cases has far less adverse impact on recreation and scenic resources than new transmission routes, and we urge maximum adoption. Draft environmental statements for facility location supplements should contain thorough justification for proposed new routes.

The draft states on page 24 that most transmission line rights-of-way are held in easement by BPA, and public access for recreation is subject to permission of the landowner or managing agency. Environmental statements for facility location supplements should discuss the potential of rights-of-way for recreation from the standpoint of terrain, scenery, recreation attractions, etc., irrespective of ownership. Ownership should be discussed as it effects recreation potential and, where it acts as a constraint, the feasibility of fee simple or easement acquisition should be treated.

Maurice H. Lundy
for Maurice H. Lundy

U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101



REPLY TO
ATTN OF: M/S 443

NOV 21 1978

Mr. Jack Kiley, Environmental Manager
Bonneville Power Administration
Department of Energy
P. O. Box 3621
Portland, Oregon 97208

Dear Mr. Kiley:

EPA has completed its review of your draft environmental impact statement on BPA's Proposed Fiscal Year 1980 Program and on the draft facility planning supplements incorporated within this DEIS. Our review found no significant errors or omissions. We therefore have no major comments or suggestions to make with regard to the contents of the final environmental impact statement.

However, you should note that Executive Order 11752, referenced on page 29, has been replaced by a new Executive Order that reflects the new amendments to the Clean Air Act and the Federal Water Pollution Control Act (now known as the Clean Water Act). This new Executive Order appeared in the Federal Register on October 13, 1978. You may wish to modify your environmental statement's discussion to reflect the changes made in the new Order.

The Environmental Protection Agency's comments on this draft statement have been rated LO-1 (LO - Lack of Objections; 1 - Adequate Information). This rating will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed federal actions under Section 309 of the Clean Air Act, as amended.

Thank you for the opportunity to review this environmental statement. If you have questions or would like to discuss these comments, please feel free to contact me or Daniel Steinborn of my staff at (206) 442-1285 or (FTS) 399-1285.

Sincerely,

A handwritten signature in cursive script, appearing to read "Alexandra B. Smith".

Alexandra B. Smith, Chief
Environmental Evaluation Branch



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WEP-7/73)
WASHINGTON, D.C. 20590
PHONE: 202-426-3300

.16476/7.b 509

22 NOV 1978

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

Dear Mr. Kiley:

On behalf of the U. S. Department of Transportation the concerned operating administrations and staff of the U. S. Coast Guard have reviewed the draft environmental impact statement for the Bonneville Power Administration Proposed FY 1980 Program. We have neither comments nor objections to offer regarding this proposal.

The opportunity to review the draft statement is greatly appreciated.

Sincerely,

Commandant
U.S. Coast Guard
Bonneville Power Administration
Environmental Protection
by direction of the Commandant

SPEED
LIMIT
55

It's a law we
can live with.



DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION, CORPS OF ENGINEERS
P.O. BOX 2870
PORTLAND, OREGON 97208

OFFICIAL FILE COPY	
No.	Date
	NOV 27 1978
Referred To:	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY
By	Date
	24 November 1978

NPDPL-ER

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

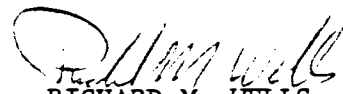
Dear Mr. Munro:

This is in response to your letter of 28 September 1978, requesting our review of your Draft Environmental Impact Statement on your Fiscal Year 1980 Proposed Program.

The Bonneville Power Administration will be required to obtain a permit from the Corps of Engineers for the location of any transmission lines on project lands. Also, a Section 10 permit would be required for any transmission lines crossing any navigable waterway. A Section 404 permit would also be required for any work which would involve the discharge of fill material in the waters of the United States, including adjacent wetlands.

We appreciate the opportunity to review and comment on the Draft EIS. If you have any questions regarding any required permits, please contact Mr. Don Lawyer, 503-221-3780 or FTS 423-3780.

Sincerely yours,


RICHARD M. WELLS
Brigadier General, USA
Division Engineer

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
Region 6
P. O. Bos 3623, Portland, Oregon 97208

OFFICIAL FILE COPY	
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Date	
November 24, 1978	

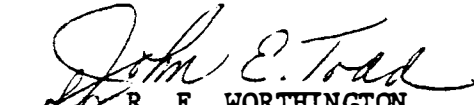
Mr. Sterling Munro, Administrator
U. S. Department of Energy
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208



Dear Mr. Munro:

Thank you for the opportunity to review your Draft EIS for the Bonneville Power Administration Proposed FY 1980 Program.

We have reviewed the Draft EIS and have commented on those points which require further clarification.


R. E. WORTHINGTON
Regional Forester

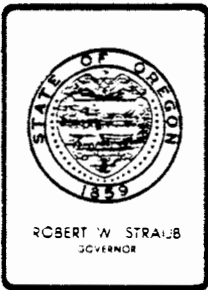
Enclosure

Response to Draft EIS:

Bonneville Power Administration
Proposed Fiscal Year 1980 Program

We have reviewed the Draft Environmental Impact Statement, (EIS), for the Bonneville Power Administration Proposed FY 1980 Program. The EIS proposes that some Right of Way areas within the boundaries of National Forests in the Pacific Northwest Region of the Forest Service be treated with herbicides. Before such areas can be treated, site specific conditions must be considered and a site specific assessment must be prepared.

You may find it appropriate to include such site specific data in the final EIS, or you may wish to provide it through coordination between our respective field units.



Executive Department

INTERGOVERNMENTAL RELATIONS DIVISION

ROOM 306, STATE LIBRARY BLDG., SALEM, OREGON 97310

November 21, 1978

OFFICIAL FILE COPY	
No.	Date
	NOV 27 1978
Referred To:	
Action Taken:	
<input type="checkbox"/> ANSW.	<input type="checkbox"/> NO REPLY
By	Date

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

Dear Mr. Munro:

RE: 1980 Proposed Program
 PNRS 7810 4 170

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

Your draft was referred to the appropriate state agencies. The Departments-Environmental Quality, Land Conservation and Development, Forestry, Water Resources, Highway and Aeronautics offered the enclosed comments which should be addressed in preparation of your final Environmental Impact Statement.

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

Sincerely,

Kay Wilcox
 A-95 Coordinator

KW:cb

Enclosure

Oregon Administrative Rules, Dept. of Environmental Quality,
 Division 23, Rules for Open Burning, pp 53-60.



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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

PNRS STATE REVIEW

RECEIVED
NOV 14 1978

Project #: 7810 4 170

Return Date: NOV 10 1978

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.
- () We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.
- () No comment.

REMARKS

- See attached comments on noise
- Air Quality: (Copy of Open Burning Rules attached)
 - Non-agricultural land clearing debris is considered "construction and demolition waste" under DEQ rules (OAR Chapter 340, Division 23). Open burning of such wastes must conform to these rules on all federal, state and private lands. In particular, OAR 340-045(5) prohibits such burning in certain "burning control areas". When planning to burn such debris, BPA should contact the appropriate DEQ Regional Office (see attached), to discuss burning sites, and methods.
 - Slash burning from logging operations is exempted from these DEQ rules because it is covered by a Smoke Management Plan jointly formulated by DEQ and Dept. of Forestry, and administered by DOF.
 - Statement on page 48, Section 6 is not correct: "Relatively high concentrations of these products near fire sites decrease rapidly to ambient levels in all directions". Recent studies (not yet released to public) have shown slash smoke has major impacts on populated areas.

XIV-22

Agency

DEQ

By

Robert L. Day Nov. 13, 1978



STATE OF OREGON

INTEROFFICE MEMO

DEQ-Noise Control

229-5360

DEPT.

TELEPHONE

TO: Bob Gay

DATE: November 8, 1978

FROM: Norma Jette thru John Hector

SUBJECT: Noise Comments on BPA's FY 1980 Program (7810-4-170)

In reference to the BPA's discussion of the noise impacts (pages 28-30), we have the following comment:

Although three of the four substations exceeding the state noise standards are within 4 dBA of the regulated limit, plans should be developed to attain compliance with DEQ noise standards. DEQ does not agree that such exceedances are "very minor violations."

In reference to those projects in the Albany/Salem area, BPA should take precautions to prevent future noise impacts from occurring due to urban growth. This may include contacting local land use agencies to prevent encroachment of residential development and/or purchasing land for a noise buffer.

/dro

P.O. Box 1760
Portland, Oregon 97207
229-5696/5630

Northwest Region Office

522 S.W. 5th Avenue
P.O. Box 1760
Portland, Oregon 97207
229-5263

Eastern Region Office

424 S.W. 6th
Pendleton, Oregon 97801
276-4063/4065

North Coast Branch Office

3600 E. Third
Tillamook, Oregon 97141
342-6637

Willamette Valley Region

Salem Office
796 Winter N.E.
Salem, Oregon 97310
378-8240

Eugene Office
16 Oakway Mall
Eugene, Oregon 97401
686-7601

Central Region Office

2150 N.E. Studio Rd.
Bend, Oregon 97701
382-6446

Cos Bay Branch Office

290 N. 2nd
Cos Bay, Oregon 97420
269-2721

Southwest Region Office

1937 W. Harvard Blvd.
Roseburg, Oregon 97470
672-8204

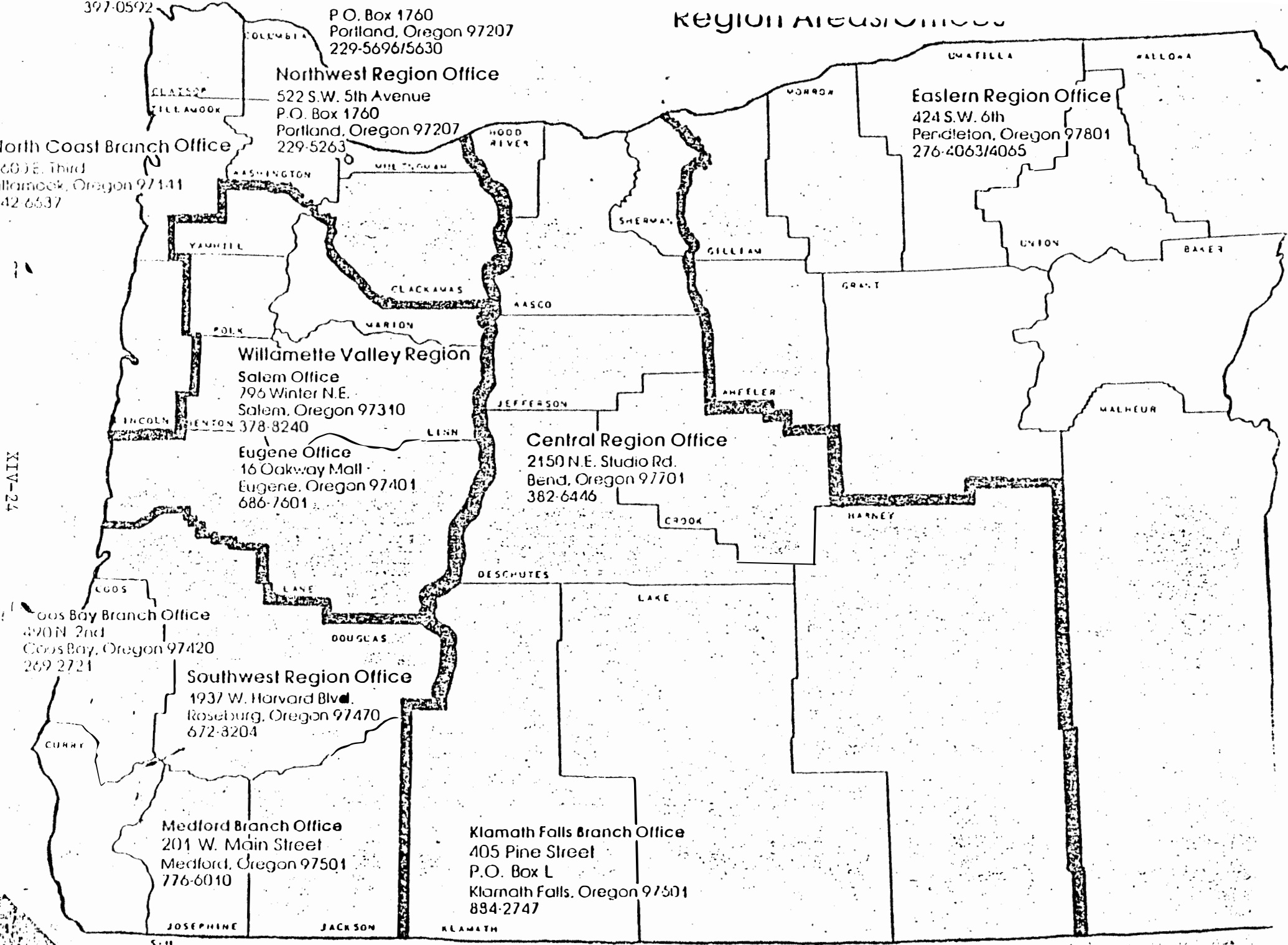
Medford Branch Office

201 W. Main Street
Medford, Oregon 97501
776-6010

Klamath Falls Branch Office

405 Pine Street
P.O. Box L
Klamath Falls, Oregon 97501
894-2747

XIV-24





OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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

PNRS STATE REVIEW

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INTERGOVERNMENTAL RELATIONS DIVISION
NOV 09 1978

Project #: 7810 " 170

Return Date: NOV 10 1978

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.
- (X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.
- () No comment.

REMARKS

XIV-25

Agency

Forestry

BY

Philip D. Bryan



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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

DEPARTMENT OF
LAND CONSERVATION
ADMINISTRATIVE

PNRS STATE REVIEW

SALEM
NOV 10 1978

Project #: 7810 4 170

Return Date: _____

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.

[Handwritten mark] We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.

- () No comment.

REMARKS

beg 1/30 - 1/31

Agency LEDC

BY JH Campbell

IV. Area Has No Plan, But Has A Compliance Schedule

This project and its related land use implications must be coordinated and consistent with local efforts to develop a comprehensive plan for the Counties of Linn and Marion and to reach compliance with the statewide land use goals. Linn and Marion Counties has adopted a schedule and work program for reaching compliance with the statewide goals which should be recognized in coordination of this project with the jurisdiction. Consideration of the relationship between statewide goals

#5 (Open Spaces, Scenic and Historic Areas, and Natural Resources) & #11 (Public Facilities and Services) etc. and the project should receive special attention. In addition, the applicant should make every effort to ensure that the project makes use of recognized citizen and agency involvement programs established by the local jurisdiction in accordance with the statewide land use goals.

DB
10/24/78



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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

RECEIVED

OCT 10 1978

WATER RESOURCES DEPT.
SALEM, OREGON

PNRS STATE REVIEW

Project #: 7810 A 7

Return Date: _____

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.
- () We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.
- () No comment.

REMARKS

Figure 3. What does the dashed black line represent?

Page 9. 1. Hydrologic Resources.

Text should mention irrigation water uses because of the farm land involved in the right of way.

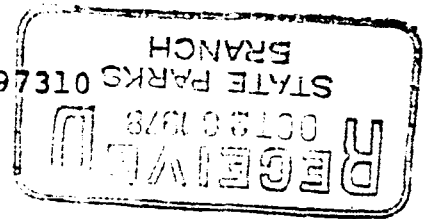
Page 32. There is flood way data available for Marion County



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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



P N R S S T A T E R E V I E W

Project #: 7810 4 170

Return Date: _____

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.
- (X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.
- () No comment.

REMARKS

Early coordination with the Oregon Highway Division should be initiated on any aspect of the program that directly impacts the State Highway System.



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

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

Do Closure letter
INTERGOVERNMENTAL RELATIONS DIVISION
NOV 17 1978

P N R S S T A T E R E V I E W

21

Project #: 7870

Return Date: NOV 10 1978

ENVIRONMENTAL IMPACT REVIEW PROCEDURES

1. A response is required to all notices requesting environmental review.
2. OMB A-95 (Revised) provides for a 30-day extension of time, if necessary. If you cannot respond by the above return date, please call the State Clearinghouse to arrange for an extension.

ENVIRONMENTAL IMPACT REVIEW DRAFT STATEMENT

- () This project does not have significant environmental impact.
- () The environmental impact is adequately described.
- (X) We suggest that the following points be considered in the preparation of a Final Environmental Impact Statement regarding this project.
- () No comment.

REMARKS

REMARKS

This report does not address the impact that the establishing of powerlines may have on airport or airway structures. No coordination was effected with the Oregon Aeronautics Division in establishing this Environmental Impact Statement. The lack of initial coordination in the past in establishing such powerlines has caused considerable concern to the Oregon Aeronautics Division and has resulted in rerouting and costly delays in the power companies. These impacts should be reflected in the report.

Please Coordinate.

by Aeronautics

By Paul E. Burket
PAUL E. BURKET, Aeronautics Administrator

Agency Aeronautics By _____

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

November 27, 1978

NORTHWEST REGION
FAA BUILDING KING COUNTY INT'L AIRPORT
SEATTLE, WASHINGTON 98108



Mr. John Kiley
Environmental Manager
Bonneville Power Administration
P.O. Box 3621
Portland, OR 97207

Dear Mr. Kiley:

We have reviewed the draft environmental impact statement for the Bonneville Power Administration proposed FY-1980 program and submit the following comments:

a. We request Notice of Proposed Construction or Alterations (FAA Form 7460-1) be prepared at least 30 days prior to the start of construction on projects which meet filing requirements of Federal Air Regulations, Part 77.13, Objects Affecting Navigable Airspace.

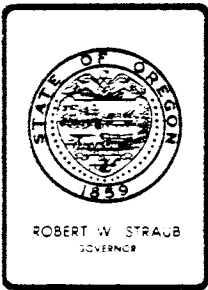
b. None of the Salem-Albany Area support alternatives depicted in the Draft Facility Supplement appear to impact McNary Field at Salem, the existing Albany Municipal Airport, or any of the alternate sites considered at Albany. We would appreciate having the opportunity to review the facility location supplements as they become available.

If we can be of further assistance, please feel free to contact this office.

Sincerely;

A handwritten signature in cursive script that reads "Dale F. Backman".

DALE F. BACKMAN
Chief, Appraisal and Planning Staff



Department of Fish and Wildlife
OFFICE OF THE DIRECTOR

506 S.W. MILL STREET, P.O. BOX 3503, PORTLAND, OREGON 97208

December 6, 1978

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

Dear Mr. Kiley:

We have completed our review of Bonneville Power Administration's Proposed Fiscal Year 1980 Program and have no major objections to the plan.

The environmental effects of the proposal appear to be adequately addressed in the statement. However, we do have some additional recommendations for your consideration.

1. The Salem-Albany area support proposal may damage some wetland areas near the Willamette River. We request that our local field biologists be consulted during site selection to assist in preventing significant effects on fish and wildlife habitat. They are: Jim Heintz (wildlife) and Joe Wetherbee (fish), 2491 Lancaster Drive NE, Salem, Oregon 97303, and office phone number is 378-6925.
2. We request the opportunity to make technical input to and subsequently review the facility location supplements to reduce potential habitat conflicts.
3. Right of way management activities adjacent to waterways should be coordinated with this department. Please contact Jerry MacLeod (229-5679), a staff biologist in the Central Office. He will refer you to the appropriate district biologist for whatever area may be involved.

We appreciate the opportunity to review the proposed plan. If you have questions or would like to discuss these comments, please feel free to contact us.

Sincerely,

William E. Pitney
WILLIAM E. PITNEY, Chief
Environmental Management Section

cc: Intergovernmental Relations Division

WEP:mv



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

OFFICIAL FILE COPY

No. Date
DEC 12 1978

Referred To

Action Taken:

ANSW. NO REPLY
By Date

DEC 8 1978

In Reply Refer To:
ER 78/995

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

Dear Mr. Munro:

Thank you for your letter of September 28, 1978, requesting our views and comments on the draft environmental statement for your agency's Fiscal Year 1980 Proposed Program. We have the following general and specific comments.

General Comments

The draft statement refers to a number of general construction activities including substations, bridges, culverts, and submarine conductors which could require further review under established permit processes, other legislative mandates, and the recent Executive Orders on Floodplain Management and Wetlands Protection. Accordingly these comments do not preclude an additional and separate evaluation by the Department's Fish and Wildlife Service (FWS) pursuant to the Fish and Wildlife Coordination Act and other authorities. The position of the FWS along with its recommendations would be set forth at the appropriate time in the planning process for each individual activity.

From a mineral resource standpoint, electric power generated and distributed by BPA is important to the domestic production of light metals. Considering that increasing non-industrial power demand and low precipitation in the Columbia River have already caused shortages of interruptible power (on which light metal production depends) the planned system improvements will have a beneficial impact on our mineral production.

The discussion of geology and mineral resources in relation to transmission line corridors is adequate. Although detailed mineral studies have not been made on these corridors, we agree with the BPA conclusion that direct adverse impacts to mineral resources are not anticipated.

Specific Comments

Main Text.

Clearing of new right-of-way during line construction in old growth timber areas may benefit some herbivores, as stated on page 15. However, such clearing would be greatly detrimental to wilderness species such as the cougar, wolverine, and the northern spotted owl. Species such as the northern spotted owl could be displaced due to loss of old growth Douglas fir habitat.

Another impact to wildlife, not mentioned in the statement, is the possibility of collisions of birds with the power lines and towers.

The statement does acknowledge (on page 37) that large birds of prey often use transmission line structures as nesting sites. It also describes BPA's policy of not destroying such nests. The final statement should recognize the possible electrocution loss to those raptors.

The tables in Section XI.A showing herbicide work planned on transmission line rights-of-way crossing lands administered by the Department's Bureau of Land Management (BLM) are not site specific as regards areas to be treated. It is not shown whether all BLM land on the particular transmission line is to be treated or only portions of the line, and if the latter, which portions. This comment is true also of the National Forest lands and of the private lands. We feel this additional information should be shown.

Facility Evaluation Appendix

On page VI-1 we note that fish and wildlife are not included in the listing of important resources. The final statement will be more comprehensive if these resources are added.

Recognition of legislative requirements to protect wetlands should be provided on page VI-7 by deleting paragraph 2 and inserting the following.

Wetland areas play an important environmental role and will be given special consideration in accordance with requirements of Executive Order 11990.

The section on natural vegetation should be expanded by adding the following.

The Endangered Species Act of 1973 is applicable to plant species (as well as animals) and special attention will be given to mandates of the Act during planning and construction activities.

The last sentence of paragraph 2 on page VI-9 should be deleted since the suggested rewording of paragraph 4 (below) will better explain the "rare" and "endangered" concepts.

Paragraph 4 should be revised as follows since the 1973 edition of Threatened Wildlife of the United States is no longer an appropriate reference.

Special attention will be given to species and subspecies determined to be endangered or threatened in accordance with criteria of the Endangered Species Act of 1973 as officially listed in the Federal Register. Section 3 of the Act defines endangered and threatened as follows:

Endangered: The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under provisions of this Act would present an overwhelming and overriding risk to man.

Threatened: The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Species classified as rare, endangered, or threatened by the involved States will also be given special consideration.

The most recent lists of endangered or threatened species of flora and fauna and of species being studied for classification can be obtained from:

Endangered Species Program
U.S. Fish and Wildlife Service
500 N.E. Multnomah Street
Portland, Oregon 87232

Planning Supplement, Salem-Albany

This section of the draft statement does not indicate that the FWS has previously expressed opposition to the line segment that would cross Ankeny National Wildlife Refuge. The Department of the Interior tentatively supports the FWS position and this could become an important factor in the decisionmaking process and should be outlined in the final statement.

On page 5 the wetlands section should be expanded to reflect responsibilities for wetlands protection under Executive Order 11990.

The description of the four alternative plans (pages 9 and 10) are very brief and it is difficult to determine what actions will be involved. It is especially difficult to determine the major differences between Plans B and C which both deal with the Salem-Albany No. 1 line.

It is suggested that the differences among the four plans be explained more specifically in the final statement. Also, since Plans A and D both cover the same line segment it would seem more appropriate to include them in sequence for comparison purposes.

On page 10 it is noted that subalternatives to route Plans B and C to avoid Ankeny NWR are not included. This possibility was set forth in the FWS letter of May 5, 1978, to BPA. We feel consideration of these subalternatives should be given.

Discussion on pages 14 and 15 appears to be an appropriate place for reference to the FWS opposition to the Ankeny NWR crossing and the possible alternatives to this action. Of the four plans, Plans A and D would be preferred at this time since they avoid crossing the refuge.

We hope these comments will be of assistance to you.

Sincerely,



Deputy
Assistant

Larry E. Meierotto
SECRETARY

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE
P.O. Box 7669, Missoula, MT 59807

OFFICIAL FILE COPY
DEC 14 1978
By 1950 Date
DEC 14 1978



✓
Sterling Munro, Administrator
U.S. Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208
└

Dear Mr. Munro:

Thank you for the opportunity to review BPA's Draft Environmental Statement covering the Proposed F.Y. 1980 Program. We have the following comments:

Herbicide Use Along Transmission Lines - Proposals to use herbicide for right-of-way management purposes will be jointly developed in individual right-of-way management plans. Prior to actual herbicide application, BPA will be required to furnish specific herbicide and application data to the Forest Service for project approval.

Facility Evaluation Appendix - Libby Integration and Northwest Montana and North Idaho Support - In view of the current injunction on the Libby Reregulation Dam project and the resulting delays in construction activities, we feel that the schedule for this project is overly optimistic. It seems that to go beyond selection of the centerline location of the BPA schedule would be wasting manpower and dollars until the Libby Reregulation project is back on track and going ahead. Should the Corps of Engineers secure the necessary approvals to go ahead by spring, their completion date for the project will now slip to 1984 or 1985.

Sincerely,

Robert H. Torheim
for ROBERT H. TORHEIM
Regional Forester

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

OFFICIAL FILE COPY	
No.	Date
	DEC 22 1978
Referred To:	
12	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY.
December 20, 1978	

1920

December 20, 1978



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

Dear Mr. Munro:

Reference is made to your September 28, 1978, letter and enclosed draft environmental statement covering your proposed fiscal year 1980 construction and maintenance program.

Mr. James Butler of our Regional Office talked to Mr. Dick Schaefer, your systems right-of-way specialist, and resolved questions we had regarding interpretation of your right-of-way management program in the Intermountain Region of the Forest Service. Mr. Schaefer mentioned two items you plan to include in future drafts that will aid us in evaluating the proposed methods in future years. These are descriptions of treatment methods you plan to use and designation of the beginning and ending mile or structure on the transmission line where you will treat.

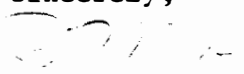
Considering the information furnished by your statement and Mr. Schaefer's explanation, we do not believe there should be any conflicts with proposed treatment methods. We would, however, emphasize the following points:

1. Please have your right-of-way maintenance personnel contact the District Ranger at least one month prior to treatment, and review in detail your treatment methods and specific areas to be treated.
2. All of the personnel applying herbicides shall be trained and certified state applicators.
3. Instructions on the container for applications of herbicides shall be followed.

Also, please have your maintenance supervisor at Idaho Falls contact the Forest Supervisor at St. Anthony prior to meeting with the Rangers so he will be aware of your activity.

Thank you for your continued cooperation.

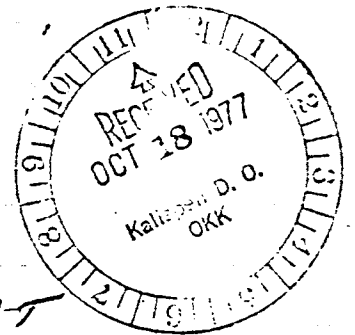
Sincerely,


P.M. REES
Director, Regional Planning
and Budget

OCTOBER 15, 1977

BONNEVILLE POWER ADMINISTRATION
KIALESPELL MONTANA

DEAR SIR



IT IS MY UNDERSTANDING THAT
SOME CHANGES ARE BEING CONSIDERED
FOR TRANSMISSION LINES NEAR LACLEDE.

MY WIFE AND I ARE PLANNING TO
BUILD A NEW HOME ON OUR PROPERTY
NEAR LACLEDE. PRESENTLY THERE IS A
B.P.A. TRANSMISSION LINE THROUGH OUR
PROPERTY.

WE OBJECT TO AN ADDITIONAL LINE
THROUGH OUR PROPERTY. WE ALSO OBJECT
TO CHANGING THE LINE FOR A HIGHER
CAPACITY.

WHAT ARE YOUR PLANS IN
THIS AREA?

YOURS TRULY

DANIEL A. RIX
RT 2 BOX 341 E
SANDPOINT, IDAHO
83864

OUR PROPERTY IS LOCATED APPROXIMATELY
1 1/2 MILES WEST OF LACLEDE ADJOINING
HIGHWAY 200



IN REPLY REFER TO:

Land Services

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

PORTLAND AREA OFFICE

POST OFFICE BOX 3785

PORTLAND, OREGON 97208

OCT 31 1977

Memorandum

To: Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

From: Office of the Area Director

Subject: Review of Draft Environmental Statement Bonneville Power Administration's FY 1979 Proposed Program (DES 77/30)

The Proposed new transmission alignments and other additional land requirements for FY 1979 do not appear to directly impact either Indian trust lands or communities. A copy of our Billings Area office review of the draft is attached. There is concern about a 500 KV transmission system scheduled for 1981 that may cross lands of the Flathead Indian Reservation. It is also suggested that ground application of herbicides and hand clearing of vegetation be given additional investigation.

Indian trust land may be involved in other future additions shown on figure 1, page 2. The map is too general to be certain. As more definitive alignments are developed we will evaluate them.

Acting

James W. Haddy
Assistant Area Director
(Economic Development)

Enclosure





United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

BILLINGS AREA OFFICE
316 NORTH 26TH ST.
BILLINGS, MONTANA 59101

RECEIVED

OCT 27 8 15 AM '77

BUREAU OF INDIAN
AFFAIRS
PORTLAND AREA
OCT 25 1977

IN REPLY REFER TO:

Environmental Quality
(BES 77/30)

MEMORANDUM

To: Area Director, Portland, Area Office
From: Office of the Area Director
Subject: Review of Draft Environmental Statement, Bonneville Power
Administration's Fiscal Year 1979 Proposed Program (DES 77/30)

The office has, as requested by the Chief, Division of Trust Facilitation, reviewed the subject statement and wishes to submit the following comments:

- (1) The statement does not discuss any new main grid additions that would affect Indian lands within our jurisdiction. Figure 1, page 2, does, however, identify a projected 500 KV system running west out of Hot Springs, Montana and across lands of the Flathead Indian Reservation. This 500 system is tentatively scheduled for a 1981 energization date. This office would urge the early coordination and development of compatible and mutually beneficial uses of the right-of-way with the Indian landowners.
- (2) Page 45, Alternatives, discusses alternative methods of vegetation control. The alternative to aerial application of herbicides is ground application of herbicides and hand clearing of vegetation. We believe this alternative merits additional investigation, particularly on Indian lands where high unemployment exists. In addition to providing Indian employment, the effects of herbicides on nontarget vegetation and drift of herbicides would be substantially lessened.

Acting Assistant

Area Director

Loy Buffalo



Bureau of Indian Affairs
RECEIVED
OCT 27 1977
Land Services
Portland

CESAR HERNANDEZ
STAR ROUTE
NOXON, MT. 59853

10/31/77

DEAR PEOPLE,

A FEW WORDS OF COMMENT ON YOUR DRAFT FACILITY PLANNING SUPPLEMENT; LIBBY INTEGRATION AND N.W. MONTANA / N. IDAHO SUPPORT STUDY. I DRAW FROM MY KNOWLEDGE AS AN AMERICAN CONSUMER!

I OBSERVE THAT WE THE AMERICAN PEOPLE ARE "ENERGY ADDICTS"! YOUR 20 YEAR LOAD PROJECTIONS TABULATION ONLY CONFIRMS SUCH. THE THREE (3)

CRITERIA (PAGE 1) BY REASON OF WHICH YOU OFFER THE PROPOSAL,

1. POPULATION GROWTH

2. INDUSTRIAL EXPANSION

3. GREATER PER CAPITA USE OF ELECTRICITY,

ONLY CAUSE TO BE EXPLAINED YOUR ROLE AS THE "PUSHERS", OF THIS DREAD & DESIRED COMMODITY.

HOW DO YOU EXPLAIN A NEAR NEED OF 2 1/2 TIMES OF PEAK POWER, WHEN THE POPULATION OF THE AREA SERVICED DOES'NT UNDERGOE ANYWHERE NEAR DOUBLING IN THE PROJECTED TIME SPAN? AND DOES

"A GREATER PER CAPITA USE OF ELECTRICITY," MEAN AMERICANS INSTEAD OF CONSERVING OUR DWINDLING ENERGY STOCKS, ARE BEING ENCOURAGED AND GIVEN THE MORE ROPE NECESSARY TO HANG THEMSELVES?

AS FOR "INDUSTRIAL EXPANSION;" WILL WE NEED THE EXTRA ELECTRICAL FORKS, TOOTHBRUSHES, COMBS & TOILET SEATS TO BE PROVIDED? I THINK NOT

ENOUGH THOUGHT WAS GIVEN "NON CONSTRUCTION," (PAGE 47) AND CONSERVATION BY YOUR PEOPLE. BY

THIS STUDY MAYHAPS THE BPA LIKE SO MANY OTHER GOVT. AGENCIES SEEKS ONLY TO PERPETUATE ITSELF;

IT'S ONLY ASSET THE DESIRE TO SATISFY OUR ENDLESS GLUT FOR ENERGY. CONSTRUCTIVELY, I BELIEVE

YOUR AGENCY IS IN A UNIQUE POSITION TO

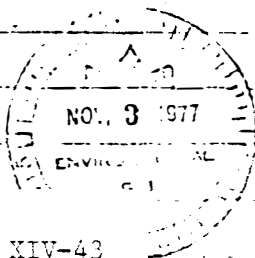
INFLUENCE THE CONSUMPTIVE EXCESSES OF OUR SOCIETY. BE THEY COMMERCIAL, INDUSTRIAL OR WHAT HAVE YOU. I GIVE THE FOLLOWING SUGGESTIONS.

① GET TOGETHER WITH THE ARMY CORPS OF ENGINEERS, THE BUREAU OF RECLAMATION, THE POWER CONSORTIUMS AND LAY ON AMERICANS THE "ULTIMATE STUDY," SHOW US HOW WE CAN EXPECT A DAM EVERY 20 MILES OF RIVER AND A POWER PLANT EVERY 50. HOW THE ONLY WAY WE'LL SEE THE SUN IS IN MOVIES OR AS ASTRONAUTS, AND HOW IF THE NUKES DON'T GET US FIRST WE'LL BE ABLE TO READ ABOUT BIRDS AND DEER AND FISHING.

② LOSE THIS STUDY, AND 99% OF ALL YOUR OTHER ONES; PULL THE PLUG ON YOUR COMPUTER, GIVE YOUR WORKING STAFF A SEMI-PERMANENT VACATION ON A FARM; IT'LL MAKE THEM HEALTHY. GET LOST AND QUIT "PUSHING."

THANK YOU FOR THIS OPPORTUNITY TO COMMENT ON YOUR DRAFT STATEMENT. FOR THE RECORD!

Sincerely,
Cesar Hernandez



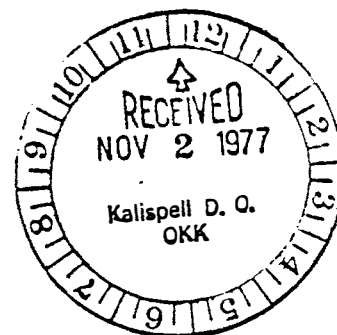
Northwest Citizens for Wilderness

STAR ROUTE

NOXON, MONTANA 59853

PHONE 406 847-2216

November 1 1977



Mr. Ronald Wilkerson
Bonneville Power Administration
District Office
E. Hiway 2
Kalispell, Mt. 59901

Dear Ron,

We have completed review of the B.P.A. Libby intergration and N.W. Montana/N. Idaho support Draft Facility Planning Supplement.

Our primary concerns were voiced at the recent Noxon meeting, however, it is felt appropriate to briefly re-iterate them herein.

Portions of Routes B/C3, B/C2 and B/C4, Plan B, and those same routes Plan C, pass through wildlands upon the Idaho Panhandle Forest's proposed for wilderness study by our organization, therefore would be unacceptable.

Portions of Routes A4, A2 & A3, A1, pass through wildlands identified during the RARE II process as potential additions to the Wilderness System. This same area, plus roadless lands within the Silver Butte drainage (i.e. Owl Peak RARE #186, Barren Peak RARE #183 and Allen Peak RARE #185) are presently being evaluated for possible recommendation to the U.S. Forest Service by this organization for inclusion into the wilderness system through the RARE II process.

Until such analysis is completed, designation of additional transmission corridors would be unacceptable.

It is hoped these factors are taken into consideration during prperation of the Draft Location Supplement.

Information available does indicate restructuring existing 230kv & 115kv facilities is indeed a viable alternative. Aside from the foregoing, the necessity of a Libby transmission intergration corridor would appear most feasible following a Libby to Bronx substation, or B/C I, thence B/C 3 route.

We regret not having a Representative attend the BPA Oct 26 Missoula Role "EIS" public workshop. Our energy consultant does inform us however, his review of the document is coming along nicely & expects to have comments drafted by the dead-line.

Our sincere thanks for the opportunity to participate.

Respectfully,

Mike Comola
Mike Comola, Coordinator



U.S. ENVIRONMENTAL PROTECTION AGENCY

REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101



REPLY TO MS 623
ATTN OF:

NOV. 4 1977

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

Dear Mr. Kiley:

We have completed our review of BPA's draft environmental impact statement (DES) on the Fiscal Year 1979 Proposed Program for construction and maintenance of high voltage electricity transmission facilities in the Pacific Northwest. As with most of BPA's annual program statements, we are generally satisfied with the FY 79 program statement. However, we do have a few suggestions regarding areas which could benefit from a more detailed or modified discussion.

We have attached more detailed comments and suggestions with regard to each of the draft facility planning supplements to the DES. The suggestions with regard to the DES per se are detailed below.

The description of the proposed construction and maintenance program, found on pages 3-7 of the DES, would be more complete if it contained a listing of the facilities still under construction, which were described in previous program statements and facility location supplements thereto, and their projected dates of completion and energization. This would give the reader a better picture of the total BPA construction activity underway during the fiscal year.

The discussion of substation noise on page 28 of the DES makes no mention of the fact that some of BPA's current substations do not meet the noise emission standards in the State of Oregon. It is our understanding, based on the recently completed OMB Circular A-106 review, that funds for correcting this problem at one of the subject substations are included in the BPA FY 79 budget. This discussion should indicate which substations do not presently

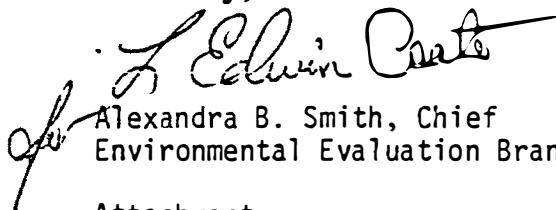
comply with State standards, how severe the violations are, and what is being done to bring the facilities into compliance with State standards pursuant to the Noise Control Act of 1972. You should note that the substation noise discussion in Appendix B of the Draft Role Environmental Impact Statement, at pages VII-55-56, does not address this subject in enough detail to eliminate the need for a discussion in the FY 79 DES:

We are still reviewing the right-of-way management appendix regarding the use of herbicides, in conjunction with the appropriate sections of Appendix B to the Role Statement, and will forward our comments, if any, within the next two weeks.

Based upon this review and our concerns about substation noise, we have rated this statement ER-2 (ER-Environmental Reservations; 2-Inadequate Information). The date of our comments and this rating will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions, pursuant to the Clean Air Act, as amended.

We appreciate the opportunity to review your environmental statements and would be glad to discuss our concerns with you at your convenience.

Sincerely,


Alexandra B. Smith, Chief
Environmental Evaluation Branch

Attachment

ATTACHMENT

Detailed Comments

Franklin Area System Reinforcement
Draft Facility Planning Supplement
BPA Proposed FY 1979 Program

Page 2: The Levey Substation, in Alternative Plan A, is not shown on Figure 1 on the following page. It is not clear how the Badger Canyon Substation and associated transmission lines fit in to the plans of service described in Alternative Plans D and E. They do not seem to be in close proximity to the study area and the possible routes.

Page 7: The discussion of land use should describe the local shoreline master programs within the study area in enough detail to allow a determination as to whether utility corridors are consistent with those programs. The discussion of population should indicate why Umatilla experienced such dramatic growth and whether it is likely to continue.

Page 16: Will the substations called for by the alternative plans of service comply with the Washington Administrative Noise Code due to their distance from noise sensitive receptors or due to particular design features of these particular substations?

San Juan Island Area Service
Draft Facility Planning Supplement (revised)
BPA Proposed FY 1979 Program

Page 13: The land use discussion needs more detail to demonstrate that the local shoreline master programs environment designations and implementing regulations do not rule out all of the service alternatives. A map of the shoreline designations and a summary of the implementing regulations might be appropriate.

Page 15: The discussion of the "classes" of recreation areas should indicate what the classifications mean and what the distinguishing characteristics among classes are.

Page 18: If Alternative Plan B is selected, ambient air quality data may be needed to determine the effects of the new combustion turbines on air quality. Additionally, it should be noted that under Section 116 of the Clean Air Act Amendments of 1977 (Public Law 95-95) BPA would have to obtain approvals from the local air pollution control authority.

Page 20: In addition to the information on impacts of submarine cable construction, which you have indicated will be provided in the facility

location supplement, there should be a discussion of possible mitigation measures to reduce damages to aquatic biota and a description of the actual measures to be used.

The BPA Draft Role Statement Appendix B does not discuss mitigation measures appropriate to submarine cable installation and maintenance and we were unable to find relevant contract stipulations in Attachment A to that appendix.

If Alternative B is the selected plan of service, the facility location supplement will need to discuss the impacts of laying the fuel supply pipeline, impacts of the fuel storage facilities on air quality and the measures which will be taken to reduce the risk of fuel spills (including navigational risks involved in barging the fuel to the Island).

Libby Integrating Transmission Draft Facility Planning Supplement

We were particularly pleased with this facility planning supplement. It used tables and clear graphics to good advantage to display the potential impacts of alternative plans of service. In particular we found Table 5 (Comparison of Reference Corridors and Natural Resource Considerations), Table 7 (Resource Use Considerations), Table 8 (Summary Table) and Figures 5-14 to be a great deal of help in evaluating the alternatives.

The analysis and information therein have led us to believe that Alternative Plan A would be the most environmentally acceptable, assuming that the Hot Springs-Bell transmission line is built as planned. In that regard it would be useful if this planning supplement discussed the current status of the Hot Springs-Bell 500 KV Transmission Line, in that it has been nearly two years since its Draft Facility Location Supplement was issued and no final location supplement has yet been issued.

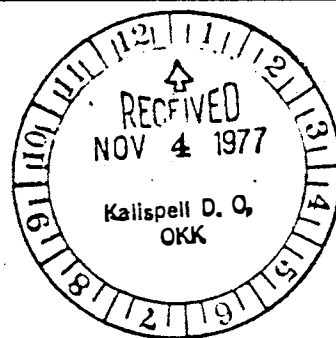
Page 6: The discussion of atmospheric conditions and air quality should indicate how good or bad mixing conditions are in the study area.

Page 7: The discussion of reservoir storage should indicate the total storage available in those reservoirs and the distribution among the reservoirs.

South Puget Sound Reinforcement Draft Facility Planning Supplement

Page 6: The discussion of current air quality in Tacoma should be expanded so that the reader has a better picture of Tacoma's standards non-attainment problems and their principal causes. This is significant

in that slash burning from right-of-way clearing; where necessary, could aggravate this problem.



A G E N D A

I. EPA's Planning & Environmental Evaluation Ken Wilkerson

II. F.Y. 1979 Program Environmental Impact Statement

III. PERMITS Process

- A. BPA: Dan Bisenius
- B. USFS: Bill O'Brien

IV. Libby Integration & Northwest Montana/North Idaho Support -
Draft Facility Planning Supplement Ansel Peterson

V. Public Comments

- A. By Request
- B. From the Floor

MICHAEL H. CZERWINSKI
STAR ROUTE 2, BOX 217
TROUT CREEK, MT 59874

Note: If you wish to make written comments at this time, please use the other side of this sheet, or you may send written comments, by November 4, 1977, to:

Bonneville Power Administration
Kalispell District Office
Box 753
Kalispell, MT 59901

11-2-77

Dear Mr. Wilkerson:

I own property which would be cleared of my Tree Farm timber. Your power line corridor should come through the Noxon Area. I do not want this valley cut up into an ever increasing number power corridors.

As I stated at your October public meeting at Noxon, I do not think that your alternatives adequately explored using higher voltage lines and/or thicker cable on EXISTING power corridors; therefore, your E.I.S. should be rewritten. Please keep me informed of future developments.

Sincerely,
Michael H. Czerwinski

November 3, 1977

Bonneville Power Administration
Kalispell District Office
P. O. Box 758
Kalispell, Montana 59901



Gentlemen:

I wish to comment on your Draft Environmental Statement, fiscal year 1979 proposed program as it applies to the Libby Integrating Transmission system.

My major concern deals with your lack of objectivity in regards to the proposed diversion of part of Kootenai River by Canada. If it is done by the B. C. Hydro authority, I see it would reduce the yield at Libby by 400 million kilowatt hours annually. With that loss of electric generation capability, I would see no reason to proceed with either the reregulating dam or the Integrating Transmission System.

As to the alternatives presented for our consideration, I feel the most viable is to upgrade and reconductor existing facilities. This should not require any more rights of way, but is probably more expensive than the proposed plan. This is because you are not paying the entire value for your easements. Fair market value concepts do not include future social values forgone by removing the land from production. Therefore, it must be cheaper to build another new lines than to reconductor an existing route. That is probably the same reason you do not propose higher towers so that trees may be grown under the lines, like is done in Europe.

Also, I find it alarming that you are proposing to run lines from Libby to Noxon via the Fisher River. These routes were investigated in the late 60's for the Libby Loop line and abandoned because of poor geologic conditions. What has changed your thinking in this area?

In regards to your analysis of forest productivity, you have not gone into depth enough. The ownership and hence the forest management intensity and goals will have a very important influence on the yields from those lands. An example being the highly productive foothills of the Cabinet mountains. Most of these areas owned by the U.S.F.S., are becoming buffer areas for the wilderness and will not be harvested. Conversely, some of the private lands in the Fisher River on drier sites, are very

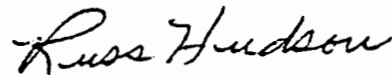
intensively managed and are producing more forest benefits than those Cabinet foothills.

In closing, I do not see any landowners listed among those who were consulted or coordinated with. These are the people most adversely affected by your actions. We would all feel better to have had an early part in expressing our concerns.

Personally, I find nothing wrong with the alternative to do nothing.

Thank you for hearing our concerns.

Sincerely yours,

A handwritten signature in cursive script that reads "Russ Hudson".

Russell H. (Russ) Hudson
Manager of Forestry

RHH:lc

November 1, 1977



Bonneville Power Administration
Kalispell District Office
P.O. Box 758
Kalispell, Montana 59901

RE: Comments on the Libby Integration and Northwest Montana/North Idaho
Support-Draft Facility Planning Supplement

Dear Sirs:

The Bonneville Power Administration is to be complimented for publishing the Draft Facility Planning Supplement on the Libby Integration Project and for holding meetings to receive public comments. Some of the Energy Planning Division staff and I attended the meeting in Libby on October 12, and, based upon that meeting and the Draft Facility Planning Supplement, we offer the following comments.

Although BPA has set forth several different transmission system and routing alternatives for public review and comment at an early planning stage, an important decision concerning the need for the facility has apparently already been made, and without public input. The Draft Facility Planning Supplement explains the need for the Libby Integration Project as follows:

When the new generation is added at Libby, an outage on one of the 230 kV lines will overload the remaining 230 kV line and the 115 kV line from Libby. There is not enough transmission capacity now to carry the new generation from Libby into the grid system; for without a third 230 kV line, generators at Libby would automatically disconnect from the system during line outages. Loads on the 115 kV system could also be dropped. (p. 2)

At the public meeting when asked why additional transmission lines should be built, the BPA representative essentially repeated this explanation. He stated further that building transmission lines to satisfy a single contingency, i.e. the loss of one transmission line, is standard utility practice. Whether this utility practice should be followed in this case was not a question addressed by BPA either in the Planning Supplement or in the public meeting.

The Draft Supplement does briefly discuss the "no construction" alternative in two short paragraphs on page 47. However, these paragraphs basically describe the actions necessary to keep existing lines from overloading if the additional generation is built at Libby and a 230 kV line outage occurs. They also state that if no new lines are constructed line losses on existing transmission lines would be higher and that the money which would be spent to con-

ENERGY PLANNING DIVISION
BOB ANDERSON, ADMINISTRATOR

14061 249-1770

32 SOUTH EWING, HELENA, MONTANA 59601

XIV-53

struct, operate, and maintain the additional lines would be saved.

This discussion is not sufficient for the public or BPA to rationally decide if applying the single contingency design standard is worth it in this case. It certainly does not constitute the cost-benefit analysis of need required by the National Environmental Policy Act. Although the BPA is only at an early stage of its consideration of the proposed line, it should begin to consider and report to the public a more detailed analysis of the benefits and costs associated with construction of the proposed facility and alternatives. Reporting in detail on impacts of alternative routings without a similarly detailed discussion of the issues surrounding need implies to the public the BPA has predecided the need issue.

Because of the difficulty of quantifying the benefits and costs associated with a projected increase in transmission system reliability, conducting a benefit-cost analysis will be a complex task. The benefits of the proposed Libby integration project would appear to include: reduced probability of loss of generation from the Libby dam; reduced probability of inconvenience, capital losses, and productivity losses to electricity consumers; and reduced transmission system line losses. The costs would include the construction, operation, and maintenance dollar costs and the adverse natural and cultural environmental impacts resulting from the construction and operation of the new lines.

The amount of the benefits which will ensue from the proposed project will depend directly upon the number, duration, and timing of outages on the existing 230 kV transmission lines and upon the amount of load on the Libby generators at the time of the outage. According to the Draft supplement the capacity of the existing transmission system will be insufficient to withstand loss of a 230 kV line when the four additional generation units are added at Libby. However, the Draft Supplement also states that the additional units will be peaking units which will not run continuously. Thus the loss of a 230 kV line even after the new Libby units are added may not always result in insufficient transmission capacity, loss of Libby generation, and loss of power to electrical consumers. The BPA should begin the benefit cost analysis by examining the historical outage statistics for the existing lines to construct a distribution of the number and duration of outages. This distribution could then be compared to the projected distribution of generation loads at Libby after the four additional units are added. This comparison would allow BPA to estimate how often loss of a 230kV line would mean insufficient transmission capacity, and the amount, duration, and timing of the electrical energy which would be lost if the proposed Libby integration project was not constructed. This information could in turn be used as a basis from which to estimate productivity and capital losses to electrical customers.

These comments are not intended as a "cookbook recipe" for a reliability benefit-cost analysis. They are intended to stimulate thought concerning some of the issues surrounding the need for this project. Although increased transmission system reliability is desirable, it carries with it very real economic

letter to BPA
November 1, 1977
Page 3

and environmental costs. Reliance upon utility industry design standards to justify need may hide these costs but does not aid the public in understanding the relative merits of the options available.

Two other concerns were raised during the public meeting and should be addressed by the BPA. The first is the absence of any cost estimates for the various alternatives. Obviously, the BPA cannot precisely estimate the costs of the proposed transmission lines before the lines are designed and before specific alternative routes are identified. However, the BPA should provide at least order of magnitude cost estimates so that the public can get some appreciation of the relative project costs. Surely BPA can estimate if the project will cost on the order of 10 or 100 million dollars. The BPA should also be able to estimate the relative costs of the transmission alternatives identified in the Draft Supplement. By estimating the line lengths of the different voltage lines and the different substation requirements, BPA should be able to at least rank and provide some idea of the cost variability among the different alternatives.

The second concern raised at the meeting was the possibility of upgrading existing transmission lines so that no new lines and separate rights-of-way would be required. The pros, cons, and technical feasibilities of upgrading should be discussed, including the need for and expense of new transformers and the timing and duration of any outages to existing electricity customers necessary to rebuild the lines.

Some more specific comments of statements in the Draft Supplement follow:

- 1) On page 1 in the footnote to Table 1 the ASARCO mining load is listed as 9.5 MW. A preliminary copy of Northern Lights, Inc. application to this Department for a 115 kV transmission line to serve the ASARCO mine projects the ASARCO load to be "...approximately 18 MW..."
- 2) Page 2 lists the capacity of the proposed Kootenai Falls project as 160 MW. The application for a preliminary permit from the Federal Power Commission filed by Northern Lights, Inc. lists the installed capacity as 140 MW. No mention is made of a third 20 MW turbine.
- 3) Page 3 states that "Alternative Plan A assumes that the proposed Hot Springs-Bell line is built on one of the alternative routes that pass by the Noxon area." Will the Libby Integration Project influence the choice of routes for the Bell-Hot Springs line? Since Plan A will be the least costly alternative to construct, will this plan be listed as a justification for routes in the Noxon area?

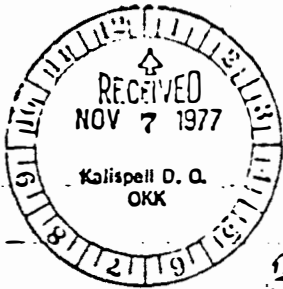
I again commend the BPA for interacting with the public at an early stage in the Libby interconnection project and appreciate this opportunity to comment on it.

Sincerely,

Bob Anderson

Bob Anderson, Administrator
Energy Planning Division, DNR

BA/psg



5112 SW. 311th pl
Federal Way, Washington
98003
November 2, 1977

Sonneville Power Administration
Comments for the lobby, Montana public meeting

I wanted to thank you for going around the northwest area getting public comments on your proposals. You all did a good job presenting them.

First off my name is Carl Hilbert Hawcett and I attended the public meeting in lobby, Montana last month. I have since looked over the 4 proposals of the new transmission lines and find none of them completely satisfactory.

The only positive alternative is to reconduct the existing transmission lines to carry the expanded load. I feel it is very unsatisfactory to ruin any more land ~~for~~ just for the sake of comfort and more energy. The never ending energy growth in the United States has to stop and we have to stop and plan our future.

It's a well known fact that consumers will always burn up as much energy that is available to them. The idea is to conserve our energy, ~~not~~

To restate my firm commitment is for no new power line corridors to be constructed (evening the long distance ones 10+ miles). But instead reconduct the present ones to carry the load.

All the alternatives are not acceptable
because they will build new lines
across new land.

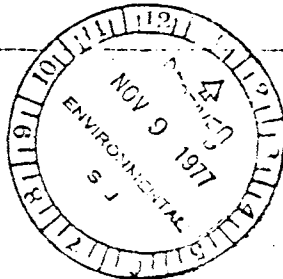
Thank you for your time

Sincerely,
Yours

Carl Gilbert Fawcett

5112 S.W. 311th St.

Federal Hwy, WA 98002



LATE Letter

1103 Dakota Ave.
Libby, Montana 59923
November 11, 1977

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

Dear Sir:

I wish to protest proposals for moving power from Libby Dam and the re-reg dam, since new transmission lines have been proposed with no consideration given to utilizing present corridors.

Further, I would like to know the total cost estimated for each of these proposed new routes, along with an estimate of what it would cost to re-structure current lines to carry the additional load.

If it is maintained that it is cheaper to build new lines than modify existing ones, I would like to know why.

Along with the question of economy in BPA planning is the fact that the Kootenai National Forest has been lowering its annual allowable cut of timber for some time, which adversely affects employment. The Kootenai N.F. should not be required to give up acreage for new rights-of-way if present rights-of-way can be used.

Yours very truly,

Mrs. J.R. Hennessy
Mrs. John R. Hennessy

Mr. Kiley =

I am very much against an additional corridor - after attending the BPA meeting at the 1st National Bank of Libby and reading the literature provided. I would support usage of the present pathway with reconductoring.

Errol Black, M.D.

Dear Mr. Kiley:

I am opposed to any new corridors - Land is not cheap. The initial cost for using existing lines may be more. But the long run costs of land and loss of tree growing land base has to be considered.

Stu Swenson

11/9/77

Dear Mr. Kiley,

I want to register my strongest objection to construction of any new power line corridors for high voltage lines from the Libby dam & Reservoir into the BPA grid & urge with the Kootenai Nat. Forest to consider re-conductoring the existing line using current right of way.

Thank you!

Lynn Lobson

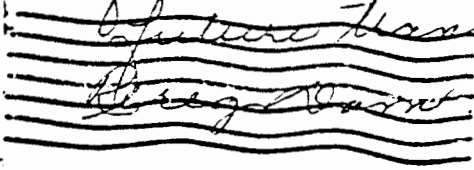
urn addresses:

Book Cabinet
Mineral Avenue
by, MT 59923

Return address:
The Book Cabinet
513 Mineral Avenue
Libby, MT 59923

The need no new power
corridors thru Lincoln County;
we should use existing
corridors to transmit power
from the Libby Dam and the
future transmission from the
Reg. Dam.

60



Lincoln County
Libby, MT
Libby, MT.

MR. Kiley.

I support using the existing power
corridors to integrate new power
into the BPA electrical grid system
from the Libby Dam and the Reg. Dam

Mike Deh

No return address

Dear Sirs;

I support using the existing power
corridors to integrate new power
into the B.P.A. electrical grid system
from the Libby Dam & Reg. Dam. I
oppose the B.P.A. plans for High Voltage
Lines into Pipe Creek, 17 miles of Yokes, Fishers
Jay Morton

No return address

Return address:
Lyle Olson
Box 525
Libby, MT 59923

Sir:

CE

THE THOUGHT OF ANOTHER
POWER LINE CORRIDOR IN LINCOLN
COUNTY IS INTOLERABLE. CAN IT
IN THE SAME CORRIDOR - COME
WELL OR HIGH WATER. WE'VE HAD
ENOUGH!

Lyle Olson

Ann Guhman
Box 547
Libby, MT 59923

LATE - 1977

11/10/77

Mr. Libby

I strongly opposed the construction
of any new power corridors in
Lincoln county. I urge
reconstruction of current
lines and corridors.

Thank you
Ann Guhman, Libby

DATE

Nov. 11, 1977

Barbara Ann Roy
621 Dakota Ave.
Libby, Montana
59923

BPA
c/o John Kiley
P. O. Box 3621
Portland, Oregon
97208

Dear Sir(s),

This letter is in response to BPA's proposal to construct several new corridors in Lincoln County. I am totally against said project. The construction would mean that another roadless area would have a road, meaning the displacement of yet more wildlife (Elk especially don't like the intrusion of man, I watched a herd of over 300 Elk leave the valley I grew up in (in Colorado) because of the encroachment of roads and therefore people and dogs). More and more land in the U. S. is becoming roads, which means there is less viable land, I am certain that the forest that is where you propose to send your line is more productive than an unnecessary line would be.

Why have you not considered re-conductoring the existing lines? Why not, if a new line must be built, run it through existing corridors or roadways? Our forest land is too important to waste by new corridors. The power that is to be conducted is not so great that it couldn't be handled in these ways. People should be instructed in ways to use less power as it isn't right to destroy the world we live in for our selfish desires, in fact it is selfishness, since we really only need a fraction of what is used.

Sincerely,
XIV-62

Barbara A. Roy



LATE 1977

DEPARTMENT OF AGRICULTURE
OFFICE OF THE SECRETARY
WASHINGTON, D. C. 20250

OFFICIAL FILE COPY	
No.	Date
	DEC 5 1977
Referred To:	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY
By	Date

November 29, 1977

Mr. Ray Foleen
Acting Administrator
Bonneville Power Administration
U.S. Department of the Interior
P. O. Box 3621
Portland, Oregon 97208

Dear Mr. Foleen:

We have had the draft environmental statement for the BPA Fiscal Year 1979 Proposed Program reviewed in the relevant agencies of the Department of Agriculture, and comments from the Forest Service, an agency of the Department, are enclosed.

The Soil Conservation Service, also an agency of the Department, will communicate with you directly if it has any comments.

Sincerely,

ERRETT DECK
Coordinator
Office of Environmental Quality Activities

Enclosure

FOREST SERVICE COMMENTS

Re: Draft Environmental Statement -
BPA FY 1979 Proposed Program

The Draft EIS appears to be quite thorough and comprehensive. The Libby Integration portion is particularly well prepared. However, following are some comments which we feel will assist in the evaluations:

1. General

Vegetative control, especially the use of herbicides, must be performed in accordance with the June 1974 Transmission Line Rights-of-Way Management Plan jointly approved by FS and BPA. This should be the guide for herbicide use in the particular areas covered by the plan. We suggest some reference to the plan in the EIS section dealing with right-of-way management.

2. Libby Integration Project

a. System Requirements (page 2) should include figures for Wallace, Kellogg, and Coeur d'Alene, Idaho, in the peak loads table. These are necessary to get the overall picture of loads in the Study Area. This is especially true in view of Washington Water Power Company's (WWPC) request for an additional 230 KV line from the Clark Fork Valley to Pinehurst, Idaho.

b. The basic assumption of Alternative Plan A is a tie with the proposed 500 KV line from Hot Springs to Bell and that construction and energization of this line will be complete by 1983. In view of the litigation and delays on Colstrip 3 and 4 generation plants, this does not appear to be a valid alternative. Decisions on corridors for the Hot Springs-Bell and Libby Integration will have to be made simultaneously or one decision will dictate the other decision. Presently, both decisions are expected to be made in February-March of 1978. Alternative A should speak to the decision date on the proposed Hot Springs-Bell 500 KV line.

Items 2 and 3 of Alternative Plan A are common to all alternatives. We feel they should be pulled out and shown as separate items of work required by the electrical system. The impacts could be shown in the discussion of the alternatives for the proposed 230 KV line (Alternative B3).

c. We feel that Alternative Plan D does not show all possible route alternatives. The last Bell-Hot Springs route proposal indicated a route alternative in the Prospect Creek drainage. This parallels the new WWPC 230 KV proposal. If the route is feasible for a 500 KV line and the WWPC 230 KV line, it should be evaluated as a potential Libby Integration alternative.

d. We feel that the following alternative should be included in the evaluation:

(1) Reconductoring existing 230 KV lines to higher capacity to handle new generation.

(2) Rebuilding existing 230 KV lines to higher voltage to handle the new generation. Both alternatives make use of the existing right-of-way.

(3) Stacking the existing 115 KV line along the Kootenai River with a new 230 KV line on the existing right-of-way.

e. The section dealing with description of the existing environment is well prepared. The potential impacts section is also very adequate for the project. Especially good are the tables showing resource acres impacted by the various alternatives and the number of cells per alternative in which the resources occur.

f. Table 8 is hard to use and understand. Horizontal comparisons are easy but the vertical comparisons are difficult. The averages are not understandable without knowing the weighting used.

g. RARE II studies impose some severe restrictions on Alternative Plan A in the Upper Fisher River-Silver Butte portion of the corridor. Until these studies are completed and the land status resolved, work other than on the existing right-of-way or immediately adjacent to the right-of-way, cannot be undertaken.

h. Alternative Plan B also conflicts with the RARE II studies. Corridors B1 and B2 in this alternative cross a roadless area at the headwaters of Callahan Creek in the vicinity of Purdy Mountain. In addition to being an uninventoried roadless area, the same area is under an appeal by the Sierra Club and Northwest Citizens for an expanded Scotchman Peak. We believe the studies and appeals will not be settled soon enough for BPA to meet their energization schedule in these two corridor variations and recommend they be dropped by BPA.

i. The EIS needs to speak to the interrelationship between the proposed 500 KV Hot Springs-Bell transmission line, Washington Water Power proposed 230 KV line from the Clark Fork Valley to Pinehurst, Idaho, and the additional Libby Dam generation in this proposal. This discussion should include the economic feasibility, relationship to the northwest power grid, and reliability criteria.

j. A discussion on reliability standards and the tradeoffs for less reliability is also needed for the reader's understanding.

k. The original plan of work agreement between the Forest Service and BPA called for a step 5 involving the weighting of the models within the permit system. Under the optimization routine, this would give the decisionmaker a ranking of the alternatives to choose from. A satisfactory method of weighting was not found and this step was eliminated from the process. The resulting corridor alternatives are with all the models having equal weight. This is a less than finished product as originally envisioned. It places a heavy burden on the decisionmaker that could have been lightened if the weighting step could have been completed.

Dear Sir:

11-13-77

CATE Letter

I support using existing power corridors for new power generated from the Libby Dam. Please, no new power corridors and accompanying roads to reduce our forest size and yield.

Sincerely,

Stewart J. Rodgers
 1021 Mineral Ave
 Libby, Mt. 59923

Dear Mr. Harty,

Please do what you can to find an alternative to the 1 1/2 mile road, Pipe Creek, Jack Upper line route from the Libby Dam.

CATE Letter

Thank you.

Richard Springer
 P.O. Box 62
 Libby, Mt. 59923

LATE



United States Department of the Interior
FISH AND WILDLIFE SERVICE

MAILING ADDRESS:
Post Office Box 25446
Denver Federal Center
Denver, Colorado 80225

STREET LOCATION:
10597 West Sixth Avenue
Lakewood, Colorado
Across From Federal Center

IN REPLY REFER TO:
FA/SE/Coop.--Bonneville Power
Adm.--Libby Integration

NOV 29 1977

MEMORANDUM

To: Environmental Coordinator, Engineering and Construction
Division, Bonneville Power Administration, Portland, Oregon

From: ^{Acting} Regional Director, Region 6
U.S. Fish and Wildlife Service, Denver, Colorado

Subject: Section 7 Formal Consultation--Libby Integration and Northwest
Montana/North Idaho Support Project (Your October 12, 1977 memo)

This memorandum amplifies our threshold response of September 17, 1977. Our threshold response was meant to include all four of the alternative plans. After examining these alternative plans we concluded all of them contain at least one corridor that may jeopardize the continued existence of the grizzly bear or result in the destruction or adverse modification of its critical habitat. The potential impact of each alternative plan and their corridors is discussed below:

Plan A

All four corridors cross Silver Butte just below the Cabinet Mountain Wilderness area which is an important area of occupied grizzly bear habitat. The last legal grizzly kill in the Cabinets occurred off the existing power line corridor. The hunter used the access road to gain access into the area and shot the bear just adjacent to the corridor. There are already problems with illegal bear kills in the Cabinet Mountain area and more access roads would worsen the problem.

Road closures and restrictions on human access are necessary to eliminate adverse impacts on the grizzly. Corridor 2 which would require new access roads appears least desirable of the four corridors in terms of increasing potential human-bear conflicts.



NIV-66

Save Energy and You Serve America!

Plan B

The grizzly bear could be affected adversely if alternative Corridor 4 from Libby up Pipe Creek and down 17 Mile in the Yaak was chosen. This proposal would create access and result in increased human activity in identified grizzly habitat. This area supports a small but viable grizzly population.

Any of the proposals (Corridors 2, 3 and 4) that cross near Calder Mountain and the north fork of Callahan Creek would have an impact on an area that is currently suitable habitat for grizzly. There is currently no access through the area. Any access into the area could affect future grizzly bear management. This area is proposed as critical habitat by both the Forest Service and the Fish and Wildlife Service.

Corridor 1 from Troy, Montana, down the Kootenai River bottom following an existing line through the area does not run through grizzly habitat. It does pass along the edge of the proposed grizzly critical habitat.

Plan C

The effects of this plan and its corridors are the same as those of Plan B and its corridors, since they follow the same route to the Bronx Substation as in Plan B.

Plan D

This plan has the same effects as Plan A, since all four of its corridor alternatives follow the same route through occupied grizzly habitat.

To summarize, only Plan B, Corridor 1, does not cross occupied grizzly habitat, although it does pass along the edge of the proposed critical habitat area. If we assume the transmission line right-of-way will be the only intrusion, then Plan B, Corridor 1, which parallels an existing line and does not cross occupied habitat, may be preferable to the other plans and corridors depending on how large a right-of-way is required and exactly where it would run. Using an existing corridor for the new line would not have the adverse effects of building a completely new corridor or a new parallel corridor. If there are access roads planned for Plan B, Corridor 1, then we need information on them and on whether and where access roads would be for the other corridors to allow evaluation of their relative potential effects.

We would also need to know your plans for access road closures and other means of restricting public access. To evaluate the relative impact of the plans and corridors on the Northern Rocky Mountain wolf we also need this information on access roads for each of the plans and corridors.

You do not need to make a separate request for a biological opinion. Your initial request for consultation covers both the threshold response and biological opinion. Upon receipt of the information requested in the threshold response, we will give you a biological opinion.

Thank you for your cooperation and interest in assuring the future of endangered species.

Marvin L. Quinn

LATE Letter

28 Dec, '77

D. Vance
c/o Eddie Tijerino
1026 Syndall Ave.
Tucson, Ariz.

85719

BPA

John Kiley

Box 3621

Portland, Ore. 97208

To the :

I am a resident of the Yaak valley in Montana temporarily residing in Tucson, Arizona. I am greatly dismayed to hear that the BPA plans to build a new transmission line through the Yaak, especially as it's entirely feasible to use existing corridors to carry the load.

That fact makes me wonder what other goodies BPA has in store for Lincoln county. Please inform me why you want to build a new corridor. Also, please send me your Draft Facility Planning Supplement regarding the Libby area.

photocopies :

Manfield

Baucus

Thank you,

Don Vance

on behalf of

Protect the Yaak Committee

LATE Edition

1/4/78
Troy, Mt.

John Kiley
BPA
Portland

Dear Mr. Kiley,

I have recently become aware of plans to construct new power line right-of-ways in Lincoln city, Mt., leading from Libby Dam. I'd like to go on record as being generally opposed to all of them. As a Yaak resident I would specifically discourage the 17 mile ~~via~~ Such a project would increase hunting pressure, encourage snowmobile traffic (which can be hard on wildlife as well as human life), waste natural resources (when compared to the expense of following existing rts.) and make an ugly straight line through a beautiful valley.

These comments submitted respectfully

b..:

Yours Truly,

XIV-72

J B Larson

11/16/77

LATE Letter

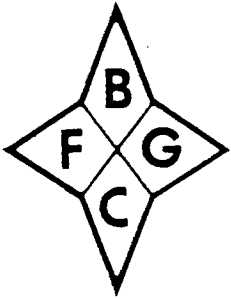
Dear Mr. Kiley,

I would appreciate information
on plans to run a power grid
corridor from Pipe Cr. down through
17 Mile Valley from the Libby Dam.

Thank you

Sincerely, Thomas P. Graham
Dt. 1

Troy, MT. 59935



BENTON-FRANKLIN GOVERNMENTAL CONFERENCE

P. O. BOX 217 • 1935 TERMINAL DRIVE • AT THE RICHLAND SKYPARK • RICHLAND, WA. 99352
TELEPHONE A.C. (509) 943-9185

September 5, 1978

Department of Energy
Bonneville Power Administration
P.O. Box 2621
Portland, Oregon 97208

Re: A-77-78, Public Notice
Franklin Area System Reinforcement

Attention SJ

Dear Sir:

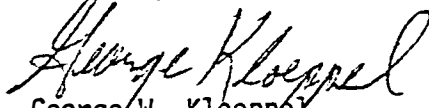
Thank you for notifying us of your intent to conduct the above-noted project. We have assigned file number A-77-78 to this notice. It will be helpful if you refer to this number in any future correspondence.

The project description which you have sent to us is being referred to interested local agencies, through the Conference NEWSLETTER. It will be considered by the clearinghouse board on Friday, September 22, 1978 at its meeting scheduled for 12:00 p.m. at the Jade East Restaurant, Kennewick as a part of the project notification and review function authorized under the Intergovernmental Cooperation Act of 1968, and the ensuing Bureau of the Budget Circular A-95.

You are welcome to attend and answer any questions which may arise regarding this proposed project.

Please let us know if we can be of any assistance to you in this regard.

Sincerely,


George W. Kloeppe
Executive Director

GWK:mas



OREGON PROJECT NOTIFICATION AND REVIEW SYSTEM

STATE CLEARINGHOUSE

Intergovernmental Relations Division
ROOM 306 Salem, Oregon 97310
STATE LIBRARY BUILDING Phone: 378-3732

PROJECT ACKNOWLEDGEMENT

APPLICANT: Bonneville Power Administration

PROJECT TITLE: Supplement to FY 79 Program

DATE RECEIVED: September 8, 1978

PNRS #: 7009 & 250

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

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

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

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

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

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

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

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

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



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

DEPARTMENT OF TRANSPORTATION

Highway Administration Building, Olympia, Washington 98504 206/753-6005
KF-01

September 14, 1978

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

Bonneville Power Administration
Proposed FY 1979 Program
Draft Supplement to
Final Environmental Impact Statement

Gentlemen:

We have reviewed the subject document and have the following comments:

1. On the Planning Study Area map (figure 1) and the Important Resources map (figure 3) SR 12 is shown as SR 410 and SR 14 south of Kennewick is shown as SR 12. The routes under the heading "Other" on page 10 should be corrected.
2. On page 31, 2nd paragraph, under the topic "Esthetics," reference to recent traffic counts for SR 124 and referral to Figure 5, page 34 for a correlation is confusing.

We are enclosing the following plan sheets for your information showing possible alternate locations for SR 82 that we are considering between Union Loop Road (south of Kennewick) and Plymouth. A Design Hearing on this segment of I-82 is scheduled for October 3, 1978, 7:30 p.m. in the Kennewick City Hall.

1. Vicinity Map
SR 82
Union Loop Road to
Plymouth Road
June 1978

Environmental Manager
Bonneville Power Administration
Page Two
September 14, 1978

2. SR 82
Plymouth Road to Columbia River
Sheets 1 thru 9 of 15 sheets
April 7, 1978
3. SR 14
Four Mile Canyon to Plymouth Road
Sheets 1 thru 7 of 10 sheets
April 7, 1978

If you have any questions concerning these comments, please call me at 753-3811.

Sincerely,

ROBERT S. NIELSEN
Assistant Secretary
Public Transportation and Planning



By: WM. P. ALBOHN
Environmental Planner

RSN:tml
WPA/DJG

Attachment

cc: R. C. Schuster
H. B. Ashford
Environmental Section

UNITED STATES DEPARTMENT OF AGRICULTURE

SOIL CONSERVATION SERVICE

Room 360, U.S. Courthouse, Spokane, Washington 99201

September 12, 1978

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

Dear Mr. Kiley:

The Soil Conservation Service has reviewed the draft environmental impact statement for the Franklin Area System Reinforcement, Walla Walla County, Washington

It appears that the draft environmental impact statement adequately addressed those concerns of the Soil Conservation Service.

We would encourage selection of Route 2 which would eliminate the impact on prime and unique farmlands which would occur should Route 1 be selected.

Thank you for the opportunity to review this draft environmental impact statement.

Sincerely,



Galen S. Bridge
State Conservationist



Advisory Council on
Historic Preservation
1522 K Street N.W.
Washington, D.C. 20005

September 19, 1978

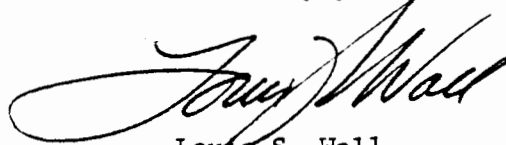
Environmental Manager
Bonneville Power Administration
P. O. Box 3621
Portland, Oregon 97208

Dear Sir:

This is in response to your request of August 29, 1978, for comments on the draft supplement, final environmental statement for Bonneville Power Administration Proposed Fiscal Year 1979 Program, Facility Location Supplement, Franklin Area System Reinforcement, Walla Walla County, Washington. We note from our review that numerous historic and cultural properties have been identified in the preliminary surveys of the planning area, but that it appears that none will be affected by the proposed undertaking. The final document should contain the State Historic Preservation Officer's concurrence with the BPA's determination of no effect.

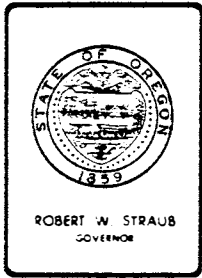
Should additional studies and planning for a specific alignment determine that historic or cultural properties included in or eligible for inclusion in the National Register of Historic Places will be affected, BPA is reminded that it is required by Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f, as amended, 90 Stat. 1320) to afford the Council an opportunity to comment on the undertaking in accordance with the "Procedures for the Protection of Historic and Cultural Properties" (36 CFR Part 800).

Sincerely yours,



Louis S. Wall
Assistant Director, Office of
Review and Compliance, Denver

XIV-79



Department of Transportation
STATE HISTORIC PRESERVATION OFFICE
Parks and Recreation Branch
525 TRADE STREET S.E., SALEM, OREGON 97310

September 21, 1978

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

RE: SJ/Cultural Resources

Dear Sir:

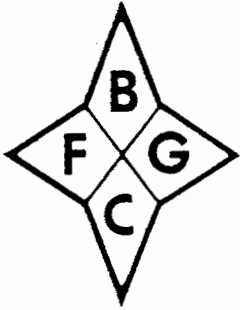
In reviewing the B.P.A. Facility Location Supplement we were most interested in provisions made for the protection of cultural resources within the impact areas. The statement included under "Potential Impacts of the Routes..." (pg. 32) regarding a proposed historic/archaeologic survey of the entire route by the Washington Archaeological Research Center fulfills adequately any request we might make at this point. We would appreciate receiving a copy of the resulting report for our files.

Thank you for the opportunity to comment on this draft supplement.

Sincerely,

Sandy L. Snyder
Preservation Archaeologist

SLS:mh



BENTON-FRANKLIN GOVERNMENTAL CONFERENCE

P. O. BOX 217 • 1935 TERMINAL DRIVE • AT THE RICHLAND SKYPARK • RICHLAND, WA. 99352
TELEPHONE A.C. (509) 943-9185

September 26, 1978

Department of Energy
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Attention: Environmental Manager

Re: A-77-78
Franklin Area System Reinforcement

Dear Sir:

Thank you for notifying us of the above noted plan.

Under Part II of the "A-95" Circular, the Governmental Conference assigned file number A-77-78 to this notice and considered the proposed project at its September 22, 1978, Board meeting. As the District Clearinghouse for this region, the Conference concluded that the proposed project is not in conflict with the development plans, goals and objectives as of this date and we, therefore, endorse the proposal.

Sincerely,

George W. Kloeppel
Executive Director

GWK:das

OFFICIAL FILE COPY	
No.	Date
	OCT - 2 1978
Referred To:	
Action Taken:	
<input type="checkbox"/> ANS.	<input type="checkbox"/> NO REPLY.
By	Date



IN REPLY REFER TO:

Land Services

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

PORTLAND AREA OFFICE

POST OFFICE BOX 3783

PORTLAND, OREGON 97208

SEP 26 1978

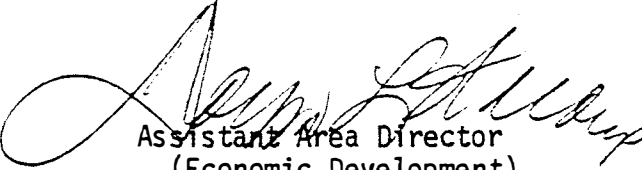
Memorandum

To: Environmental Manager
Bonneville Power Administration
Post Office Box 3621
Portland, Oregon 97208

From: Office of the Area Director

Subject: Draft Supplement, Final EIS, BPA Proposed Fiscal Year 1979
Program - Facility Location Supplement, Franklin Area System
Reinforcement (PAO-DES 78/7)

There are no Indian trust lands or communities that will be directly impacted by the alternatives proposed in the draft.


Assistant Area Director
(Economic Development)



STATE OF
WASHINGTON
Dixy Lee Ray
Governor

DEPARTMENT OF ECOLOGY
Olympia, Washington 98504 206/753-2800
Mail Stop PV-11

October 13, 1978

Mr. John Kiley
Bonneville Power Administration
P. O. Box 3621
Portland, OR 98208

Dear Mr. Kiley:

Thank you for providing our staff with a review copy of your draft supplement to the final environmental impact statement for the B.P.A. Proposed Fiscal Year 1979 Program - Franklin Area System Reinforcement, Facility Location Supplement.

Your impact statement supplement was reviewed by Department of Ecology staff in Olympia and in our Eastern Regional Office in Spokane. Upon completion of that review we find that we have no substantive comments to offer.

Should you have questions, please contact me at (206) 753-6890.

Yours very truly,

A handwritten signature in cursive script, appearing to read "Peter R. Haskin".

Peter R. Haskin
Environmental Review Section

PRH:bjw



DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
U.S. COAST GUARD (G-WEP-7/73)
WASHINGTON, D.C. 20590
PHONE: 202-426-3300

•16476/7.b 492

17 OCT 1978

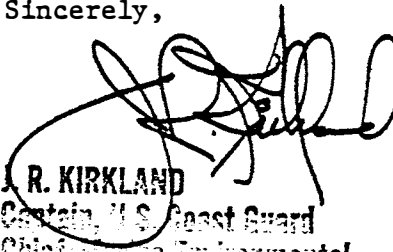
Department of Energy
Environmental Manager
Bonneville Power Administration P. O. Box 3621
Portland, Oregon 97208

Dear Sir:

On behalf of the Department of Transportation, the concerned operating administrations and staff of the U. S. Coast Guard have reviewed the draft facility location supplement to the Bonneville Power Administration Fiscal Year 1979 Program Environmental statement. We have neither comments nor objections to offer on the supplement.

The opportunity to review this supplement is greatly appreciated.

Sincerely,



J. R. KIRKLAND
Captain, U.S. Coast Guard
Chief, Environmental
Protection Division
By direction of the Commandant

SPEED
LIMIT
55

It's a law we
can live with.

XIV-84



DEPARTMENT OF THE ARMY
WALLA WALLA DISTRICT, CORPS OF ENGINEERS

BLDG. 602, CITY-COUNTY AIRPORT
WALLA WALLA, WASHINGTON 99362

NPWEN-PL

18 October 1978

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

Dear Mr. Kiley:

This is in response to your letter of 30 August 1978 requesting comments on the draft facility location supplement to the Fiscal Year 1979 Program Environmental Statement.

After reviewing the supplement, we find that the proposed transmission route would not affect any known project under the jurisdiction of the Corps of Engineers, nor do we uncover any impacts associated with the proposal in the categories of navigation, flood control, or hydropower development.

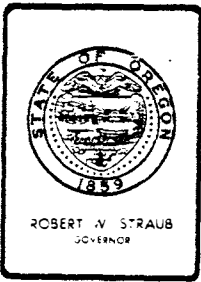
Alternative Plans A, C, D, and E would have environmental impacts of concern to the Corps of Engineers. These impacts, primarily those affecting recreation areas, are adequately addressed in the supplement.

Corps of Engineers permits for work and structures in streams may be required. For additional information on permits, contact Mr. Clarence L. Van Scotter, Chief, Navigation and Flood Control Branch, Walla Walla District, Corps of Engineers, Building 605, City-County Airport, Walla Walla, Washington 99362.

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

Sincerely yours,


W. E. SIVLEY
Chief, Engineering Division



Executive Department

INTERGOVERNMENTAL RELATIONS DIVISION

ROOM 306, STATE LIBRARY BLDG., SALEM, OREGON 97310

October 24, 1978

OFFICIAL FILE COPY

No. Date
OCT 24 1978

Action Taken:
 ANSW. NO RESP.
By Date

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

Dear Mr. Munro:

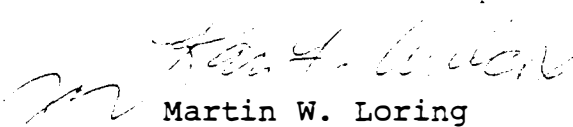
RE: FY 79 Program
PNRS 7809 4 230

Thank you for submitting your Draft Supplement to the Final Environmental Impact Statement for State of Oregon review and comment.

Your draft was referred to the appropriate state agencies for review. The Department of Fish & Wildlife offered the enclosed comments which should be addressed in preparation to your Final Supplement to the Environmental Impact Statement.

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

Sincerely,


Martin W. Loring
Manager
Grants Coordination &
Management Section

MWL:wb

XIV-86

AN EQUAL OPPORTUNITY EMPLOYER

UNITED STATES DEPARTMENT OF AGRICULTURE
FOREST SERVICE

Region 6
P. O. Box 3623, Portland, Oregon 97208

1950
October 24, 1978

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

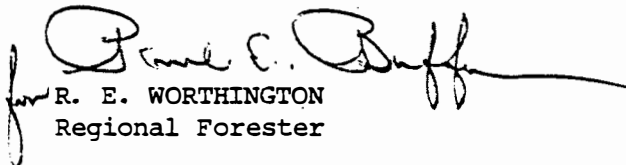


L
Dear Mr. Kiley:

Thank you for the opportunity to review the Draft Franklin Area Facility Location Supplement to the proposed FY 1979 program Final Environmental Statement.

We have no substantive comments to offer in our area of expertise or jurisdiction.

Sincerely,


R. E. WORTHINGTON
Regional Forester



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

OFFICE OF FINANCIAL MANAGEMENT

House Office Building, Olympia, Washington 98504 206/753-5450

Orin C. Smith, Director

October 24, 1978

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

Dear Mr. Kiley:

Review of the draft supplement final environmental impact statement for the BPA Proposed Fiscal Year 1979 Program Facility Location Supplement for the Franklin Area System Reinforcement has been completed by agencies of the State of Washington. The review was coordinated by the Office of Financial Management, as the designated state clearinghouse.

Comments were provided by the Parks and Recreation Commission. The Commission concurs with the determination that alternative D will have a negative impact on Sacajawea State Park.

We understand that BPA will respond directly to the Commission's comments.

Thank you for the opportunity to review the document.

Sincerely,

A handwritten signature in black ink, appearing to read "T A Mahar".

Thomas A. Mahar
Assistant Director

TAM:de

Enclosure



STATE OF
WASHINGTON

Dixy Lee Ray
Governor

WASHINGTON STATE PARKS AND RECREATION COMMISSION

7150 Clearwater Lane, Olympia, Washington 98504 U.S.A. WY 11

206-753-5755

October 2, 1978

35-2650-1820
FEIS - DRAFT SUPPL.
BPA - Proposed
Fiscal Year 1979
Program - Facility
Location Suppl. -
Franklin Area System
Reinforcement

(E-1385)

Mr. Mike Mills
Policy Analysis Division
Office of Financial Mgt.
House Office Building (AL-31)
Olympia, WA 98504

Dear Mr. Mills:

The Washington State Parks and Recreation Commission's staff has reviewed the above-noted document and concur with the determination that alternative D will have a negative impact on Sacajawea State Park.

Thank you for the opportunity to review and comment.

Sincerely,

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

DWH:PJP:eg



United States Department of the Interior

OFFICE OF THE SECRETARY

PACIFIC NORTHWEST REGION

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

OFFICIAL FILE COPY

DATE
OCT 27 1978

Numbered For:

Action Taken:

FILED

NO REPLY
DATE

October 27, 1978

ER-78/926

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

Dear Mr. Munro:

This responds to your request for Department of the Interior comments on the draft facility location supplement to BPA's Fiscal Year 1979 Program Environmental Statement for the proposed Franklin Area System Reinforcement Facility, Walla Walla, Benton, and Franklin Counties, Washington, and Umatilla County, Oregon.

General Comments

Visual and other impacts of locating a transmission line along a new route are generally much greater than those created in following an existing route. We do not believe the draft supplement adequately discusses and substantiates the need for a new route in this case, nor does it adequately compare the relative visual and other impacts of the proposed location and existing routes. We suggest the final supplement reflect a concerted effort by BPA to make maximum use of existing rights-of-way, within specified system reliability requirements, and avoid the proliferation of new routes. Impacts of the proposed action on selection of future routes should also be discussed.

The final supplement should contain evidence of consultation with the State Historic Preservation Officer pursuant to 36 CFR 800. Consultation should include a determination of need for survey(s) to locate additional properties eligible for inclusion on the National Register and a determination of effect on cultural properties within the area of potential environmental impact.

We concur with the selection of Alternative B as the least damaging of those proposed in terms of probable impacts to fish and wildlife. As will be noted in our specific comments, however, portions of the environmental analysis of the alternatives are deficient.

The document does not discuss measures that will be used to compensate for project-caused environmental losses. Executive Order 11514, Protection and Enhancement of Environmental Quality, states that agencies shall develop programs and measures to protect and enhance environmental quality in carrying out their activities. Compensation or enhancement measures are not included in the supplement.

Specific Comments

Summary. The summary of environmental impacts at the front of the draft supplement lists acreages and miles of native vegetation and agricultural lands involved in each alternative. The data and parameters are diverse and unclear, and appear to conflict with other statements, such as on page 15 (wildlife). The summary appears to indicate less acreage permanently lost (0.5 acres) than in the discussion on page 15 (6 acres); however, it is difficult to determine actual quantitative losses or changes of natural habitats by vegetative types. A suggested improvement is given in part for Figure 5, page 34 (see below).

Summary Sheet and page 37. Bureau of Outdoor Recreation has been renamed the Heritage Conservation and Recreation Service.

Page 2, Figure 1 (facing). Map locations of alternate transmission line locations are not clear. Existing and proposed routes should be clearly identified and there should be a suitable legend.

Pages 11, 12, 20, Historical, Architectural, and Archeological. The draft supplement identifies cultural sites in the study area which are either listed or eligible for inclusion on the National Register. However, these are not discussed in relation to proposed and alternate transmission routes, and this should be done in the final supplement. Also on page 20 is the statement that "At this stage in the planning process, no effect is expected on the Strawberry Island Village Archeological site..." This implies that later planning could result in an impact on the site. The final statement should be specific as to the relative locations of the site and proposed transmission line and the nature and extent of the probable impact of the latter on the former.

We disagree with the showing of no effect on historic and archeologic properties. At present, it is not known whether archeologic properties exist along the route; and the degree and likelihood of impacts are, likewise, unknown.

Page 15, Wildlife. Other than the mention of Smith Canyon Canal, the supplement should state whether there was any effort to identify low-level routes of flight of migratory birds that would indicate a potential for collision with power lines. Concerns regarding this type of mortality have been expressed in many past reviews of BPA programs, including the draft EIS on the Role of BPA in the Pacific Northwest Power Supply System.

The loss of shrub-steppe wildlife habitat through construction of the project will only add to the cumulative impact of innumerable past developments which in total have drastically reduced this vegetative community in eastern Washington to a small fraction of its original extent. The cumulative impacts of many developments such as the proposed project are clearly significant. To state that such habitat is abundant, and that no noticeable impact on wildlife is expected, misrepresents the true general picture for this vegetative community and the dependent wildlife populations.

Page 17, Agricultural Land Use. It is noted that annual and perennial weeds in the transmission line right-of-way would be controlled by herbicides. The kinds of herbicides and methods of application should be mentioned in the environmental statement. Such information would be helpful in assessing effects on the water quality of the project area.

Page 31, Esthetics. The first paragraph states that vineyards and irrigated land have enhanced the visual quality of the area. This is a value judgment which might be disputed by those who prefer a natural landscape. We suggest it be either omitted or qualified in the final statement.

Page 34, Figure 5. Only a slight impact is shown on esthetics for both potential routes of the preferred alternative. We disagree with this assessment as we believe that a powerline along a new route, which traverses open country and crosses a highway, will have more than a slight esthetic impact.

This summary impact matrix also provides only a very subjective and general evaluation of the extent of natural habitat affected by the alternatives and does not even reflect the acreage figures provided in the summary statement which were questioned in our comments above.

The impact matrix could be substantially improved by including relative acreages involved where possible, expanding the breakdowns in terms of habitat types affected, further defining visual impact, and so forth. These changes would afford more efficient impact comparison and clarify the conflicting acreage values and diverse parameters utilized in the supplement.

Sincerely yours,



Charles S. Polityka
Regional Environmental Officer

NFWOP-IL

8 November 1978

Department of Energy
Bonneville Power Administration
ATTN: Jerry Frick
Walla Walla Area Office
P.O. Box 1518
Walla Walla, Washington 99362

Dear Mr. Frick:

We have reviewed the Draft Environmental Impact Statement on the proposed BPA power line between the Lower Monumental-John Day line and the Sacajawea Substation.

We have no objections to the route of the Proposed Plan of Service. However, we do have some concerns about the aesthetic degradation which will be created by the towers and the additions to the Sacajawea Substation. Both of which would be visible from the south access road to Ice Harbor Dam.

To help lessen the visual impact, we request that the towers visible from the road and the substation be painted the same color as the existing substation. In addition, we request that the substation addition be kept at a low profile similar to the existing substation structure.

We appreciate the opportunity to comment on your proposal. Please feel free to contact this office at 547-7781 if we can be of further assistance.

Sincerely yours,

PAUL F. WINBORG
Project Engineer
Ice Harbor-Lower Monumental Project

CF:
Ch, Opera Div

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION X

1200 SIXTH AVENUE
SEATTLE, WASHINGTON 98101



REPLY TO
ATTN OF: M/S 443

NOV 20 1978


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

Dear Mr. Kiley:

We have completed our review of your draft Facility Location Supplement for the Franklin Area System Reinforcement project.

We have no comments or suggestions to offer. We have rated the draft supplement LO-1 (LO - Lack of Objections; 1 - Adequate Information). This rating will be published in the Federal Register in accordance with our responsibility to inform the public of our views on proposed Federal actions under Section 309 of the Clean Air Act, as amended. Thank you for the opportunity to review this environmental statement.

Sincerely,


Alexandra B. Smith, Chief
Environmental Evaluation Branch



"OWNED BY THOSE IT SERVES"

115 EAST MAIN ST.
P.O. BOX 46
DAYTON, WASHINGTON 99222

MANAGER	ADMIN. TELEPHONE ROOM
	ADMIN. ROOM
POWER MGR	SAFETY OFF.
ENGR.	O & M SUP.
ECONOMIST	ENCL. OFFER.
	TRANS. MAINT.
	SUB. MAINT.
	AMP. MAINT.
<input checked="" type="checkbox"/> AREA ENGR.	PSC MAINT.
ENGR.	
<input checked="" type="checkbox"/> ENGR. SUP.	FILE

September 18, 1979

Jerry Frick, Area Engineer
Bonneville Power Administration
Walla Walla Area Office
PO Box 1518
Walla Walla, WA 99362

Dear Jerry,

Columbia Rural Electric Assn. Inc. would like to offer the following comments on the Franklin Area System Reinforcement Draft Supplement to the EIS.

Route 2 appears to us to be more favorable than Route 1. The impact on present and future irrigation projects would be less under Route 2.

Any Route chosen should provide locations along the new line that would enable Columbia REA to construct aerial power line crossings under the new 500KV line. Sufficient clearances should be provided to allow crossings with clearances between the farmed ground and the REA distribution lines and the REA line to the BPA 500KV line. We have experienced problems in the past of constructing our power lines under the BPA lines, for example under the LM-JD 500KV line at Dodd Road and the Walla Walla-Franklin 115KV line at Highway 124.

For your information, we plan to construct an aerial line from Highway 124 straight south to the "Water Pumping Station" along the west side of the private gravel road.

Thank you for inviting our comments.

Very truly yours,

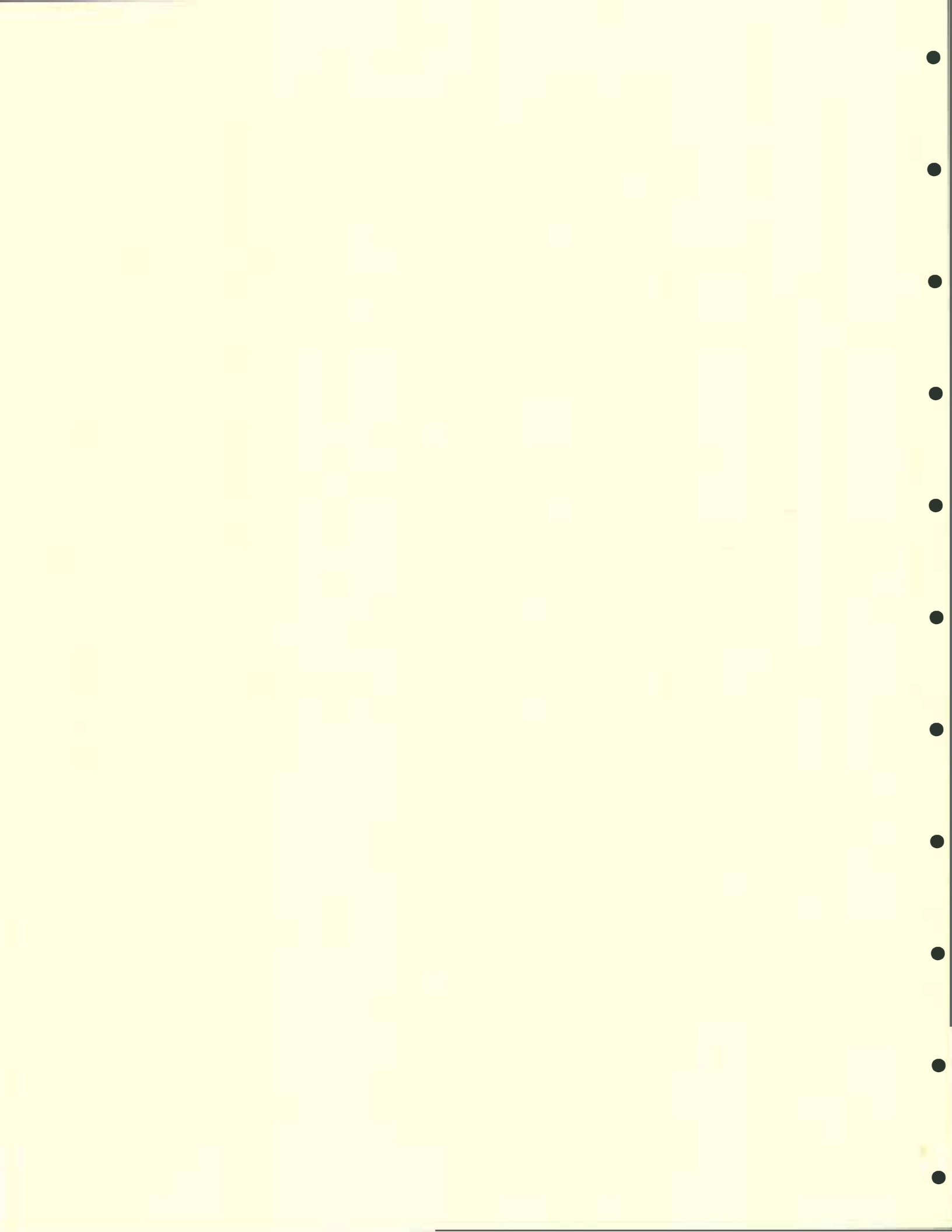
COLUMBIA RURAL ELECTRIC ASSN. INC.

Clark A. Brewington

Clark A. Brewington, Manager

CAB:vb

XV. Summaries of Public Meetings



LIBBY INTEGRATION AND NORTHWEST MONTANA/NORTH IDAHO SUPPORT
PUBLIC MEETING SUMMARY

The Facility Planning Supplement for the Libby Integration and Northwest Montana/ North Idaho Support Project was filed with the President's Council on Environmental Quality, September 1, 1977. Public information meetings were conducted at Noxon, Montana, on October 11, 1977; Libby, Montana, on October 12, 1977; and Sandpoint, Idaho, on October 13, 1977. An information center was held October 13, 1977 at Bonners Ferry, Idaho. A court reporter was present at the three public meetings in Noxon, Libby, and Sandpoint to record questions and statements by the public.

Three topics came up in each of the meetings. In each session, someone asked about the effect of the proposed Canadian diversion of the Kootenai River on this project. People also inquired about the relationship of Libby Integration to the proposed Kootenai Falls Dam in regard to additional transmission requirements. The third subject discussed at each meeting was the Roadless Area Review and Evaluation (RARE II) study by the U.S. Forest Service; questions were asked regarding how BPA plans to incorporate consideration of RARE II lands in the final corridor selection, and whether corridor location would affect the disposition of those areas.

Noxon, Montana - October 11, 1977

Twenty-four members of the public were present. A number of issues were raised. Questions that related directly to the project asked for clarification on the location of specific corridor options within various plans. One person also had questions on how the analysis method came up with the corridors and whether the process identified a preferred route. In addition, much concern was expressed about the relationship of the Libby project to Hot Springs-Bell, Colstrip, and other proposed projects in that area, and whether their impacts had been evaluated in conjunction with this study.

Questions addressed the reliability standard and its relationship to the possibility of upgrading existing lines rather than building a new one. The opinion was expressed that EPA's discussion of upgrading versus a new corridor was inadequate.

Other topics discussed at the meeting were: the assumptions behind BPA's projections of electrical consumption; the agency's role in promoting conservation; Montana's status as a net importer or exporter of electrical energy; and EPA's use of herbicides.

Libby, Montana - October 12, 1977

Twenty-four members of the public were present. Comments were shared by a large portion of the group. Several issues that were raised at Noxon also were raised at Libby, including EPA's use of herbicides, how the EIS was prepared (including questions on the weighting system used for the analysis), and whether Montana is a net exporter of importer of electrical energy.

People expressed the opinion that Montana is paying more than its share, in terms of environmental degradation, to provide energy to non-Montanans, particularly urban Washingtonians. People felt that BPA is not adequately evaluating the environmental costs of building a new line in Western Montana. They wish that the agency would do more to encourage conservation and perhaps accept lower reliability standards in order to prevent more new transmission corridors in their area. The opinion also was expressed that higher power costs, which could help pay for an environmentally acceptable solution to the region's power needs, might also force some conservation. There was considerable support for upgrading existing lines as opposed to opening up new corridors; it was felt that cost should be less of a concern than staying within areas now dedicated to utility use. Several people asked about the availability of cost data for the alternative plans. One person stated that the non-construction alternative should be given equal treatment with the other four plans.

In relation to specific plans, BPA was asked why it has identified an alternative corridor up the Fisher River when that alternative was considered on the previous Libby-Noxon circuit and rejected. This question prompted some discussion on the adequacy of BPA's route selection process.

Other questions raised addressed the future of Libby Dam and of the light metals industry contracts.

Sandpoint, Idaho - October 13, 1977

Twelve members of the public were present. In addition to questions that were common to all three meetings, the subject of the need for a new line and its relationship to existing lines was raised. One person stated that the proposed additions to the transmission system were needed because of increasing consumption and population combined with a transmission system that is barely adequate to serve current demands. Again, questions also were asked regarding the project's relationship to other proposed lines, including Hot Springs-Bell and The Washington Water Power Company's (TWWPCO) plans for the Pine Creek circuit. It was stated that consideration of these other proposals should be part of the decision on future transmission in the area.

Other comments included: the statement that the portion of the original study plan calling for weight ng between the analysis models apparently has been declared invalid; questions regard ng a possible increase in noise levels at the Sacheen Substation if a transmission line should be routed there; and a suggestion to build a line through Canada to provide the Canadians with the portion of Libby Dam's power to which they are entitled by treaty, instead of building through this country.

SUMMARY of PUBLIC MEETING
HELD IN BURBANK, WASHINGTON
on OCTOBER 17, 1978

Facilities Covered: Franklin Area System Reinforcement (SA 79-1)

A public information meeting was held at the Columbia High School Commons in Burbank, Washington, on October 17, 1978, at 7:30 p.m. The proposed construction of six miles of 500-kV transmission line connecting Sacajawea Substation with the Lower Monumental-John Day 500-kV line was presented. In addition to three BPA representatives being present, there were six other people attending the meeting, including a court reporter and a representative from Columbia REA. Emphasis was given to alternative line routes and their environmental impact.

Representative Comments:

Impact statement does not show 1 1/3 mile distribution line already in existence on Route 1.

There are no access roads on Route 1. Do total cost figures include acquisition of right-of-way?

Route 1 impacts my land; why not Route 2 which causes less impact to the other person's land?

Vineyard divisions may not be accurately located on section lines.

Route 2, staying between existing property owner's lands, and using present natural access road, would cause less disruption of farming and any future development of these lands.

Prefer all utilities go on property lines because of natural roads located there.

SUMMARY of PUBLIC MEETING
HELD AT SALEM, OREGON
on NOVEMBER 14, 1978

Facilities Covered: Salem-Albany Area Support (SA 80-1)

A public information meeting was held on the Draft Facility Planning Supplement for the Salem-Albany Area Support at Brush College Elementary School in Salem, Oregon, on Tuesday, November 14, 1978, at 7:15 p.m. Seventeen people were present at the public meeting including nine people from BPA, the court reporter and his wife, and six residents of Salem, Oregon.

Representative Comments:

Do you have more power to sell than you are selling now?

Do you anticipate having more power to wheel than you do now?

Are these higher kilowatts lines (230) a higher voltage than the lines already there?

At what kilovolt do the high voltage transmission lines begin?

SUMMARY of PUBLIC MEETING
HELD AT ALBANY, OREGON
on NOVEMBER 16, 1978

Facilities Covered: Salem-Albany Area Support (SA 80-1)

A public information meeting was held on the Draft Facility Planning Supplement for the Salem-Albany Area Support at Albany Main Public Library in Albany, Oregon, on Thursday, November 16, 1978, at 7:15 p.m. Sixteen people were present including six representatives from BPA, Mayor of Millersburg, City Attorney of Millersburg, a reporter for the Democrat Herald, the court reporter and his wife, and five area residents.

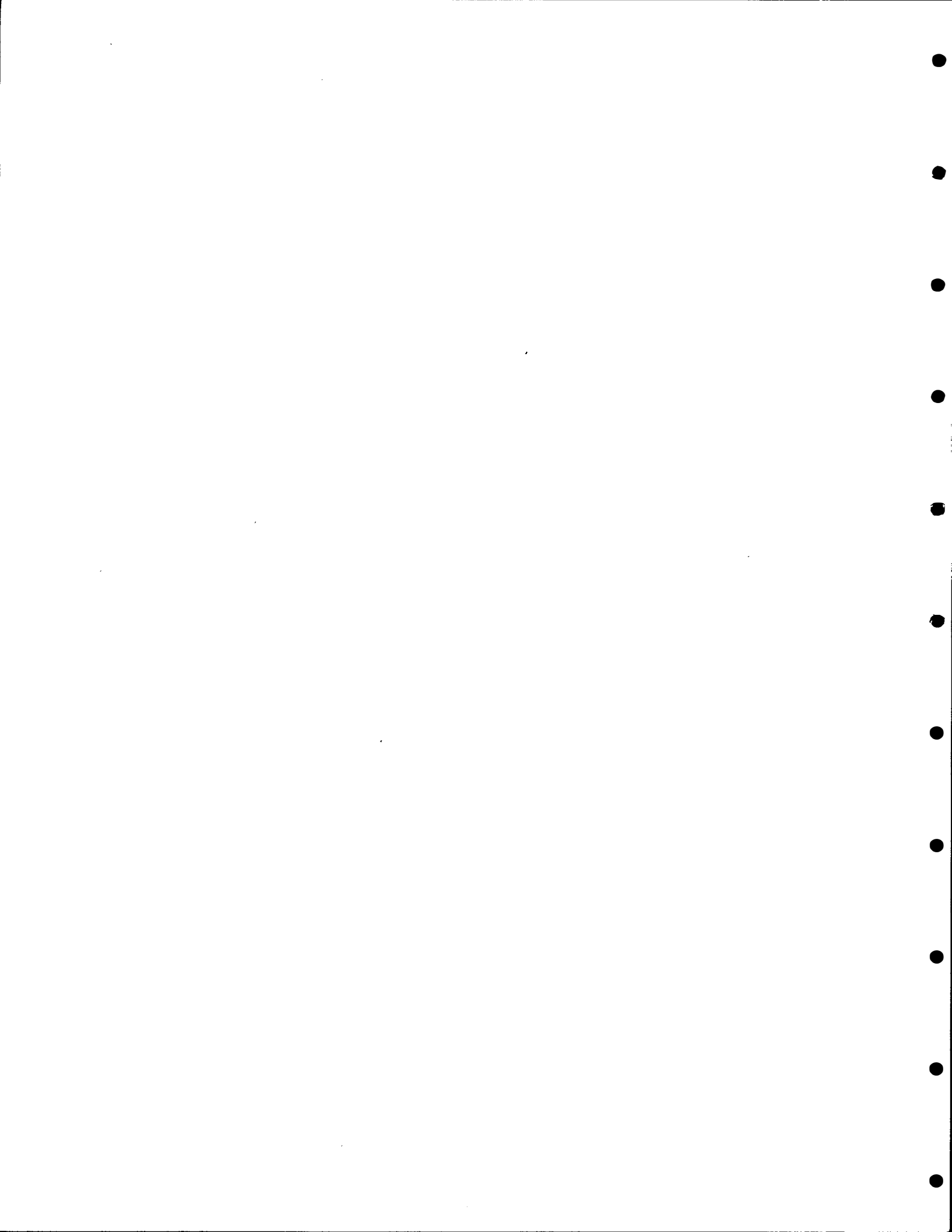
Representative Comments:

What's going to happen to the existing 230 line? Is it going to be changed or reconductored to increase the capacity?

My house sits almost right underneath this 230 line now. If you change it to a higher voltage, what effect is that going to have on me? Would they have to cut out more trees?

I realize it's too early in the planning to know how many and where the lines that would radiate out from the substation (Conser), but do you have a general idea where they're going to end up?

Did the Department of Fish and Wildlife submit any reports to you that you condensed for this, as far as the impact of the line through the Ankeny Wildlife Refuge?



FACILITY EVALUATION APPENDIX

FACILITY EVALUATION APPENDIX

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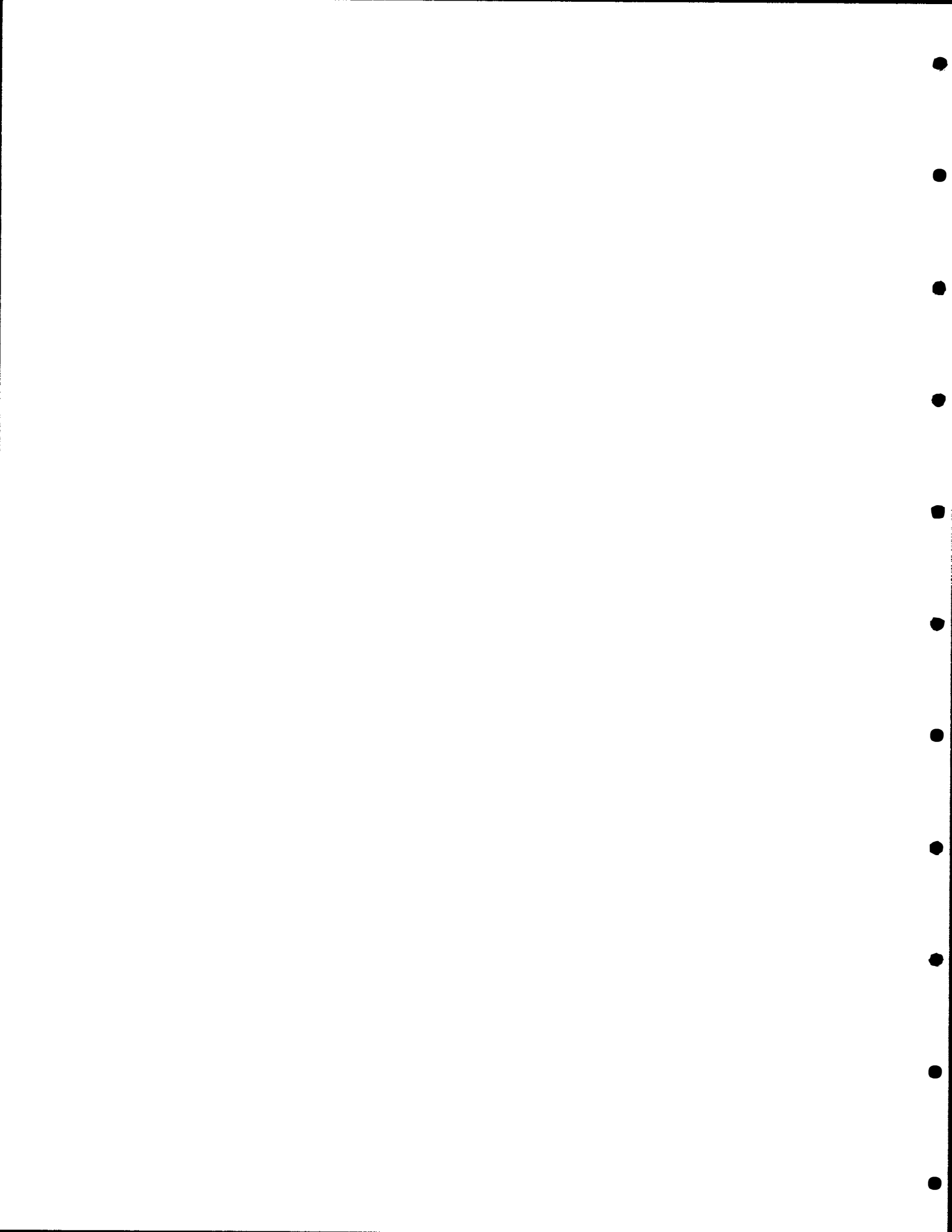
Draft Facility Planning Phases
(Fiscal Year 1980 Proposals)

<u>Facility</u>	<u>Appendix Designation</u>
Salem/Albany Area Support	S.A. 80-1 & 2
*Libby Integrating Transmission	S.A. 80-3

Final Facility Location Phases

<u>Facility</u>	<u>Study Area No.</u>
Franklin Area Service	S.A. 79-1
VII Glossary	VII-1
VIII Bibliography	VIII-1

*The Draft Facility Planning Phase EIS for Libby Integration and Northwest Montana/North Idaho Support was originally appended to the Draft FY 1979 Program Statement. The project was subsequently deferred to the FY 1980 Program. Since the planning phase EIS was already issued as a draft along with the draft FY 1979 Program Statement, it did not appear in the Draft FY 1980 Program Statement. The Final Planning Phase for Libby Integration appears in this document.



I. I N T R O D U C T I O N

This "Facility Evaluation Appendix" contains final facility planning phase EISs (See "Note to Reviewers") on major projects included as part of BPA's Fiscal Year 1980 Proposed Program.

Three key points must be kept in mind in using this Appendix:

1. The map and narrative material included in the Appendix must be used in conjunction with Appendix B of the Role EIS--BPA Power Transmission, and the attached Fiscal Year 1980 Final Program Statement to obtain a complete view of the environmental impacts of the proposed major facilities.
2. As indicated in the Note to Reviewers, those facilities included in this Appendix are in a preliminary planning phase. These facilities discussed as final planning phases will be presented in subsequent facility location phase EISs as they progress through the planning and design process until the full scope of design and impact information has been presented in a final environmental statement.
3. It must be emphasized that material presented in the attached final facility planning phases on these fiscal year 1980 projects is not intended to be complete. Rather, it is designed to give the earliest possible notice of system plans for major new facilities, and to provide a vehicle for comment at a preliminary stage by other agencies and the public. As mentioned above, these proposals will be presented in subsequent more detailed facility location phases for further public and agency review and comment.



II. PLANNING AND DESIGN PROCESS

Bonneville Power Administration's Fiscal Year 1980 Proposed Program includes recommendations for construction of transmission lines, substations, and other electrical facilities necessary to maintain service to areas in the Pacific Northwest.

These recommendations are based on load growth and generation addition forecasts developed in conjunction with public and private utilities in the Pacific Northwest through the Pacific Northwest Utilities Coordinating Council. The steps involved in the identification of need, system planning, and location and design for a typical facility are briefly summarized below.

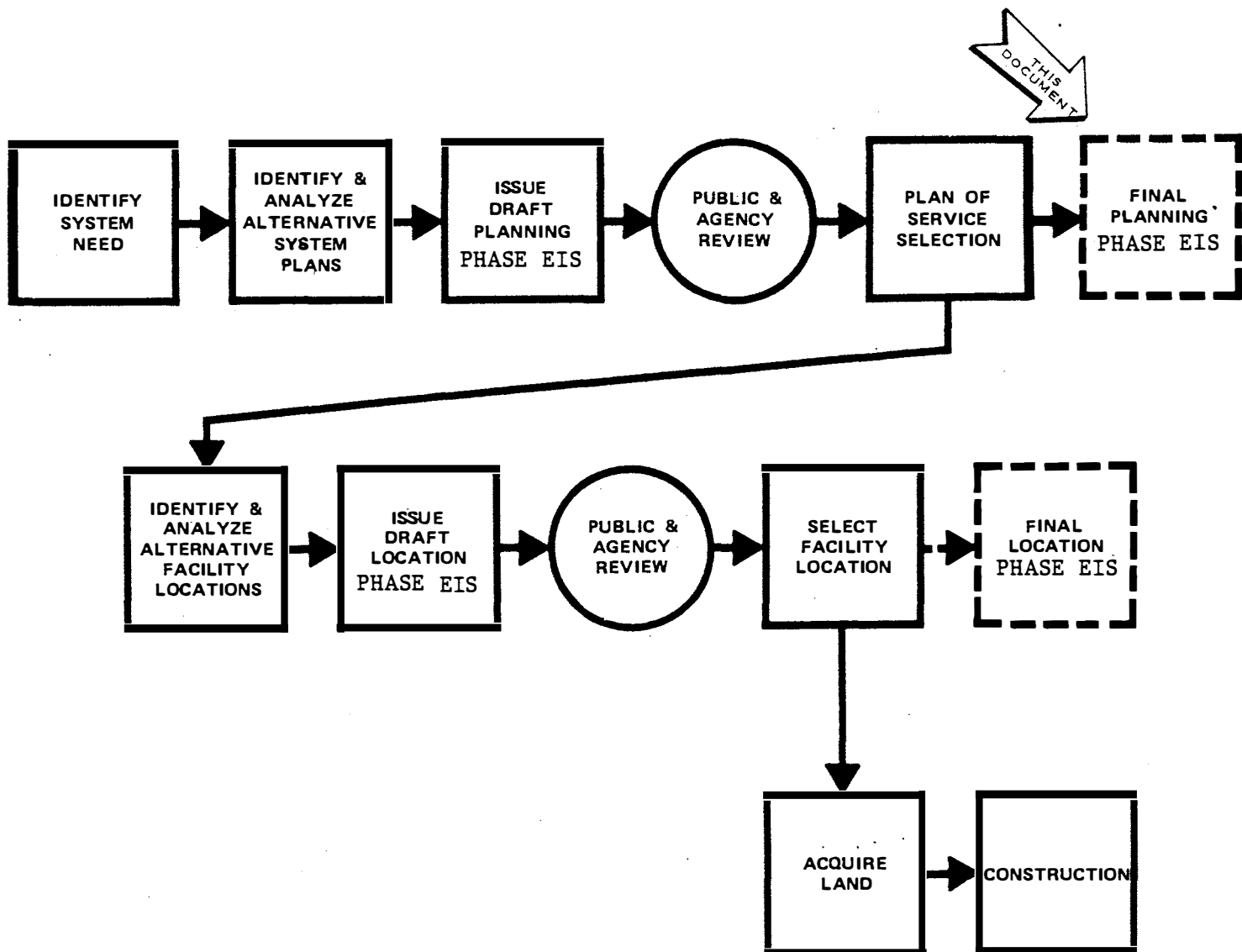
1. In conjunction with utilities and industries served by BPA, the Division of Power Management and the Area Power Managers identify regional power needs. See Part I, Chapter IV of BPA's Role EIS on detailed procedures for load estimating.
2. BPA systems engineers perform electrical load flow studies to identify new transmission system needs or requirements essential to meet BPA's contractual requirements with its customers and maintain transmission system reliability and stability.
3. BPA systems engineers develop plans of service which require the upgrading of existing lines to higher voltage or capacity, a new transmission line between two points on the system, or a new substation or new substation and transmission line--to meet identified system needs. At this time the gathering of resource information for regional system plan and detailed location evaluation are commenced.
4. A draft planning phase environmental statement is issued on each major new facility covering the alternative system plans and based on a regional resource evaluation. Public meetings are scheduled to solicit public comments and gather additional resource data for the plans of service. Meetings are also held with planning commissions to obtain local planning information.
5. Subsequent to the receipt and consideration of all comments obtained as part of the public and agency review process for the draft planning phase EIS, a decision is made selecting one of the alternative plans as the proposed.
6. Having obtained a decision on a proposed plan of service for a given project, Environmental Specialists and location and design engineers perform reconnaissance and environmental evaluations to identify feasible location alternatives for transmission lines. For substations a preliminary site analysis and investigation by a team of transmission and substation design engineers, and landscape architects and other staff identify possible substation sites and their environmental impacts.

7. Cost estimates are prepared for each alternative location.
8. A draft facility location phase environmental statement is prepared and issued covering each alternate facility location. A second public meeting is then held on the alternative routes identified.
9. The facility location is selected after the evaluation of the statement and public and agency comments and review of cost, engineering, environmental, and construction factors.
10. A final facility location phase EIS is prepared, circulated, and filed with the Environmental Protection Agency.

The scheduling of projects varies considerably with the urgency of need, size and complexity of project, roughness and remoteness of terrain crossed, availability of material, length of construction season, environmental sensitivity, and public reaction or opposition. These factors create many variations in the length and sequence of the planning, location, design, and construction processes.

III. BPA'S EIS/DECISIONMAKING PROCESS

The chart below depicts the basic relationship between BPA's decisionmaking process and the EIS process for a typical facility proposal. Generally speaking, as indicated, following the receipt of comments obtained as part of the public and agency review process on the draft planning phase EIS, a decision is made to select a proposed plan of service. Following this decision, alternative facility locations are identified and presented in a draft location phase EIS which is also circulated for public and agency review. Following this second comment process, a decision is made selecting a specific proposed facility location.





IV. FACILITY LISTING

Planning study areas have been selected for each of the major facilities included in Bonneville's 1980 proposed transmission program. The geographical limits of these areas were selected based on the following considerations:

1. Boundaries should encompass all feasible alternative plans (plans of service).
2. Selection of boundaries should reflect physical or natural barriers such as large waterbodies, mountain ranges, or topographical regions, as well as population centers and regionally important resources.
3. Consideration should be given to important regional resources which affect environment exposure and sensitivity. These consist of both important cultural and natural resources.

The following is a list of those draft facility planning phase EISs included in the attached Facility Evaluation Appendix.

Fiscal Year 1980 Major Facility Proposals

<u>Facility</u>	<u>Appendix Designation</u>
Salem/Albany Area Support	S.A. 80-1 & 2
Libby Integrating Transmission	S.A. 80-3

The following is a listing of those prior fiscal year proposals presented as final facility location phase EISs which have been attached to the appendix.

Final Facility Location Phase

<u>Facility</u>	<u>Study Area No.</u>
Franklin Area Service	S.A. 79-1

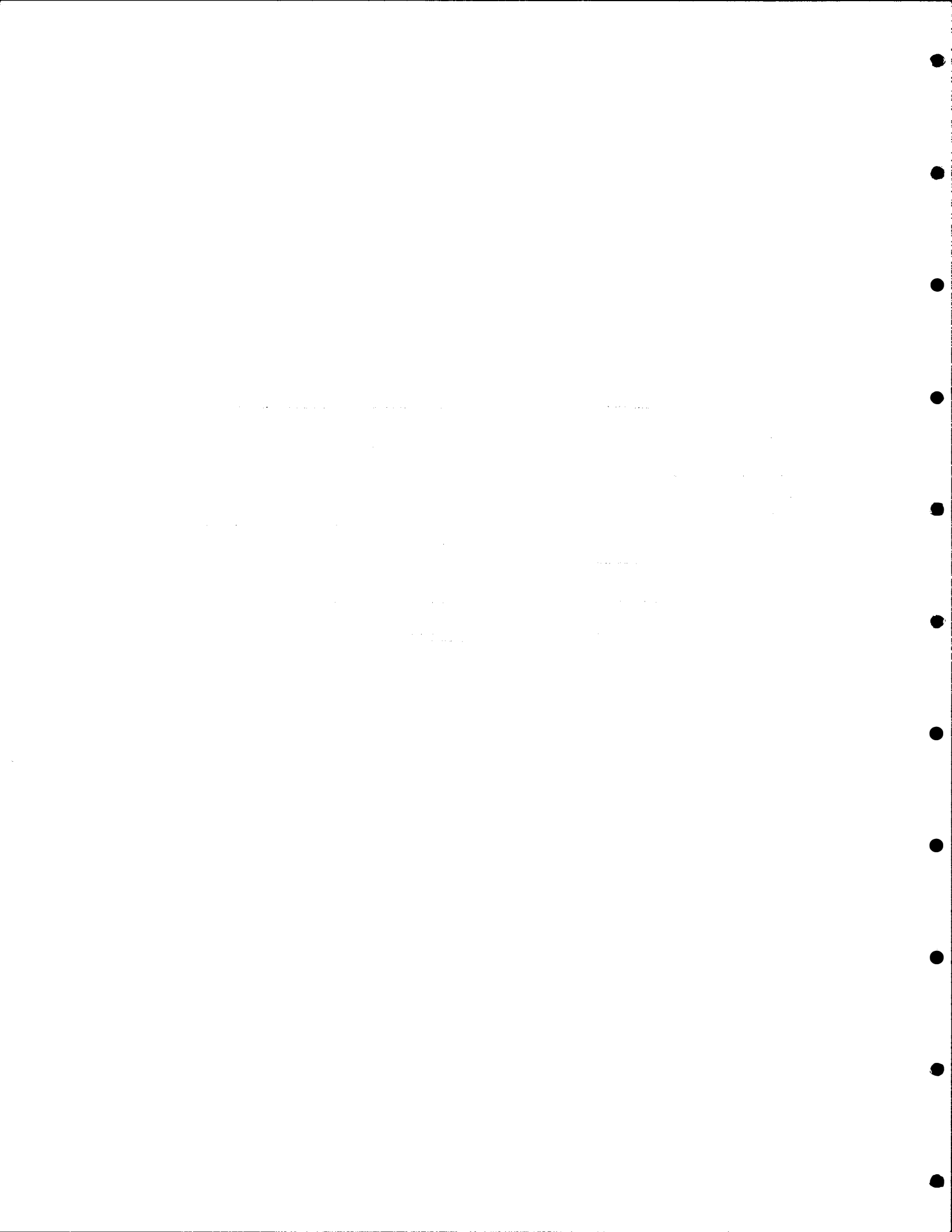


V. GRAPHIC AND NARRATIVE EVALUATIONS
PURPOSE AND OBJECTIVES

Material contained in each of the facility planning phase EISs consists of the regional preliminary planning evaluations for major facilities included in Bonneville's Fiscal Year 1980 Program. These narrative and graphic evaluations were prepared with five specific objectives:

1. To present in graphic form the geographical location associated with specific facilities in the proposed Fiscal Year 1980 Program.
2. To help identify important natural and cultural resources in each study area and to indicate where projected development may alter associated environmental quality. Such knowledge will be used in directing resource-analysis surveys in the selection of final locations and the mitigation of impacts.
3. To provide a vehicle which can be used by Federal, State, and local agencies and the public that portrays essential resource and other environmental information utilized in the location and design processes.
4. To provide a planning tool which will incorporate interdisciplinary environmental inputs into the planning process from sources both within and outside the organization.
5. To provide a systematic method of incorporating environmental and esthetic considerations into the planning and decisionmaking process.

A description or interpretation of the resource information and concepts utilized in the preparation of the graphic and narrative evaluations is presented in the following chapter. For a description of technical terms used in the narratives, see the "Glossary" section.



VI. INTERPRETATION OF RESOURCE EVALUATIONS

PURPOSE AND OBJECTIVES

The following text is an interpretation or description of the resource information compiled for each facility.

The narrative and graphic evaluation material used is the first stage in the development of a new resource-based systems analysis approach to facility siting which will take advantage of modern land-use planning concepts as well as the traditional concerns of economic and reliable operation and maintenance.

INTERPRETATION

Historically the major, if not the determining, factors in transmission facility location have been economics and service reliability. Factors considered included accessibility for construction and maintenance and ground stability, adequate clearing, and climatic conditions for electrical reliability. Consideration was also given to cultural land-use variables, such as historic, archeological, and recreation resources, as well as social and land-use factors like population density, land values, land management practices, and public acceptance. As a result, the final location of the facility is not necessarily a direct transmission line route between two points or the least costly substation site. Efforts to consider these other factors, however, have been handicapped by the lack of a systematic regional framework within which these factors can be evaluated against other environmental and economic considerations.

The material described in this chapter and utilized in the preliminary planning evaluations is intended to help fill this need for the fiscal year 1980 proposed program by providing a broad regional overview of the important land use, natural and cultural resources, and physical sensitivities which act as determinants within each study area and which are presented for each facility. The following are working definitions of important resources which have been used in the identification and evaluation of natural and cultural resources in the draft facility planning phase environmental statement.

Important Resources

An important natural or cultural resource has been considered as one that:

1. Is recognized as being valuable by a substantial proportion of the regional, state, or national population in terms of one or more of the following values:
 - a. Economic (monetary value) - example, commercial forests, high productive agricultural lands
 - b. Physical health value - example, uncontaminated ground water for drinking

- c. Safety value - example, flood storage provided by wetlands
 - d. Recreation value - example, lakes
 - e. Esthetic value - example, architecturally significant structures or unique vista (Crown Point)
 - f. Psychological/philosophical value - example, the prevention of extinction of endangered animal species or the protection of largest Douglas-fir specimen
 - g. Research value - examples, the study of ecological relationships in wetlands or virgin forests
 - h. Educational value - examples, historical events as reflected by historical buildings and unique geologic formations
2. The supply of that important natural or cultural resource is or will be scarce relative to the regional, state, or national demand due to either inherent scarcity or to degradation or depletion by the action of man; or
 3. Is not necessarily recognized as being valuable by a substantial proportion of the population, but does appear to be an integral component of the life support system of man based upon expert analysis of existing evidence.

Statement Organization

The fiscal year 1980 facility planning phase EISs have been organized into two major sections: (1) a description of the natural and cultural resources of the study area; and (2) the potential impacts on these resources.

The fiscal year 1980 facility location phase EISs which will be issued individually on completion of location and environmental evaluations, will include local detailed impact evaluations and information on: (1) unavoidable adverse impacts; (2) relationship between local short-term uses of the environment and long-term productivity; (3) irreversible and irretrievable commitments of resources; and (4) location alternatives. To obtain a full understanding of the many variations in resource planning information and associated environmental impacts presented in these evaluations, data interpretations found the Columbia-North Pacific Comprehensive Frame Study provide an excellent reference. The following is a brief synopsis of the resource definitions and logic of use in the planning and location phase EISs.

DESCRIPTION OF THE ENVIRONMENT
PLANNING STUDY AREA

Geography

The geographic description provides a framework for the resource evaluation that follow. Cultural and physical features are narrated in order to fix the planning study areas in a spatial context.

Climate

Climatic patterns are emphasized as they affect transmission line reliability, construction, and maintenance impacts on the ecological relationships found in the study region. Seasonal data is contrasted showing variations in temperature, precipitation of climatic characteristics and its relationship to the impacts of transmission development in the region.

Geology

Geologic formations and processes are fundamental elements of our physical environment. Literally, they are the foundation that supports the complex ecosystems and landscape of which man and his world are an integral part. Accordingly, an understanding of the geologic environment and its use is essential to the evaluation of potential physical impacts due to transmission facilities. Such aspects as seismic activity, slope stability, drainage, and the engineering properties of geologic materials must be thoroughly evaluated. In addition, many geologic factors are of economic and esthetic importance. Ground water is an important resource in many localities. Agriculture, industry, and commerce are dependent on a wide variety of geologic commodities, ranging from such basic construction materials as sand and gravel to special metals and ceramics having sophisticated uses in the aerospace program. Many geologic features within the landscape are of special value because of their scientific or scenic qualities. In addition, they are the point of origin of many organic and inorganic chemicals and the only source of fossil fuels. Thus, these many and varied aspects of the geologic setting make it a very significant element in environmental analysis.

NATURAL RESOURCES

Soils

Because of the important role soils play in both natural and man-made systems, a general soils evaluation has been included in the following narrative impact evaluations. The information included was derived in part from published soil survey work of the Soil Conservation Service, field observation, and from the land mineral resource appendix of the Pacific Northwest River Basins Commission, Columbia-North Pacific Region Comprehensive Framework Study.

Soils with almost the same profiles and essentially alike in their behavior in the undisturbed landscape make up a soil series. A soil association is a landscape with a distinctive proportional pattern of soils consisting of one or more major soils and at least one minor soil and is named for the major soil.

These soils series in their regional context reflect major drainage, soil problems or limitations, and land-use capabilities, based on the soils' physical, chemical, and engineering characteristics. These dominant soil series also define zones that can be (1) associated by type and characteristic landscape patterns; (2) related to detailed soil units (mapped by Soil Conservation Service) when more information is required; and (3) related directly to the land's capability and suitability for most land use.

Some of the relationships or roles played by soils include important items such as providing nutrients, moisture, and support for cultivated crops; pasture and game browse, trees, and other vegetative associations. They act as natural filters and provide habitat for many invertebrates, reptiles and small animals. Soils also provide the support and raw material for roads, dams, and terraces, as well as filtering material for sewage filter or drainage fields. Soils play an important role in water storage, natural water purification and aquifer recharge and other forms of water movement after precipitation reaches the ground. Unconsolidated material may form various types of landscape features with varying topography. These landforms may be considered "unique features of the landscape" due to inherent uniqueness, geologic importance, or scenic qualities.

The general land capability of the dominant soils associations can be broken into two divisions, (1) Classes I through IV are suitable for cultivation and other use, while (2) Classes V through VIII have limitations that make them unsuited to cultivation and either limit and/or restrict their use to pasture, range, forest, recreation, wildlife habitat and/or water supply.

Information on capability classification and soil characteristics was obtained from the U.S. Soil Conservation Service Soil Surveys and from the Columbia-North Pacific Region Comprehensive Framework Study, Appendix IV, Land and Mineral Resources, submitted by the Pacific Northwest River Basins Commission. This information is generalized in context.

Land Capability Classes

Class I. Soils in Class I have no limitations or hazards. They are adapted to all uses with a minimum of conservation treatment other than standard conditioning ones.

Class II. Soils in Class II have few limitations or hazards. Simple conservation practices are needed when cultivated. They are suited to cultivated crops, pasture, range, woodland, or wildlife.

Class III. Soils in Class III have more limitations and hazards than those in Class II. They require more difficult or complex conservation practices when cultivated. They are suited to cultivated crops, pasture, range, woodland, or wildlife.

Class IV. Soils in Class IV have greater limitations and hazards than Class III. Still more difficult or complex measures are needed when cultivated. They are suited to cultivated crops, pasture, range, woodland, or wildlife.

Class V. Soils in Class V have more limitations than Class IV. They are generally unsuited for cultivation, but are well suited for grazing and forestry use. They require good management practices.

Class VI. Soils in Class VI have severe limitations or hazards making them generally unsuited for cultivation. They are suited largely to pasture, range, woodland, or wildlife.

Class VII. Soils and landforms in Class VII have severe limitations and hazards making them generally unsuited for cultivation. They are suited to grazing, noncommercial, woodland, or wildlife.

Class VIII. Soils and landforms in Class VIII have limitations and hazards that prevent their use for cultivated crops, range, or woodland. They may be used for recreation, wildlife, or water supply. An analysis of the above-mentioned limitations provides an indication of physical soil sensitivity and a base from which right-of-way construction and management practices can be developed which best respect the physical sensitivity (erosion potential), engineering limitations, and land-use capabilities and suitabilities.

Erosion Potential

In evaluating the physical sensitivity of land for transmission location, it is generally important that the locating and degree of potential erosion can be determined. This erosion potential is an important factor in the selection of suitable site locations from the standpoint of the site's physical compatibility. Existing erosion patterns do not always act as indicators of the potential erosion in an area, since with adequate cover and limited use, existing erosion may be negligible even on highly erodible soils. Land stabilization measures and proper clearing and construction practices must be applied to minimize erosion impacts. Erosion potential in each study area was evaluated utilizing the classification system used by the U.S. Department of Agriculture.

Hydrology

Hydrologic resources are among the more important physical characteristics to be considered in evaluating the existing and potential environmental impact of transmission facilities on the physical environment. It is essential to realize that the availability and quality of water resources play a major role in determining the maximum productivity that can be derived from the natural resources in an area. In general, the ecology

of the area as well as the land use and the natural and cultural resources which exist or can be developed in an area can be maintained only through proper management and conservation of existing water resources. Reducing the impact of transmission facility location and of clearing and construction practices on the quality and use of the water resources, helps optimize the benefits available from natural resources in an area and benefits the region. The water and wetlands in an area have been broadly classified to include: intermittent streams, streams, rivers, bays, lakes, reservoirs, marshes, and swamps. These water resources have been classified for quality and use by state water quality regulations. Level of turbidity is one means utilized in testing and measuring environmental impact influences on these resources.

Because of the complex nature of these resources and the incremental contributions that intermittent streams, streams, rivers, and wetlands make to the water quality of larger water systems and ground water resources, they are an important consideration in facility siting.

Streams

This class of water resource includes all the small tributaries that serve to renew the larger water resources such as river networks or lakes on a year-round basis. These resources substantially vary in their levels of quality and sensitivity.

Intermittent Streams

This class of water resource includes all the tributaries that serve to renew the larger water resources such as stream and river networks or lakes on an intermittent basis. These streams are often important in handling heavy water concentrations during seasonal runoffs. In addition, they support localized or climatic ecosystems and are also important contributors to aquifers in the renewal of valuable ground-water resources.

Rivers

This class of water resource generally includes all the main tributaries that serve to renew the water resources in the larger order--rivers, reservoirs, lakes, or oceans on a year-round basis.

Lakes and Reservoirs

This class of water resource generally includes all natural or artificial inland bodies of water that store water obtained from tributaries.

Wetlands

The wetlands classification generally consist of springs, sedge marshes, swamps, and estuaries normally found in areas adjacent to other water sources such as rivers, lakes, and bays. These areas provide an important natural transition zone between water and land resources. They act as valuable open space and serve as aquifer recharge or discharge areas, filter beds, wildlife habitat, and water storage.

Wetland areas play an important environmental role which is given special consideration in accordance with requirements of Executive Order 11990.

Natural Vegetation

The Pacific Northwest is a diverse region in terms of environment. To a great extent, plant communities reflect the environmental conditions on a regional and local scale. Information on vegetation becomes a tool for impact evaluation.

Forests or vegetative communities provide habitat for a wide variety of wildlife.

The forest ecosystem provides watershed functions including erosion control, flood control, and water quality maintenance. Important factors related to these functions are soil conditions, vegetative characteristics, and topography. Some degree of disturbance is compatible with maintaining the integrity of the land for watershed protection.

Forest land functions represent a concern for large-scale environmental maintenance. The forests are an integral part of many natural systems at every level--local, state, national, and international. Forest vegetation has a significant role in mineral cycling, atmospheric oxygen replenishment, removal of pollutants, climatic modification (micro and macro), and soil genesis.

Forest lands and other vegetative communities can serve as laboratories for research on silvicultural and basic ecological studies on subjects such as reproduction, succession, biological production, and nutrient cycling. For research that is highly sensitive to human disturbance, the forest vegetation community concerned must be carefully protected. However, considerably more impact can be allowed if the community is to be used for general educational purposes. National forest lands and vegetative communities also provide for many leisure time activities and recreation development.

The major botanical communities found within each region are identified and described giving the breakdown by vegetative patterns with their regional and local distribution. The dominant plant species of the communities are listed by common name.

The Endangered Species Act of 1973 is applicable to officially listed threatened and endangered plant species (as well as animals) and special attention will be given to the mandates of the Act during planning and construction activities.

Wildlife

Wildlife populations are integral components of all ecosystems and many species provide food and clothing, as well as esthetic or recreational benefits to man. Wildlife will be viewed in its broadest sense and will include the following classifications:

<u>Classification</u>	<u>Examples</u>
Invertebrates	Crabs, insects, spiders, clams, snails, crawfish
Reptiles & Amphibians	Snakes, lizards, frogs, turtles
Bats	Myotis bats, pipistrel bats
Anadromous Fish	Salmonids (salmon, sea-run trout), nonsalmonids (lamprey, shad, sturgeon)
Resident Fish	Salmonids (trout, whitefish), nonsalmonids (suckers, minnows, bass, etc.)
Marine Fish	Fish spending entire life in saltwater (lingcod, ocean perch, tuna)
Waterfowl	Ducks, geese, swans, waterbirds, shorebirds
Upland Birds	Turkeys, grouse, quail, pheasant, pigeons, doves
Birds of Prey	Hawks, owls, eagles, vulture, falcons
Songbirds	All birds not covered under above classifications
Carnivores	Bears, cats, weasels, raccoons, skunks, coyote, foxes
Rodents	Squirrels, gophers, rats, mice, beaver, muskrat, nutria
Rabbits & Hares	Cottontails, jackrabbits, snowshoe hare
Large Herbivores	Deer, elk, moose, sheep, goats, pronghorn antelope

Ideally a discussion of wildlife in an area that may be affected by a proposed transmission facility should mention all species known to be present in the foregoing classifications. One of the basic laws of ecology is the existing interrelationship among all living organisms and their environment. A man-caused change in an ecosystem could in theory affect, to varying degrees, all organisms within the system. A basic problem, however, is that at present, man's ability to measure, comprehend, and predict changes occurring in even simple ecosystems is limited.

While we realize the "natural importance" inherent in all animals, the bulk of the data available to use is mainly on those species that have some degree of "human importance" attached to them. For example, information from State and Federal conservation agencies is largely related to those species having significant economic or recreational importance. While we realize the variety of animal life that exists, sections dealing with wildlife will generally reflect the main content of our available information. For the most part, the practice of classifying animals as "game" vs. "nongame," or "beneficial" vs. "detrimental" will be reserved for those sections dealing with recreation and economics.

As a result of the relatively limited information available to us on invertebrates, reptiles and amphibians, and bats, references to these species will be limited in most sections.

Another criteria in addition to recreation or economics for identifying important wildlife species or groups is their status as possibly rare or endangered. When a species is facing rapid extinction--as a result of man--we assume that this may represent an "unnatural" change in the system. The fact a species is being driven toward extinction is an indication that something may be "wrong" with the system. Since we cannot accurately predict the effects such extinctions may have upon the system (and upon man) we would prefer that such man-induced extinctions be avoided.

Special attention will be given to species and subspecies determined to be endangered or threatened in accordance with criteria of the Endangered Species Act of 1973 as officially listed in the Federal Register. Section 3 of the Act defines endangered and threatened as follows:

Endangered: The term "endangered species" means any species which is in danger of extinction throughout all or a significant portion of its range other than a species of the Class Insecta determined by the Secretary to constitute a pest whose protection under provisions of this Act would present an overwhelming and overriding risk to man.

Threatened: The term "threatened species" means any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Species classified as rare, endangered, or threatened by the involved States will also be given special consideration.

Habitat: - Impacts to wildlife from transmission facilities usually occur as a result of modifications to habitat. Wildlife habitat in general refers to any land or water area capable of supporting some type of wildlife species. These areas vary considerably in type and quality and are found in many water, forest, and cropland areas. Wildlife and fish populations are highly dependent on the quantity and quality of these habitats and proper management has done much to preserve their existence. The increasing pressures of development, however, threaten many of these areas.

Habitat for wildlife includes natural, artificial, or man-made facilities. Habitat is generally classified by use as summer, winter, or production. Typical areas covered by these classes are winter and general ranges, fish production areas, waterfowl winter nesting and production areas, and upland bird production areas. Some of the common land and water resources that provide wintering, nesting, or resting grounds are any land supporting vegetation--forest, farm and rangeland, bays, estuaries, marshes, shallow lakes, reservoirs, and streams. Wildlife facilities and fish hatcheries have been provided to supplement natural habitats in an effort to conserve wildlife resources. Federal, state, and local agencies provide management policies. These dwindling habitat resources are an important national resource and must be protected.

Wildlife Facilities - These facilities, which serve several functions, include state and Federal wildlife facilities, such as refuges, game ranges under agency control, game farms, game management areas, wildlife recreation areas, and public shooting areas. These facilities aid in the reproduction survival of wildlife, and are designed to maximize the amount of productive uses we have available for wildlife resources.

Other Natural Resources

This category will include natural resources which do not fall into the categories previously described. Included are metallic and nonmetallic mineral deposits. Another example of resources in this category would be a land form such as Hells Canyon on the Snake River.

RESOURCE USE AND CULTURAL RESOURCES

Agriculture

Pacific Northwest agriculture has both a background and future potential of great diversity, based upon variable topography, climate, soils, and markets. Possible impact from transmission facilities on man's use of the land can be better appreciated by having an understanding of such use. These agriculture resource uses will be considered very broadly as cropland and rangeland.

The agricultural cropland category utilized in the narrative evaluations include lands devoted to dryland and irrigated farming. These are lands which generally exhibit favorable land capabilities and suitabilities for crop production such as (1) good soil, (2) more gentle slopes, (3) adequate climate and growing season, and (4) sufficient water supply.

An indication of the types of land use cropping, general cultivation practices, irrigation needs and practices, and geographic distribution of cropland form a tool for environmental evaluation and impact assessment.

The rangeland category utilized as an agriculture land use includes open, nonforested grazing land. Climate, soil, bedrock, slope, and elevation factors through the process of succession have resulted in vegetative associations which are characterized by cover types such as grasses, land in perennial forbs, perennial weeds, sedges, sagebrush, and numerous species of shrubs. It may contain shade trees or scattered timber trees with less than 10 percent canopy. Rangeland consists of a mixture of those cover types which are categorized into two classifications:

Sage, other brushland, grass and meadowland and other classifications of rangeland are normally of low productivity but in many areas they must be evaluated for potential reclamation, as well as open space and natural and cultural values. Their significance is generally not modified by transmission construction. The sage and other brushland classification includes those rangelands where sagebrush or other brush is the predominant cover. Brushlands other than sage principally consist of nonforest brush types such as bitterbrush bluebunch wheatgrass in the more rocky or shallow soil areas, and the rabbitbrush, bitterbrush, and mixed grass ranges on sandy sites.

Grass and meadowlands are characterized at higher elevations by open grasslands in which bunchgrasses are dominant and perennial forbs and shrubs are common. Meadow-type grasses and forbs and grass-like plants are prevalent in areas adjacent to streams and in mountain meadows. At intermediate elevations just below the fringes of timberland are found more intensive grasslands. Meadows are quite prevalent along creeks and rivers. On more gently sloping range or lower elevations are found grasslands characterized by bunchgrasses, sagebrush, and perennial forbs.

Range condition is the present state of the vegetation of a range-soil group in relation to its climax vegetation. A range is in excellent condition if 76 to 100 percent of the plant cover, by weight, is similar to the original or climax plant community; it is in good condition if 51 to 75 percent of the vegetation is similar to the original; in fair condition if 25 to 50 percent of the plants are similar to the original; and in poor condition if less than 25 percent of the present vegetation is the original kind.

Forestry

The forestry category utilized in the narrative evaluations includes all commercial and noncommercial forest lands, private and public, which in general have more than 10 percent forest cover. These lands are used for timber production, recreation, wildlife habitat, and occasionally, livestock range. In addition, they serve as valuable watersheds for domestic water storage and purification. Forest land suitability is important in determining the degree of impact of transmission facility construction on forest

resources. This associated degree of facility impact varies substantially throughout the Northwest with the many variations in land suitability resulting from variations in climate, slope, exposure, altitude, and other factors. As forest lands are highly incompatible with transmission development, the removal of trees from the right-of-way is required in most instances and a complete loss of future production results.

Forest range consists of those lands which may be of either commercial or noncommercial character which have sufficient low-growing vegetation to support livestock grazing. Forest range areas generally occupy the lower fringes of the forest zone adjacent to rangeland or agricultural areas. These lands are normally characterized by marginal soils and climatic extremes.

Noncommercial forest land consists of forested lands characterized and designated as either nonproductive timber with no commercial market value, or productive timber lands of commercial character which have been reserved from timber harvest. A high percentage of these lands is unsuitable for raising commercial timber crops because of their low productivity due to high altitude, low rainfall, steep terrain and other factors. Many of these areas have been designated as national parks, wild and scenic areas, wilderness areas and similar uses.

Commercial forest land is land which is producing, or is capable of producing, crops of industrial wood and is not withdrawn by statute or administrative regulation. Commercial forest lands include areas suitable for management and capable of producing 20 cubic feet annual growth per acre. This may include both accessible and inaccessible areas.

Forest land reserved from timber harvest consists of commercial or noncommercial timber lands which through legislation have been designated for use as: national parks, wild, wilderness and primitive areas; and primitive areas; and state, county and municipal parks. These lands have recreational potential and scenic values.

Urbanized Land Uses

Resources discussed in this section range from farm and rural residences, where development may be minimal, to suburban and urban land where residential land use is highly concentrated along with other associated land uses.

Basic population data such as size, location and distribution, and change through time are fundamental in the planning process. Analysis of the settlement pattern and current trends form an integral part of evaluating the cultural and socioeconomic resources and potential impacts. The 1970 census of population data and such supplemental inputs as recent state or local population statistics, aerial photomaps, and U.S. Geological Survey mapping are utilized in developing a review understanding of the population.

Economic base information provided is used to characterize local economies and to allow an assessment of adverse impacts as a result of BPA construction activities.

Recreation

Recreation resources represent a principal resource and industry in the Pacific Northwest. Because of the often unique character of these resources, special attention must be given to preserving the quality of existing and potential areas.

Typical existing and potential recreation areas are: general outdoor recreation, national environmental, outstanding natural, primitive and wilderness, high density recreation, and national rivers. These, defined below, are affected to some degree by the construction of transmission facilities through or near them.

Existing Recreation Areas

General Outdoor Recreation Areas are generally nonurban and may or may not be developed. Examples include: summer and winter sports, resort, boat launching, swimming, hiking and campground areas, and nonurban parks.

National and Environmental Areas include the national forests, parks and other public lands of national significance. These areas are characterized by the absence of man-made developments in the presence of natural qualities of national significance.

Outstanding Natural Areas include those exceptional scenic, geologic and natural resources, such as mountain ranges, canyons, waterfalls, lava caves, and other natural phenomena of exceptional character. Developments in these areas consist of only those utilized in the preservation of the natural resources.

Primitive and Wilderness Areas include wilderness and primitive land designated by Congress through legislation. Man-Made developments are limited mainly to foot and horseback trails.

High-Density Recreation Areas include those which are often associated with urban populations and which are in high demand. They include such areas as urban parks and play fields.

State and National Rivers include those which have been nationally accepted as having exceptional environmental quality or which are being studied for future designation. They are or may become an integral part of the state or national system of wild, scenic, and outdoor recreation rivers. Conservation policies control the use of these important water resources and development is restricted or tightly controlled.

Potential Recreation Areas

Development Zones include those which have been designated by Federal or state recreation authorities as having sufficient site amenities to have potential for development into useful recreation areas.

Roadless Areas include those designated by Federal and state agencies as having sufficient exceptional natural qualities to be considered for future classification. Their status is preserved by restricting access roads to trails, such as foot and horseback. This access limits development to assure the preservation of the areas' ecology and visual amenities.

Recreation Rivers include those selected by Federal and state agencies as having the resource qualities deemed necessary to justify their possible future use as recreation rivers. They are capable of providing a valuable source of recreational diversity. Development is restricted and selective.

Visual

The description of the scenic character of the study areas is largely based on the diversity of physiography, vegetation and water forms which are apparent to the viewer. Often cultural features such as farmland or rustic appearing buildings will add to the scenic value of an area. These features may be further enhanced by the time of day, season, weather or lighting conditions at a particular time. Any judgements of scenic quality are also variable depending on the personal characteristics of the viewer.

Scenic Routes include those which have been designated by Federal and State agencies as having exceptional scenic character. Included are highways, roads and trails, both foot and horseback, which pass through or alongside areas of exceptional natural and cultural diversity.

Scenic Roads include those considered by State and Federal agencies as having sufficient environmental qualities to warrant designation. They would be treated in the same manner in facility location as would existing scenic routes previously described.

State and National Rivers include those which have been nationally accepted as having exceptional environmental quality or which are being studied for future designation. They are or may become an integral part of the state or national system of wild, scenic and outdoor recreation rivers. Conservation policies control the use of these important water resources and development is restricted or tightly controlled.

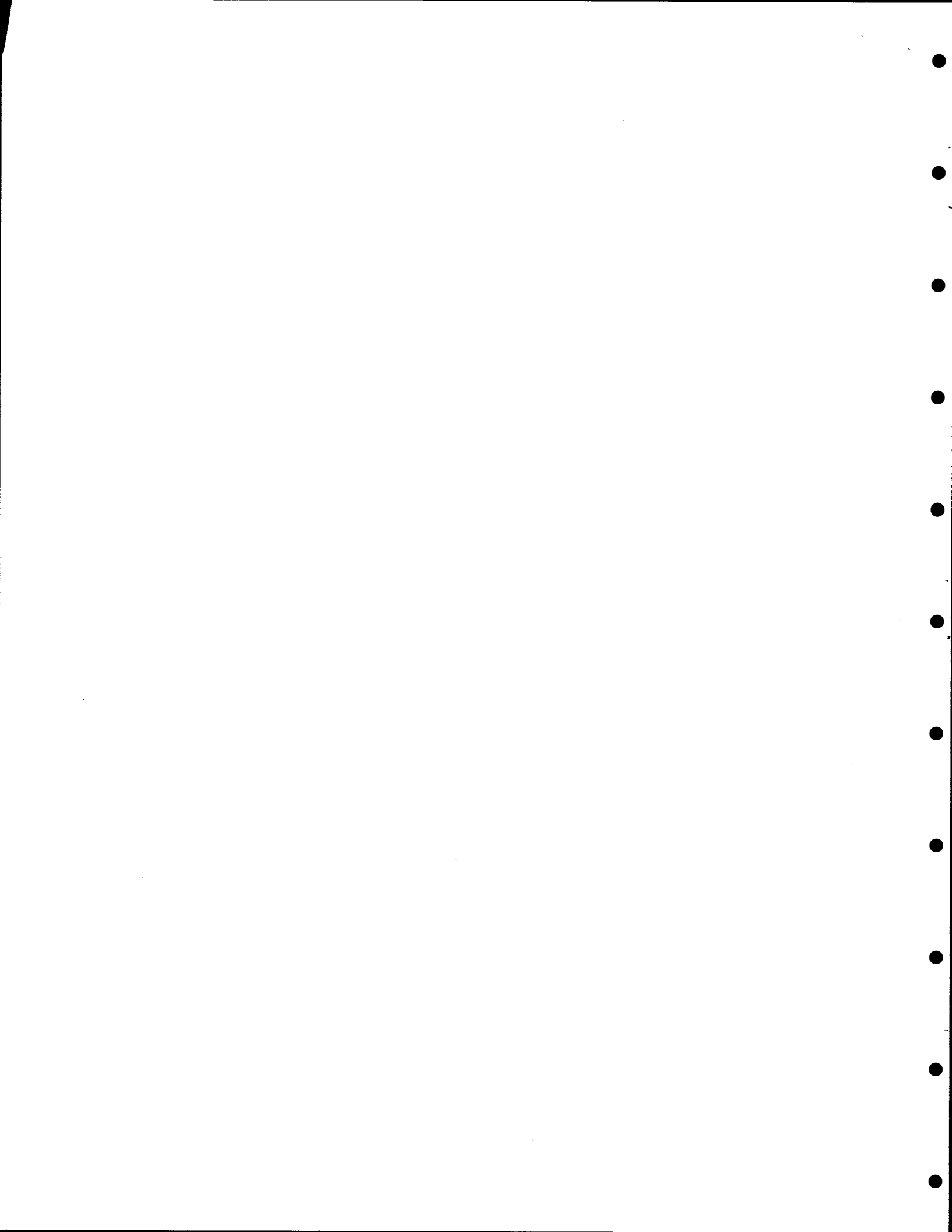
Historic Archeologic

Historic and archeologic resource areas are included in this category since they include unique sites which are associated with our history, tradition, and cultural heritage. Sites listed in the National Register of Historic Places, up to and including December 1978 were identified and analyzed for potential impact for each of the study areas listed in accordance with "National Historic Preservation Act" (Public Law 89-665) and Executive Order 11593. Additionally, archeological review is undertaken on a contract basis for site locations that could be affected by BPA's program activities. (Refer to the Historic and Archeologic Appendix, Section XII, page B-1, of the Program Statement for additional details.)

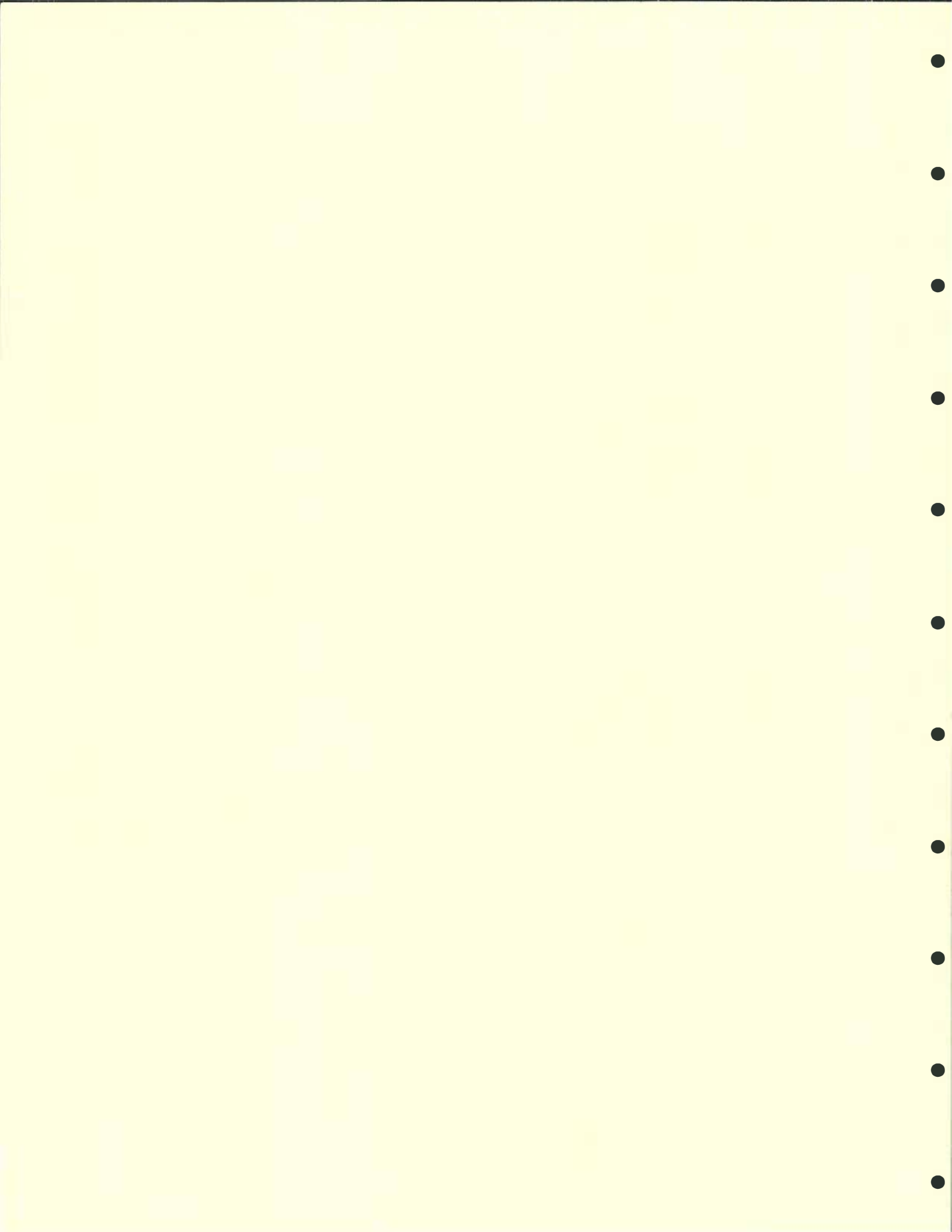
Other Resource Uses and Cultural Resources

Resources included under this category are transportation routes, mining activities or other mineral extraction, nonurban industries, airports, and military and indian reservations.

Also included are properties listed in the National Register of Natural Landmarks, (Federal Register, Vol. 42, No. 2, January 4, 1977).

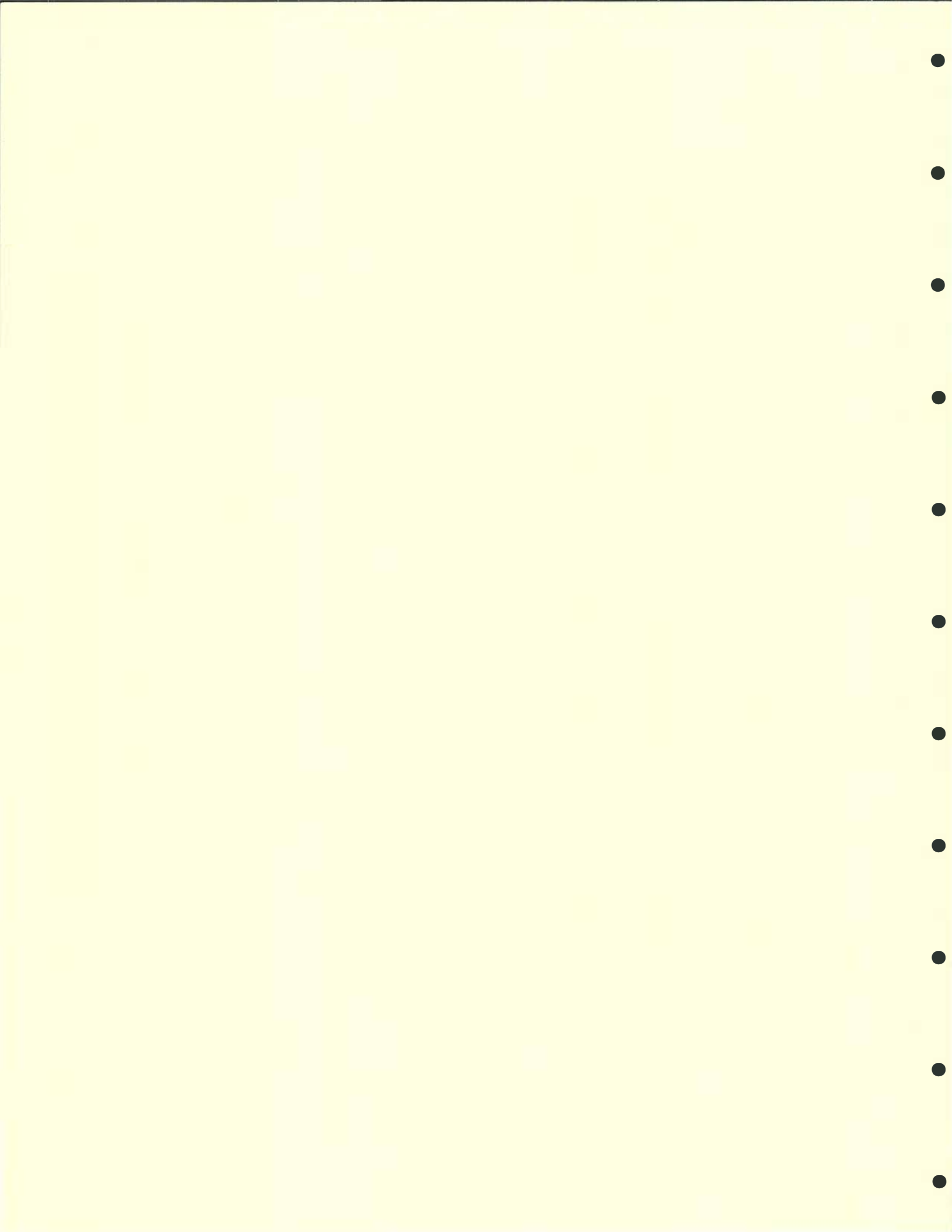


FINAL FACILITY
PLANNING PHASES



SA-80-1 & 2

·Salem-Albany Area Support



FINAL FACILITY PLANNING PHASE

SALEM-ALBANY AREA SUPPORT

STATUS

The Final Facility Planning Phase completes the environmental review process as it pertains to the selection of a Plan of Service to satisfy the identified electrical needs of the Salem-Albany area. As a result of this process, Alternative Plan A was selected as the proposal for the Salem Area. This plan, primarily reconstruction of existing lines, was selected because it is the most economical proposal based on long-term capital investment and reduction in system losses. Reconductoring of the Santiam-Bethel line has been eliminated from this plan and impacts of this reconductoring discussed in the following pages no longer apply.

The plan of service for the Albany Area was deferred based on a change in generation levels at Green Peter and Foster Dams and a decrease in estimated loads in the Salem-Albany area.

A further discussion of these decisions is on page 3 under "Proposed Plan of Service" and "Plan of Service Decision".

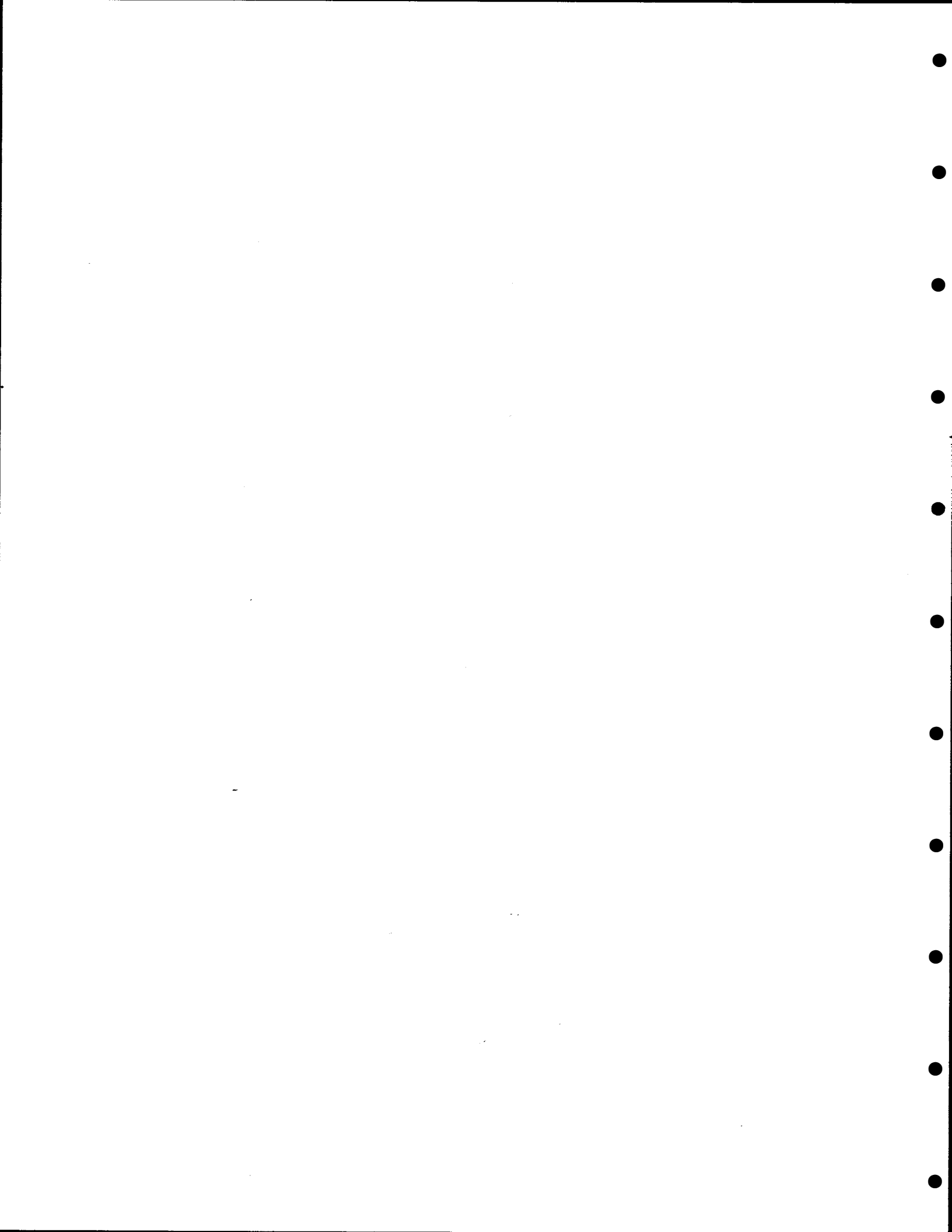
A Draft Facility Planning Supplement was filed with the President's Council on Environmental Quality on September 27, 1978, and made available to the public on that date. A notice of availability was placed in the Federal Register and in the local news media in advance of the public meetings. Public meetings were held at the Brush College Elementary School, Salem, November 14, 1978, and at the Main Public Library, Albany, November 16, 1978. Three hundred notices were mailed to directly affected property owners. Public attendance at Brush College was three and at Albany, seven. Public and agency comments received during the review period which closed on November 24, 1978, were considered prior to selecting a proposed plan.

The following tentative schedule dates for the Salem Area project are:

Salem Area Support (FY '80)

Location Surveys	Fall 1979
Land Acquisition	Spring-Fall 1980
Construction	Winter-Summer 1981
Energization	October 1981

A schedule has not yet been established for the continuation of the Albany Area Project.



FINAL FACILITY PLANNING PHASE

SALEM-ALBANY AREA SUPPORT

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DESCRIPTION OF THE PROPOSAL

The projects presented in this facility supplement reinforce the areas around greater Salem and Albany, Oregon. Although they are two separate projects they are included in one document because of their geographic proximity and because one alternative in each of the projects is dependent upon construction of a single substation. The alternative plans considered are described in detail beginning on page 10. The study area is shown in figure 1. In the material that follows, alternatives for the Salem project will be referred to as "north" alternatives and for Albany project as "south" alternatives.

SYSTEM REQUIREMENTS

The Salem project is to reinforce the area around Salem, Oregon. In addition to the Bonneville Power Administration (BPA), this area is served by Portland General Electric (PGE), Pacific Power and Light (PP&L) and Salem Electric Cooperative (SEC). BPA has two primary substations in the immediate vicinity, Salem Substation and Chemawa Substation. In addition, BPA has two customer service substations, Salem Alumina and Brush College, between Chemawa Substation and Salem Substation.

BPA's loads in the area are fed by 115-kV transmission lines. These are the 10.4-mile (17 km) Chemawa-Salem No. 1 and No. 2 lines, the 23.9-mile (38 km) Salem-Albany No. 1 line and the 27.9-mile (45 km) Salem-Albany No. 2 line. Salem Alumina and Brush College Substations are served from taps to the Chemawa-Salem No. 1 and No. 2 lines.

The Salem project is proposed in the FY 1980 Budget because of two conditions. First, it is needed because one of BPA's 115-kV Chemawa-Salem lines overload upon an outage of the other line under peak load conditions during the winter of 1981-82. In addition, the 230/115-kV, 250 MVA transformer at Chemawa Substation would load to its thermal limit at this time if there were an outage of the 230/115-kV, 250 MVA transformer at Albany Substation. The proposals to reinforce this area must solve the problem in each of the above conditions, as well as accommodate the load growth projected for this area.

The Albany project is concerned with upgrading service to the area in the vicinity of Albany, Oregon. Bonneville Power Administration (BPA), Pacific Power and Light (PP&L), and Consumers Power Inc. (CPI) now serve loads in the area. The only major BPA substation in this vicinity is Albany Substation, fed by the 28.5-mile (46 km) 230-kV Santiam-Albany No. 1 line. The 67.6-mile (108.7 km) 230-kV Santiam-Toledo No. 1 line crosses through the area.

Five 115-kV transmission lines radiate from Albany Substation. These are the 39.8-mile (64 km) Albany-Eugene No. 1 line, the 16.8-mile (27 km) Albany-Lebanon No. 2 line, the 23.9-mile (38 km) Albany-Salem No. 1 line, the 27.9-mile (45 km) Albany-Salem No. 2 line and 42.0-mile (66 km) Albany-Toledo No. 1 line.

*Change
57.8 10 years
price 1*

Salem-Albany Area Support
Study Area 80-1

The Albany project is needed because BPA's 230/115-kV 250 MVA transformer at Albany Substation overloads during an outage of the Pacific Power and Light 230-kV Bethel-Fry line or BPA's Santiam-Bethel Tap section of the Santiam-Chemawa 230-kV line. Alternatives for this project are designed to meet these needs.

DESIGN, CONSTRUCTION, AND OPERATIONAL NEEDS

The various alternatives discussed here involve two basic construction activities: reconductoring or rebuilding. When a transmission line is reconducted the existing towers are utilized but new conductor and insulators are installed. Since heavier, higher capacity conductor is used, some towers will not be able to support the additional weight or provide necessary ground clearances and are replaced as necessary. Construction activity is concentrated at conductor stringing sites near angle structures and at 1 to 3 mile (3-5 km) intervals along straight sections of line.

When a transmission line is rebuilt the existing towers and conductor are removed. Footings are cut off below ground level. The new line is built utilizing the same right-of-way. The same approximate tower sites can be utilized for the new towers if the design parameters of the new line permit. This will not be determined until surveys and sagging have been completed.

In general no additional right-of-way or clearing will be required. Exceptions to this may occur where obtaining adequate conductor clearance may require minimal clearing in some undetermined locations where there are timber and trees outside of BPA's right-of-way. Where the Salem-Albany No. 1 line is on the Burlington Northern railroad right-of-way additional easements may be required depending upon the design used.

In most cases existing BPA access roads or other highways, rural and private roads can be used to gain access to the transmission line right-of-way. Access right will be obtained for private roads. Early estimates of access road requirements are in Table 1.

Table 1. Access Road Requirements

Transmission Line	New Access Road Construction	Access Road Improvements	Existing non-BPA Access Road to Acquire
Salem-Albany #1	1000 ft. (30 m)	1000 ft. (30 m)	7200 ft. (2194 m)
Chemawa-Salem	1500 ft. (45 m)	1500 ft. (45 m)	2000 ft. (60 m)
Santiam-Chemawa	0 ft.	1000 ft. (30 m)	500 ft. (15 m)

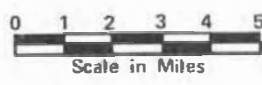
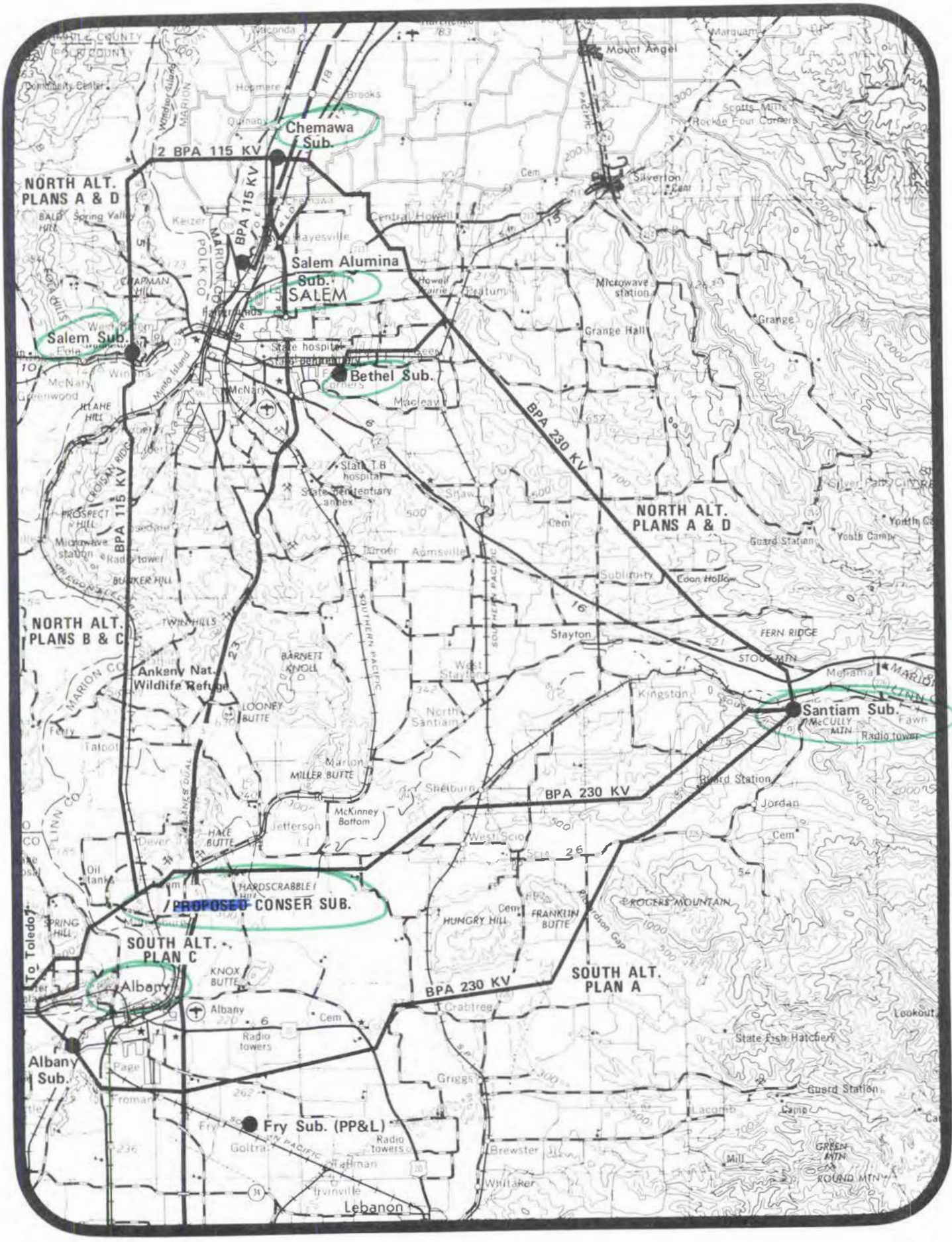
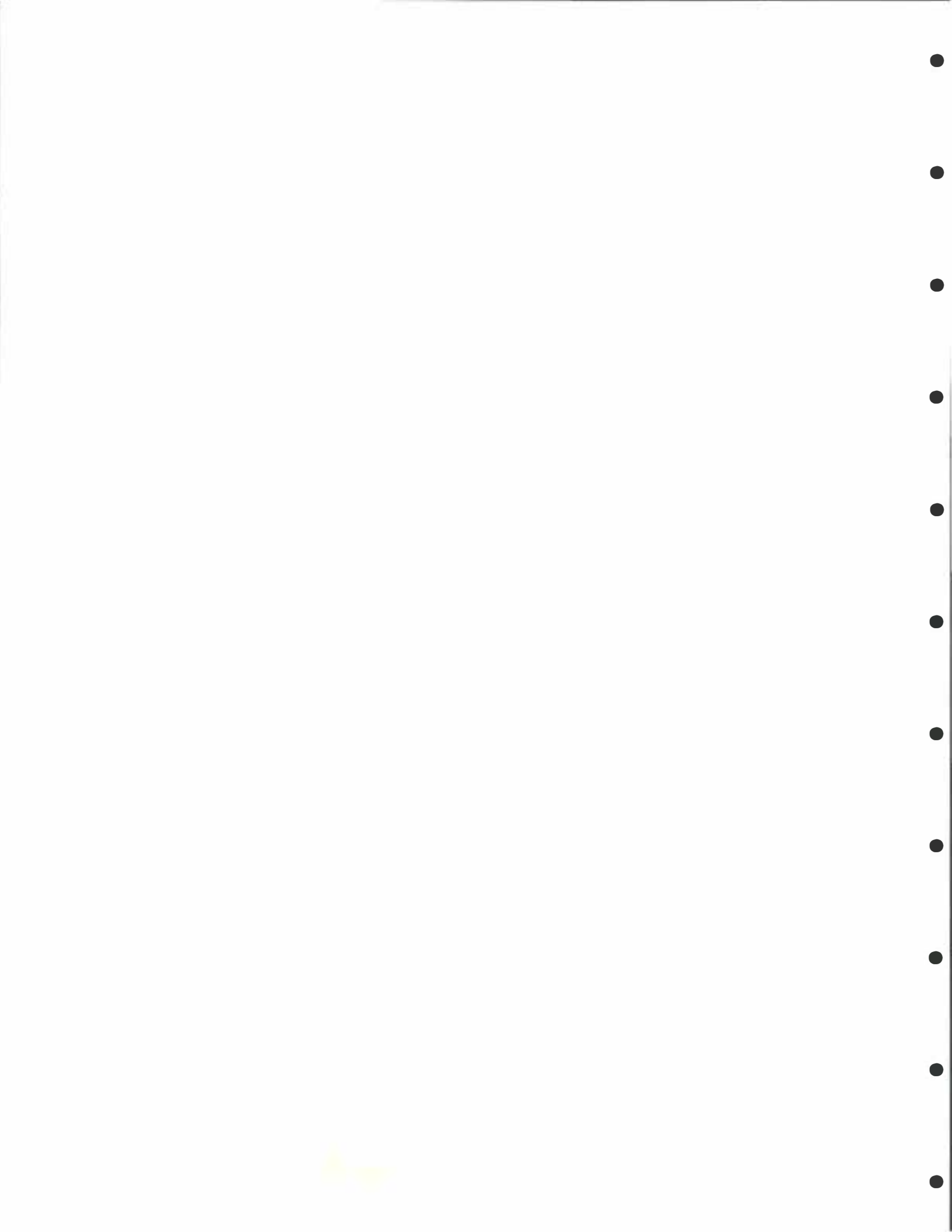


FIGURE 1
STUDY AREA
SALEM/ALBANY AREA SUPPORT



The construction of Conser Substation would require 6 to 12 acres (2.4-4.8 ha) of land. Development at the site would involve the clearing of vegetation, the possible addition of fill material and the fencing of the site. ?

PROPOSED PLAN OF SERVICE

Plan A of the Salem Project is the Proposed Plan. This plan includes removal of one or both of the 11-mile (18 km) 115-kV Chemawa-Salem lines. In its place, a 230-kV double-circuit line, either lattice or single tubular steel pole, or a combination thereof would be constructed. One side would operate at 230-kV, the other would continue as the 115-kV Chemawa-Salem #2 line. A 230/115-kV, 250 MVA transformer would be installed at Salem Substation.

It is not necessary to reconnector the Bethel-Santiam Tap, as indicated in the Draft Facility Planning Supplement, at this time. Hence that part of the original Plan A Alternative has been eliminated.

PLAN OF SERVICE DECISION

Alternative Plan A has been selected as the most economical plan based on long-term capital investment and reduction in system losses. This proposal fits into long-range plans to provide 230-kV support at Salem Substation. A 230/115-kV transformer is best located at Salem Substation because of its proximity to existing loads. In addition, it provides support for both Albany and Chemawa Substations. Selection of Plan A delays large scale future investments longer than Plans B, C, and D.

Environmental analysis of all the corridors indicated that Plan A, though having a low potential for impact, was not the least impact alternative. Plan D, adversely effecting approximately 12 miles of Prime and Unique Farmland and also crossing the Willamette River would be environmentally preferable. The increased impact of Plan A would not preclude its selection as the Proposed Plan. Impacts to Prime and Unique Farmland and the river crossing would be the same as Plan D. The only additional impacts, caused by constructing a double-circuit line, would be experienced to the west and north of Salem, where extensive suburban development is now taking place. A detailed discussion of these specific impacts can be found in the text. Since the increment in impacts between the two plans are based only on the difference between reconnectoring and rebuilding through suburban areas and that Plan D, as discussed in subsequent paragraphs is not the best electrical solution for the area, Plan A is an environmentally acceptable proposal. why?

The three other alternatives of the Salem Project were not selected for various reasons. Part of Alternative Plan B, involving installation of a 230/115-kV transformer at Salem Substation, is also included in the proposed plan of service. The other part is constructing a 17-mile double-circuit line from a tap to the 230-kV Santiam-Toledo line, to Salem Substation. This is not as economical as the 10-mile double-circuit Chemawa-Salem line but will be considered as an alternative for future support to Salem with probable energization in the late-1980's. why?

Alternative Plan C consists of two parts as does the previous alternative. One part is construction of a 17-mile double-circuit line which was discussed in the previous paragraph. The other part consists of constructing a new substation, known as Conser, with a 230/115-kV transformer. This would be constructed by either PP&L or BPA and would be considered as a future alternative with probable energization in the mid-1980's.

The fourth alternative, Alternative Plan D, has three parts as does the proposed plan. With this alternative the 115-kV Chemawa-Salem No. 1 and 2 lines would be reconducted, instead of rebuilt to a higher voltage. This alternative has the least initial capital investment, however it is not the most economical long-term solution. This is only a short-term solution until the mid-1980's. At that time, a 230-kV double-circuit line would be required. The second part of this alternative, locating a 230/115-kV transformer at Chemawa Substation, was not considered at this time because it is not as close as Salem Substation to existing loads. Also this location would not provide support to Albany Substation. This will be considered as a future alternative to be constructed by PGE or BPA with probable energization in the mid-1980's. The third part, reconductoring the 17-mile 230-kV Santiam-Bethel Tap line, has been found to be unnecessary at this time.

There will be no Proposal Plan of service for the Albany Project at this time. The reasons for this include a change in generation levels at Green Peter and Foster Dams and a decrease in PGE's estimated loads in the Salem-Albany area. This project to be constructed by PP&L or BPA will be reconsidered in the future.

DESCRIPTION OF THE ENVIRONMENT

PLANNING STUDY AREA

The project study area includes four main urban areas; Keizer, West Salem, Millersberg, Salem, and Albany. (Refer to fig. 3) In addition, many suburban areas are expanding and may be affected by the alternatives. Almost all of these areas are adjacent to the urban developments. The eastern portion of the study area is predominantly rural farm land with the communities of Lyons, Stayton, and Scio acting as service centers.

Six existing substations are within the study area; Chemawa, Salem, Albany, Brush College, Bethel (PGE), Murder Creek (PP&L), Hazelwood (PP&L), Fry (PP&L), and Santiam. In addition, Salem Alumina substation is nearby and would be indirectly affected by construction of any of the alternatives. Four transmission corridors are included in the study area; the Chemawa-Salem, Salem-Albany No. 1, Santiam-Albany No. 1, and Santiam-Chemawa corridors (fig. 1).

Geography

The Salem and Albany Area Support projects are in the Willamette Valley of Oregon. The alternatives for these projects are located between Albany in the south, Keizer in the north, and Lyons in the east. Since all alternatives determined to be feasible parallel existing corridors, the width of the project study area can be limited to approximately 1/2 mile (.8 km). Another

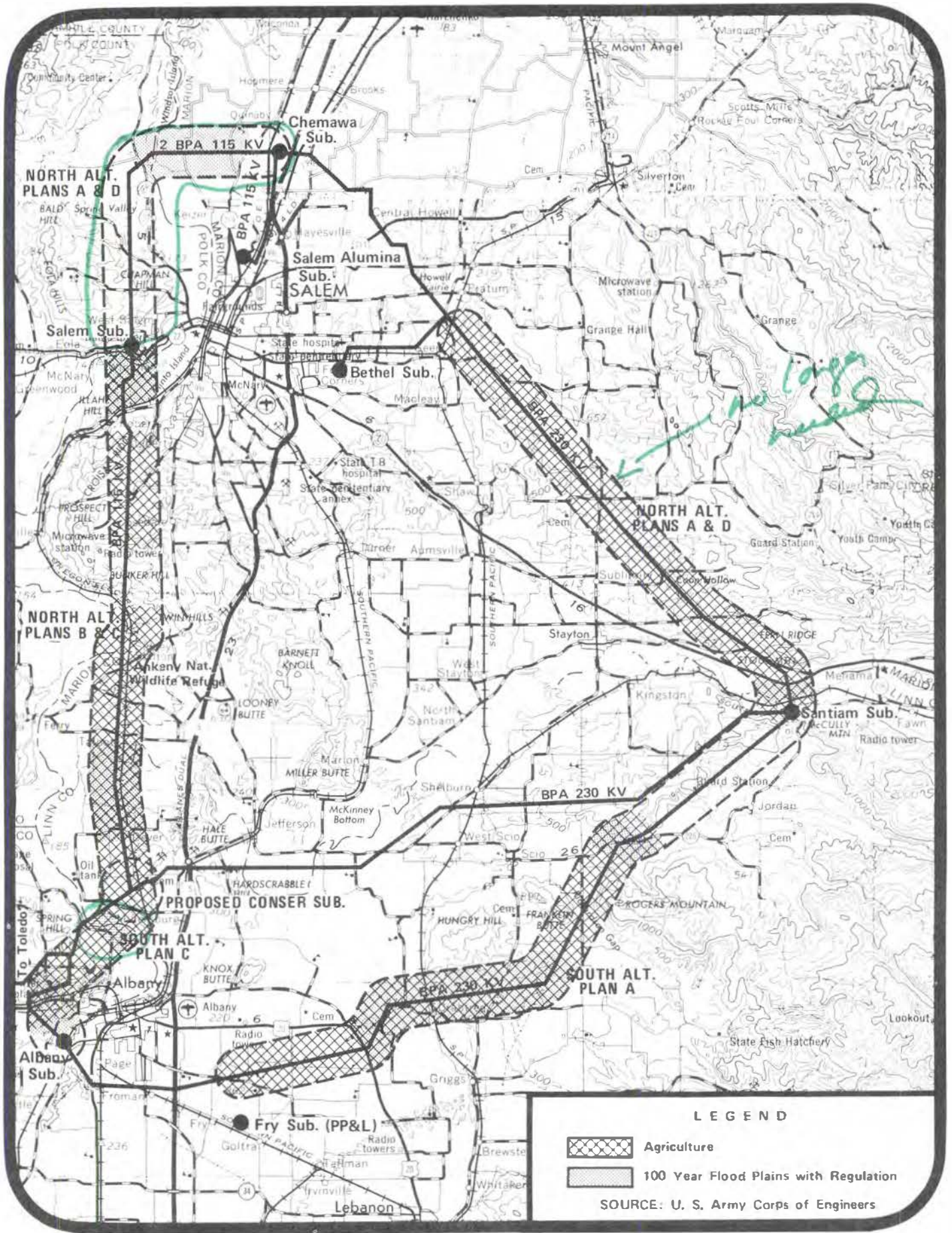
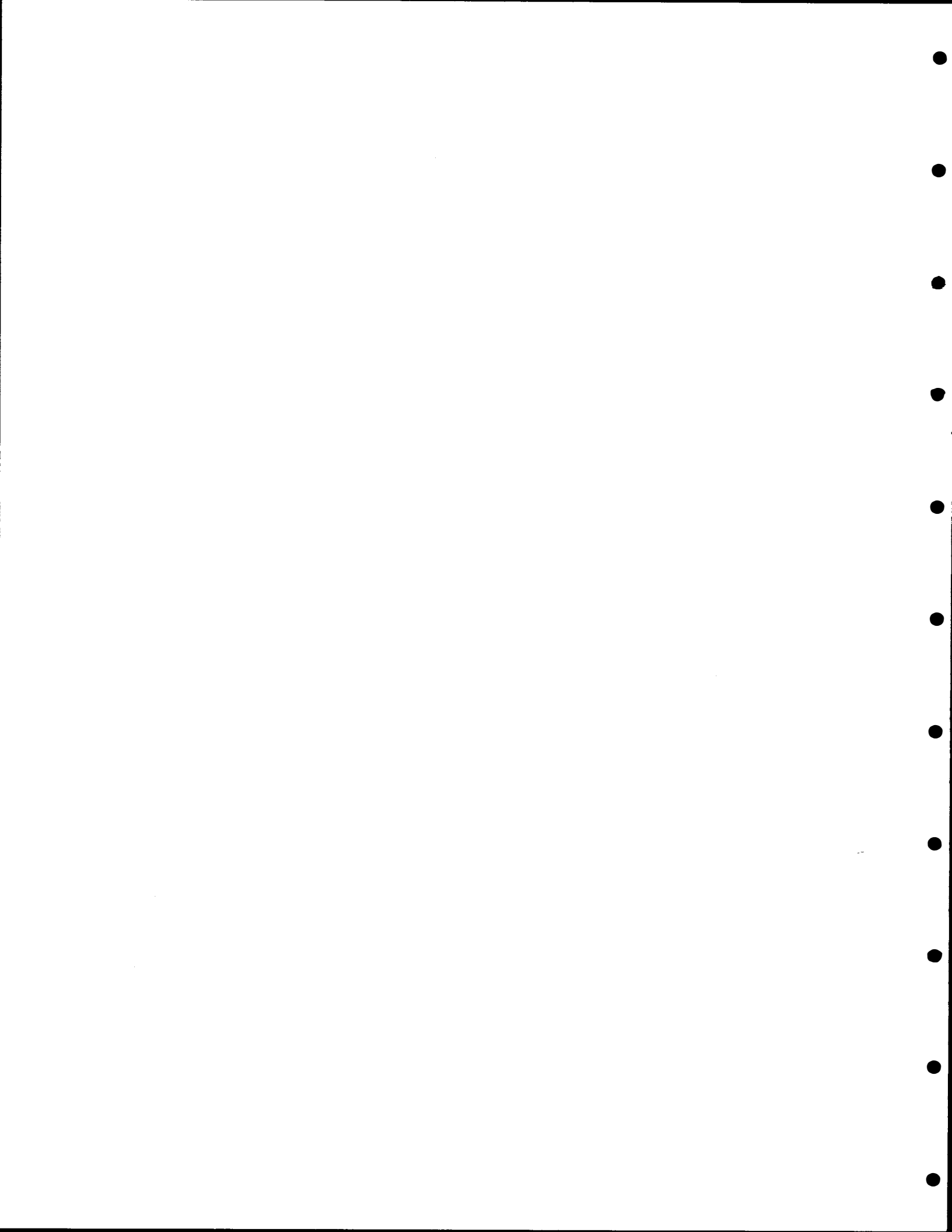
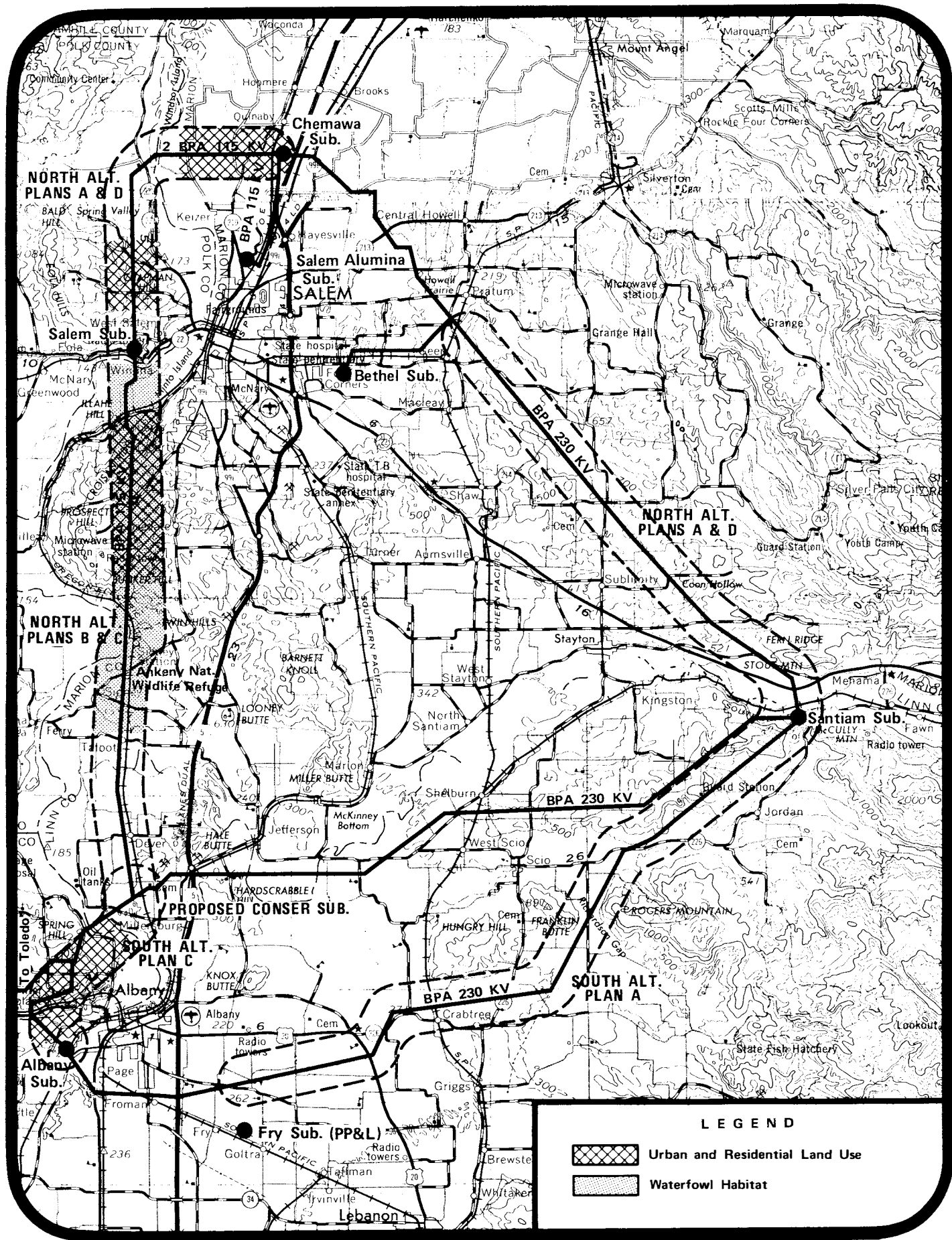




FIGURE 2
RESOURCE MAP
SALEM/ALBANY AREA SUPPORT





LEGEND

-  Urban and Residential Land Use
-  Waterfowl Habitat

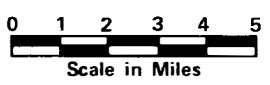
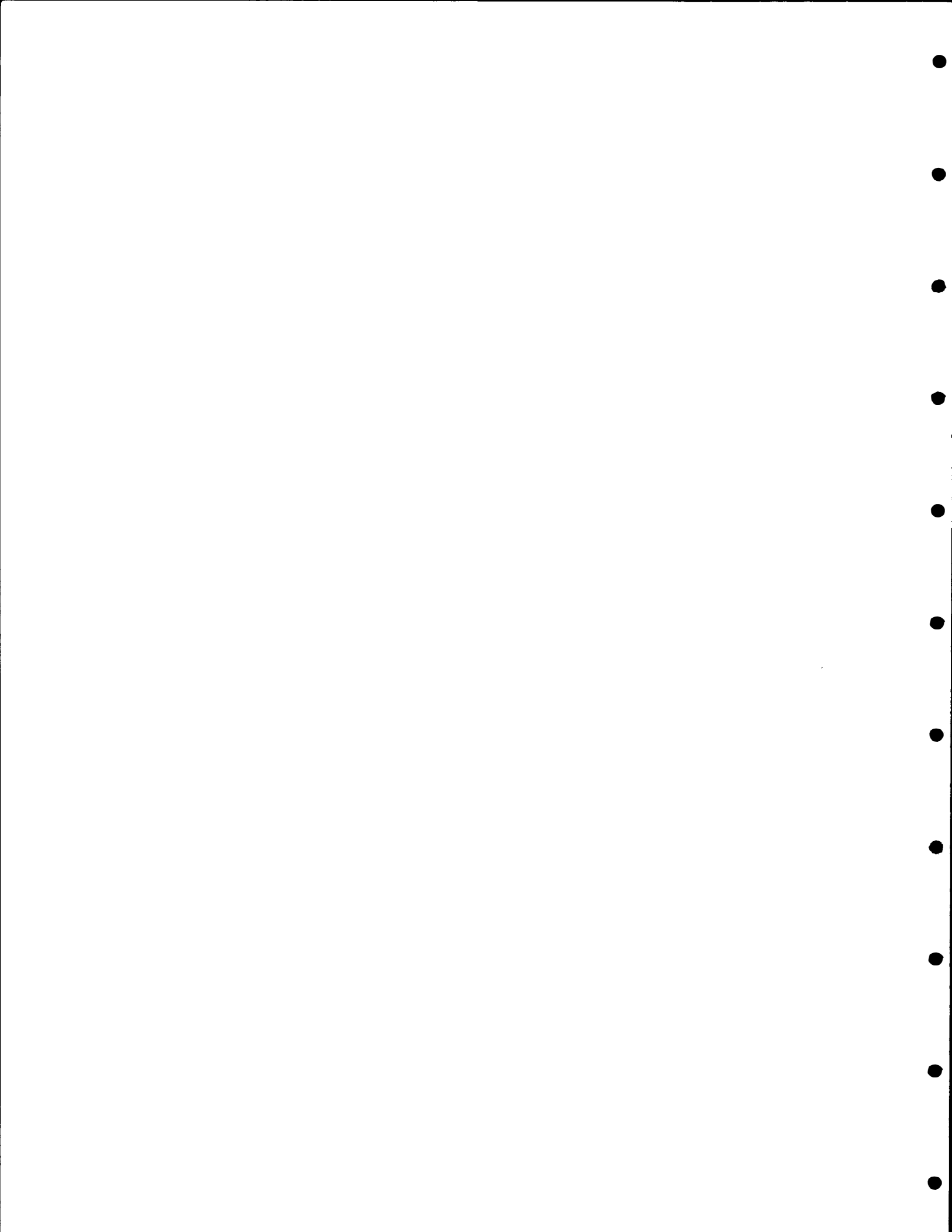
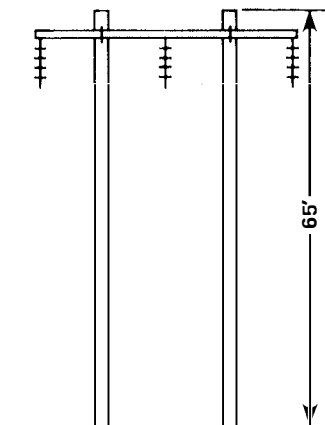


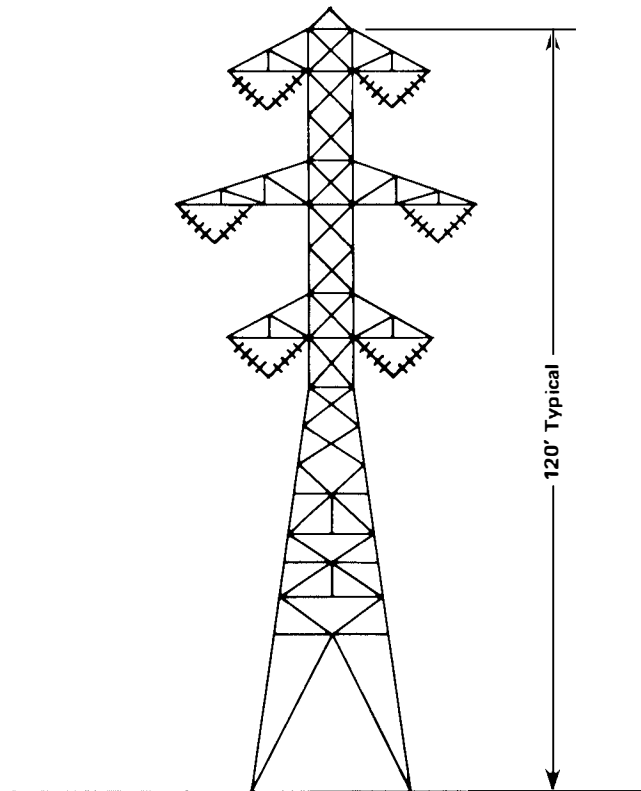
FIGURE 3
RESOURCE MAP
SALEM/ALBANY AREA SUPPORT



230 KV H-FRAME WOOD POLE



230 KV DOUBLE CIRCUIT TOWER



230 KV TUBULAR STEEL POLE

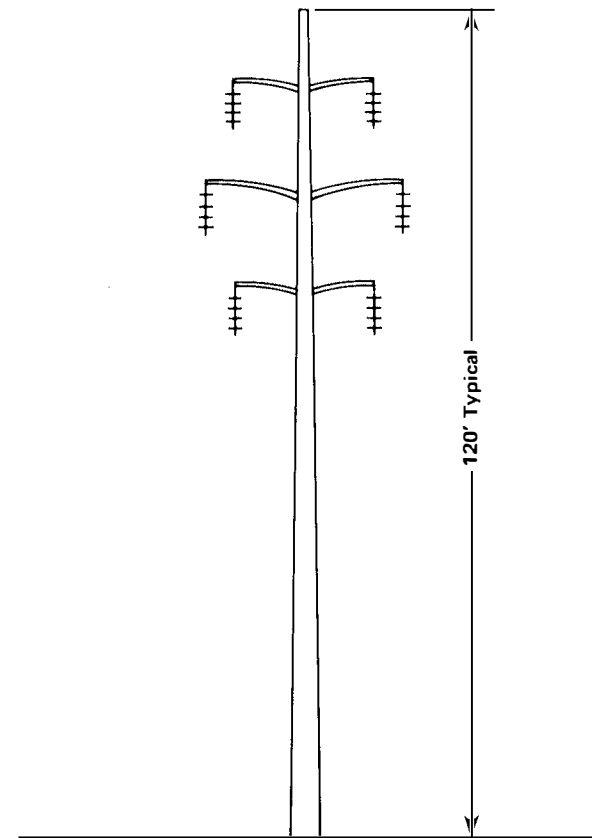
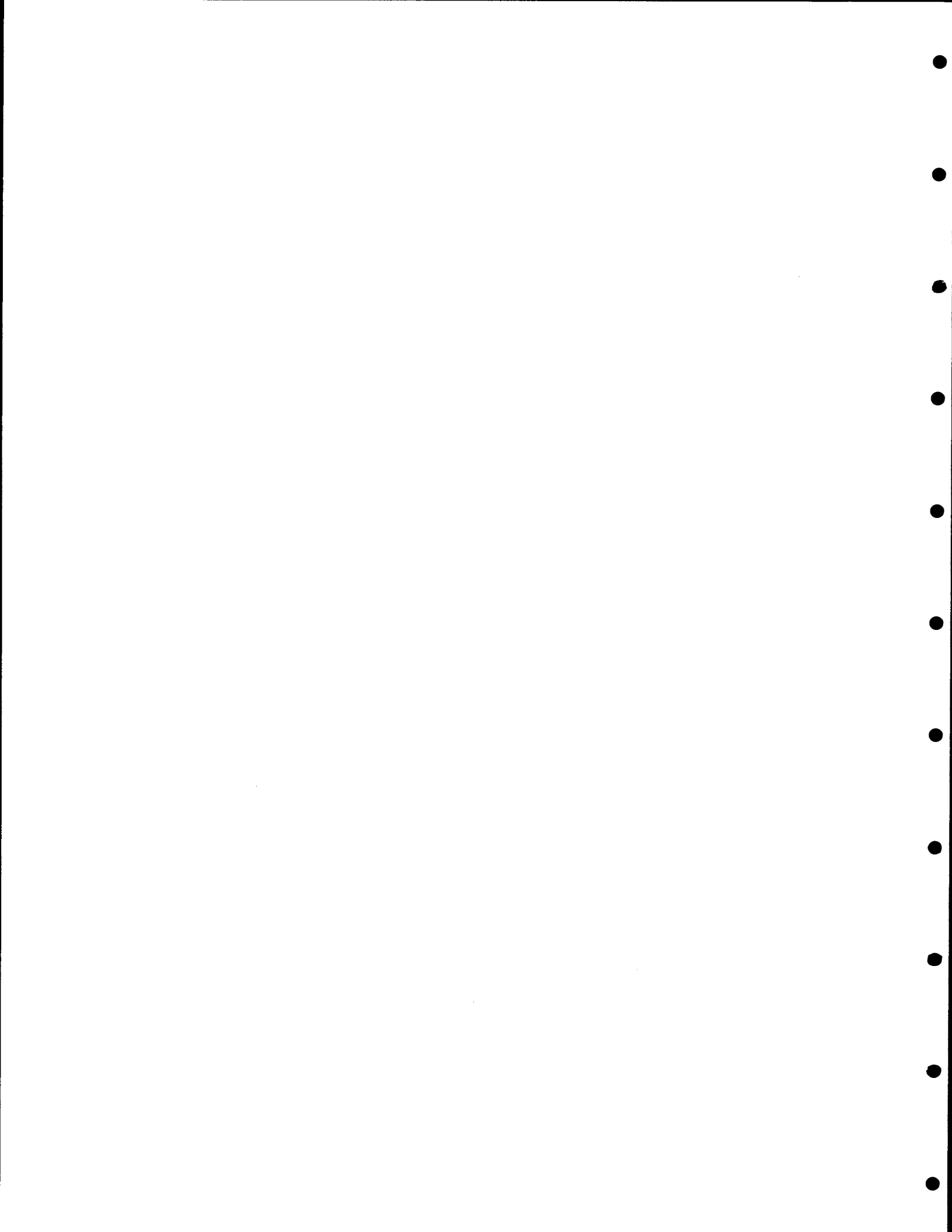


FIGURE 4
STRUCTURE DESIGN
SALEM/ALBANY AREA SUPPORT



is the consideration of possibly reconductoring the Santiam-Bethel tap portion of the 230-kV Santiam-Chemawa line, which is also in the study area. This line lies on the edge of the Cascade foothills. This tap line is approximately 18 miles long.

NATURAL RESOURCES

Geology, Soils, and Minerals

This study area encompasses three physiographic provinces.^{1/} The Willamette Valley Province includes the nearly level valley floor and adjacent terraces. Soils 40 to 60+ inches (100-150 cm) deep are underlain by unconsolidated to semi-consolidated gravel sand and silt deposits up to several hundred feet thick.

Adjacent to the river channels gravels predominate. Soil textures range from silty loams to clay loams on the valley floor and terraces. The potential for soil erosion on this nearly level topography is low. Seasonally, there are water ponds in areas with poor surface drainage. Occasional flooding adjacent to the Willamette and Santiam Rivers is the major geologic hazard in this province. The existing right-of-way locations are such that flooding and potential stream channel changes would not damage our structures.

The Low Relief Hills Province occurs near Salem and Albany. In the Salem-Eola Hills elevations vary from 200 to 800 feet (61-244 m), while slopes range from 5 to 30 percent. Soil textures in this area range from loams to silty clays and are 20 to 40 inches (50-100 cm) deep. Two geologic groups occur in these hills. Oligocene tuffaceous sedimentary rocks are overlain by Columbia River Basalt. At exposed contacts, the sedimentary group weathers faster than the basalt, removing its support. Due to this weathering, portions of these hills are susceptible to landsliding. In the geologic past several massive areas have slid towards the Willamette River. Evidence of present day movement is noticeable along Highway 12 between Monmouth and Salem.

Spring Hill, northwest of Albany, is also in the Low Relief Hills Province. This area is underlain by tuffaceous sandstone that regionally dips 120 to the east. Soils in this area range from loams to silty clay loams, and have a moderate to high potential for water erosion.

The other province in this study area is the Lower Foothills of the Cascade Range. These foothills are underlain by pyroclastic and flow lava of the Little Butte Formation, and are capped by Columbia River Basalt. At exposed contacts between these formations, large landslides have occurred in the geologic past. Two such areas are crossed by the existing 230-kV Santiam-Albany No. 1 line. In recent geologic time, these landslides and adjacent areas have been stable. Soil depths in this area range from inches to several feet, while soil textures range from loams to clay loams. A low to moderate potential for water erosion exists in this province.

^{1/} Preliminary Geologic Reports, Salem and Albany, contain detailed geologic descriptions, maps, and tables.

Salem-Albany Area Support
Study Area 80-1

Although gravel extraction is prevalent throughout the study area, the alternate plans do not cross any active quarries.

Seismic activity has been low in this area. The few earthquakes that have occurred have had magnitudes less than 3.7 on the Richter Scale. Intensities from earthquakes of this magnitude should not impact the transmission facilities.

Hydrology

Generally, streams in the area are moderate flowing and in some cases, such as the South Santiam, may flow in a continuously changing pattern of oxbows, sharp bends, and old river channels. All surface water elements are in some way tributary to the Willamette River. There are no major reservoirs in the area.

Table 2. Major Streams and Discharges

<u>Stream</u>	<u>Gaging Station</u>	<u>in C.F.S....(cubic meters/sec.)</u>	
Willamette R.	Salem	23,370	(661)
Willamette R.	Albany	14,111	(399)
Rudding R.	Mt. Angel	711	(20)
Santiam R.	Jefferson	7,754	(219)
N. Santiam R.	Mehama	3,328	(94)
S. Santiam R.	Waterloo	2,856	(81)

Source: PNW River Basins Commission, 1970. C-NP Comprehensive Framework Study.

Generally, discharges reach a maximum during the months of November, December, and January, and gradually decrease until the July-September period. This varies for specific streams depending upon stream lengths as well as size and physical nature of individual watersheds. Between September and November, discharges rapidly increase to near maximum again.

Wetlands

Preliminary field and aerial photography investigations have been made and some wetland areas have been identified. Primarily, existing lines cross moderate and small sized marshes associated with low lying areas adjacent to the Willamette River and many small perennial streams east of Albany. The U.S. Fish & Wildlife Service is in the process of identifying wetland areas

Salem-Albany Area Support
Study Area 80-1

for portions of the Willamette Valley. As they are identified, BPA will work with Fish & Wildlife in determining the extent of BPA facilities in wetlands.

Floodplains

This entire area has a history of flooding. Numerous studies of flood prone areas have been conducted. Areas subject to a 100-year flood are shown in figure 2. The annual flood season is from October through April, with the majority of larger floods occurring in December and January. Floods are normally widespread rather than limited to a few streams and are caused primarily by periods of intensive rainfall from winter storms. At least ten major floods have occurred between 1927 and 1964.

The Willamette River is open to commercial navigation at both Salem and Albany. Existing BPA lines cross the Willamette at both locations.

Vegetation

Much of the natural vegetation of the area has been disturbed by farming operations and housing. The remaining portion can be divided into three general areas: riparian vegetation occurring along the waterways and in very moist areas; oak fir woodlands located mainly in the hill regions north and south of Salem; and early successional species of willow and alder occurring within and adjacent to the remaining right-of-way (ROW). Minor amounts of natural vegetation along the Santiam-Bethel line are mainly an alder-maple-fir complex indicative of the foothills around the Marion area which trend into the Cascades.

Some marshy areas are located near the southern terminals of the study area. These are in or adjacent to the Ankeny National Wildlife Refuge.

Wildlife

The Willamette River within the study area provides important spawning and rearing habitat for anadromous fish, especially fall chinook. Fall chinook spawn upstream, from Salem. The floodplains adjacent to the river also furnish important waterfowl habitat. High concentrations of waterfowl winter on the Ankeny National Wildlife Refuge and adjacent agricultural land between November 1 and April 15. Canada geese and dusky Canada geese winter in the Willamette Valley and along the lower Columbia River. Grebes, herons, hawks, vultures, quail, band-tailed pigeons, shorebirds, woodpeckers, and a variety of song birds are found within the study area. In 1978 an osprey nested on a cross-arm of the existing 115-kV Salem-Albany No. 1 line west of the refuge.

Black-tailed deer, red fox, and species of reptiles and amphibians inhabit the area.

The American peregrine falcon, federally classified as endangered, may occur within the study area. The northern Bald Eagle, federally classified as threatened in Oregon by the U.S. Fish & Wildlife Service (Federal Register, February 14, 1978), does occasionally occupy the area. or

RESOURCE USE AND SOCIOECONOMIC RESOURCES

Socioeconomic Characteristics

Socioeconomic characteristics vary in the vicinity of both projects. Urban population growth between 1960 and 1970 outdistanced county growth. Albany grew by 40.7 percent which accounted for 40 percent of Linn County's population growth. Population in the south and north areas of Salem grew at 111.0 percent and 115.7 percent, while populations in and around West Salem grew by 36.9 percent. West Salem grew rapidly during the 1960's, but has slowed considerably because growth led to traffic congestion on the two narrow bridges across the Willamette River, the only links between east and west Salem. This coupled with rising taxes and building costs associated with the steeper terrain of West Salem has recently tended to discourage residential construction and growth. Comparable housing is less expensive in east and south Salem.

Between 1960 and 1970, county populations grew by 22.2 percent in Linn County, 25.2 percent in Marion County and 33.3 percent in Polk County. County growth figures compared to city of Salem figures indicate urban growth has occurred at the expense of the rural population. Increases in rural populations were generally due to increases in on-farm residents who commute to jobs in the city. Population growth and densities increase from low near Dever (southern part of the area) to high near Salem, especially south and north of Salem. These trends are expected to continue, but at a slower pace. Future zoning will discourage conversion of agricultural land to urban use, but will encourage higher urban densities where services can most easily be provided for less cost.

Land Use

Agriculture

In general the existing transmission lines cross areas designated as Prime and Unique Farmland by the Soil Conservation Service. Land classified as unique is that used for special crops such as mint, cherry orchards, nut groves, and grass seeds. Prime farmlands are level class I & II soils. Crops grown on prime farmland include small grains, vegetables, and seed crops. About 90 percent of the study area is agricultural. About 70% of the land is designated as prime or unique farmland.

Urban and Residential

The dominant land use in the study area is agriculture. In the north study area along the existing line in the vicinity of the Salem Hills and between the Willamette River and Brush College road much of this agricultural land is being converted to residential land use (Fig. 3). The Marion County Comprehensive Plan and a planning map prepared by the Mid-Willamette Valley Council of Governments have designated an Urban Growth Boundary including the area between where the existing lines cross Skyline Road on the south and Brush College Road on the north. This boundary also includes the portion of the Chemawa-Salem lines between Chemawa Substation and the Willamette River. Eventually the land within this boundary will be completely urbanized.

Salem-Albany Area Support
Study Area 80-1

In the south study area the Salem-Albany No. 1 line passes through a small portion of Benton County which is under intensive residential development. Much of the right-of-way is adjacent to residences and in some cases is being used as extensions of the residential property for gardens, play areas, and other related uses. The same pattern is also evident west of Albany.

Along the Santiam-Albany No. 1 right-of-way there are no concentrations of urbanized land. Land use consists largely of agriculture and timber with scattered rural residences

Esthetics

The study area is largely within three identifiable landscape types. The Salem Hills southwest of Salem and the Eola Hills west of Salem are hilly fields and orchards and interspersed with small areas of forest cover. The hills offer many highly scenic vistas and in some areas provide expansive views of the Willamette Valley and the Coast and Cascade Mountain Ranges. Because of their scenic quality the hills are highly favored as homesites. South of the Salem Hills and north and east of the Eola Hills the lines are in nearly flat land on the floor of the Willamette Valley. This land is also quite scenic with its broad expanses of grassland and fields backdropped by hills. While highly scenic, its visual character contrasts strongly with the hill areas. Within this area are a few small areas adjacent to the Willamette River where riparian vegetation has significantly reduced the scale of the valley floor landscape and provides some strong visual contrast with nearby areas. The west portion of the Santiam-Albany line passes through a similar landscape. Along the Santiam-Bethel line the landscape is similar to the Salem Hills but the terrain is not as hilly and has a more "open" character. Significant changes in visual character are occurring in the Salem and Eola Hills where many areas of highly scenic rolling hills are undergoing residential development. This pattern is expected to continue and is reflected in local comprehensive planning documents. In time, the visual character of the hills may change from rolling fields and forest to suburban residential development.

The eastern portion of the Santiam-Albany line passes through some hilly areas which are also similar in character to the Salem Hills. Near Richardson Gap where the hilly areas begin there is a strong contrast between the flat valley floor and the hills with resulting high visual quality.

Recreation

Three designated recreation areas are situated on or adjacent to the existing rights-of-way. Near the south end of the Salem-Albany No. 1 line the Ankeny National Wildlife Refuge provides areas for hunting, wildlife observation, photography, and related activities. Near the north end of the same line there is a bicycle path which for less than a mile is parallel to the right-of-way. It is not on the right-of-way but is a short distance away in a wooded area. Spongs Landing Park is situated where the Chemawa-Salem lines

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cross the Willamette River. This county park, which is close to Keizer, includes a small playground, picnic facilities, and open areas for other related recreational activities. With its proximity to populated areas, the entire study area is likely to be used for recreational activities such as driving, bicycling, and picnicking.

Historical and Archeological

A review of the Federal Register has revealed several sites in the Salem-Albany region which are listed on the National Register of Historic Places. The majority of these sites are homes and buildings within the urban area that would not be affected by line construction. Contact has also been made with the Oregon State Historic Preservation Office (SHPO) to determine whether any new sites have been nominated for inclusion in the register. The SHPO has indicated there are no known historical or archeological sites within the study area which have not been listed in the February 1978 Register and its subsequent addenda. In addition to contacting the SHPO for current information regarding archeological and historical sites, BPA will contract for an archeological/historical survey to be conducted along the selected transmission line corridor and at the substation site in an attempt to locate, prior to construction, any possible sites which might be affected by construction activities.

S A L E M P R O J E C T

A L T E R N A T I V E S C O N S I D E R E D

ALTERNATIVE PLAN A (PROPOSED)

This alternative includes removal of one of the 11-mile (18 km) 115-kV Chemawa-Salem lines. In its place, a 230-kV double-circuit line, either lattice or single tubular steel pole, would be constructed. One side would operate at 230-kV, the other would continue as the 115-kV Chemawa-Salem #2 line. A 230/115-kV, 250 MVA transformer would be installed at Salem Substation. The Santiam to Bethel Tap portion of the 230-kV Santiam-Chemawa line would be reconductored. 230-kV terminal additions, along with power system control and protective equipment would be needed at Salem and Chemawa Substations.

ALTERNATIVE PLAN B

This alternative is similar to Alternative Plan A in that a 230/115-kV, 250 MVA transformer would be installed at Salem Substation. This alternative includes removing a 17-mile (27 km) northern section of the 115-kV Salem-Albany No. 1 line and constructing a 230-kV double-circuit line either lattice or single tubular steel pole, utilizing this right-of-way. It may be necessary to rebuild small portions of the line on new right-of-way if unforeseen problems are found with the existing right-of-way. As with Alternative Plan A, one side would be operated at 230-kV, while the other side

would continue as the 115-kV Salem-Albany No. 1 line. The 230-kV side of the double-circuit line would be operated as a Salem Tap to the 230-kV Santiam-Toledo line. 230-kV terminal additions, as well as power system control and protective equipment, would be required at Salem Substation.

ALTERNATIVE PLAN C

As in Alternative Plan B, this alternative would include removing the 17-mile (27 km) section of the 115-kV Salem-Albany No. 1 line. This right-of-way or short length of new right-of-way would be used for a double-circuit line, either 115-kV or 230-kV construction. Initial operation would be at 115-kV. In the vicinity of the intersection of the 230-kV Santiam-Toledo No. 1 line with the 115-kV Salem-Albany No. 1 line, a new substation, tentatively called Conser, would be constructed. It would consist of a 230/115-kV, 250 MVA transformer with 115-kV terminals and power system control and protective equipment. A 115-kV terminal would also be added at Salem Substation.

ALTERNATIVE PLAN D

This alternative would place a second 230/115-kV, 250 MVA transformer at Chemawa Substation. A second part of this alternative would be to reconductor the 11 mile (18 km) 115-kV Chemawa-Salem No. 1 and 2 lines. They would operate at 115-kV. As with Alternative Plan A, the Santiam-Bethel Tap section of the 230-kV Santiam-Chemawa line would be reconducted. 230-kV terminal additions would be necessary at Chemawa Substation, along with 115-kV terminal and power system control and protective equipment at Chemawa and Salem Substations.

OTHER ALTERNATIVES CONSIDERED

Another alternative to those discussed would involve removal of all or part of the 115-kV Salem-Albany No. 2 line. On this right-of-way, a 230-kV single or double-circuit line would be constructed. This alternative is not considered feasible at this time because of three reasons. This line is longer in length than the No. 1 line, it is the only power source for Adair and Monmouth Substations, and its intersection with the 230-kV Santiam-Toledo No. 1 line is further from the load center in the Albany area.

An option to installing 230/115-kV transformation at Salem Substation would be to construct a new substation south of Salem Substation, along the 115-kV Salem-Albany No. 1 line. This is not being considered in detail because of its proximity to Salem Substation and the cost of a new substation, including feeders to serve the load.

A design option which could be utilized for Alternatives B and C on the Ankeny National Wildlife Refuge is to build a 230-kV wood-pole line parallel to the existing Salem-Albany No. 1 line. Such a proposal requires additional right-of-way. The new structures in or adjacent to the wildlife refuge would be generally 5 ft. higher than the existing line. The height of the present

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line is about the same as the adjacent trees. If taller steel towers would be built there would be an increased chance of bird collisions with the new line. This proposal would reduce the chance of such collisions and is discussed further in the wildlife discussions.

NONCONSTRUCTION

During the winter of 1981-82, an overload will occur on one of the 115-kV Chemawa-Salem lines for an outage of the other line under peak load conditions. Besides this, the 230-kV, 250 MVA transformer at Chemawa Substation reaches its thermal limit for an outage of the 230/115-kV, 250 MVA transformer at Albany Substation during this same time. If an outage were to occur under these conditions on one of the 115-kV Chemawa-Salem lines, BPA reliability criteria could not be satisfied. As a result, BPA would have to curtail load in this area.

P L A N O F S E R V I C E A N A L Y S I S

POTENTIAL IMPACTS OF THE ROUTES AND THEIR MITIGATION

Natural Resources

Atmosphere

Plans A (Proposed), B, C, D - Impacts will be minor and short-term during the construction period. Emissions will be in the form of vehicle and equipment exhaust emissions, dust particles and the burning of slash. Principal emissions will include oxides of nitrogen and sulfur dioxide from exhaust, and water vapor, particles, hydrocarbons, carbon monoxide, and carbon dioxide from burning. Ambient air quality standards would be affected slightly if any slash is burned. Noise levels will be increased by heavy equipment in the immediate construction area for the duration of the line building period.

In addition, the air quality may be diminished for short periods during vegetation control. This may result from herbicides being sprayed. This impact would be short-term and limited to the immediate area.

Geology, Soils, and Minerals

Plan A (Proposed) - The removal of old structures and installation of new towers would disturb the soil surface, but should not alter the geologic processes in the area. In the Willamette Valley Province minor soil erosion could occur. Equipment operation along temporary access could compact the soil. If detrimental compaction should occur, mitigation measures would be implemented once construction has been completed. In the Salem-Eola Hills Province, the soils have a moderate to high erosion potential. Disturbance of stabilized access road surfaces, and at tower sites, could accelerate soil erosion. If construction occurs during the dryer summer months, erosion prevention measures would be implemented once the project is completed.

However, if construction occurs during the wet season, stabilization and sediment containment measures would be implemented during construction to minimize erosion impacts.

This plan also includes reconductoring a portion of the Santiam-Chemawa 230-kV line. The Cascade footslopes in this area are similar to the Salem-Eola Hills. Reconductoring impacts would be similar to those described above.

Plan B - Soil disturbances would be the same as those described under Plan A - Salem-Eola Hills. This plan crosses approximately 2 miles (3 km) of mass movement topography. The removal of old towers and installation of new structures should not impact the geological processes in this area unless exceptionally large cuts are made. Due to the historic instability of this area and noticeable active movement on the western slopes of these hills, there is a remote possibility landslide movement could damage BPA structures. A detailed geologic investigation is recommended on the mass movement terrain before any major construction occurs. Elsewhere in these hills construction activity would not alter the geologic processes.

Plan C - This plan is the same as Plan B with the addition of a substation near the southern portion of the line. Soil and geologic disturbances would be the same as Plan B. The potential substation sites are located out of the 100-year floodplain. Construction of the substation could alter the soil characteristics. This is dependent on the type of surface covering material used.

Plan D - This plan includes reconductoring of two existing lines. Impacts would be similar to Plan A.

Hydrology

General impact considerations having to do with stream temperature, herbicides, wetlands, and floodplains are presented here and are discussed in the plan specific narratives as needed. Wetland considerations are also addressed in the Wildlife section. Additional reference may be made to BPA's Role EIS, App. B, Sec. VII. Stream temperatures are influenced by riparian vegetation providing shade. For this project, all plans require little major tree removal. Increases in stream temperature will likely be highly localized and will probably only be an influence where the rights-of-way cross small, slow-moving streams. Herbicides are occasionally used at substation and some right-of-way areas. Studies have indicated that with careful selective application, non-target areas are not usually affected; herbicides used usually decompose rapidly and present minimal chance of affecting adjacent areas (Role EIS, App. B, Sec. VII).

Floodplains

Plans A (Proposed) B,C,D - All four alternative plans involve some construction within the 100-year floodplain; practicable alternatives outside

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of the floodplain have not been identified. Each of the alternatives involve construction activities largely within existing corridors. Land use within the floodplain would not be significantly changed by implementing any of these alternatives. Transmission line structures would not alter the hydrologic characteristics of the floodplain, and flood waters would not damage the transmission line structures.

The Willamette River is open to commercial navigation in this area. Since plans B and C would remove an existing line and install a new line at the same point, no impacts to navigation would occur.

Installation of new towers and reconductoring would locally disturb the soil surface. Some minor erosion could occur that would transport small amounts of sediment into streams. This could be expected primarily in the Cascade foothills and near Salem. These impacts would be short-term and would cease once construction is complete. For mitigation measures refer to BPA's Role Statement App. B, Sec. VIII.

Wetlands

With regard to wetlands, all alternatives have the potential for involving small marshy areas where the existing transmission lines cross small slow-moving tributary streams. Only preliminary photo interpretations have been made. Contact with the U.S. Fish and Wildlife Service has been made and they have indicated the presence of wetland habitat in and near the Ankeny National Wildlife Refuge. The existing Salem-Albany No. 1 line parallels a railroad in this area. As both Plans B & C involve replacing the existing line with another one, impacts to wetlands may primarily consist of short-term disturbances of vegetation at new tower sites. As planning for this project continues, field investigation will be made to determine the extent to which plans actually involve specific wetland areas.

Vegetation

Plans A (Proposed) B,C,D - The construction of any of the alternatives would require the removal of only a small amount of vegetation such as an occasional tree which could potentially interfere with the operation and maintenance of the line.

Only those alternatives requiring new steel towers are likely to cause any change in vegetation composition. The diversity of natural vegetation within the study area would not be altered. Early succession species such as weeds, willow, alder, and hazel will be more prevalent on disturbed sites. Some weed species like thistle, milkweed, and mustard may be introduced around tower and reel stringing sites if they are cleared of existing vegetation. These species would not be new to the area, but may gain a foothold on newly disturbed areas. Their presence would be noted and controlled to prevent their spread to the agricultural fields nearby. Many weeds can be an extreme problem to farmers if not controlled early. The volume of natural flora

(which consists mainly of Douglas-Fir, scrub oak, alder, and maple, with snowberry-dominated undergrowth) removed for any of the alternatives, including the Santiam-Bethel, would be negligible. Both alternatives between the West Salem substation and the Salem-Albany tap point or the Conser substation would pass through marshy areas near Ankeny Bottom but would not disturb the area to any great extent.

Wildlife

FWs being here?

Plans A (Proposed) and D - During construction activities there would be short-term disturbance to wildlife species within and adjacent to the right-of-way causing them to temporarily leave the area. Some habitat modification would occur around tower sites and along temporary access roads. Plans A and D will include reconductoring across the Santiam and Willamette Rivers using existing towers. As a result, no long-term adverse impacts to waterfowl or other wildlife are anticipated.

Plans B and C - Short-term impacts on wildlife because of construction activities would be similar to those discussed above for Plans A and D. In addition, Plans B and C could result in long-term impacts on waterfowl and other birds, especially where the line would cross the Ankeny National Wildlife Refuge. Such impacts would primarily involve changes in local bird flight behavior near the double-circuit line and mortality from bird collisions with conductors. BPA research and experience (Lee 1978) indicates several interrelated factors must be considered in attempting to quantify these kinds of impacts. In this particular case, pertinent factors include: (1) the conductors on the double-circuit line would extend above the height of most trees near the existing line, (2) the line would be perpendicular to low altitude waterfowl flyways in some areas, (3) the line would cross areas of good waterfowl habitat, (4) waterfowl hunting in the area probably results in frequent nocturnal waterfowl flights, (5) and frequent periods of reduced visibility including fog occur in the area. All of the above factors are thought to contribute to a high potential for bird collisions. Discussions with personnel from the U.S. Fish and Wildlife Service also indicate impacts on waterfowl are likely. At present it is not possible to quantify the collision mortality that could occur, partly because of an absence of data on bird flight intensities and altitudes within that part of the Ankeny Wildlife Refuge the line would cross. Refuge personnel have indicated the existing 115-kV wood-pole line has not had a noticeable impact on birds in the area. Although we would not expect collision mortality from an additional line to have any significant effect on bird populations in the area, such mortality could be seen as undesirable by refuge users. The Dusky Canada goose and other waterfowl which winter in the area have significant value to hunters and to "non-consumptive" recreationists such as bird watchers and photographers. Deaths of such waterfowl due to collisions with a transmission line would be viewed by many such persons as highly undesirable.

The potential for adverse impacts on bird flights resulting from a double-circuit line could be reduced by constructing an additional

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single-circuit wood-pole adjacent to the existing line on and near the Ankeny National Wildlife Refuge. (See figure 5). Because the line would be the same height as the existing line, no noticeable increase in collision mortality would be expected. The additional clearing required for the additional line would result in greater direct habitat modification, however. An additional line would also represent an additional facility which may not be directly compatible with the management objectives of the Ankeny National Wildlife Refuge.

Placing the new line underground parallel to the existing 115-kV line through the high bird use area would eliminate any potential for additional bird collisions. This alternative, however, would not have any significant advantage over the above design alternative if only the impact on birds is considered. It may, however, be preferable to an overhead line as far as overall impacts to the refuge environment are concerned. BPA is conducting further study on undergrounding this transmission line. The results of these studies will be addressed in the final supplement.

Electrocution of raptors and other birds with a large wingspan is not a problem with lines of 115-kV and above because conductors are widely spaced.

Construction activities would occur during the dry summer months to avoid damage by heavy equipment to marsh and wetland habitat. Nesting mortality would occur to upland game birds if construction took place during the early spring.

No adverse impacts are expected to the threatened Bald Eagle or the endangered American peregrine falcon.

Resource Use and Socioeconomic Resources

Socioeconomic Characteristics

Plans A (Proposed) B,C,D - The construction of any of the alternatives will have minor to no impacts on the population growth, size, spatial distribution, density, age distribution, or educational characteristics in the area. Nor will this project stimulate a need for additional housing or community services, impact employment, or income distribution significantly.

Depending on the alternative selected, an estimated range of 25 to 50 workers might be required. Where these workers come from depends on the contractor's hiring policies, but an estimated one-third to one-half of the workers could come from the local area. In 1970 county work forces were as follows: 26,513 in Linn; 52,803 in Marion; 12,479 in Polk. Therefore, the impact of these workers or their dependents on the local economy will be negligible.

The proposed BPA facilities will in some locations be adjacent to portions of communications facilities and railroad signal systems. No adverse electrical impacts are anticipated at this time to these facilities. If a telephone

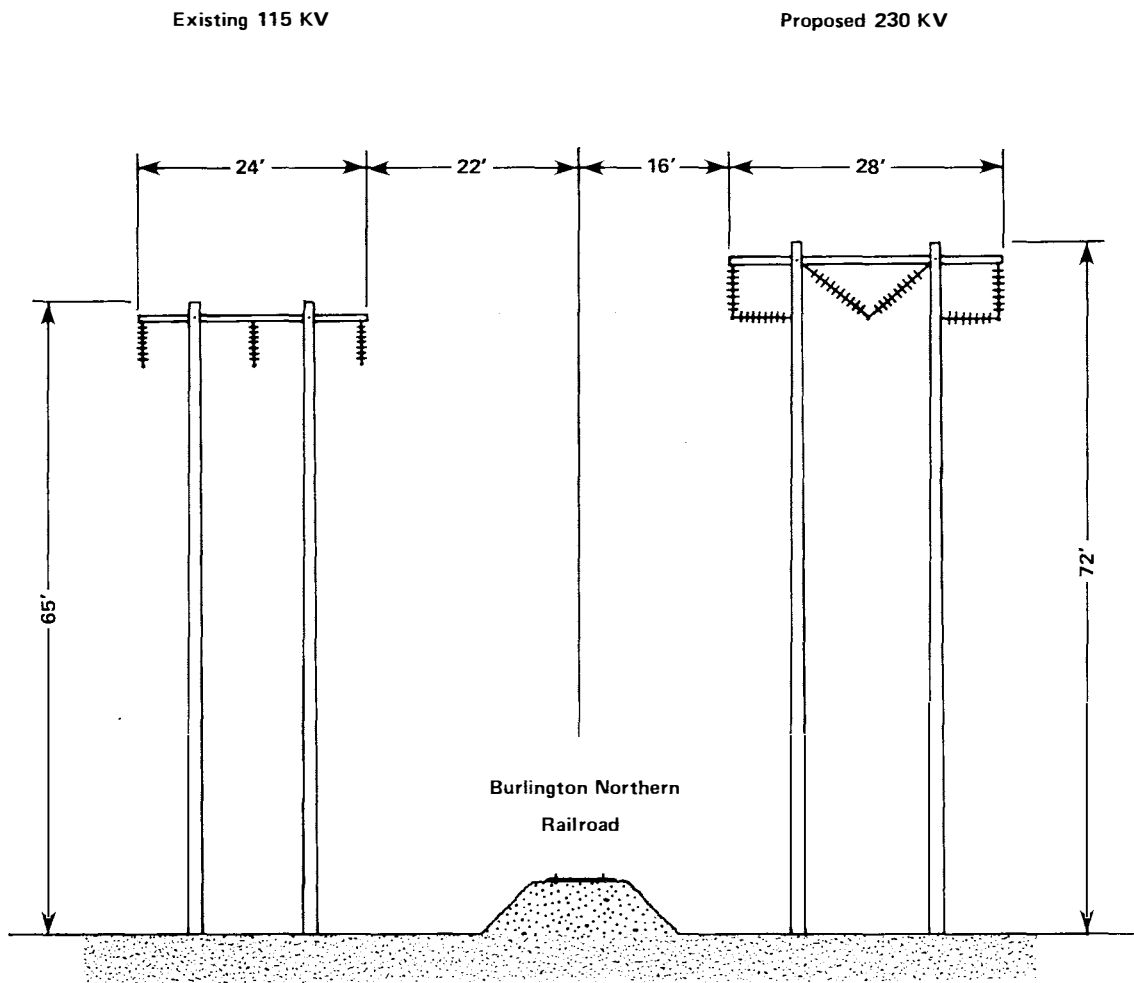
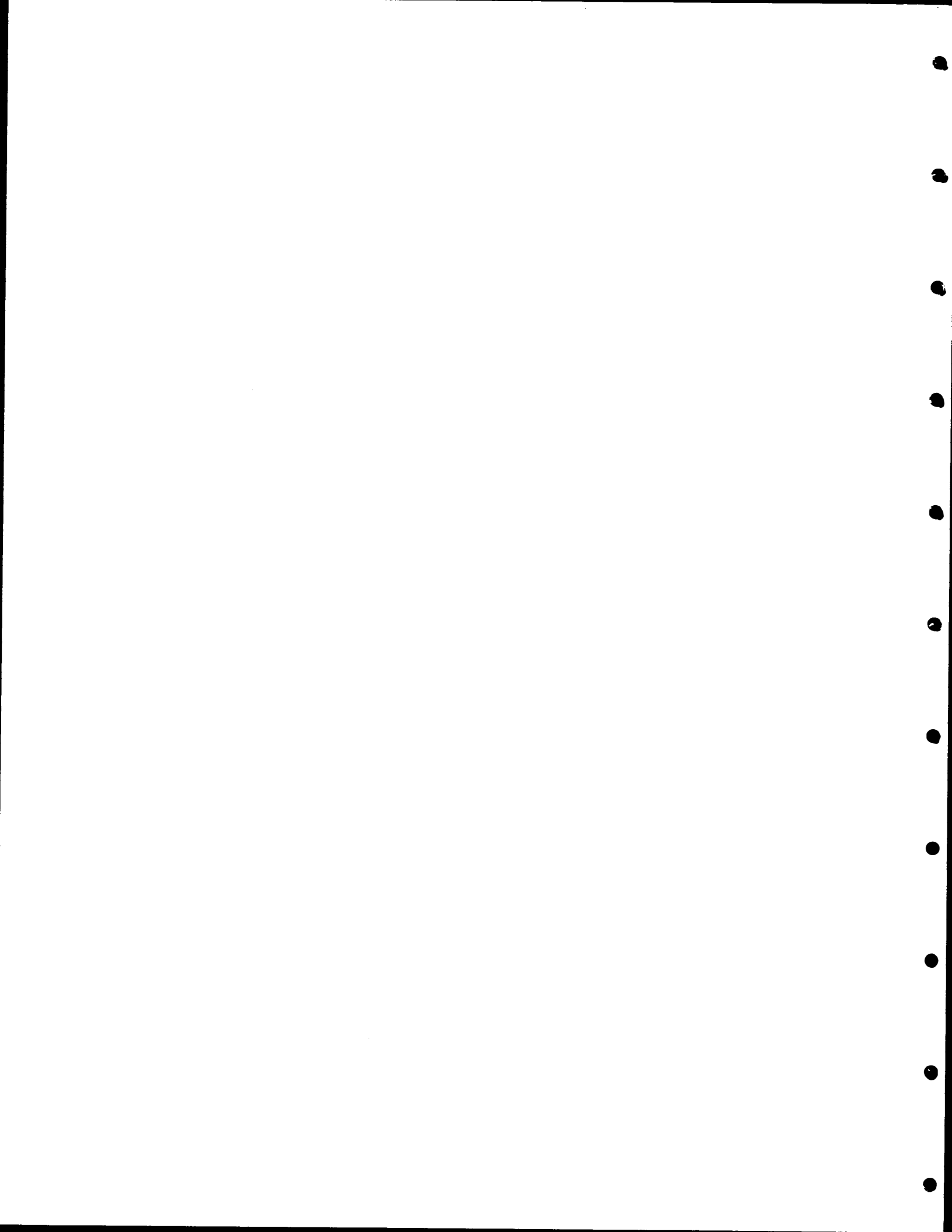


FIGURE 5
 ALTERNATIVE LINE CONFIGURATION
 SALEM/ALBANY AREA SUPPORT



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utility or railroad determines that a problem may be occurring because of the BPA transmission line, it will be investigated and mitigated according to BPA policy in cooperation with the affected utility.

Plan B would require an approximate 9-mile parallel with railroad facilities of the Burlington-Northern, Inc. Since the B-N railroad wire communications facilities along this line section have been abandoned, no major electrical impacts to railroad facilities are expected.

Land Use

Agriculture

The amount of impact from a tear-down and rebuild would depend upon the time of year work was done. During the winter the level fields in particular become supersaturated with moisture. It is very difficult to move heavy construction equipment under wet conditions. Under such conditions compaction and rutting of soil would be severe. Construction during the growing season, April through September would lessen this type of damage. Crop damage would occur but compensation for damages would be made on completion of construction.

Plan A (Proposed) - This plan is a tear-down of one 115-kV line between Chemawa and Salem and replacing it with a 230-kV double-circuit line and reconductor from Chemawa to Santiam. Lattice steel construction would remove the area under the towers from production. The new towers would probably be located in different places due to differences in types of towers and span lengths between them. The span between steel towers is usually greater than wood-pole H-frame towers. Single pole tubular steel towers would have less impact because of less land requirements at tower sites. This route crosses Prime and Unique Farmland.

The area from Chemawa to Santiam that would be reconducted would receive a minimal impact. There are areas of land not farmed at various intervals that could be used as pull sites for stringing the new conductor.

Plan B - The proposal to replace 17 miles (27 km) of 115-kV line between Salem and Albany with a 230-kV double-circuit line would cause crop damage and soil compaction. About 9 miles (14 km) of this route parallels a railroad track. However, access in the right-of-way is not always feasible. Farmland adjacent to the right-of-way would likely be used and it may be necessary to acquire access rights. This route crosses prime and unique farmland. Use of single-pole tubular steel towers would minimize land requirements.

Plan C - This plan is very similar to Plan B except a new substation would be constructed near the intersection of the 230-kV Santiam-Toledo No. 1 line with the Salem-Albany No. 1 line. This area is level agricultural land. The crop presently grown is rye grass seed. Construction of the substation would remove 6 to 12 acres (2.4-4.8 ha) of land from agricultural production.

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Plan D - This plan is to reconnector Chemawa-Salem No. 1 and No. 2 lines. The total impact of this plan is minimal. Crop damage could occur during construction. Conductor stringing sites would be the main areas of impact. This route crosses Prime and Unique Farmland.

Urban and Residential

During the construction period there would be short term impacts to businesses and homes immediately adjacent to the right-of-way. These would involve noise, dust, traffic congestion, potential safety hazards, as well as the visual impact of construction vehicles and equipment. Long term impacts would be minimal since the rights-of-way are largely already cleared and additional land easements will not be required. The most noticeable disturbance would occur where adjacent land owners are using the existing right-of-way for extensions of their property. Portions of this land may be required for new transmission towers. If lattice towers (see figure 4) are used in any of the plans, the visual impact and land requirements will be greater than the existing lines. If tubular steel towers are used, the impact of the new line may be less than existing impacts. The proposed actions do not conflict with land use plans in effect within the study area.

Plan A (Proposed) - In Plan A the rebuilding of the Chemawa-Salem line would cause most of the impacts described above. This is particularly true north of Salem Substation to Brush College Road and between Chemawa Substation and the Willamette River where there are concentrations of land undergoing suburban development. The reconnectoring of part of the Santiam-Chemawa line would have a minimal impact on urbanized land because of its rural setting. The impacts on rural residences would be negligible except at conductor stringing sites where there would be noise and dust disturbances.

Plan B - In this plan, impacts to urbanized land uses, as described above, would occur in the Salem Hills, 4-6 miles (6-10 km) south of Salem Substation. In this area there are several places where houses are located very close to the existing right-of-way.

Plan C - Impacts would be the same as for Plan B. There would also be additional impacts to rural residents in the vicinity of Conser Substation. During construction, nearby residents may be disturbed by construction activities. Impacts would be similar to the impact of transmission line construction described above. Operation of the substation could cause noise impacts to any residents living very close to the substation.

Plan D - The reconnectoring of one of the Chemawa-Salem lines would have a very minimal short-term impact on those resources discussed under Plan A. Noise and dust disturbance would occur at conductor stringing sites. Between these sites impacts would be negligible. The impact of reconnectoring the Santiam-Chemawa line would be as described in Plan A.

Esthetics

Plan A (Proposed) - Rebuilding one of the existing Chemawa-Salem lines would not require establishing or clearing a new right-of-way. Because there are existing transmission facilities, visual quality along the right-of-way will not significantly change, except in areas of close proximity to the line such as near residences or road crossings. The use of lattice towers (see fig. 4) would increase the visual complexity of the right-of-way when viewed at distances of less than 1 mile (1.6 km).^{2/} The use of tubular steel towers might reduce the impact of the existing facilities because of their much simpler appearance and the capability to use paint colors to minimize contrast with the surroundings. The reconductoring of the Santiam-Chemawa line would have no long term visual impact.

Plan B - The impact of rebuilding the Salem-Albany No. 1 line would be similar to the rebuilding in Plan A. The south portion of this line passes through open grasslands where distant views of the line are more likely. The towers would be noticeable at distances up to 2 miles (3.2 km). Beyond this visibility would be quite low.^{2/}

Plan C - Impact of the transmission line rebuilding would be identical to Plan B. The new substation would noticeably alter the visual character of an agricultural area by introducing a facility that would contrast strongly with its surroundings. Existing vegetation in the area would not provide any visual screening.

Plan D - The reconductoring of the Santiam-Chemawa line and the Chemawa-Salem lines would cause no long-term changes in visual quality.

Recreation

Plans A (Proposed), D - During construction there would be short-term impacts to users of Spongs Ford Park. These would consist of noise, dust, and visual impacts as well as potential safety hazards.

Plans B,D - There could be some short-term disturbance to users of the Ankeny Wildlife Refuge and the bicycle path near the crossing of the Willamette River west of Salem. These would consist of noise, dust, and visual impacts as well as potential safety hazards due to the presence of construction equipment and increased vehicular traffic. In locations where lattice towers may be used there would be some long-term impact to the visual component of the recreation experience.

Historical and Archeological

Plans A (Proposed), B,C,D - Based on contact with the State Preservation Officer and a review of the National Register of Historic Places and monthly

^{2/} Jones and Jones, 1976.

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addenda through March 17, 1977, no impacts would be evident at any known historical or archeological site in the Salem area. It is possible that adverse impacts could occur to unknown archeological sites during the construction of facilities associated with any of the alternatives. Possible breakage or disruption of cultural materials at presently unknown sites could occur due to use of vehicles and equipment needed for construction purposes. For the most part, equipment would be restricted to access roads and would be unlikely to disturb any unknown surface or subsurface cultural residue. If artifacts or evidence of archeological significance are discovered during construction operations, they shall be reported to BPA's Contracting Officer. All work shall be suspended at the site of discovery until the find can be investigated by the proper authorities.

A L B A N Y P R O J E C T

A L T E R N A T I V E S C O N S I D E R E D

ALTERNATIVE PLAN A

This alternative would involve reconductoring approximately 23 miles (37 km) of the 230-kV Santiam-Albany No. 1 line from Santiam Substation to a point north of PP&L's Fry Substation. From this point, PP&L would be responsible for the construction of a tap and approximately 1 mile (1.6 km) of a 230-kV line to Fry Substation.

ALTERNATIVE PLAN B

This alternative is feasible only if Alternative Plan C of "Salem Area Support" is chosen as the Proposed Plan. Under this alternative, a new substation, tentatively known as Conser, would be constructed near the intersection of the 230-kV Santiam-Toledo No. 1 line with the 115-kV Salem-Albany No. 1 line. A 230-kV/115-kV 250 MVA transformer, 115-kV terminal additions, power system controls, and protective equipment would be installed at this location. The 7-mile (11 km) Conser-Albany section of the 115-kV Salem-Albany No. 1 line would be removed and replaced with a double-circuit 115-kV or 230-kV line initially operated at 115-kV. PP&L's 115-kV line from Conser Tap to Murder Creek Substation would need to be strengthened.

OTHER ALTERNATIVES CONSIDERED

An alternative being considered involves construction of a 230-kV line in lieu of reconductoring the Santiam-Albany No. 1 line. This line would tap one of BPA's 230-kV Santiam-Alvey lines and terminate at PP&L's Fry Substation.

NONCONSTRUCTION

During the winter of 1981-1982, the 230/115-kV 250 MVA transformer at Albany Substation will overload for an outage of PP&L's 230-kV Bethel-Fry line or BPA's Santiam-Bethel Tap Chemawa 230-kV line, under peak conditions. If there

is no construction and if the 115-kV Albany-Hazelwood tie is not opened, BPA could not supply all of the load. Under this condition, load would have to be reduced on PP&L's system.

P L A N O F S E R V I C E A N A L Y S I S

POTENTIAL IMPACTS OF THE FACILITIES AND THEIR MITIGATION

Natural Resources

Atmosphere

Plans A, B - Atmospheric impacts are similar to those discussed for the Salem Project. See page 11.

Geology, Minerals, and Soils

Plan A - The existing line crosses several old landslide areas that are now stabilized. Since this plan requires only reconductoring of an existing line, no new towers would need to be installed and a basic access road system exists. Completion of this plan should not affect the stability of the area. Equipment operation during reconductoring would disturb the stabilized roadbeds, increasing the potential for soil erosion. Once reconductoring is finished, erosion control measures such as water bars, reseeding or gravel surfacing would be implemented. Temporary access would be necessary across agricultural land. This area has a low to moderate potential for soil compaction. Where compaction occurs, the area would be mitigated to restore prior productivity.

Plan B - Removal of old towers and installation of new towers would disturb the soil surface. Since the existing line is on nearly level topography and does not transversely cross the side slopes of Spring Hill, no geology and minimal soil impacts would occur. Once construction is completed, all access roads and areas of exposed soil should be stabilized to prevent accelerated erosion.

Hydrology

Wetlands

Due to the similarities between the two project areas much of the impact discussion for the Salem Area Support presented earlier reflects considerations here. Numerous wetland areas are crossed by both Alternatives A and B; however, there are two significant aspects to be considered. (1) With few exceptions around Albany and near the town of Crabtree, the identified areas^{3/} are small and narrow, and (2) the existing lines generally cross these areas at right angles. Although the lines cross these

^{3/} Based on preliminary photo interpretations.

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identified wetland areas, it is likely that heavy equipment can avoid them, thus keeping physical disturbances at a minimal or non-existent level.

Floodplains

Both Alternative Plans A and B involve construction activities in the 100-year floodplain.^{3/} Both Plans A and B involve the use of existing rights-of-way. In each case, the plans would result in the same land uses as those which presently exist; noticeable changes in land use from Plans A and B within the floodplain would not occur.

Plan A - Impacts from reconductoring the existing Santiam-Albany No. 1 line would be associated primarily with the use of heavy equipment on existing or new temporary access roads. Where heavy equipment is used in crossing minor streams between Crabtree and Albany, short-term disturbances of stream bed and bank materials could occur. This could cause minor downstream sedimentation, particularly during the spring and early winter months.

Plan B - Impacts would be minimal and, if they occur, would be associated primarily with the new Conser Substation. The general location of Conser Substation is mostly level; apparently neither perennial nor seasonal streams are present. No significant surface water impacts are foreseen. There is a slight potential for accidental oil spills in the substation, however, these spills rarely occur. BPA is developing oil spill countermeasures for use in the event of accidental spills. With implementation of appropriate measures, there would be little chance of oil finding its way out of the substation yard with such an accident.

The Willamette River is open to commercial navigation in this area. The existing Albany-Salem No. 1 line, which would be replaced, crosses the Willamette twice near Albany. The existing minimum clearances would be maintained by the new line at these crossings. No impacts to navigation are expected, however, BPA will apply for a Section 10 River Crossing Permit from the Corps of Engineers.

Vegetation

Natural vegetation in Plan A is limited to wetland habitat and fence row brush for the most part, which would not be impacted. In Plan B, riparian vegetation at the two Willamette River crossings will be slightly impacted. Reconductoring under either alternative generally does not impact vegetation. There are no officially listed threatened and endangered plants in the study area.

Wildlife

Plans A and B- Impacts for these are the same as for Alternatives A & D of the Salem Project.

^{3/} Based on preliminary photo interpretations.

Resource Use and Socioeconomic Resources

Socioeconomic Characteristics

The impacts in the south study area would be similar to those described for the Salem Project. See page 16.

Land Use

Agriculture

Plan A - This plan will require the removal of the existing 230-kV line from Santiam to Fry substation near Albany.

The new line requires towers of heavier and stronger steel. The conductor will be of higher capacity. During the process of tearing down the old line, crop damage could occur.

The digging of new footings, hauling of new steel, and assembly of towers could cause crop damage. The use of heavy construction equipment will cause compaction of soil. The land can also become rutted by travel of the construction vehicles.

Construction should be done during the period of April to October. The ground becomes super-saturated with moisture during the fall and winter months. Movement of heavy equipment in agricultural fields is very difficult during the wet season.

Compaction and rutting is corrected by subsoiling and leveling. Crop damage is paid following construction. Any damage caused by construction to fences, drains, or irrigation systems is repaired at no cost to the owner.

Portions of the existing right-of-way are considered Prime and Unique Farmland.

Plan B - This plan would rebuild the present 115-kV line to double-circuit 115-kV or 230-kV from Albany to the proposed Conser Substation. The new Conser Sub would be near the intersection of Salem-Albany No 1 and Santiam-Toledo No. 1 lines. The substation would be located in agricultural land. Crop damage and soil compaction would occur during construction. The area under the double circuit steel towers would be lost to future production as would the area used by the substation. Crop and property damage will be reimbursed following construction. Compaction can be corrected by proper subsoiling.

Urban and Residential

Plan A - Rebuilding the Santiam-Albany No. 1 line would not require the acquisition of additional right-of-way. It is unlikely operation of this reconducted line would increase audible noise levels, TV, or radio

Salem-Albany Area Support
Study Area 80-1

interference. During construction operations there would be short-term impacts from noise, dust, and traffic congestion. Due to the rural location of these lines these impacts would affect a limited number of people who reside near the line.

Plan B - Rebuilding the Conser to Albany portion of the Salem-Albany No. 1 line would have impacts on urban and residential land use, particularly along the portion of the line in Benton County. In this area there are numerous places where houses are located near the existing right-of-way. The nature of the impacts are similar to those described on page 18.

Esthetics

Plan A - Rebuilding the existing Santiam-Albany No. 1 line would not require establishing or clearing a new right-of-way. The configuration of the new towers would be similar to the old towers. For these reasons there would be no long-term visual impacts from this alternative.

Plan B - Rebuilding the Conser-Albany section of the Salem-Albany No. 1 line would not require establishing or clearing a new right-of-way. Because there are existing transmission facilities, visual quality along the right-of-way will not significantly change except near the line, such as at residences or road crossings. The use of lattice towers (see fig. 4) would increase the visual complexity of the right-of-way when viewed at distances of less than 1 mile (1.6 km).^{2/} The use of tubular steel towers might reduce the impact of the existing facilities because of their much simpler appearance and the capability to use paint colors to minimize contrast with the surroundings.

Recreation

Plans A,B - There are no designated recreation sites along the Salem-Albany No. 1 or Santiam-Albany No. 1 rights-of-way. There could be some impacts to recreationists such as bicyclists, recreational drivers, or photographers. These impacts would consist of short-term noise, dust, and visual impacts, and increased traffic congestion during the construction period.

Historical and Archeological

Since no known Historical or Archeological sites have been identified through consultation with the State Historic Preservation Officer or the National Register of Historic Places and monthly addenda, impacts attributable to Alternative A are expected to be negligible. No footing excavations would be necessary as the existing towers would simply be reconductored. Possible breakage or disruption of cultural materials could occur from use of vehicles and equipment needed for the restringing of towers, but for the most part any equipment would be restricted to access roads and would be unlikely to adversely affect any unknown surface cultural residue.

^{2/} Jones and Jones, 1976

No impacts would occur to historical or archeological resources as a result of adopting Alternative B.

Possible impacts could occur to unknown archeological sites during the construction of facilities associated with Alternative A. The use of heavy equipment and the excavation for footings and reeling sites could have adverse effects on unknown sites. Similar impacts can be expected at the proposed Conser Substation site. Presently, no known sites are in the area and it is not expected any will be found. Regardless of expectations, an archeological survey would be conducted along the transmission line corridor and at the substation in an attempt to locate any possible sites prior to construction.

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

← *had to*

At this time Alternatives A (Proposed), B, C, and D have been identified for Salem, Alternatives A and B for Albany. Certain limitations on land use and productivity could be an unavoidable result of the construction of any of these alternatives. BPA will work with landowners to explore appropriate mitigation measures. They will also be compensated for the loss of crops during construction. Loss of soil by erosion and elimination of some wildlife habitat could occur within the study area. The addition of new structures and conductors will add to the visual impact of the area.

Temporary, unavoidable impacts include the noise, dust, and visual impacts associated with construction activities. These are often considered to be a physiological annoyance to nearby residents.

T H E R E L A T I O N S H I P B E T W E E N L O C A L
S H O R T - T E R M U S E S O F M A N ' S E N V I R O N M E N T
A N D T H E M A I N T E N A N C E A N D E N H A N C E M E N T O F
L O N G - T E R M P R O D U C T I V I T Y

Based on present technology, the line and associated facilities needed for the alternatives will have an expected useful life of 50 years.

Experience in the past years has shown that, in most 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, will likely result in a long-term use of this corridor. However, if required, complete removal of these transmission facilities, including the tower footings, would be possible in order to make the land available for other uses.

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THE IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

Unreclaimable steel, aluminum, and other materials used for conductors and other facilities would be irretrievably committed. Manpower and fuel for construction equipment would be irretrievably expended.

Although it would be possible to remove the entire facility at a future time, it is likely that the land used for transmission corridor would be irreversibly committed. The land used for tower sites and access roads would be unavailable or limited for any other land use.

The vegetation removed during construction, the wildlife eliminated, and the soil lost by erosion would be irretrievably committed.

CONSULTATION AND COORDINATION
WITH OTHERS

PLANNING COORDINATION

The following agencies and organizations were contacted by BPA economists, engineers, and environmentalists during the planning phase of this project. Information on land use plans, resource data and engineering concerns were exchanged. Additional meetings to review locations during the location phase of the project will be held to determine their compatibility with local land use plans and zoning.

Federal Agencies

Soil Conservation Service

-Linn County	Albany, OR
-Marion County	Salem, OR
-Benton County	Corvallis, OR
-Polk County	The Dalles, OR
-State of Oregon (Guy W. Nutt)	Portland, OR
-State USDA Land Use Committee	Portland, OR

U.S. Fish and Wildlife Service

Regional Office	Boise, ID
District Office	Portland, OR
Ankeny National Wildlife Refuge	Jefferson, OR

State Agencies

Oregon State Historical Preservation Office, Salem, Oregon
Oregon Dept. of Fish & Wildlife, Portland, Oregon

Local Agencies

Linn County Planning Commission, Albany, Oregon
Benton County Planning Commission, Corvallis, Oregon
Marion County Planning Commission, Salem, Oregon
Polk County Planning Commission, Dallas, Oregon
Mid-Willamette Valley Council of Governments

Other Utilities

Load estimates are prepared by BPA. For this project they included load projections from Portland General Electric (PGE), PP&L, Salem Electric Cooperative (SEC), Consumers Power Inc., the U.S. Bureau of Mines, Wah Chang, Oregon Metallurgical Corp., and the City of Monmouth. In addition to load projections, these utilities and industries provide transmission system data to be factored into the power flows.

Alternatives are proposed to solve system problems based on analysis of the power flows. These alternatives are discussed with personnel of PGE, PP&L, and SEC by personnel from BPA's Branch of System Engineering and Portland Area Office.

COORDINATION IN THE REVIEW OF THE DRAFT FACILITY PLANNING PHASE

The Draft Facility Planning Supplement for Salem-Albany Area Support (as part of the proposed Fiscal Year 1980 Program) was sent to Federal agencies, State clearinghouses, the public 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. The respondent agencies are marked with an asterisk and listed below. BPA economists, engineers, and environmentalists exchanged information with the following agencies on land use plans, resource data and engineering concerns during the planning phase of this project.

AGENCIES REQUESTED TO COMMENT ON THE DRAFT FACILITY PLANNING PHASE

The Planning Supplement received wider coverage than was necessary, as it was bound with the Fiscal Year 1980 Draft Program Statement. Only pertinent agencies and those who responded to comments are listed.

Independent Agency

*Advisory Council on Historic Preservation,
Office of the President

Federal Agencies

U.S. Department of the Interior

Bureau of Mines

Bureau of Indian Affairs

National Park Service

Geological Survey

Bureau of Reclamation

Fish and Wildlife Service

* Area Office, Boise, Idaho

*Bureau of Land Management, Denver Service Center

*Bureau of Land Management, Wyoming State Office

*Heritage Conservation and Recreation Service, Northwest Region

*Advisory Council on Historic Preservation

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- U.S. Department of Transportation
 - *U.S. Coast Guard
 - *Federal Aviation Administration
- U.S. Department of the Army
 - *Army Corps of Engineers, North Pacific Division
- U.S. Department of Agriculture
 - *Forest Service, Region 6
 - *Soil Conservation Service
- *U.S. Department of Housing and Urban Development
- *U.S. Environmental Protection Agency, Region X
- U.S. Department of Energy

State Agencies

Oregon

- *Intergovernmental Relations Division, Salem, Oregon
- *Department of Forestry
- *Department of Water Resources
- *Department of Highways
- *Department of Aeronautics
- *Department of Environmental Quality
- *Land Conservation and Development Commission

Washington

- *Regional Planning Council of Clark County
- *Puget Sound Council of Governments

Local Agencies

- Blue Mountain Intergovernmental Council
- Columbia Region Association of Governments
- Mid-Columbia Economic Development District
- East Central Oregon Association of Counties
- Mid-Willamette Valley Council of Governments
- Linn County Planning Commission
- Benton County Planning Commission
- Marion County Planning Commission
- Polk County Planning Commission
- District 4 Council of Governments
- Clatsop-Tillamook Intergovernmental Council
- Coos-Curry Council of Governments
- Central Oregon Intergovernmental Council
- Umpqua Regional Council of Governments
- Klamath Lake Planning and Coordinating Council
- Lane Council of Governments
- Southeast Oregon Council of Governments
- *Puget Sound Council of Governments
- *Regional Planning Council of Clark County
- *City of Millersburg

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Other

Oregon Environmental Council
National Wildlife Federation
Oregon Wildlife Federation
Federation of Western Outdoor Clubs
Friends of Earth, Northwest Coordinator
Natural Resources Defense Council (Palo Alto Office)
The Wilderness Society (Western Regional Office)
Sierra Club, Northwest Representative
 Pacific Northwest Chapter
Pacific Northwest Conservation Council
Environmental Defense Fund, Rocky Mountain Office,
 Washington D.C.
Natural Resources Law Institute
Oregon State Historic Preservation Office
Museum of Natural History, University of Oregon
Pacific Power and Light
Portland General Electric
Salem Electric Cooperative
Wah Chang Oregon Metallurgical Corp.
*Burlington Northern Railroad, Portland Office

COMMENTS RECEIVED DURING REVIEW PROCESS

Department of the Army, Corps of Engineers, North Pacific Division
(November 24, 1978)

Comment:

The Bonneville Power Administration will be required to obtain a permit from the Corps of Engineers for the location of any transmission lines on project lands. Also, a Section 10 permit would be required for any transmission lines crossing any navigable waterway. A Section 404 permit would also be required for any work which would involve the discharge of fill material in the waters of the United States, including adjacent wetlands.

Response:

BPA will comply with the U.S. Army Corps of Engineers request to obtain river crossing and Section 404 permits.

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Land Conservation and Development Commission, Oregon State
(November 10, 1978)

Comment:

This project and its related land use implications must be coordinated and consistent with local efforts to develop a comprehensive plan for the counties of Linn and Marion, and to reach compliance with the statewide land use goals.

Response:

The Comprehensive Plans for the counties of Linn, Marion, Polk, and Benton, as well as a planning map prepared by the Mid-Willamette Valley Council of Governments, have been consulted. Our plans are consistent with these comprehensive land use plans.

Department of Aeronautics, Oregon State
(November 21, 1978)

Comment:

This report does not address the impact that the establishing of powerlines may have on airport or airway structures. No coordination was effected with the Oregon Aeronautics Division in establishing this Environmental Impact Statement. The lack of initial coordination in the past in establishing such powerlines has caused considerable concern to the Oregon Aeronautics Division and has resulted in rerouting and costly delays in the power companies. These impacts should be reflected in the report.

Response:

We will consult with aeronautics officials during the location phase of the project. No unusually tall structures are anticipated on this project.

Department of Environmental Quality
(November 8, 1978)

Comment:

In reference to those projects in the Albany/Salem area, BPA should take precautions to prevent future noise impacts from occurring due to urban growth. This may include contacting local land use agencies to prevent encroachment of residential development and/or purchasing land for a noise buffer.

Response:

This concern will be addressed at the location stage. A more complete discussion of Noise Quality associated with transmission and substation facilities construction and operation can be found in Appendix B, Role EIS.

City of Millersburg, Planning Consultant
(November 20, 1978)

Comment:

Within this framework, the City of Millersburg respectfully request the Bonneville Power Administration to notify the City of your long-range plans and ask that opportunities for review and comment on alternative site locations for power facilities be made available to the City prior to final site selection. It is essential that local needs are addressed and that the plans of both agencies are fully coordinated.

Response:

We will consult with the City of Millersburg prior to siting transmission facilities in the planning area.

Mr. Richard H. Renn, Attorney representing the City of Millersburg
(November 20, 1978)

Comment:

I am informed by the officials of the City that your proposed location of the substation at the present may not be approvable by the City.

Response:

We will consult with the City of Millersburg prior to siting transmission facilities in this planning area.

U.S. Fish and Wildlife Service, Area Office
(May 5, 1978)

Comment:

We recently learned of the proposal to upgrade the Salem-Albany support line that crosses Ankeny National Wildlife Refuge south of Salem. It is our understanding that the existing 55-foot high, wood pole, three conductor line would be replaced with steel towers 120 feet in height with a total of six conductors. It is the Fish and Wildlife Service's conclusion that the proposed changes would have an excessively detrimental impact on the refuge and its natural resources. For your information, we are appending a leaflet that describes the area.

The existing line dissects an important refuge waterfowl feeding area and to date has not caused any significant losses that we are aware of. This is, in our opinion, largely attributable to the low height of the conductors, the

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distribution of all three conductors on the same level, the presence of relatively high brush along the right-of-way, and the reluctance of waterfowl to feed near the brush along the right-of-way. Combined, these four factors cause waterfowl to attain an altitude higher than the poles and conductors.

The proposed transmission line would, based on the information we have, result in at least four physical changes that would conflict with the mission of the refuge and its natural resources. These are:

1. Increased height of towers and conductors which would place these obstacles within the existing flight elevations.
2. Increased levels of conductors (from 1 to 3) thus increasing the potential for, and probability of, bird strikes.
3. Removal of vegetation along the right-of-way which naturally causes waterfowl to fly higher.
4. Loss of waterfowl feeding and resting area as a result of the widened right-of-way.

Physical changes and wildlife losses are not the only criteria used to determine the Fish and Wildlife Service's position on this proposal. The National Wildlife Refuge system places major emphasis upon the retention of the "natural environment." To achieve this objective we are removing many man-made structures and relocating or camouflaging others. Likewise, we do not approve construction or placement of objects on refuges unless they are absolutely essential for wildlife enhancement and protection. Accordingly, the placement of the proposed towers and conductors would not be compatible with the natural environment of Ankeny National Wildlife Refuge. We could not, therefore, respond favorably to a right-of-way application for that purpose.

In view of the threat to bird life, the loss of wildlife habitat, and the degradation of the natural environment of the refuge we are opposed to upgrading of the existing 115-kV line in the manner proposed. Our opposition applies specifically for the line section extending from Wintel Road to a point about 1/2 mile north of Buena Vista Road. This is shown in red on the appended map. We have three suggested alternatives for avoiding the conflicts with Ankeny National Wildlife Refuge. We have not had time to make an extensive analysis of these alternatives, but based upon available information they are listed in order of our preference.

1. Reroute the line away from the refuge.
2. Put the line underground within the existing railroad right-of-way.

3. Place the new line adjacent to the existing line within the railroad right-of-way. To be acceptable this line would have to be essentially identical to the physical specifications of the existing line.

It is important that site specific planning for the Ankeny Refuge segment of the line be coordinated closely with the Fish and Wildlife Service. It would, therefore, be appreciated if your planning process is coordinated directly with this office.

Response:

FWS memo

A planning level discussion addressing the above concerns is provided on Page 14 and 15 of the text. Figure 5 (following Page 14) is a transmission design, alternative line configuration, especially developed for the area near the Ankeny National Wildlife Refuge. At the Draft and Final Facility Location level of study all possible alternative routes (to include alternatives mentioned above) for transmission lines will be evaluated.

The following studies have been initiated by BPA to investigate such concerns as mentioned above:

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

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

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

J. M. Lee, Jr., L. E. Rogers, and T. D. Bracken, "Electric and Magnetic Fields as Considerations in Environmental Studies of Transmission Lines." To be presented at the 18th Annual Hanford Life Sciences Symposium, Biological Effects of Extremely - Low-Frequency Electromagnetic Fields, Richland, Washington, October 1978.

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.

Proposed Plan A will not cross the Ankeny National Wildlife Refuge.

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SALEM PUBLIC MEETING COMMENTS

Mr. Sutherland
(November 14, 1978)

Comment:

I see that you're increasing the capacity of all those lines--that's your intent. Do you have more power to sell than you are selling now? It's pretty hard to get squared away with all the propaganda that's going around--do you have more power or you don't?

Response:

More power is or will be available from the Hanford atomic plants, Grand Coulee Third Powerhouse, and Boardman Coal Plant, to name a few. This power must be transmitted to the population centers, in this case, the Salem/Albany area of the Willamette Valley. The BPA system grid provides the means of supplying you with the energy generated at great distances.

Mr. Sutherland
(November 14, 1978)

Comment:

I don't have any solid information, but when they talk about high lines, are they talking about 250 or 230 or 500,000? There's suppose to be some health problem with real high generating facilities.

Response:

Both 230-kV and 500-kV transmission lines are considered high voltage lines. There are not-known health problems associated with these lines.

Mr. Robert Gilbert, BPA, Portland Area Engineer
(November 14, 1978)

Comment:

Before the meeting, we were visiting with some people here that brought up a point that's very good as far as our environmental analysis of this particular project of the Salem-Albany Support. They'd mention to us that they are concerned about some trees which support a spring which is a water source to their home, which I feel is the exact type of information that we're seeking tonight, having the public help us identify these resources.

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We will be sending our map of our station at Salem Substation to these people so that they can pinpoint the location of this spring and we can take this into consideration as our planning progresses.

Response:

Line location engineers try to avoid sources of domestic water such as springs and wells. If it is unavoidable, and the source is rendered unusable by BPA actions a comparable source must be provided before any alteration takes place. Your information will be helpful in the location process.

ALBANY PUBLIC MEETING COMMENTS

Mr. Yeley
(November 16, 1978)

Comment:

Yes, I'd like to ask--what's going to happen to this existing 230 line? Are you going to change that in any way--that Santiam-Toledo line? My house sits, oh, almost right underneath this 230 line now. So, if you change it to a higher voltage, what effect is that going to have on me?

Response:

There are no immediate plans to alter the voltage of the Santiam-Toledo transmission line.

Mr. Rem
(November 16, 1978)

Comment:

And you said the Salem-Albany No. 2 Line would be routed from Salem across the river and down through Camp Adair. Would it then avoid the Conser area altogether? Would that substation not be part of your plan then?

Response:

At the Facility Planning level this alternative was not considered feasible for the following 3 reasons?

1. The line is approximately 4 miles longer in length, therefore more costly.

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2. It is the only power source for Adair and Mommouth Substations. The line would have to be built and completed in 3 segments (costly and time consuming).
3. The intersection of Salem-Albany No. 2 line and the Santiam-Toledo No. 1 line, is further from the load center in the Albany area. Therefore, it is not as desirable, as more distribution lines will be needed.

Mr. Quentin Smith
(November 16, 1978)

Comment:

My name is Quentin Smith. In reading through this, or an earlier draft of this, it mentioned the line through the Ankeny Wildlife Refuge. It seemed to understate or possibly understate the effect of that line. Did the Department of Fish & Wildlife submit any reports to you that you condensed for this, as far as the impact of that line on the Refuge?

Response:

The U.S. Fish and Wildlife Service did submit a letter to BPA on May 5, 1978, addressing their concerns. The letter has been reproduced in its entirety in this comment/response section. At the Location Analysis level further study will address this concern.

Mr. Wood
(November 16, 1978)

Comment:

Clayton Wood again. On your--in your draft supplement here, you mentioned about that lines would need to radiate out from the substation. I realize it's too early in the planning to know how many and where they would have to go, but do you have a general idea where they're going to have to end up? You now have a small line going down the Burlington-Northern that intercepts Conser--Conser Road and Burlington-Northern that you hooked on just west of there.

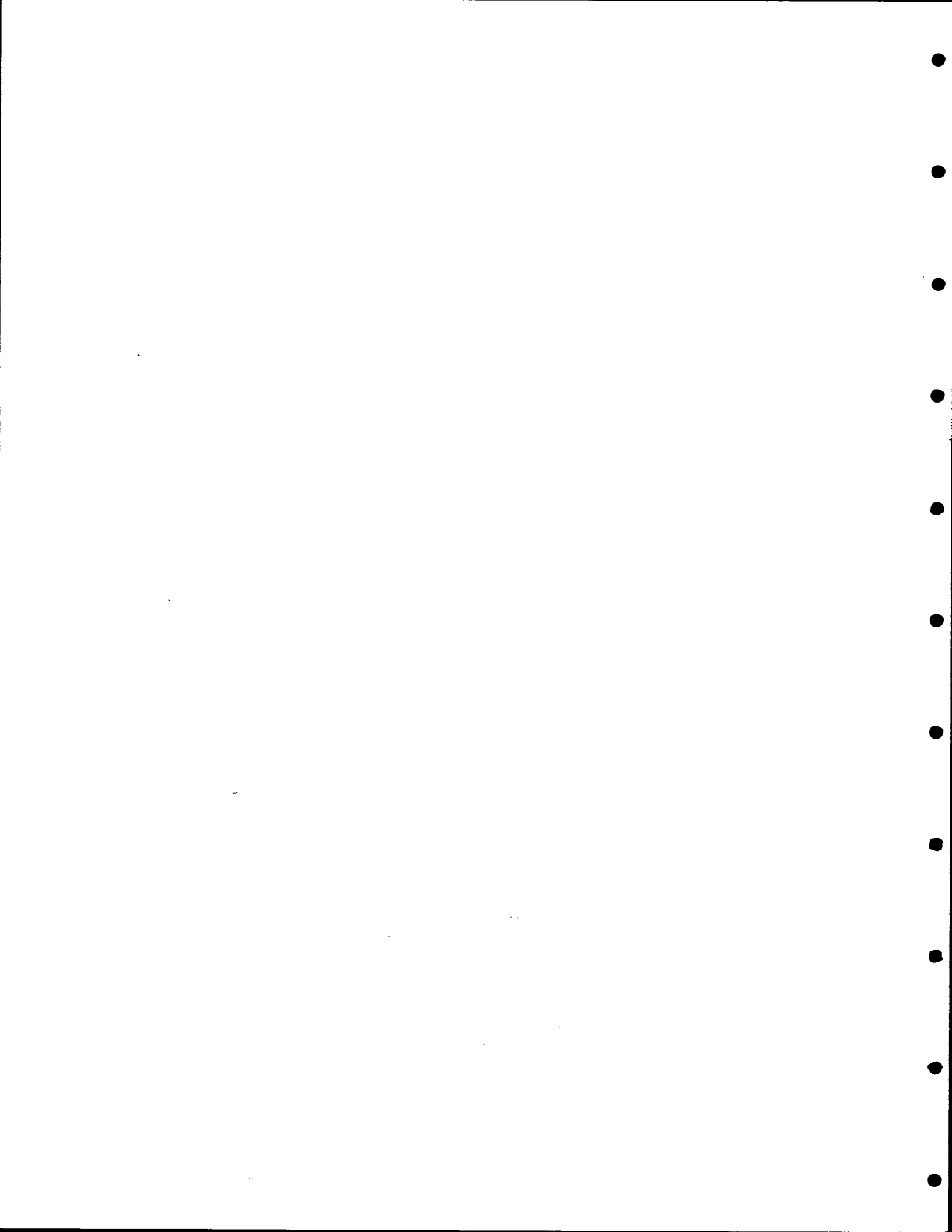
Response:

Lines necessary to deliver power to the customer are designed by the local utility when the need arises. We are not aware of where these lines will be built.

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

This Final Facility Planning Phase was prepared by the following interdisciplinary team:

<u>Specialist</u>	<u>Specialty</u>
R. Goranson	Project Manager
L. Driessen	Reconnaissance Engineer
T. Bellerby	Electrical Engineer
L. Purchase	Project Team Leader
K. Crossland	Agriculture Specialist
M. Jeffers	Wildlife Biologist
J. Kehoe	Geographer
S. Vickers	Geologist
J. Peterson	Archeologist
J. Lee	Wildlife Biologist
D. Maxwell	Landscape Architect



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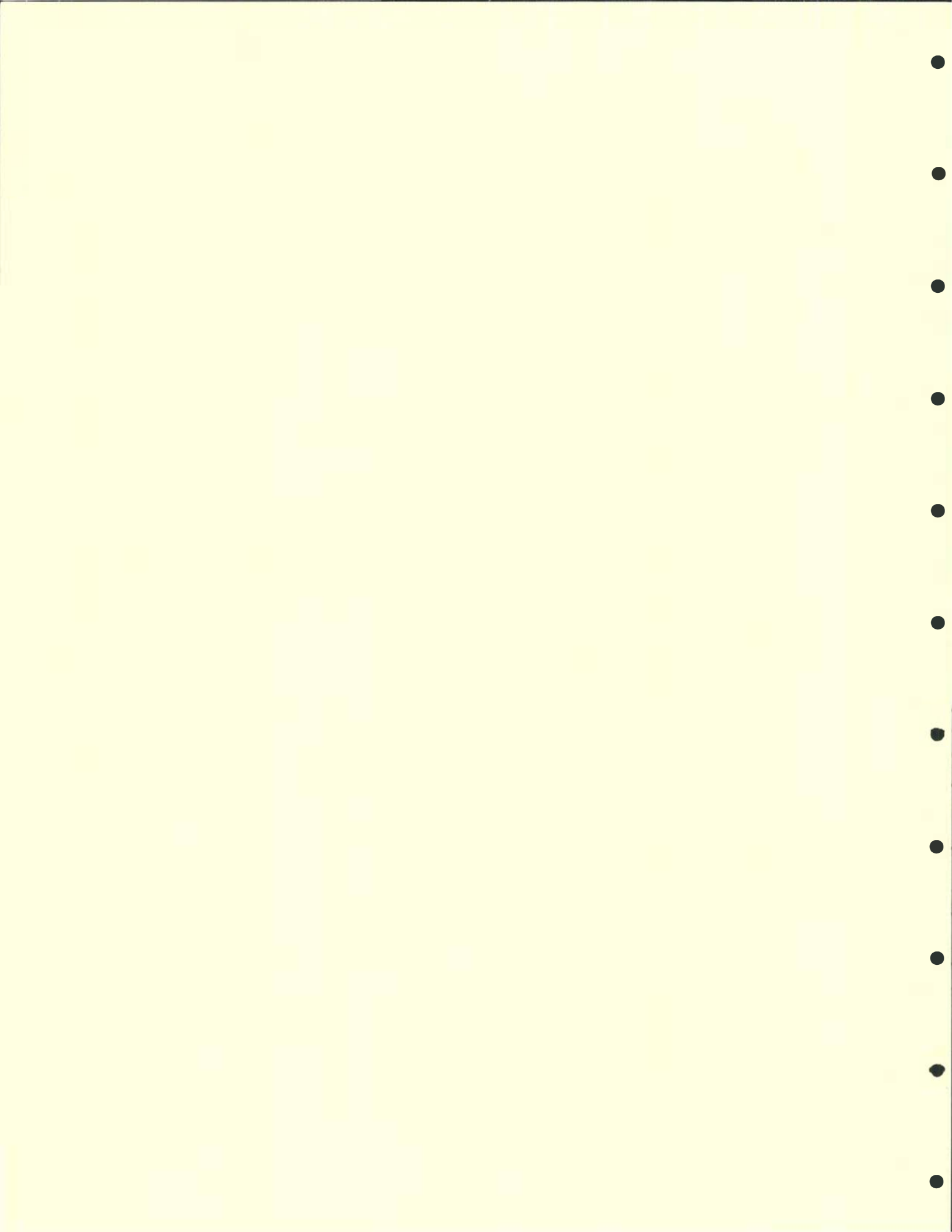
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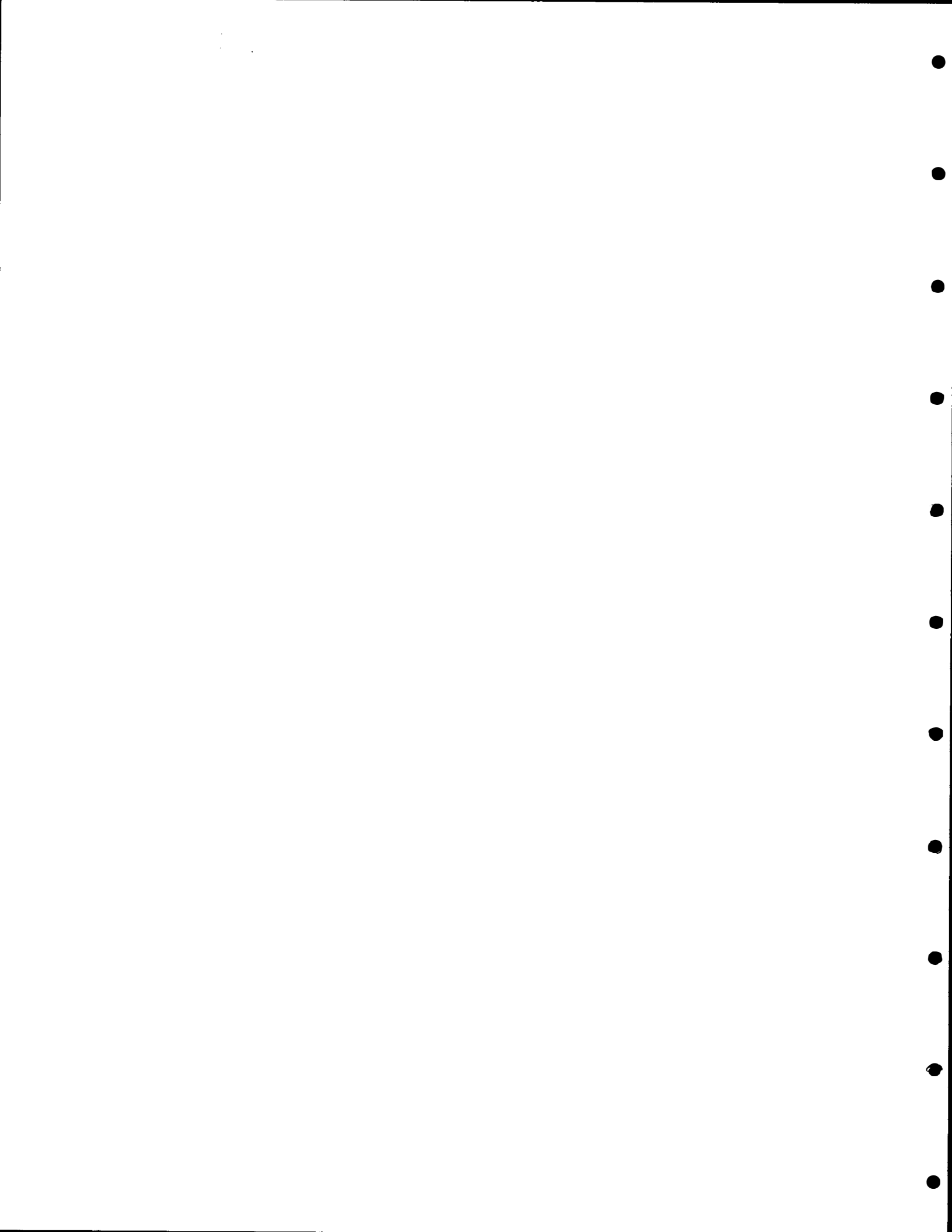
SA-80-3

Libby
Integrating Transmission



LIBBY INTEGRATION AND
NORTHWEST MONTANA/NORTH IDAHO
SUPPORT

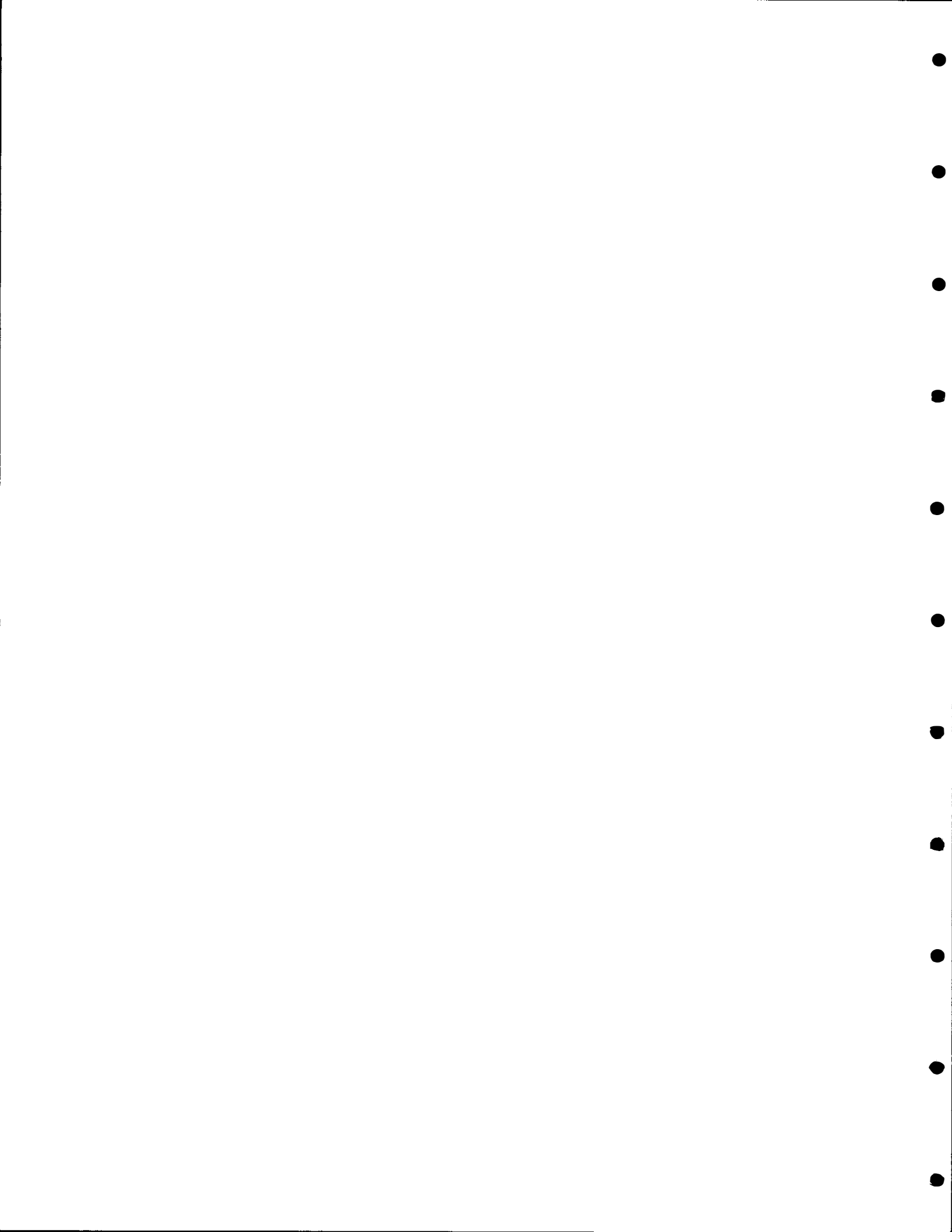
FINAL FACILITY PLANNING PHASE



Libby Integration and Northwest Montana/North Idaho
Support STUDY AREA FY 80-3

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STATUS

This project was first described in a draft facility planning supplement, Study Area 79-3, in the 1979 Program EIS. The supplement was filed with the President's Council on Environmental Quality September 1, 1977. Public information meetings were conducted at Noxon, Montana, October 11, 1977; Libby, Montana, October 12, 1977; and Sandpoint, Idaho, October 13, 1977. EPA personnel also held a one-day informational open house on October 13, 1977, at Bonners Ferry, Idaho, to answer public questions on alternative transmission lines.

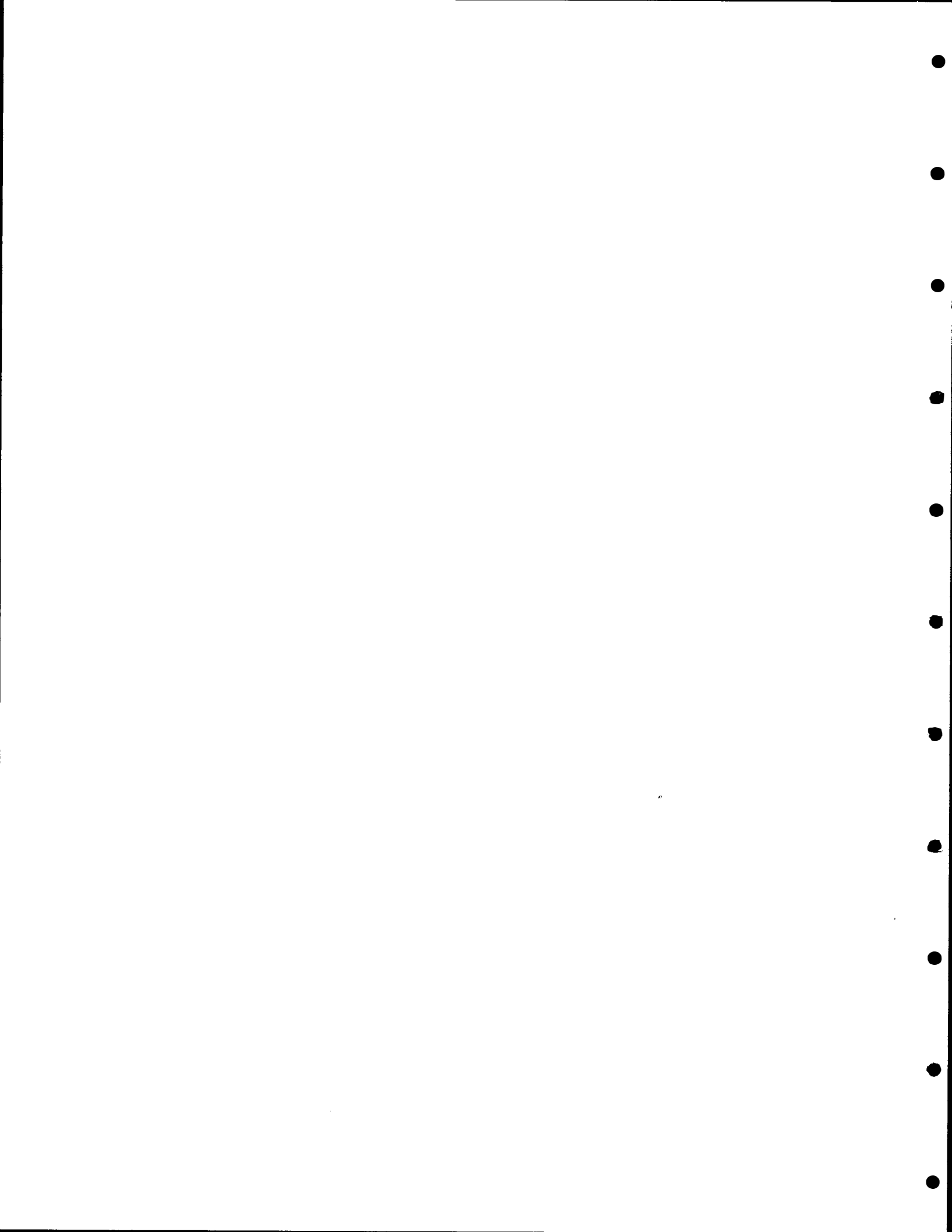
A preferred electrical system plan was selected by BPA in June 1978. This plan, Plan B in the supplement, involves upgrading existing facilities from Libby Dam in Montana to the Sandpoint, Idaho area and building a line on new right-of-way from the Sandpoint area to Rathdrum. Plan B reflects BPA's policy of using existing right-of-way whenever possible. It will meet long range needs to serve electrical customers in northwestern Montana and northern Idaho, as well as accept the energy from additional generators planned for Libby Dam. If the proposed Kootenai River project is built, the planned transmission facilities also would be able to integrate the energy generated.

The plan of service decision was based on consideration of the draft facility planning supplement, concerns expressed during public review of the document, and engineering and economic studies. BPA's proposal for a 500-kV line between Hot Springs and Bell was reviewed in conjunction with this information because of its potential relationship to the Libby project.

Plan A, which proposes a line between Libby and Noxon, would have lower impacts; however, Plan A assumes that BPA's proposed Hot Springs-Bell line would be built as scheduled. This line will be built on a schedule which coincides with the energization of Colstrip Unit No. 4. Unit 4 is presently delayed. To make Plan A viable, transmission would have to be built from Noxon to Rathdrum as presented in Plan D. Plan B, Plan C (a line between Libby and Sacheen Substations), and Plan D all have similar impact ranges (see text and Table 8). However, the impact predictions in the draft statement assumed that a new line would parallel existing right-of-way or open a new corridor. Rebuilding the 115-kV line between Libby and Sandpoint to higher capacity using existing right-of-way, as now proposed, would reduce the impacts of Plan B significantly. A detailed analysis of these impacts will follow in the draft location supplement.

On September 8, 1978, the U.S. District Court for the District of Montana issued a preliminary injunction against the Corps of Engineers, halting further construction on the additional generators at Libby Dam and the Libby Reregulation Dam. BPA's proposal assumes that the additional units will be built as planned; however, implementation of the transmission project will take place on a schedule which meets the area's needs.

If the additional generators are installed, BPA is required to integrate the power into its transmission system in order to fulfill the marketing responsibilities outlined in the agency's legislative mandate. If the Corps does not construct the units, BPA will reconsider its plans.



DESCRIPTION OF THE PROPOSAL

SYSTEM REQUIREMENTS

Pacific Northwest peak loads are expected to nearly triple within the next 25 years, based on forecasts of the Pacific Northwest Utilities Conference Committee. This group is a planning forum that consolidates load projections for electric utilities in BPA's service area. The region's January 1979 peak load is estimated at 24,620 megawatts. The estimated peak load for January 1989 is 37,740 megawatts which represents an increase of about 4.4 percent per year. The regional increase in loads is caused largely by population growth, industrial expansion, and a greater per capita use of electricity (Pacific Northwest Utilities Conference Committee West Group Forecast of Power Loads and Resources 1978).

Much of the growth is expected to occur west of the Cascade Mountains along a heavily populated axis extending from Bellingham, Washington, through other Puget Sound urban areas south to Portland, the Willamette Valley, and Eugene, in Oregon. Additional load centers such as Spokane, Washington lie east of the Cascade Range.

The loads are more dispersed in other areas, such as northern Idaho and northwestern Montana. They, too, will grow, dictating a schedule for additional facilities to serve their needs. Electrical loads of BPA customers in northern Idaho and northwestern Montana are tabulated in Table 1.

Table 1. January Peakloads for North Idaho and Northwest Montana from official BPA and PNW FY 1980 Peakload Forecast for period July 1979 through January 1989. Loads are served by BPA except for the PP&L loads at Libby, Sandpoint and Newport which are served by PP&L Co. over the BPA and TWP system.

Substation	Utility	Estimated January Peakload (Megawatts)					1989
		1979	1984	1985	1986	1987	
Priest River	Northern Lights Inc.	6.8	10.4	11.2	12.4	13.3	15.8
Laclede	Northern Lights Inc.	6.4	8.0	8.2	8.7	9.1	10.2
Newport	Inland Power & Light Co.	6.4	10.8	11.8	13.0	14.3	17.3
	Pend Oreille Co. PUD	18.4	23.9	25.2	26.6	28.1	31.2
Athol	Pacific Pwr. & Light Co.	12.1	16.8	17.7	18.6	19.5	21.4
	Northern Lights Inc.	2.0	2.7	2.7	2.7	2.9	2.9
Sandpoint	Kootenai Elec. Co-op	11.5	16.6	17.8	19.0	20.2	23.4
	Northern Lights Inc.	6.6	8.7	9.2	9.7	10.3	11.2
Samuels	PP&L Company	27.1	37.4	39.2	41.8	44.5	49.7
	Northern Lights Inc.	5.1	6.5	6.8	7.1	7.4	8.0
Bonners Ferry	Northern Lights Inc.	8.2	11.0	11.7	12.4	13.2	14.9
	City of Bonners Ferry	9.2	11.3	11.7	14.9	15.6	13.8
Moyie	City of Bonners Ferry	3.7	4.5	4.8	4.8	4.9	5.4
Yaak	Northern Lights Inc.	0.6	0.8	0.8	0.9	0.9	0.9
*Troy	Northern Lights Inc.	1.9	11.8	12.0	12.2	12.4	12.8
Libby(PP&L)	Pacific Power & Light	29.9	32.7	33.6	34.4	34.4	37.0

*Northern Lights Inc., load at Troy includes 9.3 MW to serve a potential ASARCO mining load.

Part of the electricity to meet new loads will be generated at Libby Dam and the Reregulating Dam on the Kootenai River in Montana (Fig. 1). Additional generation in the same area is not yet licensed but is planned near Kootenai Falls on the Kootenai River. The generation installed and operating now consists of four units at Libby Dam with a capacity of 483 megawatts (MW). The Corps of Engineers plans to install four more generators at Libby Dam which would add 483 MW of capacity for a total

of 966 MW. Much of the capacity would be for peaking power. Units Number 5 through 8 at Libby Dam are scheduled for operation in November 1983.

The Corps of Engineers also plans to construct the Libby Reregulation Dam which will have three generators with a total capacity of 87.9 MW. Unit 1 with a rating of 17.7 MW is scheduled for December 1983. Units 2 and 3 are scheduled for February and April of 1984. Each has a capacity of 35.1 MW.

Northern Lights, Inc., has a preliminary permit from the Federal Power Commission to determine the feasibility of constructing a hydroelectric dam project at Kootenai Falls 4 miles east of Troy, Montana. It would have two 70-MW generating units for a total capacity of 140 MW. This potential generation was considered in the transmission line plans.

Three lines have already been built from Libby Substation. One is a 115-kV line to Albeni Falls, Idaho. This line and the Washington Water Power Co. (TWWPCo) 115-kV Cabinet Gorge-Bronx Substation line provide the main 115-kV transmission for northern Idaho loads.

The two remaining lines from Libby are 230-kV lines. They provide the main transmission to integrate existing generation. One line goes to Conkelley Substation near Columbia Falls, Montana, and the other to Noxon Substation near Noxon, Montana. When the new generation is added at Libby, an outage on one of the 230-kV lines will overload the remaining 230-kV line and the 115-kV line from Libby. There is not enough transmission capacity now to carry the new generation from Libby into the grid system, for without a third 230-kV line, generators at Libby would automatically disconnect from the system during line outages. Loads on the 115-kV system could also be dropped.

THE PROPOSED PLAN OF SERVICE (ALTERNATIVE PLAN B)

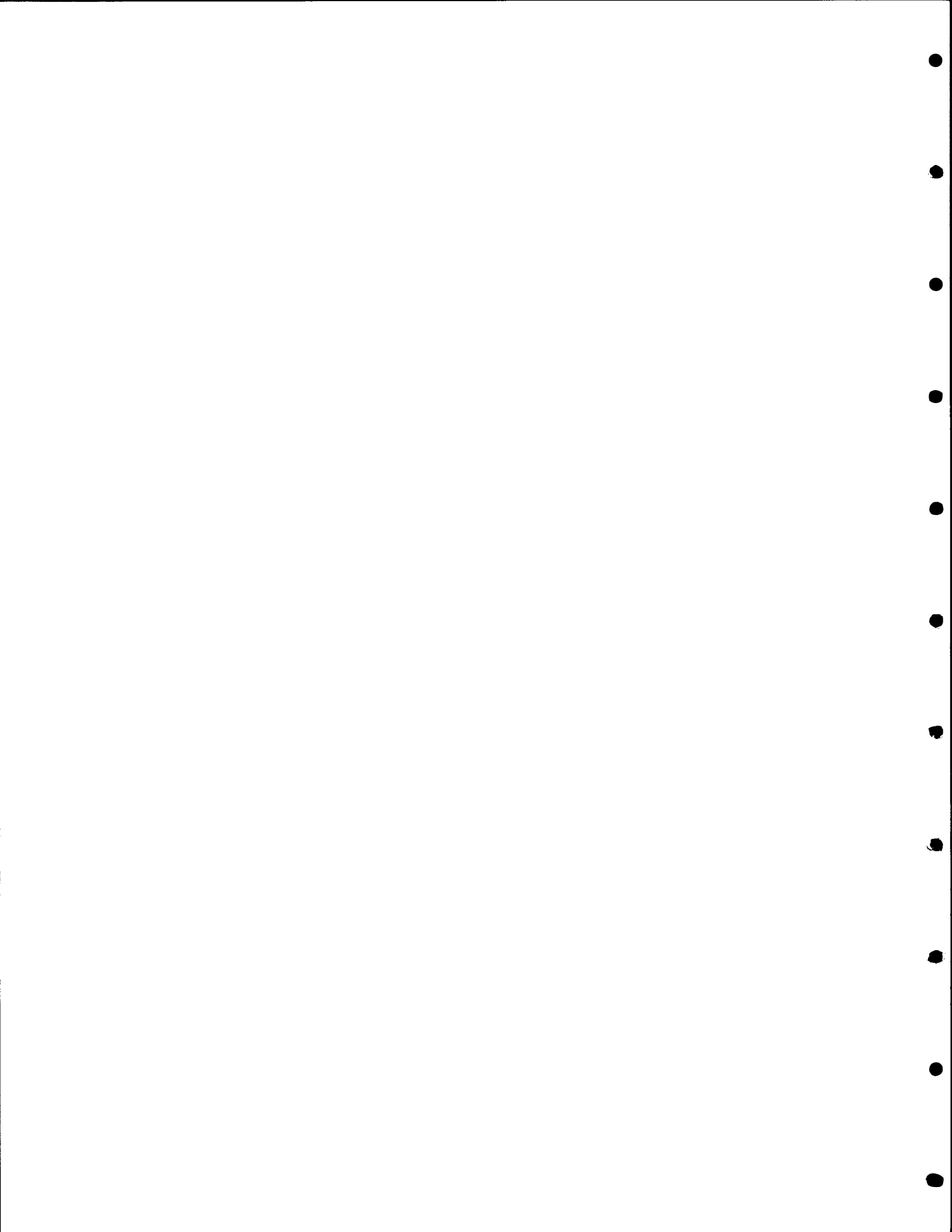
This plan requires:

1. A 230-kV line from Libby via Bonners Ferry to the planned Rathdrum Substation. This line would be 127 to 133 miles (203-213 km) long. Between Libby and the Sandpoint area a double-circuit line would replace the existing 115-kV wood-pole line. (Fig. 2) One side of the tower would carry the 115-kV line, the other side would carry the 230-kV line. This segment would be 94 to 102 miles (150-163 km) long and for the most part would use existing right-of-way. A single-circuit 230-kV line would be constructed from the Sandpoint area to Rathdrum. A substation will be developed at Rathdrum and a 230-kV terminal will be required at the existing Libby Substation.
2. Reconductoring for higher capacity operation 10 to 23 miles of the 115-kV transmission line between the Sandpoint area and Albeni Falls.
3. A 115-kV line between Libby Reregulating Dam and Libby Substation (PP&L), about 7 miles (11 km) long.

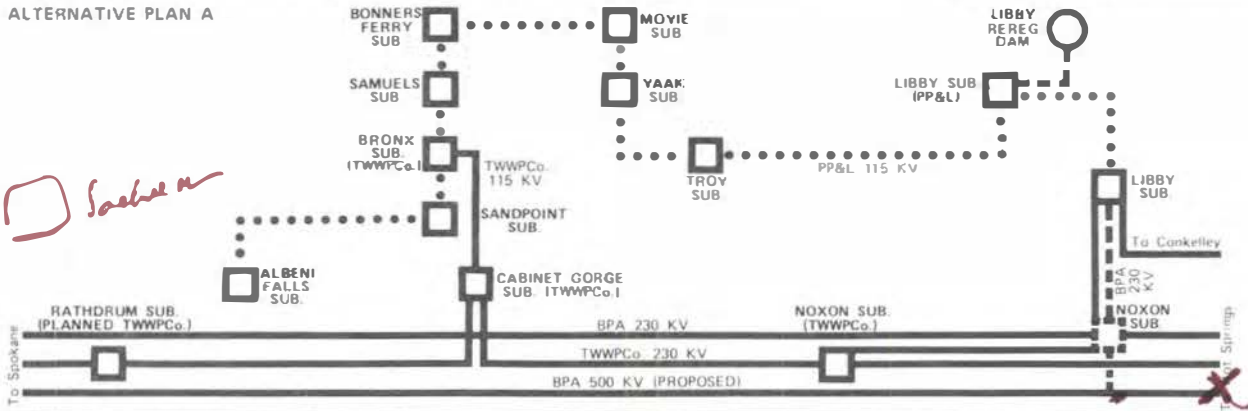
The proposed plan is a long range solution to the problem of serving the electrical needs of northwestern Montana and northern Idaho and providing



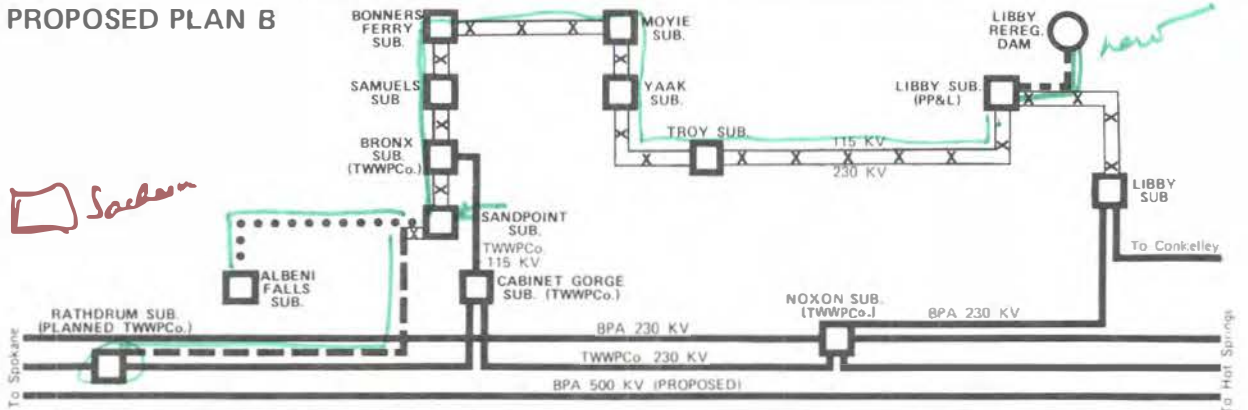
FIGURE 1
AERIAL PHOTO MAP
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
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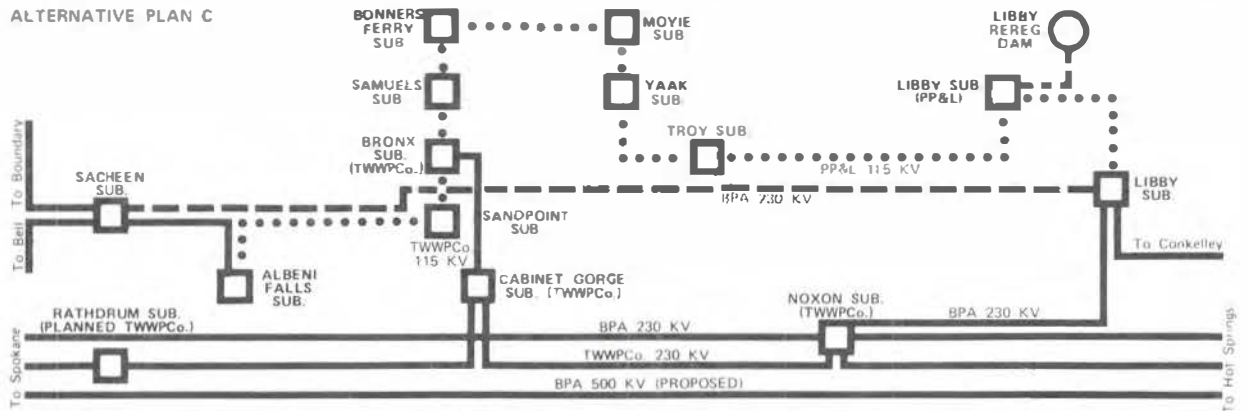
ALTERNATIVE PLAN A



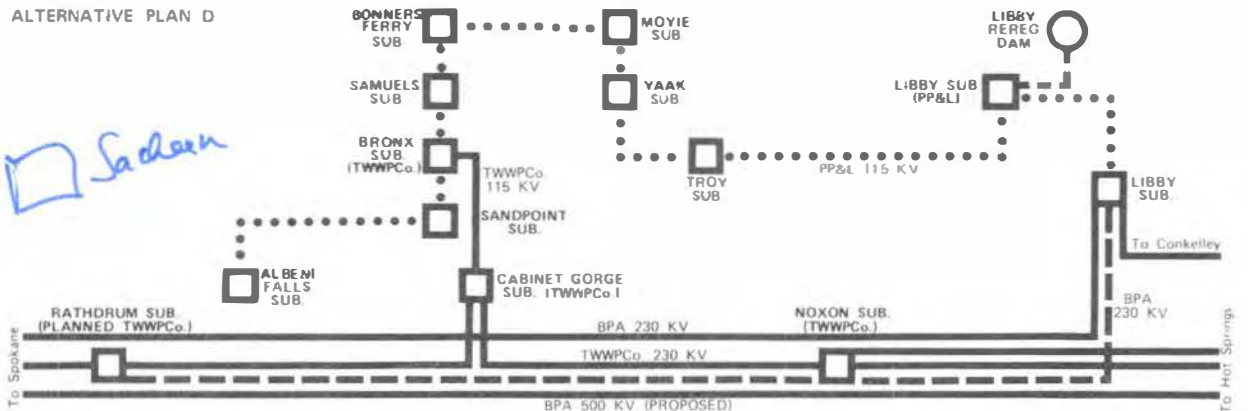
PROPOSED PLAN B



ALTERNATIVE PLAN C



ALTERNATIVE PLAN D



- EXISTING
- - - CONSTRUCT
- RECONDUCTOR
- X—X— REBUILD DOUBLE CIRCUIT ON EXISTING ROW

NOTE
System is BPA 115 KV
unless otherwise labeled

FIGURE 2
PLANS CONSIDERED
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
80-3

adequate transmission for integrating additional power from Libby Dam. Factors important in this plan selection included: using existing right-of-way; developing a multi-purpose facility with the flexibility to serve area requirements reliably and reinforce the main high voltage transmission grid; conserving power transmission losses; and minimizing environmental impacts. This plan avoids proposed critical habitat of the grizzly bear, a threatened wildlife species. It also avoids roadless areas whose status is still being determined under the Forest Service's Roadless Area Review and Evaluation (RARE II). The uncertainty about the status and schedule for Colstrip Units 3 and 4 and its required transmission facilities, including the Hot Springs-Bell project ^{1/}, was another consideration.

ALTERNATIVE PLANS CONSIDERED

Four alternative plans to reinforce transmission facilities from Libby and in the northern Idaho area were identified in the Draft Facility Planning Supplement; one of them, Plan B, was selected and now is presented as the proposed plan. The alternatives are described as follows:

ALTERNATIVE PLAN A

This plan requires:

1. A second 230-kV line between Libby and Noxon with the development of a 500/230-kV substation near Noxon with circuit breakers for existing lines, a 500/230-kV transformer, and power system control and protective equipment (Fig. 2). The 230-kV transmission line would be 45 to 70 miles (72-113 km) long.
2. Reconductoring the 115 mile (185 km) 115-kV Albeni Falls-Libby transmission line for higher capacity operation.
3. A 115-kV line between Libby Reregulating Dam and the Libby Substation (PP&L), about 7 miles (11 km) long.

Alternative Plan A assumes that the proposed Hot Springs-Bell line is built on one of the alternate routes that pass by the Noxon area. This allows for the integration of Libby power into the 500-kV system at Noxon.

ALTERNATIVE PLAN C

This plan requires:

1. A 230-kV line between Libby and Sacheen Substation. This line would be 115 to 140 miles (185-225 km) long. At Libby and Sacheen Substations 230-kV terminals would be required.

1/ The Hot Springs-Bell project is part of a proposed east-west Transmission System that would (a) integrate electrical power produced from coal-fired generating plants in Colstrip, Montana, and (b) provide reinforcement to the Spokane and northwestern Montana load areas. Environmental impacts of this project were evaluated in a Draft Facility Location Supplement to the Fiscal Year 1977 Environmental Statement (September 1975).

2. Reconductoring the 115 mile (185 km) 115-kV Albeni Falls-Libby transmission line for higher capacity operation.
3. A 115-kV line between Libby Reregulating Dam and Libby Substation (PP&L), about 7 miles (11 km) long.

ALTERNATIVE PLAN D

This plan requires:

1. A 230-kV line between Libby and Rathdrum, through the Noxon area. These lines would be 115 to 145 miles (185 to 233 km) long. Line terminals would be required at Libby, Noxon, and Rathdrum.
2. Reconductoring the 115 mile (185 km) 115-kV Albeni Falls-Libby transmission line for higher capacity operation.
3. A 115-kV line between Libby Reregulating Dam and the Libby Substation (PP&L), about 7 miles (11 km) long.

This plan assumes that the proposed Hot Springs-Bell line will bypass the Noxon area, or that the nonconstruction option of the Hot Springs-Bell project is selected.

DESCRIPTION OF THE ENVIRONMENT

PLANNING STUDY AREA

GEOGRAPHY

The planning study area covers 5,800 square miles (15,000 km²) in western Montana, northern Idaho, and northeastern Washington. It includes portions of Flathead, Lincoln, and Sanders Counties, Montana; Bonner, Boundary, Kootenai, and Shoshone Counties, Idaho; and Pend Oreille County, Washington (Fig. 1). The largest landowner is the Federal Government with about 60 percent of the total area. About 35 percent is privately owned. The balance is in State or local government ownership. About 80 percent of the land is forested. Forest, along with the area's abundant mineral deposits, greatly influences development, resource use, settlement, and economic activity.

Prominent topographic features include the Clark Fork Gorge and the Purcell, Cabinet, and northern Bitterroot (Coeur d'Alene) Mountains in Montana, and the Purcell Trench, the Selkirk Mountains, and Lake Pend Oreille in Idaho. The valleys between the mountain ranges are generally narrow, with steep gradients. Elevations range from 1,800 feet (550 m) to over 8,700 feet (2,650 m).

Although the often circuitous transportation network is constructed mainly in valleys and over the lower mountain passes, excellent highway and railroad systems connect the planning study area with major urban centers, including Spokane, Coeur d'Alene and Kalispell.

CLIMATE

The climate in the area varies as a result of complex interplay between maritime and continental air masses over the mountain ranges. Differences in climate are due to the mountains and changes in elevation. Increases in elevation tend to increase precipitation and decrease temperatures. Also, the mountains tend to create local conditions such as rain shadows on leeward slopes and winds through the valleys. Table 2 lists representative climatic data for selected lowland stations.

Table 2 - Representative Climatological Data

Characteristic	Station			
	Newport Washington	Bonnars Ferry Idaho	Sandpoint Exp. Station Idaho	Libby Ranger Station Montana
Average Max/Min January Temp.	31.8/18.0°F (0.0/-7.8°C)	32.0/19.1°F (0.0/-7.1°C)	31.5/20.2°F (-0.3/-6.6°C)	30.6/15.0°F (0.8/-9.4°C)
Average Max/Min July Temp.	86.8/45.9°F (30.4/7.7°C)	84.4/49.7°F (29.1/9.8°C)	81.9/49.1°F (27.7/9.5°C)	89.3/45.0°F (31.8/7.2°C)
Mean Annual Temp.	45.5°F (7.5°C)	46.2°F (7.9°C)	45.4°F (7.5°C)	45.4°F (7.4°C)
Mean January Precipitation	3.49 in (8.9 cm)	2.80 in (7.1 cm)	3.94 in (10.0 cm)	1.80 in (4.6 cm)
Mean July Precipitation	0.60 in (1.5 cm)	0.63 in (1.6 cm)	0.57 in (1.4 cm)	0.61 in (1.5 cm)
Mean Annual Precipitation	28.57 in (72.6 cm)	24.35 in (61.8 cm)	32.94 in (83.7 cm)	18.88 in (48.0 cm)
Mean Annual Snowfall	71.1 in (180.6 cm)	—	—	55.0 in (139.7 cm)

Source: Meteorological Committee, PNWRBC 1969. Climatological Handbook, Vols. I & II.

NATURAL RESOURCES

The following sections describe the natural resources and their geographic location and distribution within the area. Reference is made to resource maps, which primarily show the plan options and differing levels of potential impact. These maps (Figs. 3-9) appear with the corresponding impact discussions. Man's use of natural resources will be presented under the section "Resource Use and Socioeconomic Resources."

ATMOSPHERE

In general, air quality throughout the area is very good. The principal air pollutant, suspended particulate matter, is most prevalent around larger towns with wood processing operations. Other "point" sources include a vermiculite plant and several aggregate and nonferrous metal

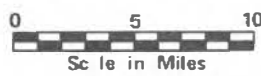
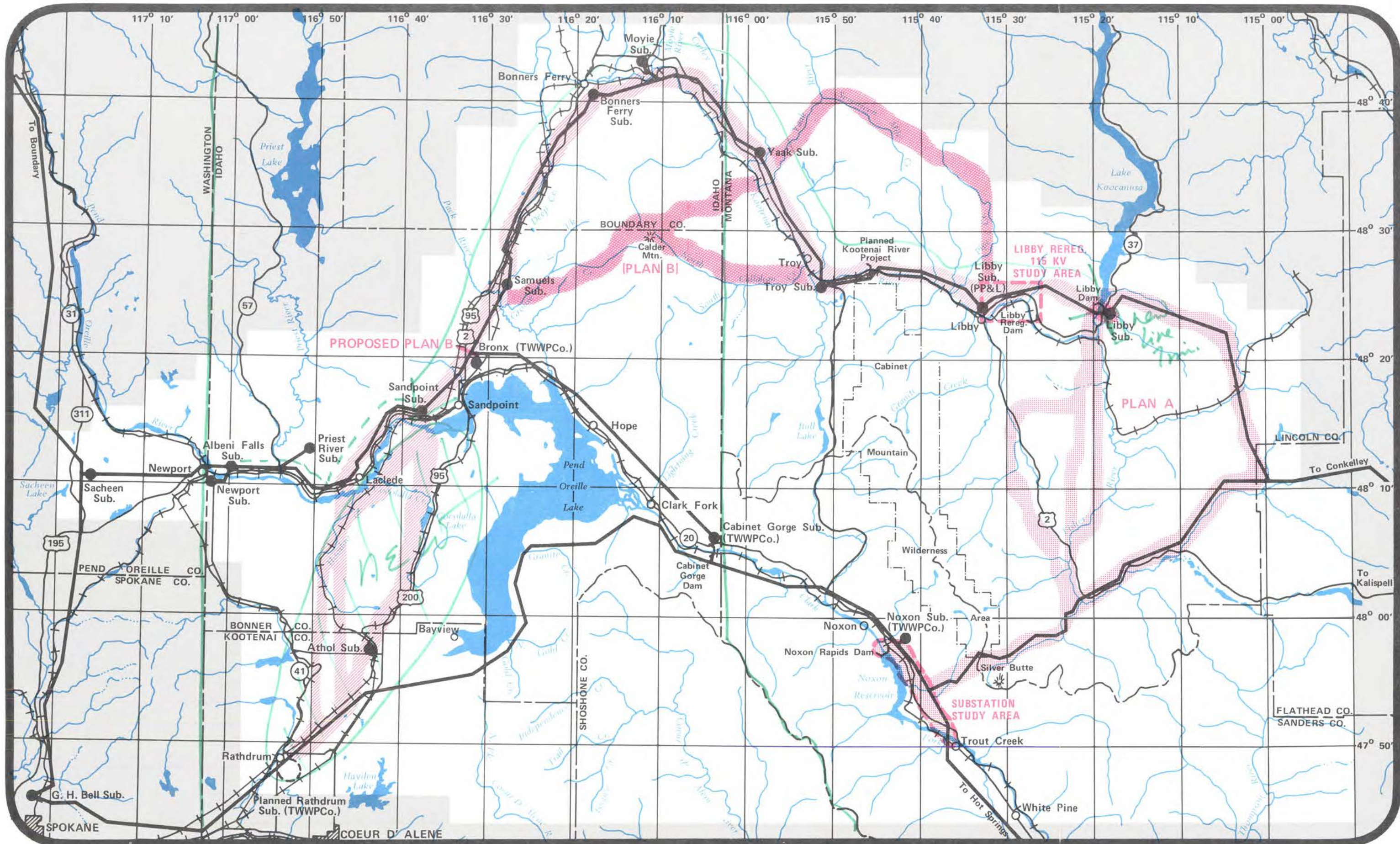
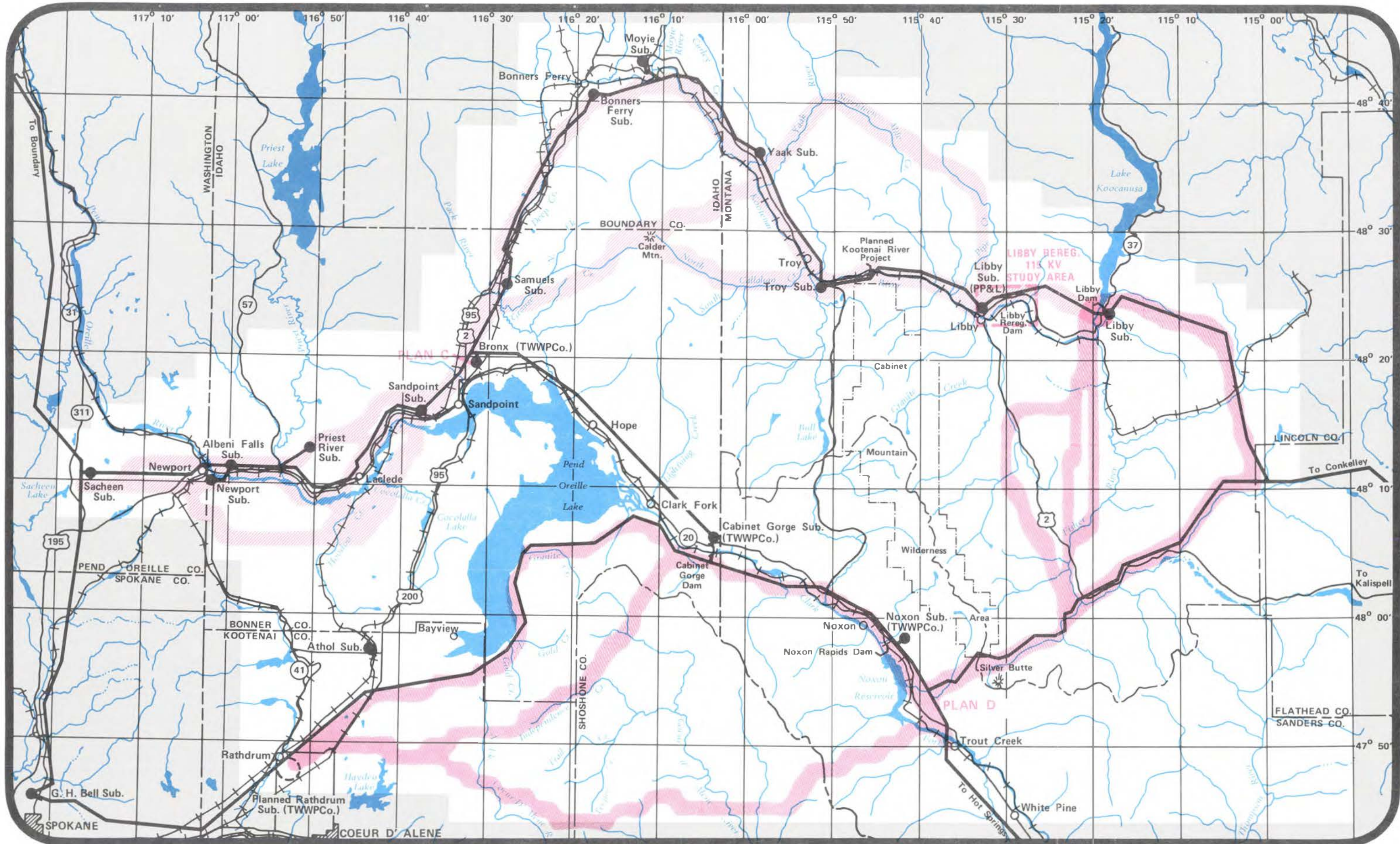


FIGURE 3
 PLANNING STUDY AREA
 LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
 80-3





PLAN C PLAN D

FIGURE 4
 PLANNING STUDY AREA
 LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
 80-3



processing plants. Pollutants from these sources are normally quite localized. The most conspicuous "area" sources of particulate matter are forest slash burning, agricultural activities, unpaved roads, and motor vehicles. Field and slash burning and cultivation activities can be troublesome, especially when atmospheric conditions are not conducive to these operations.

Atmospheric conditions influence the quality of the air. Although winds disperse localized pollution, they may raise dust clouds in recently cultivated or disturbed areas or along unsurfaced roads. The amount of mixing that takes place also affects air quality. Generally speaking, good mixing conditions prevail throughout the study area. However, low mixing or inversion heights tend to result in higher ambient particulate concentrations, as do low wind speeds. These parameters fluctuate daily; the most favorable conditions for pollution dispersal usually occur in midafternoon, the most unfavorable in early morning. From a seasonal standpoint, average mixing heights are lowest in fall and winter.

GEOLOGY, SOILS AND MINERALS

The geology of the area varies from extremely thick Precambrian metamorphic and granitic rocks (McKee 1972) to Pleistocene glacial deposits and Recent alluvium. Distinctive geomorphic subregions within the area (Fig. 1) are primarily the result of (1) massive faulting and (2) glacial activity (Thornbury 1965). These processes are reflected in the region's topography and soil characteristics.

Much of the area is composed of steep slopes and shallow soils. Snow and debris slides are common in the more mountainous terrain. Occasionally landslides and slumps are evident in such disturbed areas as highway cuts, utility corridors, and clear cuts.

The following general soil groups are found in the area:

Alluvial and Glacial Outwash Soils formed on alluvial and glacial outwash lands are located mainly on flood plains, low terraces, alluvial fans, or ground moraine landforms. Drainage varies from good to poor with shallow, fluctuating water tables. The slope varies from 0-15 percent and the elevation ranges from 2,100 to 3,000 feet (640-915 m). The potential for soil erosion is low for glacial soils to high for silty soils. Soil stability varies from high for flat areas to low for steep breaks in lacustrine silts.

Foothill Soils occur at intermediate elevation (2,500-3,800 feet (760-1,160 m)), below the intermountain basins and mountains. Slopes are generally 0-30 percent. Soil erodibility and soil instability potentials are moderate to high.

Intermountain Basin Soils are on level to hilly terrain in mountain valleys, and are derived from the surrounding mountains. The soils are deep and well drained. Alluvial terraces, glacial drift outwash terraces, and lake bottom sediments occur in some areas. Glacial deposits are

underlain by sedimentary, metamorphic, and igneous bedrock. Areas of bedrock are exposed. The slopes range from 0-30 percent. Elevation ranges from 3,000 to 5,500 feet (915-1,675 m). Soil erodibility and soil instability potentials are moderate to high.

Mountain Soils are generally on steep or very steep lands with high relief at higher elevations, underlain by bedrock. There are significant areas of rock outcrop and shallow soils. Plateau-like ridgetops occur along rocky canyons and streams. Slopes vary from 15 to over 60 percent, and elevations from 4,000 to 7,000 feet (1,220-2,140 m). Soil erodibility potential is high. Soil stability hazard is moderate to high.

A few earthquake epicenters with Richter magnitudes of 5.0 or less have been recorded within the area (Shannon and Wilson 1972). The eastern boundary of the study area is about 30 miles (48 km) from the more seismically-active Kalispell-Polson area. Geologic maps of the northern Rocky Mountains show several regional faults in the area. However, seismic intensities anticipated from earthquakes with magnitudes experienced within recorded history are not expected to exceed VI* on the Modified Mercalli Intensity Scale (Shannon and Wilson 1972).

Metallic minerals are found in portions of the area. Districts bordering Pend Oreille Lake and the mouth of the Clark Fork River have produced silver, lead, and copper, with small amounts of antimony and manganese as byproducts. The upper Kootenai River basin in Montana contains a few productive gold deposits, including gold from placers and lodes in the Libby-Troy-Sylvanite districts. Reserves plus production from lodes also include silver, lead, copper, and zinc. The Cabinet Mining District on the headwaters of Libby Creek and Fisher River has produced silver, lead, and gold in minor amounts from placers and lodes.

Sand and gravel, limestone, clay, barite, talc and vermiculite mining contribute to the economy. No fossil fuels of economic importance have been found. However, there are beds of peat in the Pend Oreille River drainage and widespread peat deposits are present in the Kootenai River drainage in Boundary County, Idaho.

HYDROLOGY

The study area covers four major drainage basins: the lower Clark Fork, middle Kootenai, upper Pend Oreille, and northern Coeur d'Alene. The larger streams, for the most part, have low gradients whereas the many tributaries are relatively short and swift. Generally, peak flows occur during May and June; average flows for these months are about three times the average annual flow. Runoff is primarily from spring snowmelt and varying amounts of rainfall. Spring floodflows are regulated by natural lakes, high wetland areas, and large reservoirs. Lakes Koocanusa

1/ Felt by all; many frightened and run outdoors. Some heavy furniture moved; a few instances of fallen plaster or damaged chimneys. Damage slight.

and Pend Oreille play an important regulation role; there are five reservoirs in the study area each with a total storage capacity of 5,000 acre feet (approximately 6,000,000 m³) or more. They are:

<u>Reservoir</u>	<u>Stream</u>	<u>Storage</u>
KOOCANUSA	Clark Fork R.	112,000 ac. ft. (138 million m ³)
PEND OREILLE	Pend Oreille R.	1,561,300 ac. ft. (1,927 million m ³)
NOXON	Clark Fork R.	493,600 ac. ft. (609 million m ³)
CABINET GORGE	Clark Fork R.	112,000 ac. ft. (138 million m ³)
THOMPSON FALLS	Clark Fork R.	69,400 ac. ft. (85 million m ³)

The Kootenai River has a mean annual streamflow of 5,328 cfs (150 m³/s) at Porthill (on the U.S./Canada border) (C-NP 1970). Major tributaries are the Fisher and Yaak rivers. The Kootenai flows through mountainous terrain where natural stream gradients run from 1 to 3 percent. However, downstream from the confluence of the Yaak, the gradient is much lower (roughly 0.1 percent). Major floodprone areas along the Kootenai occur from Moyie Springs downstream to the valley northwest of Bonners Ferry. *

Mean annual streamflow of the Clark Fork River at Cabinet Gorge is 20,889 cfs (590 m³/s) (C-NP 1970). Flows in this lower reach typically peak during the May-June spring snowmelt. The major tributary is Bull River. Gradients for the Clark Fork approach 0.1 percent in the lower valley areas; however, local tributaries originating in nearby mountainous areas run much steeper. Floodprone areas in this basin lie largely around Pend Oreille Lake.

The Pend Oreille basin is mainly a northwestward extension of the Clark Fork. Its major features are Pend Oreille Lake (94,600 acres (38,300 ha)) and the Pend Oreille River; the major tributaries are Pack and Priest rivers. Gradients generally run from 1 to 2 percent. Streamflows usually peak in late spring.

Floodprone areas as described in this statement reflect only preliminary determinations; HUD base flood plain maps will be used to identify 100-year flood plains during location studies.

Numerous wetlands occur throughout the study area (Fig. 6). They fall into two categories: small marshes at tributary headwaters and larger semi-inundated areas adjacent to major water bodies. The latter are found in the Pend Oreille Lake-Albeni Falls vicinity and the Kootenai Flats area around Bonners Ferry. The wetlands are important components of the natural system and provide hydrologic regulation and wildlife habitat.

Existing sediment yield for an area is a concern in transmission line planning. Although sediment yield data are variable, they indicate generally low yields (0.02-0.1 ac.ft./sq. mi./yr.) (10-320 m³/km²/yr.) (C-NP 1970). However, localized sediment increases can occur in disturbed areas according to the soil's erodibility characteristics.

The water in the area is used mostly for irrigation, and to supply municipal and industrial needs. Other uses include power generation and recreation. In the Kootenai basin primary users are the municipalities of Libby and Bonners Ferry and the wood products industry. Municipal and rural-domestic supplies come from Kootenai River tributaries and wells. Small Clark Fork tributaries and wells supply municipal and rural-domestic water in the Clark Fork basin. The greatest water demand occurs in the Pend Oreille basin and is associated with population; most of this use is in the Sandpoint-Newport area. The major sources of water are the Pend Oreille River and its tributaries (C-NP 1971).

Early in 1978 the Environmental Protection Agency, by authority of the Safe Drinking Water Act of 1974, designated the Spokane Valley - Rathdrum Prairie Aquifer as the sole or principal source of drinking water for an area in Kootenai County, Idaho and Spokane County, Washington. The Aquifer begins in Idaho near Spirit Lake and Pend Oreille Lake and stretches southward through the Rathdrum Prairie. Its boundaries extend beyond the study area through the city of Spokane.

VEGETATION

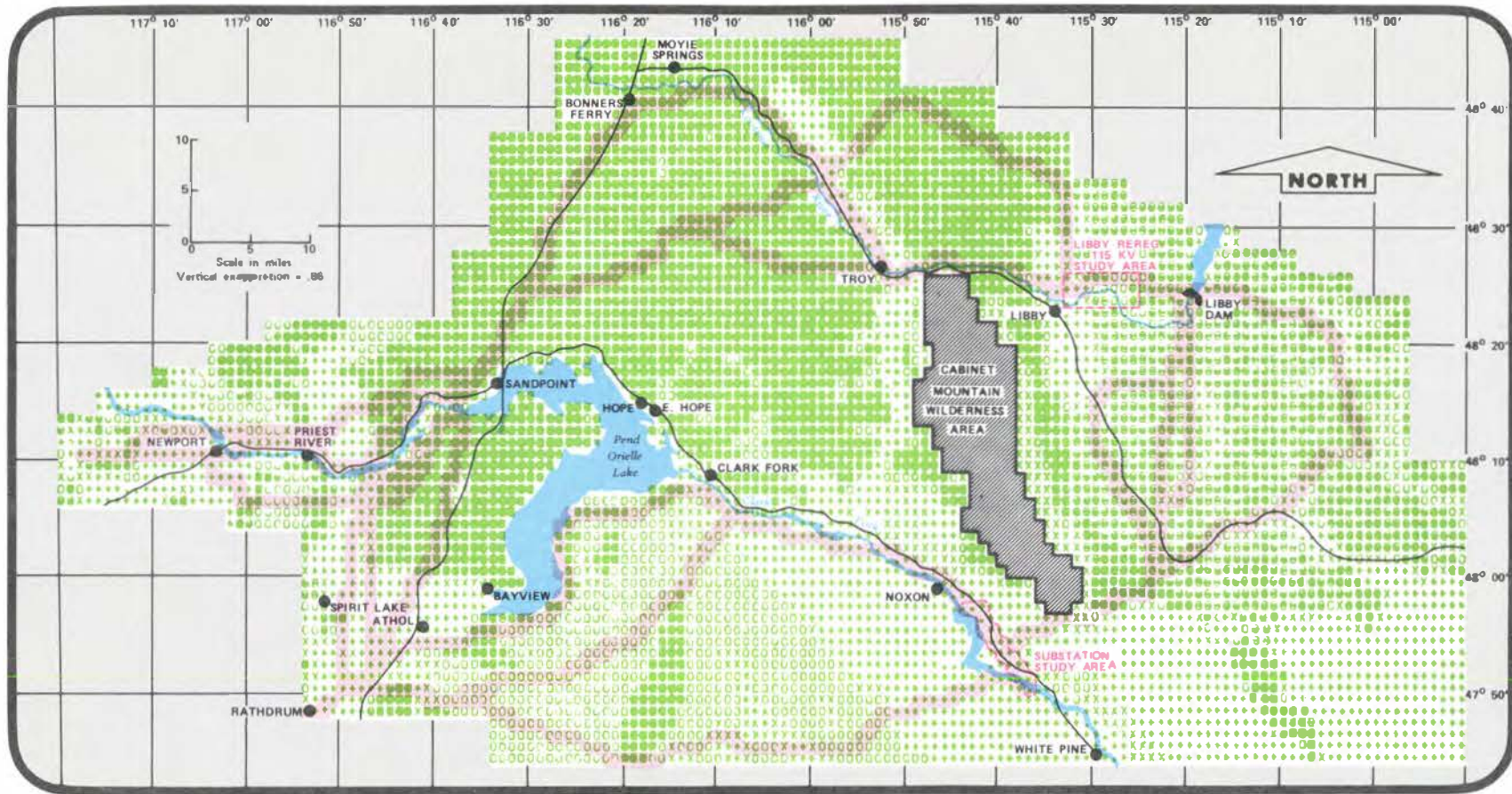
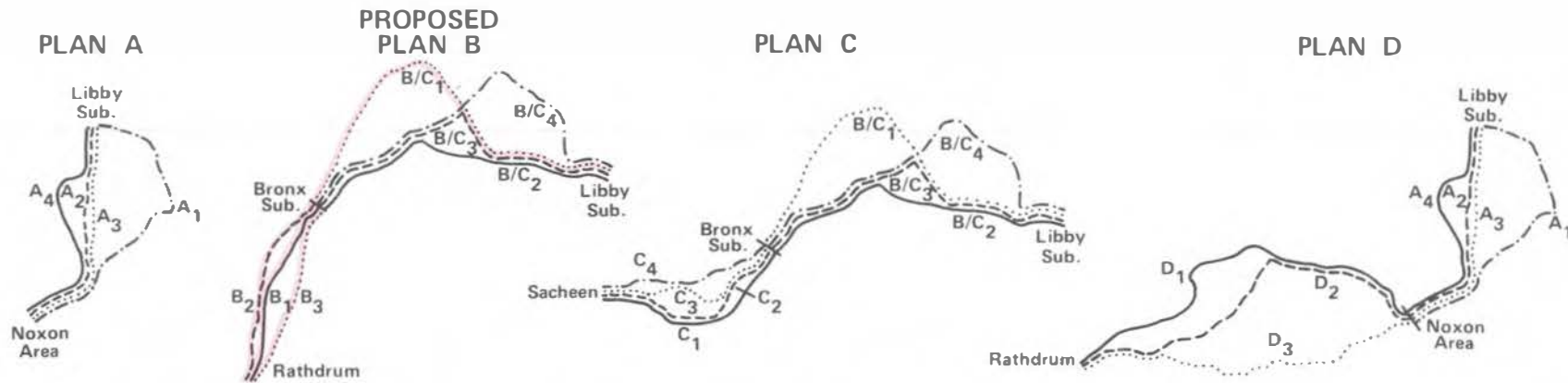
The existing vegetation is about 80 to 90 percent forest. About 10 percent of this forest is relatively open (30 percent crown cover or less); less than 1 percent is deciduous. Grass and shrub lands cover about 5 percent of the land.

Olsen and Elliott (1975) mapped the vegetation habitats (or sites) in the area. These habitats are groups of plant communities based on similarities in plant species, climate and topography (Odum, 1971). Mapped vegetation classes are used as indicators of general environmental conditions.

Predominant habitat types are shown on Figure 7. The grassland/shrubland habitat types are found locally in the driest environments. After the grass/shrub communities, coniferous forest types occur as available moisture and elevation increases: first the Ponderosa pine type, then Douglas-fir, followed by Cedar-Hemlock associations, and next Subalpine types. The talus/grass type is a general category of exposed or unstable land with fragile or partial vegetation cover, which often occurs above timberline.

Climatic conditions along environmental gradients, such as moisture availability, slope, and aspect, generally affect both the relative productivity of each plant-community and its ability to recover from disturbance.

To date fifteen endangered and two threatened plants have been listed on the "U.S. List of Endangered and Threatened Wildlife and Plants" (Federal Register, August 11, 1977, and Federal Register, April 26, 1978). From the information available, none of the 17 plants is in the study area.

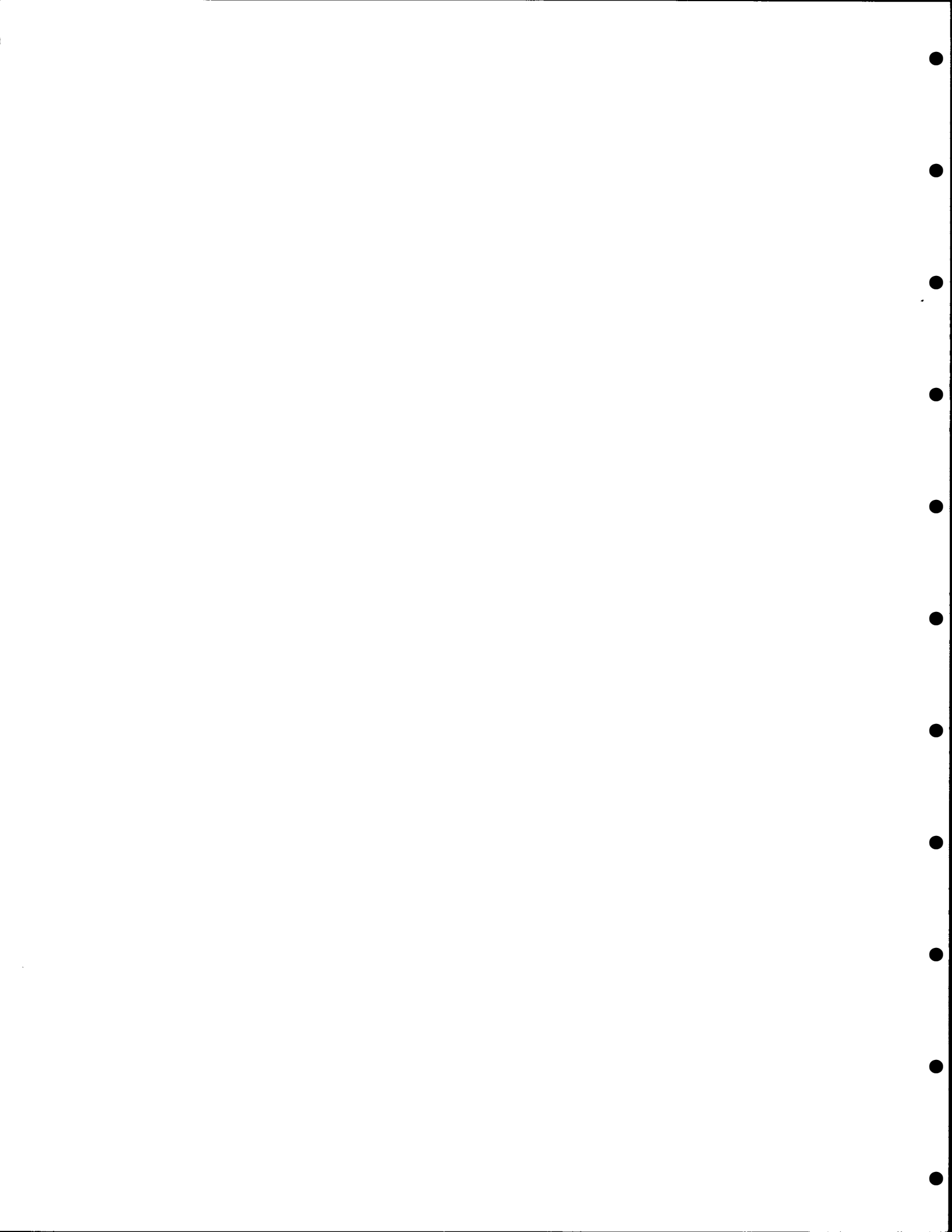


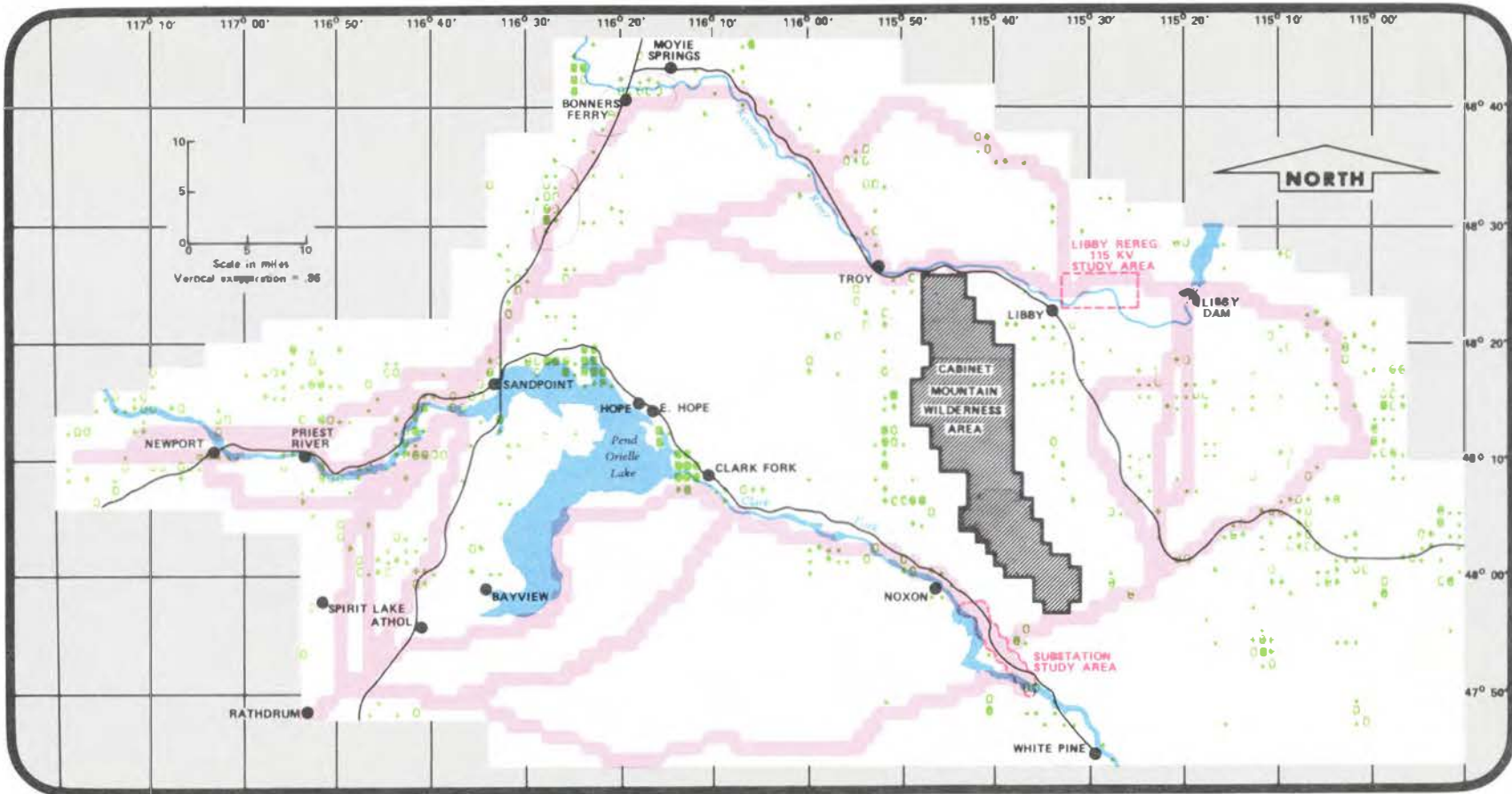
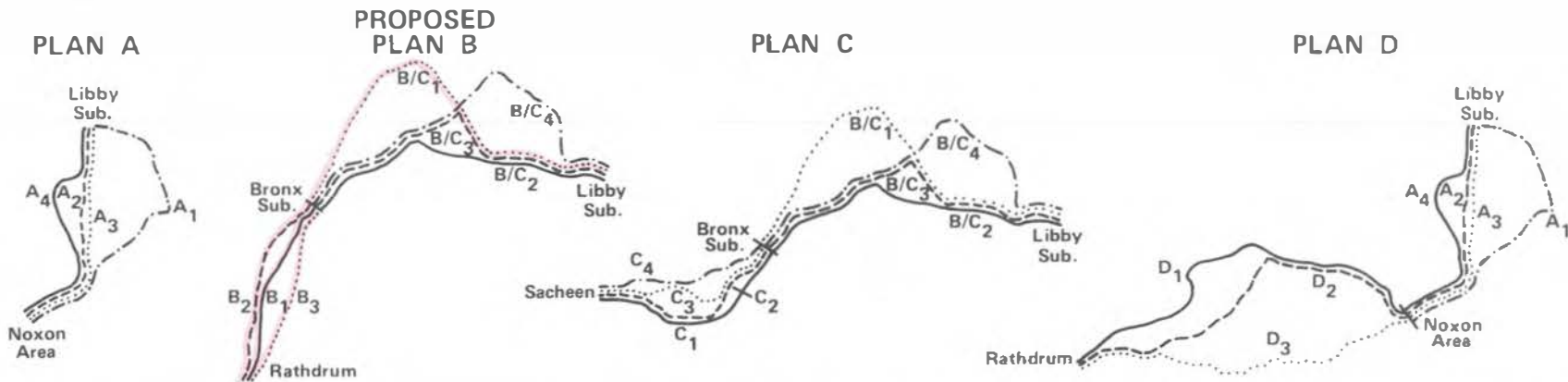
DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.

LEGEND



FIGURE 5
DISRUPTION TO SURFACE MATERIALS
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT





DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.

LEGEND



FIGURE 6
WETLANDS
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
80-3



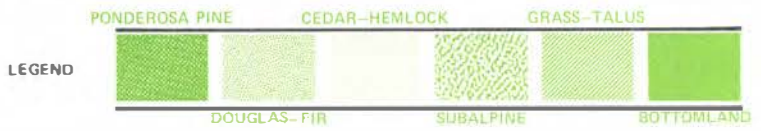
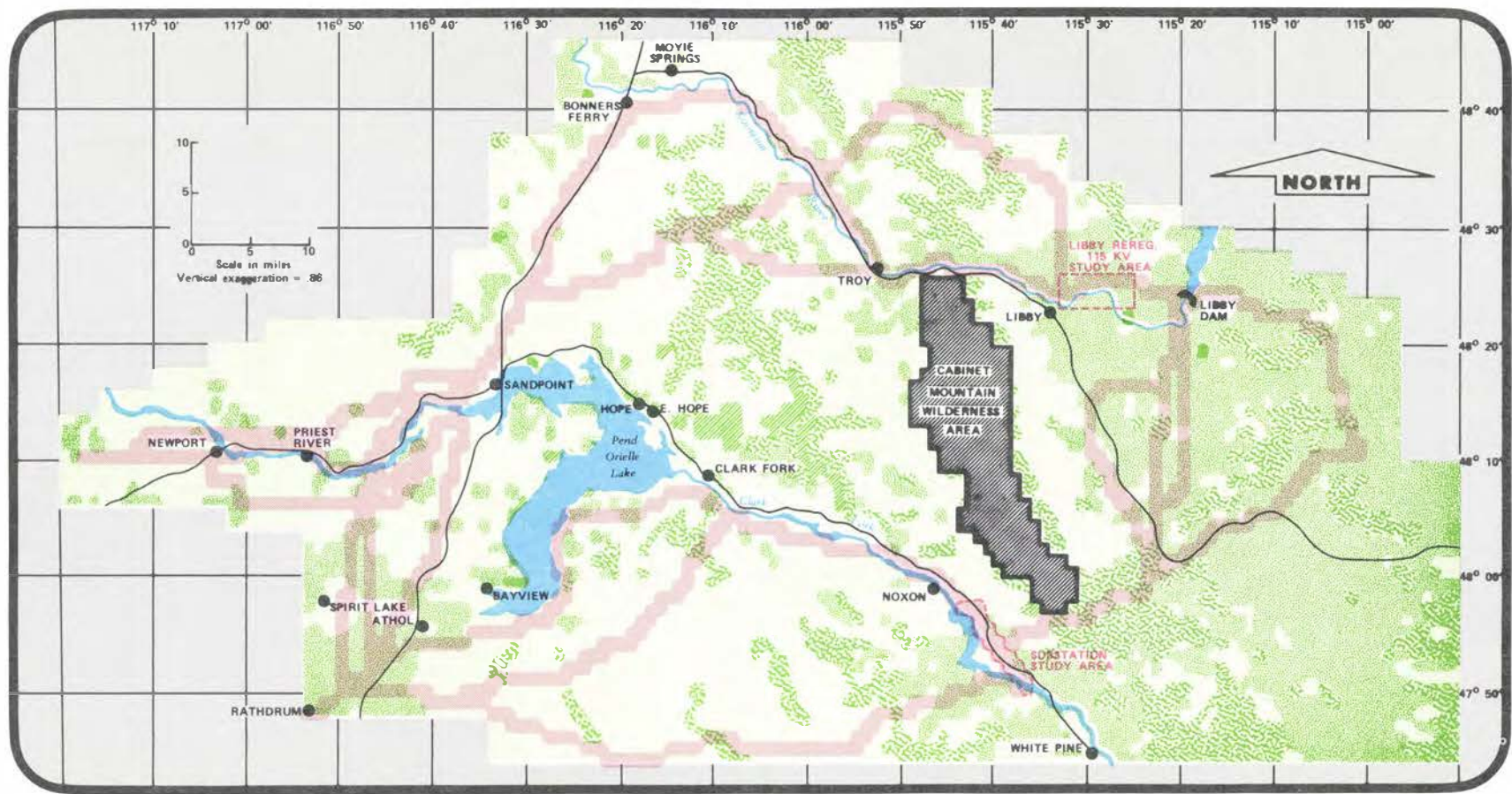
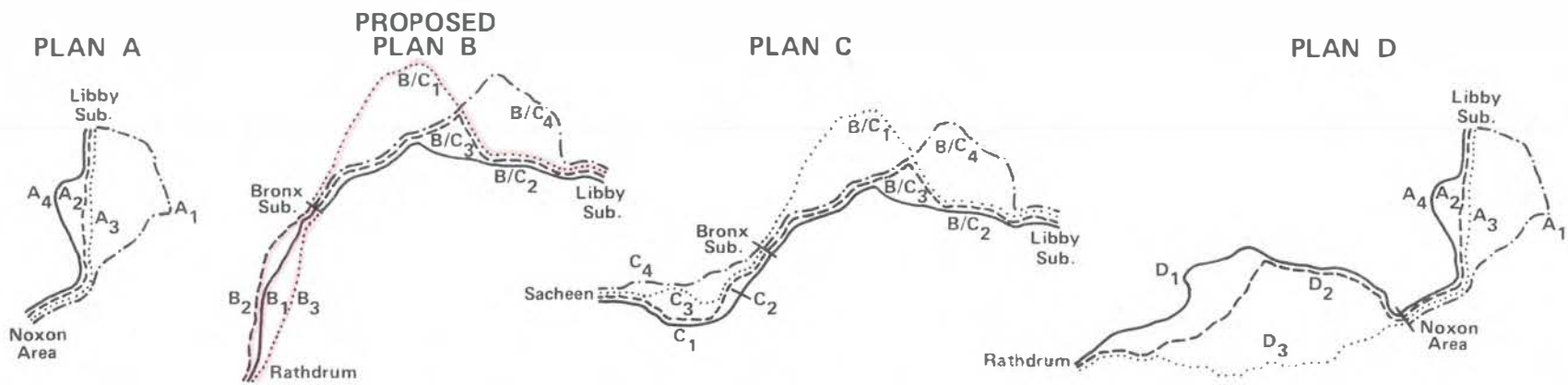


FIGURE 7
 VEGETATION
 LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
 80-3



The following research natural areas, botanical areas, and experimental forests have been identified in the planning study area.

1. Priest River Experimental Forest (permanent research studies since 1911)
2. Canyon Creek Research Natural Area (within Priest River Experimental Forest)
3. Deception Creek Experimental Forest (permanent research studies since 1934)
4. Montford Creek Research Natural Area (within Deception Creek Experimental Forest)
5. Upper Shoshone Creek Research Natural Area (proposed)
6. Ross Creek Cedars - Botanical Area

WILDLIFE

The area contains hundreds of streams and lakes which provide excellent habitat for resident fish. The aquatic habitat and wetlands also support waterfowl and numerous other wildlife species, including furbearers.

The Kootenai River contains populations of rainbow trout, mountain whitefish, kokanee, white sturgeon, and several kinds of minnows and suckers. Wood ducks, mallards, greenwing teal, and Canada geese nest on the floodplain of the Kootenai River. The Kootenai is regulated by Libby Dam, and flow fluctuations and channel dewatering have had detrimental effects on fish and waterfowl habitat (White and Cochnauer 1975).

The Clark Fork supports Kamloops, Dolly Varden, and cutthroat trout, provides some spawning habitat, and is heavily used as a migration route between its tributaries and Pend Oreille Lake. One of these tributaries, Lightning Creek, is a major spawning area for Kamloops, Dolly Varden, cutthroat, and kokanee. The Clark Fork River delta is an important waterfowl nesting area; excessive flows from Cabinet Gorge Dam can cause flooding of waterfowl nests. Water fluctuation after fish spawn has resulted in some destruction of eggs (White and Cochnauer 1975).

Fishery resources of the Pend Oreille River include rainbow trout and mountain whitefish. Some waterfowl nesting occurs along slough areas of the river. Priest River is a major tributary of the Pend Oreille and contains rainbow and cutthroat trout.

Other notable fishery streams include the Pack River, Grouse Creek, Granite Creek, Gold Creek, and the Coeur d'Alene River.

In Pend Oreille Lake, the largest in the area, the kokanee is the most abundant species. The population of this fish results primarily from natural reproduction. Dolly Varden, rainbow trout, cutthroat trout, mountain whitefish, lake whitefish, and some warm water species are also present. In addition, both wintering and breeding populations of waterfowl use the lake. Other important lakes include Hayden Lake, Sacheen Lake, Cocolalla Lake, and Noxon Reservoir.

Rainbow, cutthroat, and Kamloops trout spawn in the spring. Incubation occurs through July. Kokanee begin spawning in November; incubation occurs through May (White and Cochnauer 1975).

A wide variety of bird species inhabit the area. Osprey nesting populations in northern Idaho and eastern Washington are the largest in the western United States (Johnson and Melquist 1973). Nesting areas are common near Lake Pend Oreille and along the Kootenai and Clark Fork Rivers. Large wintering populations of bald eagles also occur in these areas and at McArthur Lake southwest of Bonners Ferry. Several other species of birds of prey occur throughout the area.

Blue, ruffed, and spruce grouse are forest species and therefore inhabit most of the area. Scattered populations of wild turkeys are found along the Clark Fork River.

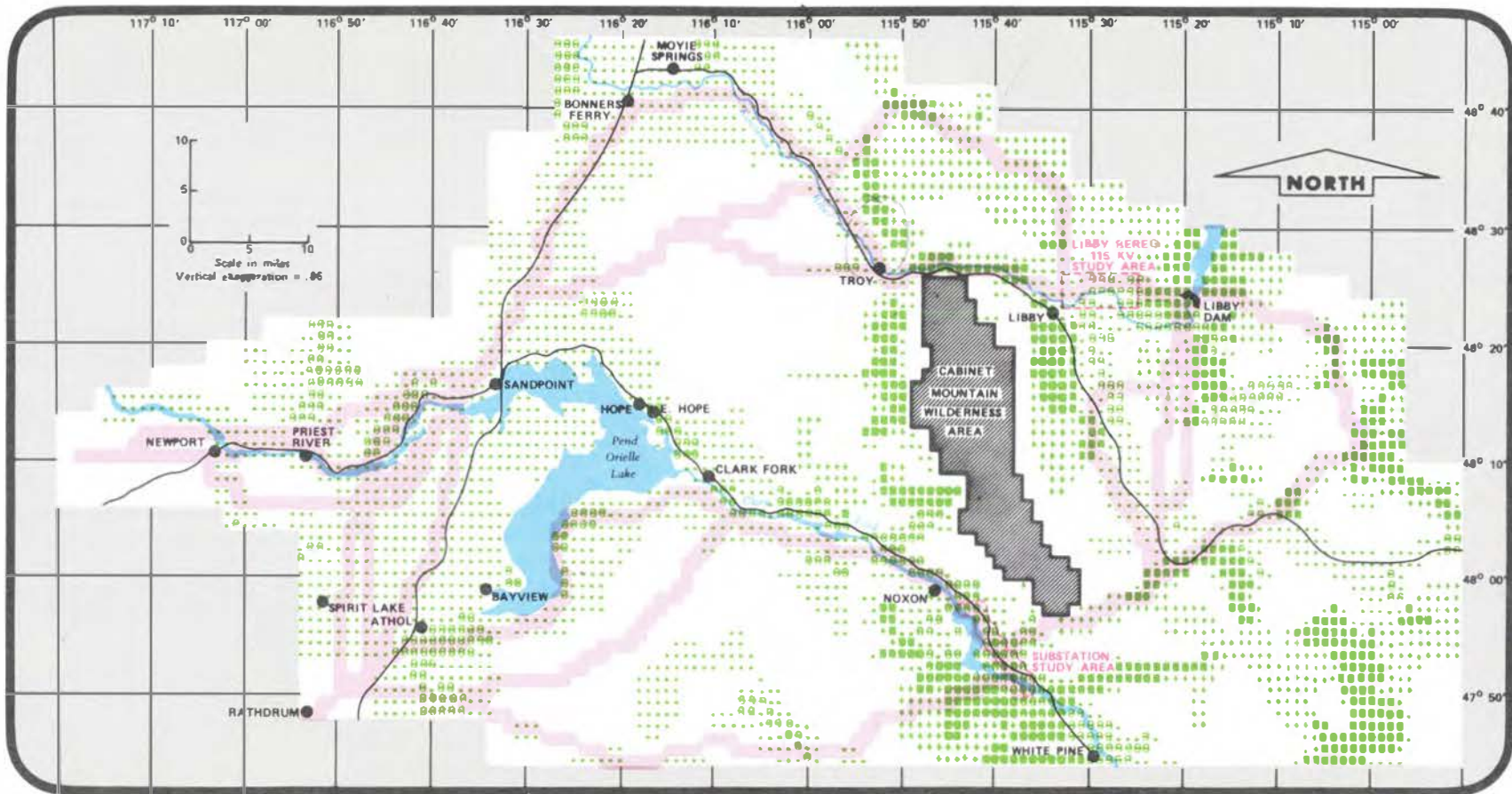
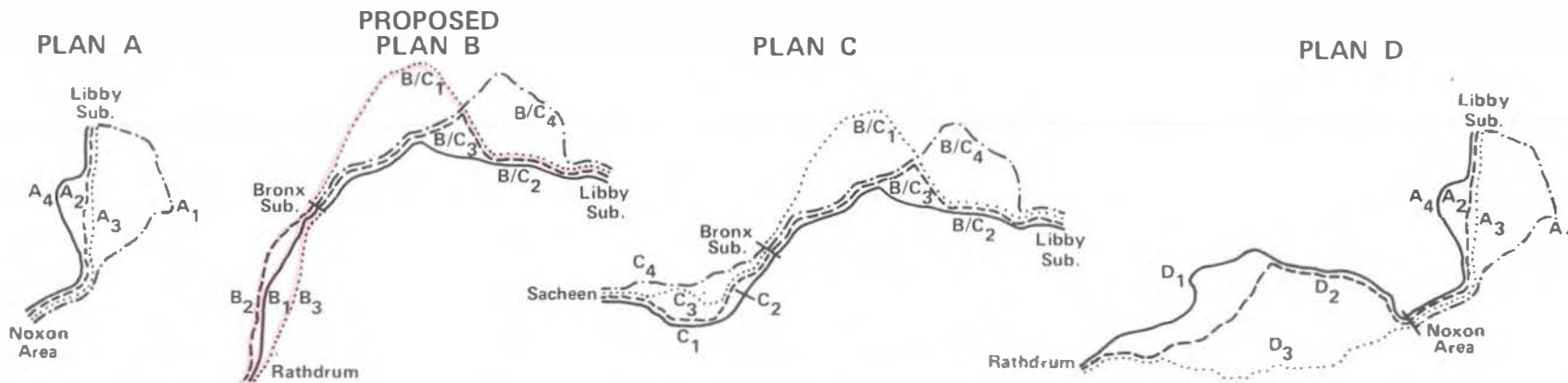
Most of the area is excellent deer and elk habitat. Both mule and whitetail deer are present; whitetails are most abundant. Large elk populations occur southeast of Pend Oreille Lake. Heavy winter snows fall in the mountainous country, forcing deer and elk to migrate to lower winter ranges (Fig. 9). These areas, which are usually along river valleys, are especially important to the continued survival of the herds.

Moose are scattered throughout the northern and eastern parts of the area. Mountain goats inhabit isolated pockets at higher elevations south of Pend Oreille Lake and in the eastern part of the area. Small populations of big horn sheep also inhabit the eastern part. Most of the large species of the order Carnivora which remain in the United States probably inhabit the area. They include black and grizzly bears, mountain lion, lynx, bobcat, coyote, red fox, and Northern Rocky Mountain wolf. With the exception of the more adaptable black bear, coyote, and red fox, these animals are generally in the relatively pristine portions of the area.

The U.S. Fish and Wildlife Service has proposed that certain areas be designated as critical habitat for the grizzly bear (Federal Register July 12, 1976) (Fig. 8) and has held public hearings on the proposal. During the hearings the Service explained that the function of a critical habitat designation is to delineate the habitat necessary for the survival and recovery of a species. It was further stated that the proposed grizzly critical habitat boundaries were drawn rather broadly to encompass all occupied grizzly habitat. Section 7 of the Endangered Species Act of 1973 directs all Federal agencies to make sure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of a threatened or endangered species or result in destruction or adverse modification of its critical habitat.

Table 3 lists wildlife species having special status which may inhabit the study area.





DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.

LEGEND

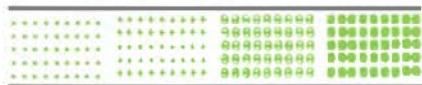


FIGURE 9
WINTER RANGE (GOAT, SHEEP, MOOSE, DEER, ELK)
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT

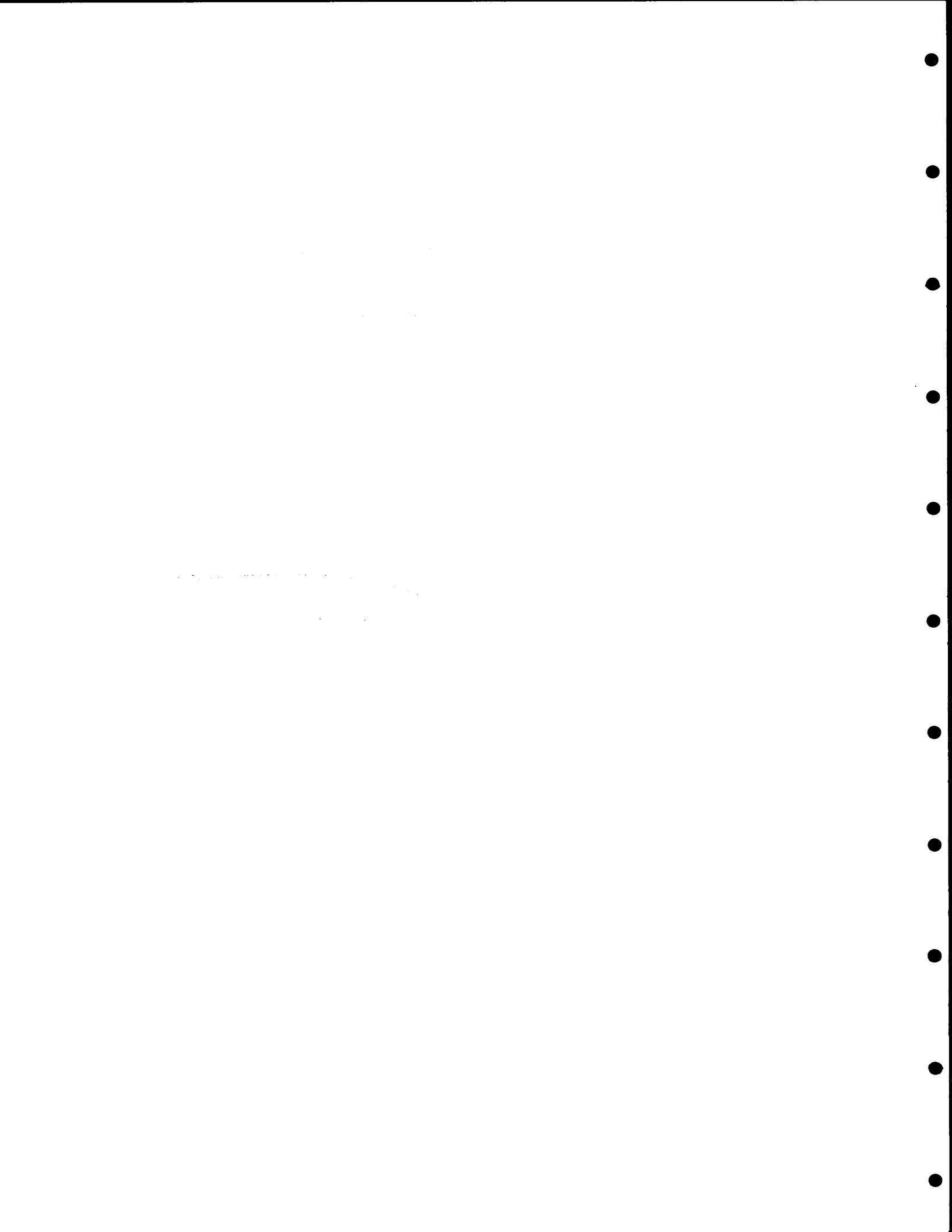


Table 3 - Special Status Wildlife That May Occur Within the
Planning Study Area

Species/Subspecies	Status	Distribution in Study Area
Montana westslope cutthroat trout <u>Salmo clarki</u> subspecies	Undetermined 1/	Fairly common throughout the Kootenai and Clark Fork river drainages.
Arctic grayling <u>thymallus arcticus</u>	Threatened 1/	Clark Fork drainage.
American peregrine falcon <u>Falco peregrinus anatum</u>	Endangered 2/	A small number of both wintering and breeding birds may occur around Rathdrum. Prefers open country including marshes. Usually nests on cliffs.
Prairie falcon <u>Falco mexicanus</u>	Threatened 1/	More numerous than the peregrine. Prefers open country. Usually nests on cliffs. Most likely occurs in the western part of the area.
Ferruginous hawk <u>Buteo regalis</u>	Undetermined 1/	Inhabits open country. Nests in trees or on cliffs. Summer resident near agricultural lands in the western part of the area.
American Osprey <u>Pandion haliaetus carolinensis</u>	Undetermined 1/	Large nesting populations occur around Pend Oreille Lake, and along Kootenai and Clark Fork Rivers. Nests in trees in or near water.
Bald eagle <u>Haliaeetus leucocephalus</u>	Endangered 2/ 3/ Threatened 2/ 4/	Large wintering populations occur around Pend Oreille Lake and along Clark Fork and Kootenai Rivers. Nests in tall trees usually near water.
Northern Rocky Mountain wolf <u>Canis lupus irremotus</u>	Endangered 2/	A few animals may exist in the more remote parts of the area.
Grizzly bear <u>Ursus arctus horribilis</u>	Threatened 2/	See Figure 8 for proposed critical habitat (Cabinet Mountains Area).
California bighorn <u>Ovis canadensis Californiana</u>	Threatened 1/	Small scattered populations in the eastern and southern parts of the area. Some animals have been trapped in British Columbia and released in Idaho.
Fisher <u>Martes pennanti</u>	Undetermined 1/	Widely scattered primarily in Idaho and in forested parts of the study area. Was reestablished in Idaho by release of animals trapped in British Columbia.
Wolverine <u>Gulo luscus</u>	Undetermined 1/	Widely scattered in forested parts of the study area.
Canada lynx <u>Lynx canadensis</u>	Undetermined 1/	Widely scattered in remote, forested parts of the study area.
Pine martin <u>Martes americana</u>	Undetermined 1/	Widely scattered in forested parts of the study area.

1/ As defined by "Threatened Wildlife of the United States." 1973. U.S. Fish and Wildlife Service. Resource Publication 114.

2/ As defined by The Endangered Species Act of 1973.

3/ In Idaho and Montana.

4/ In Washington.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

The following sections discuss man's use of the natural resources previously described. Resource maps (Figs. 10 - 15) introduced in the following sections appear with the corresponding impact discussion.

DEMOGRAPHIC AND ECONOMIC CONSIDERATIONS

The estimated 1975 population for the planning study area is 44,120 (Table 4). Much of this increase since 1970 is the result of immigration. However, most portions of the study area in Montana experienced a decline in population between 1970 and 1975. Although the population averages 7.6 persons per square mile (2.9/km²), seven principal towns account for nearly 38 percent of the total population. Generally, the rest of the people live adjacent to these towns and/or along narrow valley floors. The mountainous terrain is sparsely populated. Seasonal population fluctuations are considerable due to excellent recreational opportunities and a growing number of vacation homes.

Table 4 - Population Estimates for the Planning Study Area *

State ** County ** (Town)	1975	1970	1960
Study Area Total	<u>44,120</u>	<u>40,120</u>	<u>34,830</u>
Montana	<u>13,000</u>	<u>14,730</u>	<u>9,670</u>
Flathead	30	30	20
Lincoln (Libby)	12,510 (2,870)	14,300 (3,286)	9,300 (2,828)
(Troy)	(920)	(1,046)	(855)
Sanders	460	400	350
Idaho	<u>27,670</u>	<u>22,180</u>	<u>21,820</u>
Bonner	19,890	15,260	15,390
(Priest River)	(1,950)	(1,493)	(1,749)
(Sandpoint)	(5,410)	(4,144)	(4,355)
Boundary	6,560	5,970	5,510
(Bonners Ferry)	(3,070)	(2,796)	(1,921)
Kootenai	1,170	900	850
(Rathdrum)	(960)	(741)	(710)
Shoshone	50	50	70
Washington	<u>3,450</u>	<u>3,210</u>	<u>3,340</u>
Pend Oreille	3,450	3,210	3,340
(Newport)	(1,532)	(1,418)	(1,513)

* These population estimates were determined by relating the county subdivisions and places used in the 1970 census to the planning study area boundaries.

** Only those portions of the States and counties located within the planning study area boundaries are included in these estimates.

Source: U.S. Bureau of Census, 1970, Vol. 1, Characteristics of the Population, Part 14 - Idaho, Part 28 - Montana and Part 49 - Washington; U.S. Bureau of Census, 1975, Population Estimates for Idaho, Montana, and Washington.

The economic base is centered on forestry, agriculture, recreation, and mining; however, these activities have been changing in recent years, reflecting a move away from primary production. Personal services and wholesale and retail trade show substantial gains in employment. This reflects the increasing demand for goods and services from the growing permanent population and the seasonal visitors.

LAND USE

Land use plans and zoning ordinances have not been adopted uniformly throughout the eight counties in the study area. Boundary and Kootenai Counties in Idaho and Flathead County in Montana have zoning ordinances. Flathead and Lincoln Counties, Montana and Kootenai and Bonner Counties, Idaho have adopted county comprehensive plans. Shoshone County, Idaho has land subdivision regulations in effect.

A few cities have zoning laws, including Libby, Montana and Newport, Washington. Libby also has a planning ordinance.

In terms of land area, the most significant feature of these plans is the large amount of land planned or zoned as open space. The other major amount of zoned or planned land use is agriculture. Smaller areas are designated as Agricultural/Suburban, Residential, Commercial, Industrial and Institutional.

Agriculture and Rangeland

The principal farming areas are in the Purcell Trench, Clark Fork Gorge, Cabinet Trench, and valleys of the Trenched Uplands (Libby Trench, Fisher River, and Thompson River). The leading production areas are around Bonners Ferry, Sandpoint and Rathdrum. Figure 10 shows existing agricultural lands. Darker symbols generally show an increasing amount of agricultural land per unit area as well as a higher potential for impact.

The major field crops are small grains - wheat, oats, barley - and pasture. Most of the cereal crop acreages are not irrigated and are grown in the valleys and first bench lands. Row crops include corn, potatoes, beans, and sugar beets.

Specialized crops include peas, lentils, mint, flower seed, vegetable seed, certified seed potatoes, hops, fruit trees, sugar beets, grass and clover seed, and nursery plants. Christmas trees are grown near Sandpoint, Libby, and Troy.

Livestock production is the dominant farm enterprise. The facilities commonly include feed lots, animal barns and associated buildings and lands. The animal enterprises include beef, dairy, horses, sheep, hogs, fur-bearing animals, and poultry, but the major one is beef production. Ranch operations are mainly located in river valleys and adjacent plains and on rolling foothills. Much of the associated pasture land is improved by management practices such as irrigation, fertilization,

clipping, weed control, and seeding of perennial legumes and grasses. The cattle and sheep ranchers also lease grazing lands in open forest and rangeland from Federal agencies (U.S. Forest Service and Bureau of Land Management).

Most of the irrigated land is around Bonners Ferry and Sandpoint and extends south to Rathdrum. Irrigation is also developing near Libby. There is a potential for more sprinkler irrigation in the study area should demand for crops increase or should market conditions change favorably. Other agricultural lands may also expand under favorable market conditions. Further development could occur along stream valleys.

Forestry

Forests cover most of the study area. Over half of the study area lies within the boundaries of the Panhandle and Kootenai National Forests. Private and corporate forest holdings together comprise between 10 and 15 percent of the land, mostly in Montana. State forests are scattered throughout the study area. They occupy less than 5 percent of the land.

Productivity ratings for each habitat type indicate the relative ability of each area to grow timber. Ranges of productivity should be considered in relation to one another; that is, the Cedar-Hemlock areas are more productive habitats than the subalpine types or Douglas-fir types. Productivity by timber habitat types is grouped as follows:

<u>Habitat Type</u>	<u>Predominant Productivity Level</u> <u>Cu. ft./ac./yr. (cu.m./ha./yr.)</u>
Ponderosa pine type	16-30 (1.1-2.1)
Douglas-fir type	76-90 (5.3-6.3)
Cedar-Hemlock type	121-135 (8.5-9.4)
Subalpine type	106-120 (7.9-8.4)

Approximately 10 percent of the land in the study area falls into productivity classes 1 through 4 (0 - 60 cu.ft./acre/year) (0 - 4.2 m³/ha/year), 30 percent into classes 5 through 7 (61 - 105 cu.ft./acre/year) (4.2 - 7.4 m³/ha/year), and the remaining 60 percent are classes 8 and 9 (106 - 135 cu.ft./acre/year) (7.4 - 9.4 m³/ha/year). Figure 11 shows relative productivity. Darker areas are generally those with higher productive capacity.

Urban and Residential

The distribution of residential land use and the location of all incorporated cities are shown on Figure 12. The more concentrated areas of residential land are near the major highways and incorporated cities in the western portions of the area. Much of this residential land is associated with agricultural development of the Purcell Trench and other similar flat lands. In the more mountainous eastern part of the study area, residential land is more closely related to the transportation routes along the Clark Fork and Kootenai rivers and along U.S. Highway 2 southeast of Libby. Although Figure 12 shows only residential land and incorporated cities, commercial, industrial and institutional land use patterns closely match the urban and residential distribution.

The most significant population growth and subsequent land use change can be expected in the western part of the study area where moderate population growth has occurred. In the eastern portion, declining populations lessen the likelihood of any significant changes in land use patterns.

ESTHETICS

The distinct visual character of each of the study area's landscape subregions results from variations in landform, spatial distinction, vegetative cover, waterforms and patterns of human use. Often, the visual contrasts between two or more adjacent subregions of strikingly different landscape character reinforce and heighten the distinctiveness of each area. A report titled Visual Impact of High Voltage Transmission Facilities in Northern Idaho and Northwestern Montana (Jones & Jones, 1976) describes the landscape and explains the method used in the visual analysis.

The visual analysis is structured around two major components: 1) the visual characteristics of the landscape and the potential alteration of these characteristics associated with the introduction of transmission facilities, and 2) visibility from selected observation points. Other factors to be considered within these two major components are the relative number of observers at selected viewpoints, the distance between the viewpoint and the possible transmission facilities, and the degree to which the observers may be concerned about scenic resources.

The inventory of the visual characteristics of the study area landscapes and their compatibility with transmission lines is shown in Figure 13. This map represents a composite rating of the visual quality of the landscape and the visual compatibility of a transmission line with that landscape. On the map a transmission line located in a darker shaded area would have a higher visual impact than one in a lighter shaded area.

The viewshed or visibility analysis shown in Figure 14 shows those portions of the study area where a transmission line will be most visible depending upon distance from the viewer and the ability of terrain features to screen the line. On this map the darker areas represent the portions of the study area where potential for viewer contact with the transmission line is highest.

RECREATION

Abundant water resources and vast areas of forest land provide for a wide variety of recreational opportunities, ranging from developed resorts to wilderness. The area is within moderate driving distance of Spokane and is close to Glacier National Park. This results in a significant amount of tourist traffic through the area.

Lakes in this region are important centers of recreation. The most notable is Lake Pend Oreille. Here recreationists take advantage of numerous resources including Farragut State Park, game management areas, resorts, and osprey viewing areas. Anglers regularly take kokanee and Dolly Varden trout. World record Kamloops have also been caught (IF & GD 1972).

Streams and rivers within the area are also major recreational attractions. Two of these rivers, Priest and Moyie, are study rivers under the Wild and Scenic Rivers Act (P.L. 90-542 Sec. 5.a.). At least six other streams in the area are considered fishing streams of nationwide importance (C-NP 1972: App. XIV). These are the Pack, Kootenai, Coeur d'Alene and Clark Fork Rivers, and Lightning and Granite Creeks. At least nine game fish species occur in these streams.

Several species of big game, upland game birds, waterfowl and some nongame animals can be hunted year round. Such species also provide significant recreational benefits to persons who enjoy viewing and photographing wildlife.

There are large tracts where recreationists can experience true wilderness. Foremost is the Cabinet Mountain Wilderness Area, where a number of foot and horseback trails provide access to hikers, fishermen, hunters, campers and mountain climbers. All or parts of 24 roadless areas inventoried by the Forest Service for its Roadless Area Review and Evaluation (RARE II) are within the study area, including the former Scotchman Peak Wilderness Study Area (F.S. 1978).

Other recreational resources include Kootenai National Wildlife Refuge near Bonners Ferry, numerous governmental and private campgrounds, winter sports areas, hiking trails, scenic roads, State wildlife management areas and waysides.

HISTORICAL, ARCHITECTURAL, AND ARCHEOLOGICAL

The study area in Washington and Montana contains no historic properties listed in or eligible for the National Register of Historic Places as published in the Federal Register, February 7, 1978, and subsequent addenda. Several properties in the Idaho portion of the study area are listed on the National Register. These properties include a railway station at Sandpoint, a bank and a mission in Rathdrum, a quarry near Bonners Ferry, and the courthouse in Murray. The Spirit Lake Historic District also is under consideration for listing on the National Register.

The Calispell Trail Road and the Wildhorse Trail Road, which were early transportation routes, are now only partly visible. Indians used the Calispell Trail when traveling from the Pend Oreille River to Spokane Falls, and later it was widened and cleared by the early settlers of the Calispell Valley. Some traces of the Calispell Trail Road remain along the Pend Oreille River. Wildhorse Trail Road is listed on the Idaho historic inventory; however, only a few traces remain today of this early route from Canada. A number of old mine sites are of local interest.

The Kullyspell House on the northeast shore of Lake Pend Oreille, south of Hope, Idaho, is of state-wide significance. This historic edifice was built in 1809 by David Thompson, an early explorer and geographer. North of Newport, on State Highway 31, there is a viewpoint of considerable scenic interest. Hanson's Cabin is also in this area. The cabin is among those recorded on the Washington State Register of Historic Resources. Two early posts, known as Kootenai Post I and Kootenai Post II, are located on the Kootenai River approximately 10 miles apart. No State historic districts have been reported in the study area; however, 55

separate buildings within the city of Sandpoint and 24 in Bonners Ferry have been listed as historical properties by the State of Idaho.

There is evidence that certain areas were occupied by prehistoric hunters and gatherers as long as 15,000 years ago (Spritzer 1973). Archeological studies of this area have been largely confined to the rather narrow zones along the rivers. Along all water bodies the potential for site discovery exists in varying degrees. The majority of the recorded archeological sites have been found along the course of the Kootenai River west of Libby and on the north shore of Lake Pend Oreille. Four archeological sites on the Kootenai River are listed in an addendum to the National Register of Historic Places (April 4, 1978). Provisions for archeological survey of lands potentially affected by BPA actions will be made at the facility location stage.

P L A N O F S E R V I C E A N A L Y S I S

POTENTIAL IMPACT OF THE PROPOSAL

Impact evaluations are provided for the proposed plan and three alternative plans described in the System Requirements section on pages 1-4 and shown in Figures 3 and 4. The plans of service conform to a set of reference corridors which represent the general range of feasible paths that could connect new generation to the power grid. Planning reference corridors are broad paths (about 1 mile (1.6 km) wide), identified during early stages of transmission line planning and environmental analysis, within which a line could be located as a result of further evaluation. ^{1/} Some line location deviations from these corridors may arise when detailed route evaluations are made on a proposed plan in the facility location supplement. Such variations are typically made to avoid or mitigate impact.

Under each resource heading, impacts are discussed first for elements common to all four plans (i.e., upgrading the existing 115-kV line and building a new line from Libby Reregulation Dam to Libby) and then for the reference corridors in each plan (Figs. 3 and 4). Where applicable, resource data have been compiled for reference corridor variations (Tables 5-7). These comparative data graphically display the range of potential impacts within a plan and between plans. Resource maps (Figs. 5-15) are referenced extensively to show resource distribution in the planning study area as well as the potential for impact.

NATURAL RESOURCES

Atmosphere

BPA's construction, operation, and maintenance activities normally create relatively little air pollution. The primary pollutants would be dust and exhaust emissions from construction equipment and combustion byproducts (particulate matter and gases) from burning slash when clearing rights-of-way.

^{1/} Typical right-of-way (ROW) widths for 230-kV lines vary from 90 to 125 feet (27-38 m) and occupy 11 to 15 acres per mile (3-4 ha/km). Acreage figures for this study assume a 125-foot wide ROW, and about 15 acres/mile (4 ha/km) within these reference corridors.

The amount of gaseous and particulate pollution is primarily a function of the length of the line as it relates to vegetation disposal, access preparation, and vehicular activity on or near the right-of-way. Other factors are proximity to population centers, weather, and rate of atmospheric dispersal.

Contractors can use controlled open burning to dispose of waste materials when permitted by local, State and Federal air pollution regulations. The impacts to ambient air quality are usually localized and short-lived. The mitigating measures employed by BPA and/or our contractors include the control of the dispersal of atmospheric pollutants by considering ambient weather conditions and restricting equipment use and operating methods. Other means used to keep air pollution to a minimum are discussed in Appendix B, Draft Environmental Statement, The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System (App. B, Role EIS), Chapter VII.

Very minor atmospheric pollution would result from reconductoring the 115 mile (185 km) Albeni Falls-Libby 115-kV line and constructing the new 7 mile (11 km) 115-kV line between Libby Reregulating Dam and Libby Substation.

Plan B (Proposed Plan) - would require between ¹²⁷~~120~~ and ¹³³~~140~~ miles (²⁰³~~195~~ to ²²⁵~~225~~ km) of transmission line. Construction activities would result in dust from disturbed soil and pollutants from burning debris. Portions of the corridors are near homes whose residents may be temporarily disturbed.

Plan A - atmospheric impacts resulting from construction of the 45 to 70 mile (72-112 km) Libby-Noxon line and 15-acre (6 ha) Noxon Substation would be minor. Although the amount of clearing required could be more than for Plan B, overall the line is much shorter and encounters fewer homes, resulting in a slightly lower impact on atmospheric resources.

Plans C and D - impacts would be similar to those for Plan B.

Geology, Soils, and Minerals

Impacts to geologic and soil resources result primarily from the establishment of access roads, structure sites, conductor puller and reel sites, and helispots. Considerable potential exists for soil erosion and impacts to slope stability particularly in mountainous areas with slopes greater than 30 percent. Combinations of soil type, vegetation cover, dip slope, and high precipitation contribute to the likelihood of impact. Figure 5 shows six general levels of potential impact to surface materials. Table 5 presents tabulations on erodibility, slope, and mass movement potential for the alternative plans of service. The potential for impacts can be reduced during route location by avoiding problem or potentially unstable areas, such as fault zones, avalanche chutes, and slump areas. Corrective measures are implemented to reduce unavoidable impacts. Special access road design and slope stability programs could be used in problem areas.

Although mining claims and patents exist throughout much of the study area, most of the ore deposits are low grade and not economical to mine at present. Where there is a high potential for mineral development, construction of the line could have a slight impact on the utilization of these resources. Where the reference corridors encounter sand and gravel pits and other existing mining operations, effort will be made to ensure that the transmission facilities are compatible with these activities. At this time, no impacts are expected to mining operations.

Geologic and soils impacts would be minor for reconductoring the 115-kV Libby-Albeni Falls line and limited to minor erosion and soil compaction. The Libby-Libby Reregulating Dam 115-kV line is expected to have insignificant geologic and soil impacts.

Plan B (Proposed Plan) - consists of seven reference corridors between Libby and Rathdrum. The different combinations of corridors result in options with moderate to high impact. The combination of steep slopes and a high potential for mass movement and soil erosion, particularly in the Cabinet Mountains, is a key factor in the level of impact (Table 5 and Figure 5). *

From 7 to 20 percent of the area along the reference corridors is in topography with slopes greater than 30 percent. Between 23 and 34 percent of the corridor mileage would cross areas with high potential for mass movement. Similarly 60 to 67 percent of these corridor lengths would be in areas with high susceptibility to erosion. //

Reference corridors B/C₁ to B/C₄ encounter areas with high susceptibility to erosion where they cross the Cabinet Mountains between Libby and Sandpoint. Corridor B/C₁, because it parallels an existing line and access system, should have fewer geologic and soil problems.

Corridors B₁-B₃ cross much soil with high susceptibility to erosion (near 50 percent) and to a lesser degree encounter some areas of high mass movement potential (15-25 percent). However, they encounter substantially less steep topography, reducing the likelihood of erosion/mass movement problems for these corridors.

Plan A - reference corridors offer options that would result in minor impacts to geologic and soil resources. Problem areas may be encountered on some steep slopes and where potential for soil erosion is high (Table 5 and Figure 5).

Between 23 and 39 percent of corridors A₁-A₄ is in steep to very steep topography (over 30 percent slope). Each corridor occupies about 140 acres of land with a high potential for erosion.

Development of a new Noxon Substation would cause slight short-term erosion.

Plan C - consists of eight reference corridors between Libby and Sacheen. Impact would range from moderate to high depending on the particular combination of corridors selected. As in Plan B, steep slopes, high

potential for mass movement, and high susceptibility to soil erosion are encountered for much of the corridor length, particularly in the Cabinet Mountains (Table 5 and Figure 5).

Approximately 11 to 23 percent of the corridor area has slopes greater than 30 percent. Between 59 and 66 percent of these corridor lengths would cross areas highly susceptible to erosion, and 23 to 34 percent of the corridor mileage is in areas with high potential for mass movement. Reference corridors B/C₁ to B/C₄ (common to Plans B and C) traverse the most sensitive areas.

Nearly 50 percent of the soils crossed by corridors C₁-C₄ are highly susceptible to erosion. A lesser acreage (25 to 29 percent) has a high potential for mass movement; however, only a small portion of the corridor length is in steep topography, thus lessening the likelihood of erosion and mass movement problems.

Plan D - consists of seven reference corridors between Libby and Rathdrum. The different combinations of corridors result in options with moderate impact. Although Plan D reference corridors encounter substantial areas of steep topography in the Cabinet and Coeur d'Alene Mountains the amount of land with high susceptibility to erosion and high mass movement potential is relatively low (Table 5 and Figure 5).

From 22 to 34 percent of the corridor topography has slopes greater than 30 percent. Approximately 7 to 20 percent of these corridor lengths would be in areas with high susceptibility to erosion, and between 1 and 12 percent of the corridor mileage is on land with high potential for mass movement.

The reference corridors between Libby and Noxon (A₁-A₄) are discussed under Plan A. Between Noxon and Rathdrum (D₁-D₃), corridors D₂ and D₃ encounter fewer geologic and soil problems; however, D₁ offers the possibility of paralleling, thus significantly reducing expected disturbance.

Hydrology

Table 5 shows the major indicators of impact potential on water resources. Impacts result from right-of-way clearing and construction activities such as building new access roads and assembling towers. Impacts could be either direct (streambank and adjacent slope disturbances resulting in sedimentation) or indirect (observable downstream discoloration and sedimentation from areas of disturbance). Direct impacts occur when heavy equipment traverses a site causing changes in vegetative cover, soil conditions, and flow characteristics. Indirect impacts can result from deposition of excessive amounts of sediment from upstream areas.

Important factors determining type and amount of impact include 1) high erosion or mass movement potential; 2) existing signs of erosion or mass movement; 3) soil texture; 4) tributary streamflow characteristics; and 5) settling ability of disturbed soils. Where these factors come into

Table 5. - Comparison of Reference Corridors and Natural Resource Considerations

		PLAN A				PROPOSED PLAN B				PLAN C				PLAN D						
PLANNING REFERENCE CORRIDORS		A ₁ ⁺	A ₂	A ₃	A ₄	B ₁	B ₂	B ₃	B/C ₁ ⁺	B/C ₂	B/C ₃	B/C ₄	C ₁	C ₂	C ₃ ⁺	C ₄	D ₁ ⁺	D ₂	D ₃	
RESOURCE CATEGORY		UNITS OF MEASURE	(70*)	(43)	(43)	(52)	(46)	(46)	(48)	(95)	(75)	(83)	(94)	(48)	(48)	(44)	(40)	(76)	(73)	(73)
GEOLOGY AND SOILS	Susceptibility to Soil Erosion - Low	No. of Acres <u>1/ 2/</u>	290	140	170	170	350	370	340	440	220	370	180	400	460	420	370	1000	1280	1250
	Susceptibility to Soil Erosion - Moderate	"	820	430	400	580	--	--	--	180	180	180	340	--	--	--	--	60	60	>10
	Susceptibility to Soil Erosion - High	"	140	140	140	140	390	320	430	1150	1030	970	1150	490	400	340	380	280	60	>80
	Potential for Mass Movement - Low	"	360	210	240	240	350	370	340	490	260	420	220	330	390	400	310	860	730	710
	Potential for Mass Movement - Moderate	"	890	500	470	650	280	150	280	540	700	610	970	320	220	160	240	260	660	580
	Potential for Mass Movement - High	"	--	--	--	--	110	180	160	660	400	430	430	240	250	190	220	260	10	40
	Slope - 0 to 15%	"	560	220	210	260	640	690	640	1240	710	840	760	640	710	690	510	970	830	590
	Slope - 15 to 30%	"	430	240	230	290	80	50	100	240	280	320	470	180	130	100	180	190	290	360
	Slope - 30 to 50%	"	260	250	260	310	30	20	30	240	350	310	370	70	50	40	70	240	300	360
Slope - + 55%	"	50	50	50	60	>10	>10	>10	50	80	70	60	10	10	>10	10	60	60	50	
HYDROLOGY	Wetlands	No. of Acres	10	5	5	5	5	5	5	10	>5	>5	5	5	5	10	5	5	5	--
	Springs	No. of Cells <u>3/</u>	2	1	1	1	2	--	1	1	--	--	--	2	2	2	4	1	1	--
	Lakes and Reservoirs	"	10	7	8	5	9	15	6	26	14	20	17	11	20	33	12	36	29	13
	Rivers	"	42	19	25	13	3	11	2	46	22	32	12	2	10	23	5	22	24	9
	Perennial Streams	No. of Crossings	23	21	23	22	12	9	7	50	40	50	71	15	19	19	25	52	53	52
	Municipal Watersheds	No. of Acres	--	--	--	--	5	50	5	70	>5	>5	--	5	40	45	40	25	155	130
VEGETATION	Crown Cover Greater than 30%	No. of Acres	1080	610	620	710	390	370	420	1000	840	910	1060	620	560	370	490	800	1020	1000
	Crown Cover 30% or Less	"	80	70	90	100	70	70	60	70	50	50	70	40	50	80	100	100	70	10
WILDLIFE	Grizzly Distribution	No. of Cells	6	6	6	6	--	--	--	--	6	7	9	--	--	--	--	--	--	--
	Proposed Grizzly Critical Habitat	"	21	23	21	21	--	--	--	20	39	36	17	--	--	--	--	--	--	--
	Bald Eagle - Wintering Areas	"	1	3	3	3	--	--	--	41	28	37	10	--	--	--	--	19	19	--
	Elk - Population Concentration Areas	"	4	4	4	4	--	--	--	--	--	--	--	--	--	--	--	--	24	7
	Moose - Population Concentration Areas	"	--	--	--	--	--	--	--	--	11	11	21	--	--	--	--	--	--	--
	Bighorn Sheep Winter Range	No. of Cells	--	--	--	--	--	--	--	16	16	16	--	--	--	--	--	--	--	--
	Moose Winter Range	"	53	27	25	30	--	--	--	--	--	--	35	--	--	--	--	--	--	11
	Whitetail Deer Winter Range	"	57	36	40	50	11	--	--	64	47	57	36	2	13	14	4	58	47	32
	Elk and Mule Deer Winter Range	"	45	31	31	33	43	40	41	67	35	29	36	30	32	43	34	75	43	38
	Osprey Nest Areas	"	--	--	--	--	2	3	2	--	--	--	--	1	1	4	--	--	--	--
	Waterfowl Habitat	"	10	10	10	10	19	10	3	36	27	32	8	8	16	25	2	15	13	6
	Mountain Goat Summer Range	"	1	1	1	1	--	--	--	--	--	--	--	--	--	--	--	4	--	--
	Bighorn Sheep Summer Range	"	--	--	--	--	--	--	--	4	4	4	--	--	--	--	--	--	--	--
	Class I Fishery Streams	"	--	--	--	--	--	--	--	27	10	18	9	--	--	--	--	16	5	--
	Class II Fishery Streams	"	1	3	3	3	--	--	--	24	23	25	16	--	--	--	--	--	7	10
Class III Fishery Streams	"	1	5	10	--	7	11	3	12	16	6	7	4	13	18	2	2	9	3	
Class IV Fishery Streams	"	17	3	3	7	--	--	--	1	7	1	1	--	--	--	--	2	2	4	

1/ Hectares = 0.4046 x Acres

2/ Estimates based on 125' right-of-way through the planning reference corridor

3/ A cell is a geographic unit 1 minute in longitude by 1 minute in latitude, an area of about 570 acres (230 ha)

Note: *Estimated mileage per corridor. +Parallel to existing ROW.



play, construction activities coincident with periods of heavy precipitation could substantially increase observable stream turbidity and sedimentation. The effect of disturbance also varies with the wetness of a site. Those sites subject to streamflows during spring runoff are susceptible to erosion when high flows coincide with physical disturbances. This is usually a short-term impact, as aquatic and riparian species recover quickly. If a new line parallels an existing line, the need for additional fill is reduced. Any new fill required causes minor changes in vegetation recovery. As per the Federal Water Pollution Control Act, fill material that may be deposited into streams constituting waters of the United States is expected to be of a minor nature and allowable under the Act.

Broadly defined wetland areas are shown on Figure 6. Typically, impacts to wetlands can be expressed in terms of physical disturbance such as fill required and vegetation disrupted. Generally, access roads are not maintained in wetland areas, and wetlands are spanned or avoided when possible. All reference corridors appear to encounter wetland areas; centerline studies to be conducted later will determine the extent of disturbances to them. The final proposal for this project will include all practical measures to minimize harm to wetlands such as restricting some activities or using special equipment (See App. B, Role EIS).

The impacts to flood plains of the proposed and alternative plans have not been identified at this planning stage. In accordance with Executive Order 11988, BPA will avoid location of transmission facilities within flood plains whenever possible. In most cases, floodprone areas will be spanned; consequently, no structures would be needed on those lands. If any structures are required in a flood plain, they would be built to withstand a 100-year flood. Structures would also be designed to minimize impact to and within flood plains.

Impacts from reconductoring the existing 115-kV line would be caused by increased use of existing access roads and some increased physical disturbances within the right-of-way. Some short-term siltation and observable turbidity can be anticipated in river-crossing areas. Because an access road system exists, a significant amount of physical disturbance can be avoided. Major streams are crossed in six places, three on the Kootenai, two on Deep Creek, and one on Yaak River. These crossings are in valley areas, mostly near the mouths of perennial tributaries.

Impacts from the addition of a 115-kV line between Libby Reregulating Dam and Libby Substation depend largely on the extent to which other power lines and roads can be paralleled. Both primary and secondary roads along the Kootenai River present an opportunity for paralleling. If routing the line requires substantial vegetation removal from steep slope areas, the potential for stream turbidity from associated erosion is increased. Very minor localized turbidity may be noticed in the Kootenai River.

Plan B (Proposed Plan) - consists of seven reference corridors between Libby and Rathdrum. The different combinations of corridors offer a range of locations from extensively paralleling an existing right-of-way (relatively low impact) to traversing erodible mountainous areas (high

potential impact). The low elevation corridor which encounters the greatest wetland acreage could use an existing surrounding road system, thus reducing sediment load from construction areas. Highly erodible mountainous terrain is encountered northwest of Libby and in the Cabinet Mountains between Troy and Bronx Substation. Additionally, Plan B corridors encounter sensitive terrain south of Sandpoint (Figures 5, 6 and Table 5).

Between Libby and Sandpoint corridor B/C₁ encounters wetlands in the Kootenai Flats area near Bonners Ferry and along the Kootenai River from Bonners Ferry upstream to Troy. The entire length of B/C₁ coincides with an existing transmission corridor and much of the existing access road system could be used. Construction could cause some vegetation disturbance and filling for short spur roads and assembly sites; however, areas requiring significant amounts of fill would likely be avoided. Although encountering the highest acreage of wetland for Plan B (Table 5), this parallel corridor would probably cause the least impact.

Reference corridor B/C₄ encounters some wetlands primarily along the Yaak River. Construction activities could involve existing roads and the construction of new ones. New access roads could require some vegetation removal and filling for spur roads and sites.

The potential for stream turbidity is high along Plan B corridors. A great number of perennial streams are encountered (Table 5). Some discoloration in isolated rural-domestic surface water supplies may occur during construction.

Unstable areas are crossed by B/C₂ through B/C₄; construction and clearing here could involve significant amounts of vegetation removal and physical disturbance, possibly resulting in some high sediment yields in slower moving downstream areas.

Between Sandpoint and Rathdrum (B₁ - B₃), increases in stream turbidity could occur. Due to lower mean annual runoff, there would be potentially less runoff on new access roads and less resulting stream turbidity in the mountainous areas north of Cocolalla Creek and west of Hoodoo Creek (B₁ and B₂). Both streams presently experience some degradation from nutrients and silt; additional short-term siltation could result during construction.

Most of the wetland area in Plan B is south and west of Sandpoint, primarily along Hoodoo Creek. Parts of the area are farmed, and access is enhanced by an existing road system. Some disturbance from tower erection sites and short access segments would be necessary.

Municipal watersheds are encountered by B/C₁ and B/C₃ north of Troy, B/C₁ south of Bonners Ferry, and B₂ west of Hoodoo Creek. Impacts from B/C₁ and B/C₃ in the Troy area would be greatly influenced by possible paralleling of existing facilities. A right-of-way in B/C₁ could possibly avoid the watershed area south of Bonners Ferry; otherwise some short-term turbidity may occur. No impacts to the Spokane Valley-Rathdrum Prairie Aquifer are expected.

Plan A - overall involves the fewest wetlands, erodible areas, and the least potential effect on streams. The reference corridor options are shorter, and there is an opportunity to parallel an existing line (A₁). Impacts to the stream system (e.g., sedimentation) tend to be greatest south of Libby in erodible mountainous areas where clearing would be required.

Corridor A₁ encounters wetland areas along the upper reach of the Fisher River and along Silver Butte Creek. Although this corridor encounters more wetland areas than the other Plan A options (Table 5), the magnitude of disturbance or alteration would be less than for other areas because it could parallel an existing line and thus use existing access roads. This reduces encroachment on surrounding wetland area.

The remaining options under Plan A (A₂-A₄) traverse rougher terrain and encounter fewer wetlands. The wetlands consist mostly of small marshes (A₂ and A₃) and small low-lying wetlands (A₂-A₄) along the Fisher River. Wetland impacts from corridors A₂ and A₃ in the upper Fisher River area could almost be eliminated by avoiding these areas.

North of Noxon the corridors encounter an area with existing erosion problems. The susceptibility to erosion here is moderate to high. Some short-term siltation can be expected, mainly during short periods of heavy precipitation. Because soils are generally silty and sandy, sediment yield should be moderate.

In conjunction with a higher potential for physical disturbance, a higher potential for stream turbidity is anticipated for corridors A₂, A₃, and A₄ than for corridor A₁. Downstream areas of the Fisher River and Libby Creek could be affected. Runoff from nearby access roads may cause minor increases in tributary streamflows. All three corridors cross the same general area and roughly the same number of perennial streams (Table 5). Soils here are generally loamy and sediment yield should be slight to moderate.

Impacts from the 15-acre (6 ha) Noxon Substation depend largely on the final location in relation to surrounding streams. Impacts primarily consist of minor short-term increases in siltation during site preparation and road construction.

Plan C - consists of eight reference corridors between Libby and Sacheen. The range of impact for the different corridor combinations varies from relatively low to high. Sensitive mountainous terrain and wetland areas, principally along the Pend Oreille and Kootenai Rivers, influence the expected degree of impact.

Impacts to hydrology resources between Libby Dam and Sandpoint (B/C₁-B/C₄) are discussed in Plan B above. Most of the wetlands under Plan C between Sandpoint and Sacheen lie near the mouth of Hoodoo Creek (corridors C₁ and C₂) and near Newport (all C corridors). Generally, these areas and possible impacts to them are similar to those for Plan B.

Areas of high erosion potential are estimated in Table 5. Most are in the Sandpoint vicinity. Impacts would involve introducing small amounts of sediment into tributary streams. Although all Plan C corridors cross this area, paralleling the existing line (corridor C₃) would cause much less disruption. Disturbances from right-of-way clearing would still occur.

There is a high potential for stream turbidity between Hoodoo Creek and Newport along corridors C₁ and C₂. Impacts would occur in areas of higher slope. Despite mitigation measures (App. B, Role EIS, Chapter VII and VIII), some residual sedimentation and observable turbidity can be expected.

A municipal watershed west of Sandpoint could experience turbidity from construction activities. To reduce this impact, maintenance of right-of-way vegetation in the area could largely consist of hand-cutting and selective herbicide application (App. B, Role EIS, Chapter VII).

Plan D - is comprised of seven reference corridors between Libby and Rathdrum. Those corridors involving substantial parallel segments offer the best opportunity to minimize hydrology impacts. New stretches of right-of-way through mountainous terrain are likely to have high impacts.

Hydrology impacts for the Libby to Noxon segment of Plan D are discussed under Plan A. Wetlands between Noxon and Rathdrum (D₁-D₃) are encountered where the corridors parallel an existing line (D₁ and eastern half of D₂) (Figure 6). Thus, impacts should be less than in other areas because fill requirements would be reduced and existing access roads could be used.

Corridors D₁-D₃ encounter areas with unstable soil conditions. Areas of concern along corridor D₁ are south of Clark Fork, on tributaries of Lake Pend Oreille, and south of Bayview. Since the corridor parallels an existing line, additional impacts from stream turbidity and siltation would be minimal. Short-term increases in smaller tributary streams can be expected.

For corridor D₂, clearing and construction activities on local terraces in Cabinet Gorge may cause localized siltation in the Clark Fork River. Increased erosion and runoff can also be expected for the Clark Fork headwaters. Similar impacts are possible near Cabinet Gorge Dam and near the headwaters of the Coeur d'Alene and North Fork Coeur d'Alene Rivers.

Corridor D₃ encounters unstable soil conditions where it crosses the main stems of the Coeur d'Alene and North Fork Coeur d'Alene Rivers. Impacts are similar to those for corridors D₁ and D₂.

North of Hayden Lake, corridors D₂ and D₃ cross a municipal watershed. Impacts would include a short-term runoff increase in disrupted areas and increased discoloration in Hayden Creek.

Vegetation

Impacts on natural vegetation are determined by the amount of vegetation cover (by habitat type and percent crown cover), the existence of rare and endangered species, and the uniqueness of the vegetation (e.g. defined natural areas, botanical areas). The typical impacts of transmission construction are described in Appendix B, Role EIS, Chapter VII.

Right-of-way clearing is a long-term impact since the tree cover is removed for the life of the facility. The rate of recovery from disturbance indicates the severity of impact from right-of-way clearing and construction and maintenance activities. The Cedar-Hemlock habitat type has a moderately fast recovery rate whereas the Douglas-fir and Subalpine types recover more slowly. In general, the least impact on natural vegetation would occur in corridors having both the fewest acres of trees and the greatest amount of land in Cedar-Hemlock habitat types. Impacts on riparian vegetation at river crossings will be kept to a minimum.

Every effort is taken by BPA to prevent adverse impacts to endangered and threatened plants, pursuant to the Endangered Species Act of 1973 (PL 93-205). At this time, no listed species are known to occupy the study area. If such species are identified during location studies, BPA will initiate appropriate consultation with the U.S. Fish and Wildlife Service.

No research natural areas, botanical areas, or experimental forests are encountered by the planning reference corridors for plans A, B, C, or D.

In contrast with clearing new rights-of-way, reconductoring the existing 115-kV line between Albeni Falls and Libby will remove few trees. Soil may be compacted by heavy equipment, increasing the recovery time for grass and shrubs.

Right-of-way clearing for a new 115-kV line between Libby Substation and Libby Reregulating Dam will impact a small amount of vegetation. However, potential impact can be further reduced by following existing roads or transmission lines.

Plan B (Proposed Plan) - consists of seven reference corridors between Libby and Rathdrum. Different combinations of corridors result in impacts ranging from moderate to high; most are high. About two-thirds of the natural vegetation in Plan B is in tree cover; close to half of the forest habitat types are slow-recovering Douglas-fir and Subalpine (Fig. 7).

Reference corridors B/C₁, B/C₂, and B/C₃ parallel existing facilities to some extent, with B/C₁ being almost entirely parallel (Fig. 7). Thus, although B/C₁ is the longest Plan B corridor, its potential impact on natural vegetation is reduced. For corridors B/C₁-B/C₃ some existing roads could be used. Additional roads would be required, however, especially for the nonparallel sections of corridors B/C₂ and B/C₃. This could result in significant impacts to natural vegetation. Reference corridor B/C₄ has the greatest potential for impacting natural vegetation.

About 65 percent of the natural vegetation in Plan B corridors between Libby and Sandpoint (B/C₁-B/C₄) is forest. Although the Cedar-Hemlock habitat type predominates, the corridors encounter scattered areas of Douglas-fir habitat types and significant areas of the Subalpine habitat type along the Cabinet Mountain crest (Fig. 7).

About 60 percent of Plan B between Sandpoint and Rathdrum (B₁-B₃) is in tree cover, divided equally between the Cedar-Hemlock and Douglas-fir habitat types. Impacts to Douglas-fir habitat types can be lessened significantly by paralleling an existing line from Rathdrum northeast, where all three corridors are common. Although corridor B₁ is the shortest, corridor B₂ has fewer acres of trees and should present the fewest impacts.

Plan A - reference corridors offer options that would result in minor impacts to natural vegetation. Although most of Plan A is in the slow-recovering Douglas-fir habitat type, the reference corridor options are shorter and there is the opportunity to parallel an existing line (A₁) (Fig. 7).

Approximately 90 percent of the vegetation in Plan A is forest, most of which is Douglas-fir with a slow recovery rate. Much of corridor A₄, however, is in Cedar-Hemlock type which recovers more quickly. A₁ has the most acreage of tree vegetation to be removed and A₂ has the least. A₁, however, could parallel existing facilities, substantially reducing the amount of impact.

The area around the proposed Noxon substation contains a variety of vegetation habitat types, mostly Cedar-Hemlock. Depending on final location, the substation could alter approximately 15 acres (6 ha) of natural vegetation. The 1 to 6 miles (1.6 - 9.6 km) of additional 230-kV line possibly required could alter an additional 15 to 90 acres (6-35 ha).

Plan C - consists of eight reference corridors between Libby and Sacheen. Depending upon the particular combination of corridors selected, the range of impacts would be from low to high, with more moderate-impact options available than for Plan B. Overall, Plan C would impact fewer acres of Douglas-fir and Subalpine habitat types than Plan B (Fig. 7).

Impacts to natural vegetation between Libby Dam and Sandpoint (B/C₁-B/C₄) are discussed in Plan B above. Trees make up about 70 percent of the natural vegetation for Plan C between Sandpoint and Sacheen Substation (C₁-C₄).

Most of Plan C is in Cedar-Hemlock habitat types with a moderately fast recovery rate, except for a few relatively small areas of Douglas-fir habitat type, predominately along the Pend Oreille River. Corridor C₄ is the shortest. Corridor C₃ parallels an existing line, reducing potential impacts to natural vegetation.

Plan D - consists of seven reference corridors between Libby and Rathdrum. The different combinations of corridors result in impacts ranging from

moderate to high. The fact that Plan D vegetation is almost entirely in forest habitat types and that the corridors are relatively long are key factors in assessing the level of impact.

Impacts on natural vegetation for Plan D between Libby and Noxon are discussed under Plan A. About 95 percent of the natural vegetation for Plan D between Noxon and Rathdrum (D₁-D₃) is forest. The corridors cross Cedar-Hemlock habitat types except for small patches of Subalpine habitat types at high elevations and Douglas-fir types around Rathdrum (Fig. 7). As discussed under Plan B, impacts to Douglas-fir habitat types around Rathdrum can be reduced by paralleling where all three corridors are common. Corridor D₁, which has the fewest acres of tree vegetation and parallels an existing line, has the least potential impact on natural vegetation. Corridor D₃ encounters more slow-recovering Douglas-fir and Subalpine habitat types and has the highest potential impact.

Wildlife

Within the area there is a wide variety of high quality wildlife habitat which supports hundreds of wildlife species. Each species generally has specific habitat requirements. Habitats may vary greatly among species. The proposed transmission facilities will impact wildlife primarily because of habitat modifications which consist of physical changes in vegetation and ground cover, increased human access to wildlife habitat, and introduction of workers and construction equipment. Such modifications result in both short- and long-term impacts.

The discussion of impacts concentrates on major groups and species identified as having significant economic, recreational, and ecological importance. Threatened and endangered species and big game winter range are among the important wildlife concerns (Figs. 8 and 9). Table 5 shows relative potential for impact on the wildlife groups and species of major concern. Information as to the nature of possible impacts is summarized below.

Reconductoring the existing 115-kV line would cause primarily insignificant short-term impacts on wildlife. This line crosses several streams including Pipe Creek, Deep Creek, and Curley Creek which are Class III fishery streams. It also crosses the Yaak River, a Class II stream. The Kootenai River, portions of which are Class I and II, is crossed three times. Since very little disturbance to vegetation and soil near these streams is expected during construction, impacts on fishery resources should be negligible.

~~The 115-kV line also passes through waterfowl and bald eagle habitat.~~ Bald eagles use the area along the Kootenai River primarily during winter, when construction activities would be at a minimum. A portion of the line is within an area where some waterfowl production occurs (J. M. Montgomery, Inc. 1975). Disturbances to nesting waterfowl could occur if construction takes place during spring and early summer. *Existing Line*

Much of the land through which the 115-kV line passes is deer and elk winter range. Construction is expected to be at a minimum during most of

the winter, so no significant disturbance to wintering animals should occur.

The construction of a 115-kV transmission line between PP&L's Libby Substation and the Libby Reregulating Dam would have no significant effects on wildlife, other than some impact from right-of-way clearing. Since the line would probably parallel existing roads, the potential for creating new access into wildlife habitat is low, particularly north of the Kootenai River. Where the Kootenai River is spanned, a flight hazard to waterfowl and other birds will result.

Plan B (Proposed Plan) - options range in impact from low to high, with most options being of moderate impact. Among the possible combinations of corridors are a number of options for parallel routing. Several options also exist for routing a line through semi-roadless areas containing high quality wildlife habitat. In the latter category, construction activities and resulting increased human access to presently remote wildlife habitat could result in significant impacts on wildlife. Included are possible adverse effects on the grizzly bear, a threatened species (Table 5 and Figs. 8 and 9).

Alternative Plan B between Libby and Sandpoint (B/C₁-B/C₄) crosses a large number of fishery streams (Table 5). Corridor B/C₁, the longest corridor, has the highest potential for interaction with fishery streams, although paralleling existing facilities could greatly minimize this impact. Even so, road-building and construction activities could introduce sediment into fishery streams, including spawning areas. This could cause direct mortality to eggs and young fish and reduce the capability of the habitat to support aquatic life. Past experiences have shown that most of the impact would be short-term and significant long-term impacts to fisheries can be avoided (App. B, Role EIS, Chapter VII and VIII).

Corridor B/C₁ crosses a large amount of deer and elk and some bighorn sheep winter range between Libby and Troy (Fig. 9). Human access would not be significantly increased. Providing increased forage would probably be the major impact. Although the corridor passes along the edge of proposed critical habitat for the threatened grizzly bear, no significant long-term adverse effects are expected.

Corridor B/C₁ requires crossings of the Kootenai River, which would increase the potential for waterfowl collisions with conductors. In addition, construction activities may disturb nesting waterfowl. Ospreys and bald eagles probably would use the transmission structures for hunting and resting perches and possibly for nesting, which could make them more vulnerable to illegal shooting.

On February 14, 1978, the bald eagle was declared "endangered" in Montana and Idaho under the authority of the Endangered Species Act of 1973. As required by Section 7 of the Act, BPA has initiated consultation with the U.S. Fish and Wildlife Service (FWS) to identify potential impacts to the eagle and measures which will avoid such impacts. In addition, BPA has begun studies which will provide FWS with additional information on

the eagle and its habitat in the study area, in order to aid the agency in rendering its biological opinion.

For about half its length Corridor B/C₂ parallels an existing line along the Kootenai River, with the same impacts as for B/C₁. For the remainder of the corridor, a line would generally parallel Callahan Creek (Class III), which would have to be crossed an unknown number of times. Grouse Creek (Class I) is encountered, and the Pack River (Class I) would also be crossed. Additional roads would probably be required, resulting in impacts as described for B/C₁.

Corridor B/C₂ passes through high-quality wildlife habitat used by grizzly and black bear, moose, cougar, whitetail and mule deer, and other species, some of which require areas remote from man. The corridor includes a portion of the Cabinet Mountain divide which has relatively few roads. This area is within the proposed grizzly critical habitat (Fig. 8)^{1/}, and a small but unknown number of grizzlies inhabit the area (as indicated by information from State and Federal agencies).

As with many other wildlife species, the proposed line could have both adverse and beneficial effects on grizzly bears. Grizzlies are primarily herbivores and a transmission line right-of-way could provide some preferred grizzly plant foods. Access roads may be used by grizzlies as travel lanes. On the other hand, increased human activity on access roads could increase man-bear contacts, possibly resulting in the illegal shooting of a grizzly or the shooting of a grizzly mistaken for the more common black bear. Furthermore, increased human activity could cause grizzlies to avoid or decrease their use of the area, thus, in effect, reducing the amount of high quality habitat. The adverse impacts from making this remote area more accessible probably would outweigh the benefits of opening new forage areas.

To fulfill its obligations under the Endangered Species Act, BPA consulted with the FWS regarding impacts on the grizzly and the Northern Rocky Mountain wolf and measures which could eliminate such impacts. The FWS determined that Plan B, Corridor 1 is the only corridor not likely to jeopardize the continued existence of the two species or adversely modify their habitat. *but it has lots of other problems —*

Corridor B/C₃ parallels existing facilities along the Kootenai River. It crosses remote areas inhabited by a number of important species. Although the corridor encounters about the same amount of grizzly habitat as B/C₂, it could create a greater amount of new access to this habitat (Table 5), especially near Calder Mountain. As with corridor B/C₂, both Grouse Creek and the Pack River would be affected.

Corridor B/C₄ has the least potential for interaction with classified fishery streams (Table 5). Two Class III rivers, the Yaak River and Pipe Creek, and smaller streams, including Seventeen Mile Creek, pass through the corridor. Access roads would be required throughout much of the

^{1/} Critical habitat can include both areas presently inhabited by a species, plus areas required for future range expansion of the species.

area, causing impacts on fishery resources similar to those for the other Plan B corridors.

Although most of corridor B/C₄ is within big game range (Fig. 9), the portion of the corridor in the Seventeen Mile Creek area is especially important. This is a concentration and wintering area for moose and a wintering area for elk, mule deer, and whitetail deer. Although existing roads could be used, there is a potential for new access. A transmission line through big game range could have both beneficial and adverse impacts. Deer and elk are especially vulnerable to impact when they are on the winter range (Fig. 9). Shrubs and grasses which become established on new right-of-way through forested areas could provide additional forage for large herbivores. Conversely, increased human activity in big game ranges can occur especially during the hunting season (Goodwin 1975). Forage increases therefore must be traded off against impacts from increased access.

Between Sandpoint and Rathdrum corridors B₁-B₃ cross some fishery streams, including the Pend Oreille River, Cocolalla Creek, and Hoodoo Creek which are all Class III streams. Corridors B₁ and B₂ appear to have the highest potential for interaction with fishery resources. Impacts on fishery resources would be similar to those described above for B/C₁-B/C₄.

The reference corridors all pass through winter range used primarily by whitetail and mule deer and to a lesser extent by elk (Fig. 9). Impacts in such areas would be similar to those described for B/C₄. Corridor B₁ passes through more winter range than B₂ and B₃. All three corridors could open new access into big game winter range, especially south of the Pend Oreille River.

The Pend Oreille River provides wintering and nesting habitat for moderate numbers of waterfowl, ospreys, and bald eagles. A transmission line crossing would create impacts similar to those described for the Kootenai River. Although the endangered peregrine falcon at times inhabits the area near Rathdrum, no significant impacts are expected on this species because no known nesting areas are near the corridor.

Plan A - options would have a low impact on wildlife resources. The corridors present one option for paralleling existing lines and three for routing where lines do not presently exist. The greatest impacts would occur where new access would be created and range from short-term disturbances on fishery streams to increased human disturbances of wildlife. Habitat occupied by the grizzly could be affected. Because reference corridors crossing such habitat are primarily parallel, no significant adverse effects on the grizzly are anticipated (Table 5 and Figs. 8 and 9).

Plan A is not expected to cross any Class I fishery streams, although some Class II, III, and IV streams could be affected. Impacts would be primarily short-term (e.g. siltation). A₁ could parallel existing facilities, greatly reducing overall impacts.

Corridors A₁-A₄ pass through areas with large deer and elk populations including both summer and winter ranges. Plan A corridors would have impacts similar to those described for Plan B. Corridor A₁ would not significantly increase human access. It could provide substantial amounts of forage.

Plan A could impact waterfowl along the Clark Fork and Kootenai Rivers. Waterfowl collisions with conductors are possible and nesting waterfowl may be disturbed during line construction. Waterfowl mortality from such collisions, however, would probably not compare to that from natural and other human factors. The bald eagle might also be impacted, as described in Plan B, particularly near Libby.

Plan A encounters areas inhabited by the grizzly bear, a threatened species (Fig. 8). With the exception of corridor A₂, which could require new access roads along a short section on the eastern edge of the habitat, all the corridors would parallel an existing transmission line through the proposed critical habitat. Long-term human access into grizzly habitat would not greatly increase.

Several other "special status" wildlife species as listed in Table 3 could be affected. Information on the distribution of these species within the study area is generally not available. Many of the species, such as the Northern Rocky Mountain wolf, prefer areas remote from human activity and development. Creation of new access into remote habitat would probably be the most significant impact on these species.

A new substation in the vicinity of Noxon (Fig. 3), could remove up to 15 acres (6 ha) of wildlife habitat, including aquatic, riparian, cropland, and forest. Most of the area is within deer and elk winter range. A 230-kV transmission line to the substation could alter an additional 90 acres (36 ha) of habitat. Locating the substation on the south side of the Clark Fork River would require crossing the river. This could represent an additional obstacle to waterfowl flyways.

Plan C - options represent impacts ranging from low to high, although most options would be of moderate impact. One corridor combination calls for complete paralleling and a number of combinations would allow partial paralleling of existing facilities. Corridors common with Plan B (B/C₁-B/C₄) would cause the greatest impacts, especially in remote areas. Increasing human access to such areas is a primary element in assessing the level of impact. Adverse effects on the grizzly bear are possible (Table 5 and Figs. 8 and 9).

Impacts from Plan C corridors between Sandpoint and Libby (B/C₁-B/C₄) are discussed in Plan B. Between Sandpoint and Sacheen (C₁-C₄), Plan C corridors cross four Class III fishery rivers: Priest River, Pend Oreille River, Hoodoo Creek, and Cocolalla Creek. Impacts on these streams would be similar to those described for Plan B; no significant adverse impacts on fishery resources should occur.

Crossing the Pend Oreille River would have the same potential for impacts on waterfowl and bald eagles as described for Plan B. All reference

corridors could create new access into big game ranges. Corridors C₁ and C₂ pass through a remote area west of Hoodoo Creek.

Plan D - options would cause moderate impacts on wildlife resources, with the greatest impacts involving the creation of additional access in relatively remote areas of high quality big game range. Two of the corridors between Noxon and Rathdrum encounter such areas. Critical grizzly bear habitat could also be crossed. Among Plan D corridor combinations there is one option for parallel routing (Table 5 and Figs. 8 and 9).

Impacts from Plan D corridors between Libby and Noxon (A₁-A₄) are discussed under Plan A. Corridors between Noxon and Rathdrum (D₁-D₃) could affect fishery streams of all four classes (I-IV). Corridor D₁ could affect three Class I streams. These are Granite Creek, Gold Creek, and North Gold Creek. Because these streams would be crossed at points near an existing transmission line, impacts on fishery resources from siltation should be short-term and of low magnitude. Corridor D₂ crosses the Coeur d'Alene River, also a Class I stream. Some localized, short-term impacts on fishery resources could occur but proper mitigation measures could minimize such impacts (App. B, Role EIS, Ch. VII). Corridors D₂ and D₃ also cross four Class II fishery streams, and all three corridors cross Class III and IV streams. Impacts on fishery resources would be greater with corridors D₂ and D₃ because new access roads would be required in some areas.

The Clark Fork River is used by waterfowl, ospreys, and bald eagles. Corridors D₁ and D₂ could have an effect on such species similar to that described for the previous plans.

Although all three reference corridors pass through areas used by big game animals (deer, elk, moose) corridors D₂ and D₃ would probably have the greatest impact on these animals due to the new access which would be created for humans. None of the three reference corridors is located in areas known to be inhabited by grizzlies.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

Demographic and Economic Considerations

Establishing transmission lines 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/or substation construction, which usually involves special crews. The skills needed for these specialized construction activities are not often 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. Workers require housing, food, entertainment and a variety of trade and service items. Although the work force is seldom concentrated anywhere long enough to strain a community's resources, the actual impact of any population increase on a community depends largely on the size of the community and the magnitude of the

project. Usually only a few workers bring their families; most stay in motels and/or hotels, and the rest use trailer facilities.

Temporary jobs are often available to local residents. If people are not available locally, they are recruited elsewhere. BPA and their contractors attempt to use local facilities and equipment when possible, especially to perform clearing and grading operations and 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.

Very small towns near the proposed projects could experience some short-term adverse effects. These towns would not be "permanent headquarters" for construction crews and would not house any of the work crews. Nevertheless, crews would probably purchase some items in these towns and their presence would be very obvious in small communities. Cafes, grocery stores, gas stations, hardware, recreation and other facilities and services could be overloaded for short periods. Generally, the ability to absorb economic and social impacts is directly related to community size (Wise 1974). Construction work on large transmission line projects is frequently limited during the winter, whereas most construction work is performed during the summer and has a seasonal impact on community services.

Table 6 and the following discussion summarize the potential demographic and economic impacts. The extent of impacts to demographic and economic resources is primarily a function of line length as it relates to construction crew size, duration of the project, and proximity to service facilities. Impacts are generally short-term and low in magnitude.

Plan B (Proposed Plan) - the overall impact is expected to be low. The work force needed for constructing all the facilities is estimated to be between 150 and 185 persons. Between 50 and 75 of these jobs should be available to local residents. Potential income from the local wages should approximate 2.4 million dollars. The multiplier effect of providing services and supplies to the entire work force has not been taken into consideration, but it could provide a temporary stimulus to the local economy. For example, the incoming work force will require housing, food and other services for a 6 to 24 month period, depending on the type of job. Also, some tax revenue would accrue to each state as a result of the income and spending created by the proposed project. However, some facilities such as schools and/or recreational locations may be adversely impacted by increased use.

Plan A - options involve the shortest corridors and are expected to have the least overall impact. The work force is estimated to be between 120 and 165 persons. Between 40 and 60 jobs, with a wage potential of about 1.5 million dollars, should be available locally. The incoming work force would require lodging for a 6 to 20 month period, depending on the type of job.

Plans C and D - are comparable in length to the corridors in Plan B. They would have more impact than Plan A, but the overall magnitude

Table 6. - DEMOGRAPHIC AND ECONOMIC CONSIDERATIONS RELATED TO CONSTRUCTION ACTIVITIES*

Considerations	COMMON TO ALL PLANS		PLAN A		PLAN B	PLAN C	PLAN D
	115-kV recon.	new 115-kV line (Libby-Libby Rereg.)	new 230-kV line (Libby-Noxon)	new 500/230-kV Noxon Subst.	new 230-kV line (Libby-Rathdrum)	new 230-kV line (Libby-Sacheen)	new 230-kV line (Libby-Noxon-Rathdrum)
Approx. Range in Facility Size	115 miles (185 km)	7 miles (11 km)	45-70 miles (72-115 km)	15 acres (6 ha)	120-140 miles (195-225 km)	115-140 miles (185-225 km)	115-145 miles (185-235 km)
Total Number Employed	30-40	20-25	55-60	15-40	100-120	100-120	100-120
Number Hired from Local Area	10-15	5-10	20-25	5-10	35-50	35-50	35-50
Length of Time Needed to Complete Project (months)	10-15	6-8	12-20	10-16	20-24	20-24	20-24
Average Wage (\$/hour)	10	10	10	9	10	10	10
Estimated Potential Wages Paid to Local Employees** (\$ 000)	360	128	800	230	1,920	1,920	1,920

* Although this information is based on general estimates, it is included to provide some indication of the potential socioeconomic impacts that can be expected with the clearing and construction activities required for the proposed project.

** This does not take into consideration the potential income that will be derived from providing trade and services (i.e., food, lodging, entertainment, equipment, supplies, etc.) to the work force by local businesses.

Source: Line and Substation Construction Sections, Branch of Construction, E&C Division, BPA.

remains low. The work force, wages, and their related impacts should be similar to those discussed under Plan B.

Land Use

Each alternative plan involves locating transmission facilities in areas which have been designated for certain planned or zoned land uses. In most cases these include "open space" or agricultural land classifications. Transmission facilities can exist compatibly with most of these land uses. All existing comprehensive land use plans for the area have been reviewed. At this stage in the planning process, the four alternative plans of service are expected to be compatible with these land use plans. Additional information on potential land use conflicts will be presented in a subsequent facility location supplement.

Agriculture and Rangeland

The main impacts on agriculture from construction of transmission lines and related facilities are: potential restrictions on overhead sprinkler irrigation, increased weed growth, physical disturbance associated with heavy construction equipment and unauthorized use of access roads, and disturbance to vegetation from equipment during emergency maintenance (see App. B, Role EIS, Ch. VII).

Generally, transmission lines through agricultural land could render the area occupied by the tower structure unavailable for other use and limit land use underneath conductors. Construction equipment can temporarily compact soil. Table 7 estimates the agricultural land that may be encountered. Figure 10 shows the distribution of agricultural land.

Reconductoring the 115-kV Albeni Falls-Libby line is expected to have minimal short-term impacts on agricultural production. The principal effect would be some soil compaction along parts of the right-of-way, reducing yields in such areas. The Libby-Libby Reregulating Dam 115-kV line, because of the type of construction and the small agricultural acreage involved, would have insignificant impacts.

Plan B (Proposed Plan) - consists of seven reference corridors between Libby and Rathdrum, including options that partially parallel existing lines. Moderate amounts of agricultural land could be crossed by several of the Plan B options, particularly between Bonners Ferry and Rathdrum. Overall degree of impact would be low-moderate. The most significant impacts to agriculture could occur in irrigated areas, especially if new rights-of-way were involved (Table 7 and Figure 10).

In the reference corridors between Libby and Sandpoint (B/C₁ to B/C₄), some agricultural areas will be encountered. All corridors could cross a very small amount of irrigated acreage, resulting in short-term disturbance to crops near the right-of-way and access roads and possibly limiting the types of overhead irrigation systems used. Table 7 shows the approximate number of acres affected for various agricultural use categories.

The Cabinet Trench and upper Purcell Trench along the Kootenai River Basin have the most productive agricultural lands encountered. Likewise this area offers the greatest potential for expansion of agricultural land use and irrigation development.

Corridors between Sandpoint and Rathdrum (B₁-B₃) would affect some irrigated land. Between 80 and 160 acres (32 to 65 ha) under dryland farming could be impacted. From 135 to 155 acres (55-63 ha) of rangeland may be crossed. Heavy machinery could cause soil compaction, thus reducing crop yields. Subsoiling and deep plowing would be required to correct this condition.

Plan A - options would result in very minor impact to agricultural resources. The amount of land potentially affected is small. Line location and other mitigation methods allow latitude for further reducing impacts on agriculture (Table 7 and Figure 10).

Construction would directly impact very little field crop acreage by disturbance to or loss of crops on and near the right-of-way. Soil compaction in staging areas and along temporary access roads may slightly reduce crop yields for several years. The construction of permanent access roads, if required, would have long-term impact.

Up to 50 or 60 acres (20 to 24 ha) of rangeland may be temporarily affected in the corridors by use of heavy equipment and vehicles. Construction disturbance affects production for a year or so until the grazing-carrying capacity is regained.

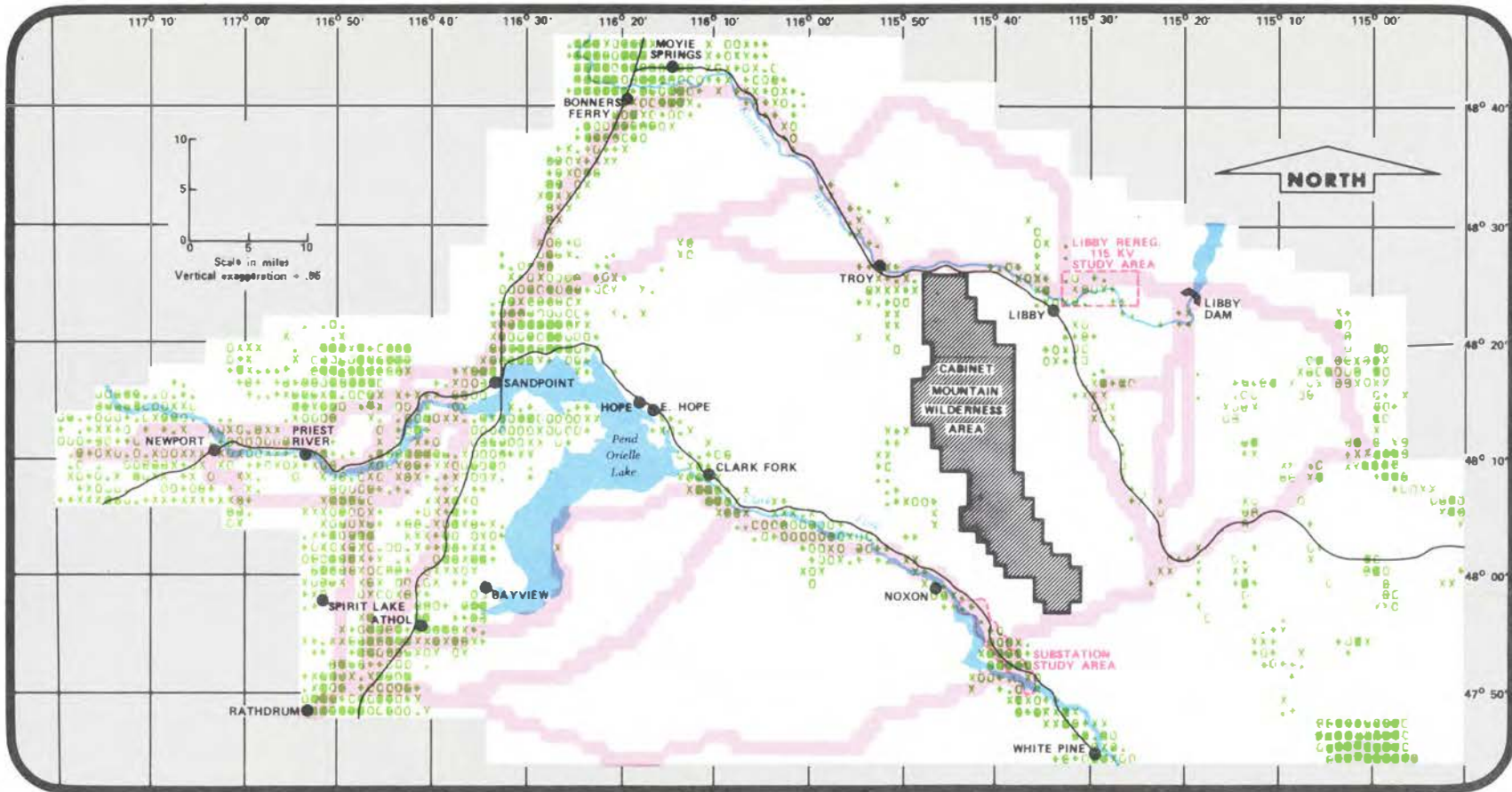
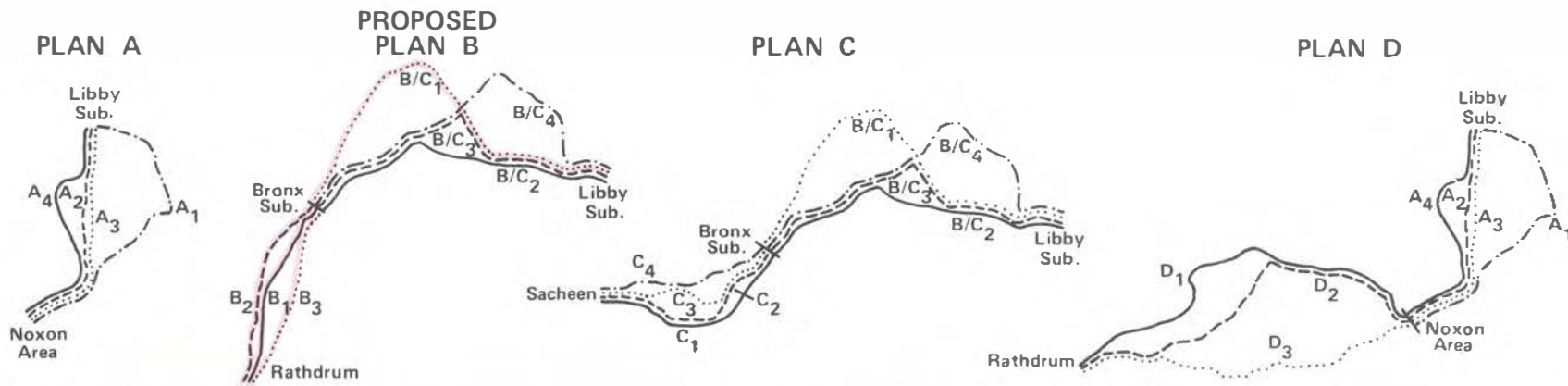
Some land with agricultural potential could be affected.

Constructing a Noxon substation, depending upon final location, could remove up to 15 acres (6 ha) from agricultural production.

Plan C - offers a number of reference corridor options between Libby and Sacheen, including one parallel to existing lines. In areas adjacent to existing lines where little new access is required, impact on agricultural production should be low. Overall only minor amounts of cropland would be involved. Although a moderate amount of rangeland is encountered in all corridors, the effect of a transmission line is expected to be minor (Table 7 and Figure 10).

Impacts between Libby and Sandpoint (B/C₁-B/C₄) are discussed under Plan B. Between Sandpoint and Rathdrum, corridors C₁-C₄ encounter some field crop acreage. Line location affects the degree of impact to field crops because it may limit the types of irrigation used. Disturbance to the rangeland crossed by the corridors is expected to be limited to short-term physical disturbances. To minimize agricultural impact, temporary or permanent roads will be built only where existing roads cannot be used.

Plan D - options between Libby and Rathdrum are expected to have low impact on agricultural production. Included is an option for routing adjacent to existing lines and a number of options for partial paralleling.



DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.



FIGURE 10
AGRICULTURAL LAND
LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT



For such routings, use of existing road systems reduces physical disturbance to the land and crops. In certain small areas, a transmission line could interfere with present or planned irrigation practices (Table 7 and Figure 10).

Impacts between Libby and Noxon (A₁-A₄) are discussed under Plan A.

Between Noxon and Rathdrum, corridor D₁ encounters the most agricultural land; however, it affords the greatest opportunity to use an existing transmission line access system. Corridor D₃ crosses the least agricultural land and is expected to have the lowest impact.

Forestry

The major impacts of transmission line corridors on commercial forest land are the removal of timber, long-term loss of the productivity and damage to surrounding timber. Access roads can increase the probability of man-caused fires. Conversely, improved access can aid in fire control efforts. Where a line can parallel existing facilities, impacts to forestry can be substantially reduced.

Table 7 summarizes reference corridors for each plan in terms of vegetation productivity classes and acres of each major habitat type. Productivity classes show relative amounts of long-term timber production. Acreage figures by habitat type estimate the productive timberland area removed from use. In general, the impact on forestry increases with both the length of a corridor and the amount of its forest land in highly-productive habitat types. Selecting a corridor from the standpoint of commercial forestry would minimize both losses in long-term productivity and the impacts of timber removal from highly productive land.

Reconductoring the existing 115-kV line between Albeni Falls and Libby should not additionally impact present commercial forestry practices.

Constructing a 115-kV line between Libby Substation and Libby Reregulating Dam could remove as much as 70 acres (30 ha) of land from timber production. Paralleling existing facilities could reduce this acreage.

Plan B (Proposed Plan) - overall ranges from moderate to high impact, with a majority of options being of moderate impact. There is an opportunity for partially paralleling existing lines along corridor B/C₁ (Table 7 and Figures 7 and 11). of p. 27

Between Libby and Sandpoint (B/C₁-B/C₄) the impact is potentially high along all Plan B corridors. Corridor B/C₄ would result in the highest potential impact. The least impact would occur along corridors B₁ and B₂ between Sandpoint and Rathdrum, where Douglas-fir and Cedar-Hemlock habitat types are almost equally predominant (Table 7 and Figures 7 and 11).

Plan A - options would have relatively little overall impact on forestry. Only 20 to 25 percent of Plan A is in highly productive Cedar-Hemlock

habitat types. The reference corridor options are relatively short and there is an option for paralleling (A₁). (Table 7 and Figs. 7 and 11).

Corridor A₁ would remove the most timber land and the highest amount of productivity. It could parallel an existing line, however, reducing impact somewhat. Corridor A₄ would also have relatively high impact.

The Noxon substation could remove up to 15 acres (6 ha) of land, principally Cedar-Hemlock, from timber production; transmission lines associated with the substation could alter an additional 15 to 90 acres (6-35 ha) (Table 7 and Figure 11).

Plan C - options represent relatively high potential impact on forestry. However, corridor options C₃ and B/C₁ together present an opportunity to parallel existing lines for the entire distance between Libby and Sacheen (Table 7 and Figures 7 and 11).

The greatest impact would occur along corridors between Libby and Sandpoint (B/C₁-B/C₄) as discussed under Plan B. However, significant impact is probable for any Plan C corridor between Sandpoint and Sacheen (C₁-C₄), where forest habitat types are almost entirely Cedar-Hemlock. Of these, C₁ and C₂ represent the greatest potential impact.

Plan D - offers the highest potential impact to forestry among all four plans, with all options being of uniformly high impact. Combining corridor options A₁ and D₁ would allow paralleling from Libby to Rathdrum (Table 7 and Figures 7 and 11).

Impacts from Plan D corridors between Libby and Noxon (A₁-A₄) are low as discussed under Plan A. The corridors between Noxon and Rathdrum (D₁-D₃), particularly D₂ and D₃, however, represent considerable impact. Paralleling an existing line (D₁) would remove less productive timberland and less productivity, thus reducing impact potential.

Urban and Residential

Urban and Residential resources, including urban viewsheds, susceptible to impact are shown in Table 7. The following discussion identifies the reference corridors with a higher probability of unavoidable land use conflicts. Such conflicts occur primarily where the new transmission lines would parallel existing lines (Fig. 12). Impacts may be as slight as temporary noise or dust during construction or they may involve radio and television interference, restrictions on the use of land or the relocation of structures. At this stage in the planning process it is not possible to assess accurately the likelihood or actual location of these impacts.

Temporary noise, dust and visual impact are possible from reconductoring the Albeni Falls-Libby 115-kV line. Visual impact to residents near Libby is possible from constructing a new 115-kV line between Libby Reregulating Dam and Libby Substation.

Plan B (Proposed Plan) - offers various combinations of corridors with moderately low impacts. Most impacts will occur where the new lines parallel existing lines along transportation routes (Table 7 and Fig. 12).

Table 7. - Comparison of Reference Corridors and Resource Use Considerations

PLANNING REFERENCE CORRIDORS		PLAN A				PROPOSED PLAN B				PLAN C				PLAN D						
		A ₁ ⁺	A ₂	A ₃	A ₄	B ₁	B ₂	B ₃	B/C ₁ ⁺	B/C ₂	B/C ₃	B/C ₄	C ₁	C ₂	C ₃ ⁺	C ₄	D ₁ ⁺	D ₂	D ₃	
RESOURCE CATEGORY		UNITS OF MEASURE	(70%)	(43)	(43)	(52)	(46)	(46)	(48)	(95)	(75)	(83)	(94)	(48)	(48)	(44)	(40)	(76)	(73)	(73)
AGRICULTURE AND RANGELAND	Field Crops - Irrigated	No. of Acres <u>1/</u> <u>2/</u>	5	5	5	10	35	10	15	10	5	10	5	15	5	5	5	30	15	15
	Field Crops - Non-Irrigated	"	--	--	--	--	80	80	160	--	--	--	--	--	--	--	--	10	10	10
	Rangeland	"	55	--	--	25	145	155	135	185	90	90	80	130	155	140	105	140	100	60
	Potentially Irrigable Land	"	110	50	70	100	360	570	410	730	260	340	240	140	290	230	130	580	430	280
	Potential Agricultural Land	"	230	100	70	90	470	410	460	990	490	640	460	450	580	550	350	780	590	340
FORESTRY	Productivity Classes I - IV (1-60 cu. ft./ac./year)	Thousands of cu. ft. per corridor per year <u>3/</u>	4.3 to 5.6	3.3 to 4.6	4.4 to 6.0	3.8 to 5.3	-- to 0.1	-- to 0.1	-- to 0.1	0.2 to 0.5	0.3 to 0.5	1.4 to 2.1	1.3 to 1.8	-- to 0.1	-- to 0.1	-- to 0.1	-- to 0.4	9.9 to 14.9	1.8 to 2.4	1.5 to 2.0
	Productivity Classes V - VI (61-90 cu. ft./ac./year)	"	47.2 to 56.0	20.6 to 24.4	16.7 to 19.8	21.0 to 24.9	20.7 to 24.5	14.8 to 17.6	19.0 to 22.5	21.4 to 25.3	20.2 to 23.9	19.8 to 23.4	20.0 to 23.7	6.8 to 8.1	4.8 to 5.6	5.5 to 6.5	8.4 to 9.9	24.3 to 28.8	12.2 to 14.4	17.5 to 20.8
	Productivity Classes VII, VIII, and IX (91-135 cu. ft./ac./year)	"	47.2 to 52.9	42.1 to 47.3	44.3 to 49.8	59.1 to 66.3	31.5 to 35.1	40.7 to 45.4	34.9 to 44.6	95.7 to 106.8	85.6 to 95.7	92.9 to 103.9	115.1 to 128.7	79.0 to 88.1	78.0 to 87.1	55.3 to 61.7	64.3 to 71.7	83.7 to 93.4	128.5 to 143.4	115.8 to 127.5
	Total Productivity <u>2/</u>	"	98.6 to 114.7	66.1 to 76.3	65.4 to 75.6	83.9 to 96.5	52.2 to 59.7	55.5 to 63.0	58.9 to 67.1	117.3 to 132.6	106.1 to 120.2	114.1 to 129.5	136.4 to 154.3	85.8 to 96.3	82.8 to 92.8	60.8 to 68.3	72.6 to 92.0	117.9 to 137.1	142.5 to 160.2	134.8 to 152.3
	Douglas-Fir (Predominant Productivity) (76-90 cu. ft./ac./yr.)	Thousands of acres per Corridor <u>1/</u> <u>2/</u> <u>3/</u>	0.6	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.1	0.1	0.1	0.1	0.3	0.2	0.3
	Cedar-Hemlock (Predominant Productivity) (121-135 cu. ft./ac./yr.)	"	0.2	0.2	0.2	0.4	0.3	0.3	0.3	0.8	0.6	0.7	0.8	0.7	0.6	0.5	0.5	0.7	1.0	0.9
	Subalpine (Predominant Productivity) (106-120 cu. ft./ac./yr.)	"	0.2	0.2	0.2	0.2	--	--	--	--	0.1	0.2	0.2	--	--	--	--	.03	0.1	0.1
	Total Acres Per R-O-W	"	1.0	0.7	0.7	0.9	0.6	0.5	0.6	1.1	1.0	1.2	1.3	0.8	0.7	0.6	0.6	1.0	1.3	1.3
URBAN AND RESIDENTIAL	Residential Land Use	No. of Cells <u>4/</u>	10	8	7	11	27	31	27	55	22	28	21	28	36	39	25	48	38	19
	Incorporated Cities	"	--	--	--	--	2	2	3	5	3	4	1	2	2	6	1	2	2	2
	Institutional Land Use	"	--	--	--	--	2	5	2	4	--	--	--	1	5	3	--	3	2	1
	Industrial Land Use	"	--	--	--	1	4	10	7	14	13	14	7	6	10	13	6	4	4	2
	Commercial Land Use	"	1	1	1	--	3	5	4	7	--	3	--	3	4	5	1	8	8	2
	Communication	"	3	2	2	2	2	1	3	10	5	8	4	2	2	5	5	18	19	11
	Conflicting Uses Adjacent to T/L Rights-of-Way	"	9	3	3	3	7	14	8	29	9	13	6	7	16	34	5	27	19	5
	Libby	Presence or Absence	--	--	--	--	--	--	--	X	X	X	X	--	--	--	--	--	--	--
	Troy	"	--	--	--	--	--	--	--	X	X	--	X	--	--	--	--	--	--	--
	Moyie Springs	"	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--
Bonniers Ferry	"	--	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	
Sandpoint	"	--	--	--	--	X	X	X	X	X	X	X	X	X	X	X	--	--	--	
Priest River	"	--	--	--	--	--	--	--	--	--	--	--	X	X	X	X	--	--	--	
Newport	"	--	--	--	--	--	--	--	--	--	--	--	X	X	X	X	--	--	--	
Athol	"	--	--	--	--	--	--	X	--	--	--	--	--	--	--	--	X	--	--	
Spirit Lake	"	--	--	--	--	--	X	--	--	--	--	--	--	--	--	--	--	--	--	
Rathdrum	"	--	--	--	--	X	X	X	--	--	--	--	--	--	--	--	X	X	X	



Table 7. - Comparison of Reference Corridors and Resource Use Considerations

	RESOURCE CATEGORY	UNITS OF MEASURE	A				B			B/C				C				D		
			A ₁ ⁺	A ₂	A ₃	A ₄	B ₁	B ₂	B ₃	B/C ₁ ⁺	B/C ₂	B/C ₃	B/C ₄	C ₁	C ₂	C ₃ ⁺	C ₄	D ₁ ⁺	D ₂	D ₃
ESTHETIC (Potential Visibility)	Primary Highways	No. of Cells	27	20	--	23	28	33	20	47	29	49	21	47	46	54	42	--	--	10
	Secondary Highways	"	--	--	--	11	50	49	43	64	53	51	27	64	60	59	49	49	26	13
	Recreation/Scenic Roads	"	35	22	23	19	38	27	54	108	60	68	54	31	20	34	33	72	61	31
	Recreation Trails	"	91	51	53	61	51	52	53	118	89	97	117	51	51	47	43	103	104	94
	Historic Trails	"	--	--	--	--	27	27	18	40	16	16	16	--	--	--	--	--	--	--
	Scenic Railroads	"	25	19	20	17	29	31	19	114	59	72	41	44	44	49	38	50	48	19
	State Parks	No. of Cells	--	--	--	--	4	2	5	--	--	--	--	4	3	3	--	5	--	--
	Waysides	"	--	--	--	--	27	21	16	22	10	10	10	30	27	31	23	9	--	--
	Lookouts	"	3	3	3	3	--	--	--	8	--	--	--	1	1	6	7	38	21	10
	Public Recreation Sites	"	19	8	8	14	--	--	--	17	1	8	28	--	--	3	6	27	20	29
	Resort Areas	"	--	--	--	--	8	10	8	6	6	6	--	--	--	--	--	16	13	13
	Historic Properties	"	1	4	4	4	18	4	6	44	26	25	26	11	7	8	1	8	5	5
	Winter Sports Sites	"	--	--	--	--	5	--	6	--	--	--	18	--	--	--	--	6	11	10
	Incorporated Cities	"	--	--	--	--	21	21	29	40	22	29	12	18	16	28	27	25	8	8
	Suburban Rural Population Clusters	"	--	--	--	--	38	36	41	53	34	38	19	40	40	51	37	54	42	25
Recreation Rivers and Streams	"	58	34	38	45	36	36	33	117	80	42	84	36	36	44	39	51	63	69	
Wild/Scenic River Study Areas	"	--	--	--	--	--	--	--	12	--	--	--	--	--	11	13	--	--	--	
Recreation Lakes and Reservoirs	"	31	14	11	14	38	41	33	28	14	16	14	56	54	57	50	72	46	26	
RECREATION	Wild and Scenic River Study Area	No. Crossed	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--
	Viewing/Recreation Resource Areas	No. of Acres	50	55	50	50	--	--	--	35	45	35	55	--	--	--	--	--	--	--
	State Wildlife Management Areas	"	--	--	--	--	5	5	5	25	--	--	--	5	5	5	--	--	--	--
	Proposed Recreation Trails	No. Crossed	--	--	--	--	1	3	1	--	--	--	--	2	2	3	--	--	--	--
	Roadless Areas	No. of Acres	--	--	--	--	--	--	--	5	5	40	40	--	--	--	--	10	225	20
	Scenic Lookout	No. of Cells	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	4	3	--
	Waterfalls	"	--	--	--	--	--	--	--	--	--	--	2	--	--	--	--	--	--	--
	Public Recreation Site	"	1	--	--	1	--	1	--	--	--	1	1	--	--	1	1	2	2	1
	Lakes	"	8	6	7	4	5	4	4	18	6	11	8	6	9	16	9	20	13	11
	Recreational Trails	No. of Cells	34	21	21	21	11	4	2	14	19	18	22	13	13	13	13	27	30	27
	Canoe Trails	"	--	--	--	--	--	--	--	11	1	1	1	--	--	1	1	--	--	2
	Resort Areas	"	--	--	--	--	1	1	1	--	--	--	--	--	--	--	--	1	1	1
	Recreational Scenic Roads	"	4	1	2	1	4	4	8	47	25	24	11	--	--	2	4	32	30	3
	State Parks	"	--	--	--	--	--	--	2	--	--	--	--	--	--	--	--	--	--	--
	Rivers/Streams	"	39	20	24	14	3	11	2	43	21	31	12	1	10	21	5	54	59	54
	Scenic Railroads	"	1	2	3	2	6	14	6	46	19	26	3	7	16	27	3	22	19	4
	Springs	"	2	1	1	1	2	--	1	1	--	--	--	2	2	2	4	2	2	1
	Private Parks	"	1	--	--	--	1	1	2	4	3	4	2	1	1	1	1	5	3	--
	Public Access Sites	"	--	--	--	--	1	1	1	1	--	--	--	--	--	--	1	4	1	--
	Additional Recreation	"	--	--	--	--	6	5	5	3	1	2	1	2	2	3	2	5	5	3
Waysides	"	1	--	--	--	--	--	--	2	1	1	--	--	--	--	--	2	--	--	
National Forests	"	540	310	370	510	30	50	20	560	770	800	1110	100	70	20	50	460	770	960	
Winter Sports Sites	"	--	--	--	--	--	--	--	1	6	6	6	--	--	--	4	25	6	18	
Public Hunting Grounds	"	540	310	370	510	40	50	40	610	770	800	1110	130	80	30	60	470	780	960	
State Forests	"	90	20	10	50	20	30	11	40	30	20	20	40	30	10	60	70	240	350	
Reservoirs	"	2	2	2	2	4	10	2	8	7	8	6	2	10	16	1	16	16	2	
Private and Corporate Forests	"	570	330	280	230	60	60	80	140	110	143	110	140	120	70	100	60	20	>10	

1/ Hectares = 0.4046 x Acres

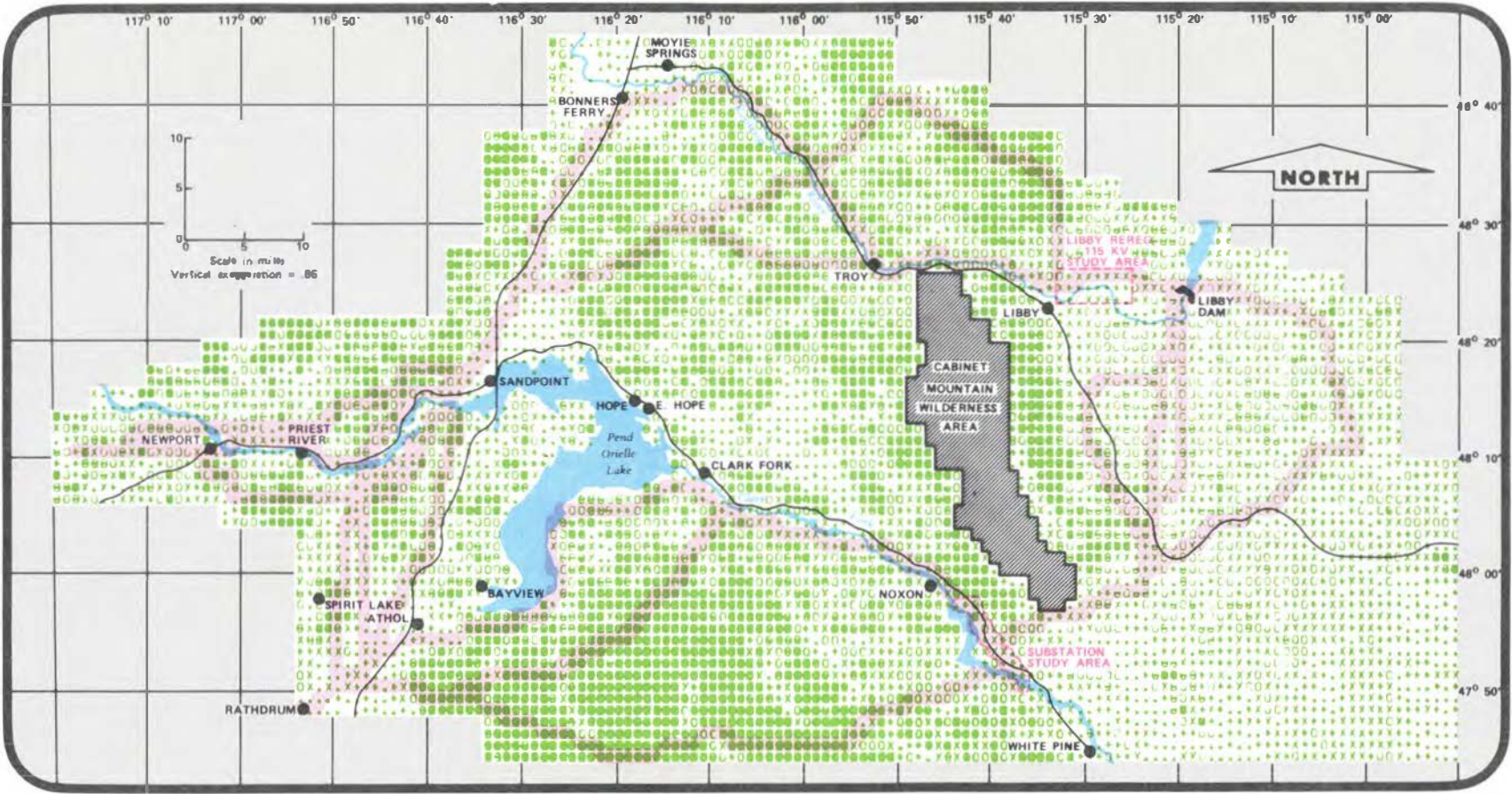
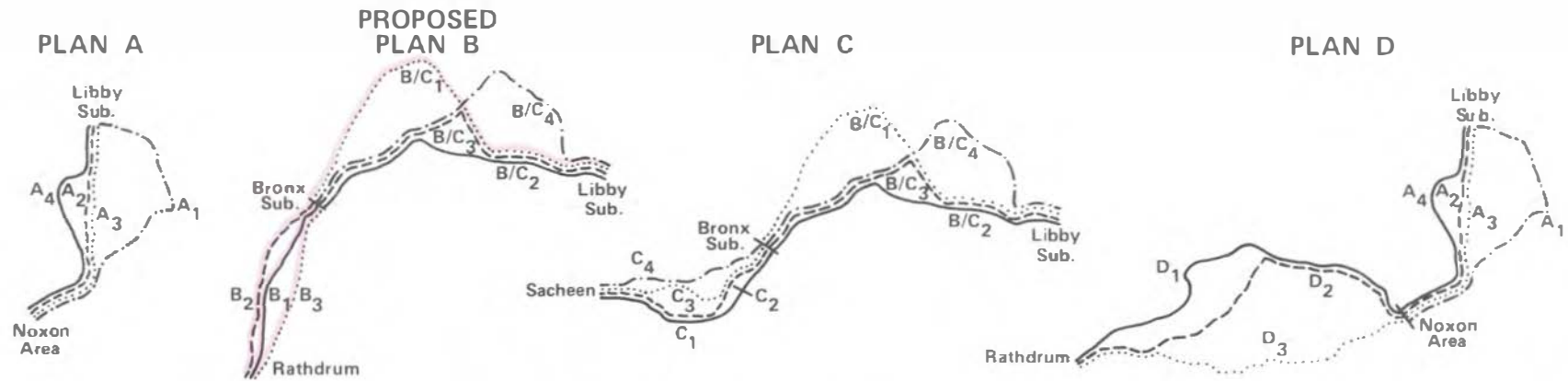
2/ Estimates based on a 125' right-of-way through the planning reference corridor

3/ Productivity estimates reduced by 10% for corridors parallel to existing ROW

4/ A cell is a geographic unit 1 minute in longitude by 1 minute in latitude, an area of about 570 acres (230 ha)

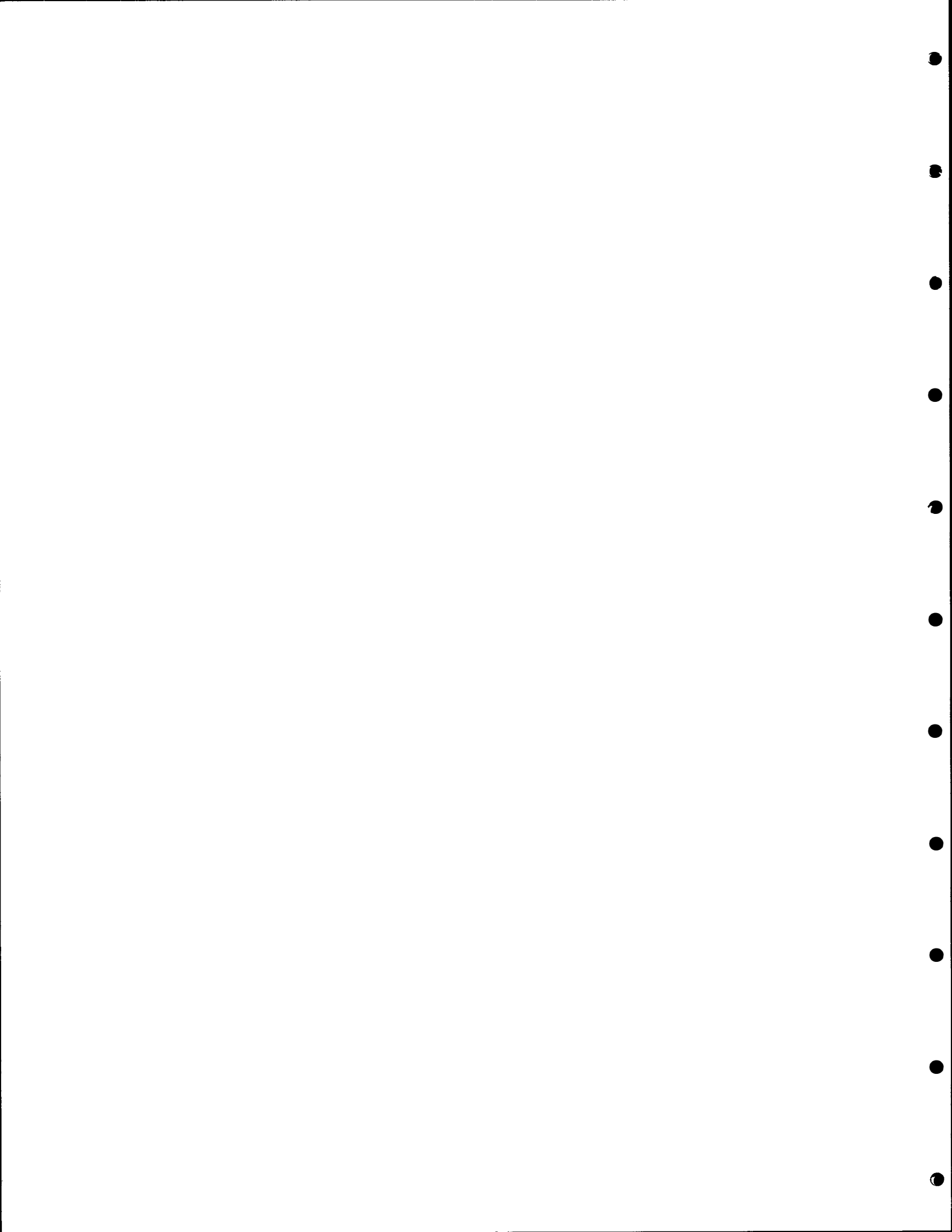
Note: *Estimated mileage per corridor. +Parallel to existing ROW.





LEGEND

FIGURE 11
 FOREST PRODUCTIVITY
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Corridors B/C₁-B/C₄, between Libby and Sandpoint, will be visible from incorporated cities, population clusters, and scattered rural land use areas (Table 7). Corridor B/C₁, paralleling the existing 115-kV corridor, may present residential land use conflicts near Libby, Troy, Bonners Ferry, along the Kootenai River and along U.S. Highway 95 north of Sandpoint (Fig. 12). Corridors B/C₂ and B/C₃ may conflict with existing residential land use near Libby, Troy, and Sandpoint. With corridor B/C₄ similar conflicts may occur near Libby and Sandpoint.

Between Sandpoint and Rathdrum (B₁-B₃), all the corridors would be visible from population clusters and scattered rural land use areas. Corridor B₁ may involve potential land use conflicts near Rathdrum and in the vicinity of Sandpoint. Corridor B₂ presents potential residential land use conflicts near Rathdrum and along the Pend Oreille River between Pend Oreille Lake and Priest River. Corridor B₃ may conflict with residential land use near Sandpoint, Athol, and Rathdrum.

Plan A - options range from no impact to slight visual impacts on rural residents. There might be conflicts with rural residential land uses if existing lines are paralleled (Table 7 and Fig. 12).

In general, Plan A corridors will have a minimal effect on urbanized land use (Fig. 12). With the exception of corridor A₄, no corridors would be visible from any population clusters or incorporated cities. It is possible that A₄ may be slightly visible in the background from Libby. In the vicinity of U.S. Highway 2, conflicts with residential land are possible if the new transmission line parallels an existing line.

Plan C - options range in impact from low to moderate, depending upon the particular combination of corridors selected. As in plan B, most impacts would occur where the new lines parallel existing lines along transportation routes (Table 7 and Fig. 12).

In addition to Plan C corridors between Libby and Sandpoint (B/C₁-B/C₄), all four corridors between Sandpoint and Rathdrum (C₁-C₄) would be visible from numerous clusters of residences. Corridors C₃ and C₄ have potential for numerous land use conflicts. C₁ and C₂ could avoid most of these conflicts. All corridors are potentially visible from Sandpoint, Priest River, and Newport.

Plan D - offers various combinations of corridors which result in low impacts in most cases. However, where the new lines could parallel existing lines, there may be land use conflicts with low to moderate impacts (Table 7 and Fig. 12).

Impacts of corridor segments between Libby and Noxon are discussed under Plan A.

Where reference corridors D₁ and D₂ parallel U.S. Highway 20 for about 35 miles (65km), there are potential conflicts with existing rural residential land uses. The two corridors would cause no impact between Clark

Fork and U.S. Highway 95, an area of undeveloped forest land. Near Highway 95, however, there are potential conflicts with rural residential land use.

Corridor D₃ is located almost entirely in undeveloped land where there would be no impacts. West of Highway 95 impacts are similar to those for corridors D₁ and D₂.

Esthetics

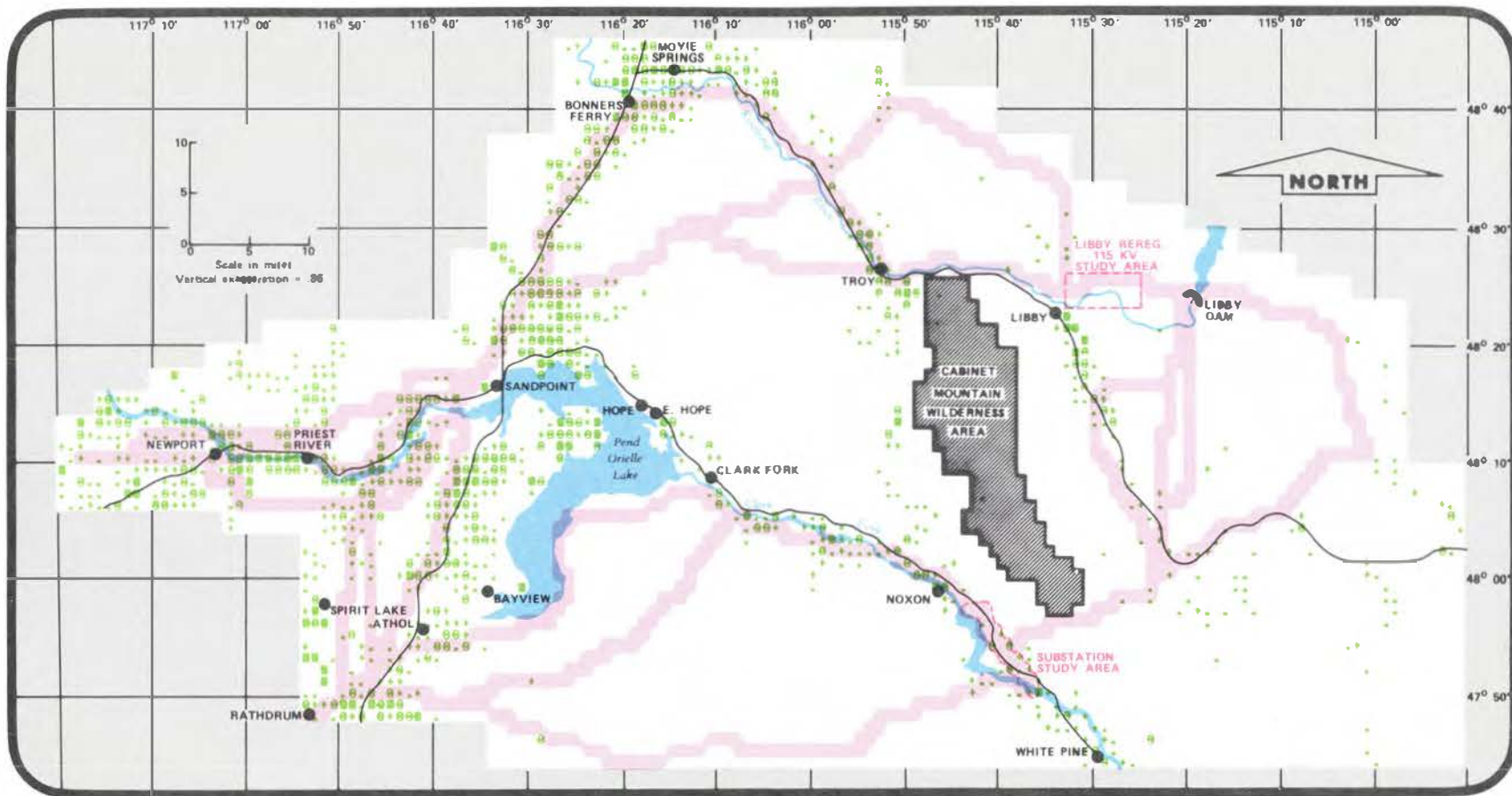
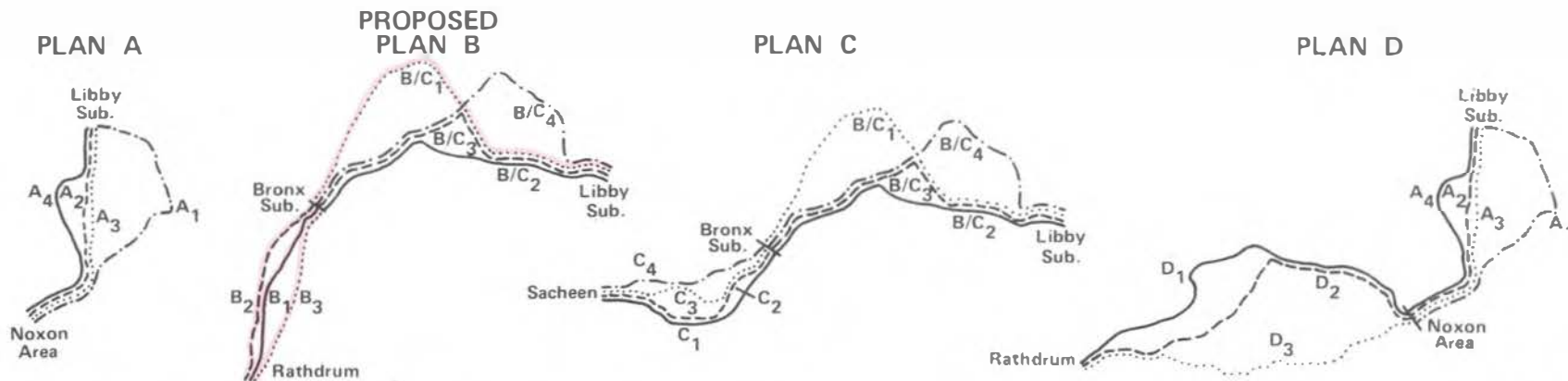
Visual impact of the proposed transmission facilities is based on both visual quality/transmission line compatibility (Fig. 13) and the relative visibility of the landscape: those portions of the area seen from major travel routes, use areas and water bodies (Fig. 14). Table 7 shows the visibility from the various resource categories, a potential worst case. Possible visual screening provided by forest cover may reduce these impacts. The potential visual alteration (Fig. 13) and the visibility of the corridors allow estimates of each corridor's potential visual impact. Impacts are discussed more specifically below.

Reconductoring activities on the existing Albeni Falls-Libby 115-kV line would cause short-term visual impacts. There would be no apparent long-term changes in conditions. A 115-kV wood pole transmission line between PP&L's Libby Substation and the Libby Reregulating Dam is not expected to have a high visual impact. Most of this area is of moderate visual quality. However, along the Kootenai River, visual quality increases significantly. A right-of-way would probably parallel an existing line and/or existing roads. A right-of-way may be visible from State Highway 37, recreation trails, a scenic railroad, an historic site, the town of Libby, and recreation streams.

Plan B (Proposed Plan) - consists of seven reference corridors between Libby and Rathdrum. The different combinations of corridors result in impacts that range from moderate to high. These corridors are long and affect a large and diverse number of viewers. They are in areas of very high visual quality (Table 7 and Figs. 13 and 14).

Plan B corridors between Libby substation and Sandpoint (B/C₁-B/C₄) pass through a variety of landscape types. Corridor B/C₁ parallels an existing 115-kV transmission line, thus affecting the fewest number of landscapes. At the same time it would be seen by a higher number of viewers than the others. Although the Moyie River would not be crossed, portions of this corridor may be visible from the river in an area designated as a Wild and Scenic River Study Area.

Corridor B/C₂ crosses the Cabinet Mountains, where the scenic quality is from moderately high to very high. Because of the reduced accessibility, however, the number of viewer contacts would be low. The primary views would be from recreation trails, the town of Troy and some nearby residences, and several streams used for recreation. Near Sandpoint a line would have much greater viewer contact, being close to U.S. Highway 95, an historic trail, a scenic railroad, highway wayside stops, an historic



DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.

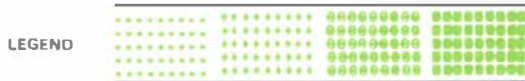
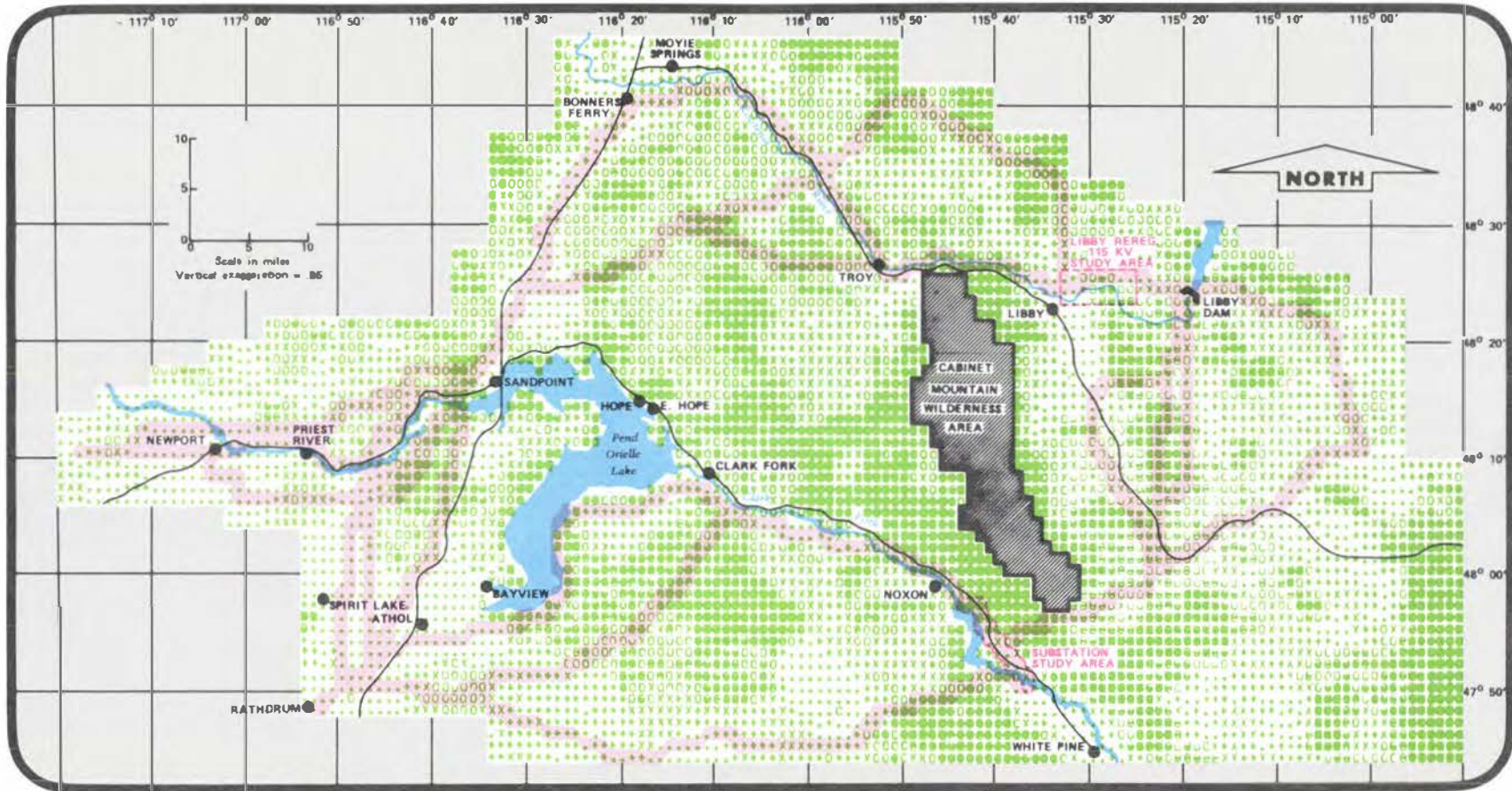
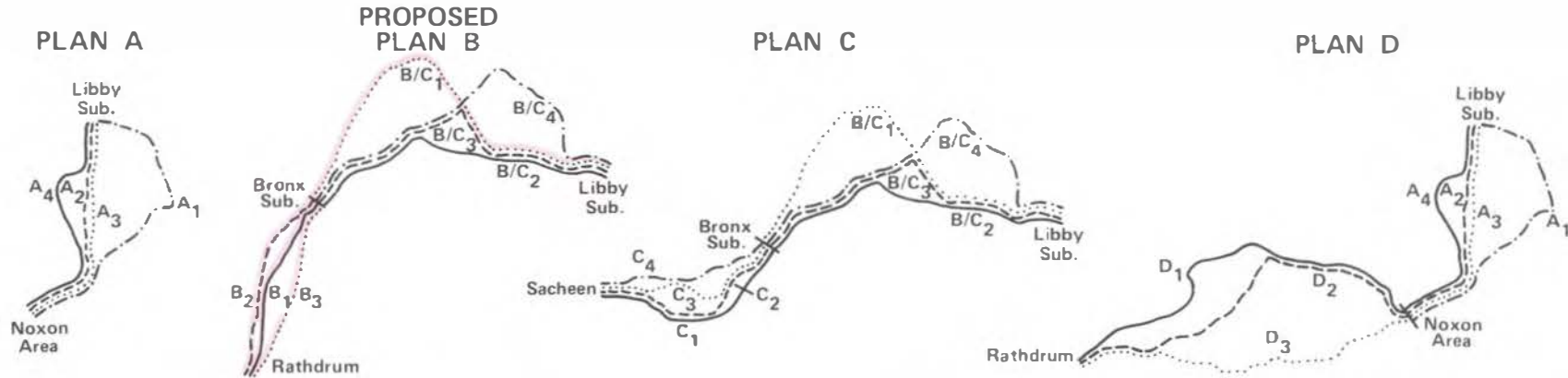


FIGURE 12
 URBAN & RESIDENTIAL LAND
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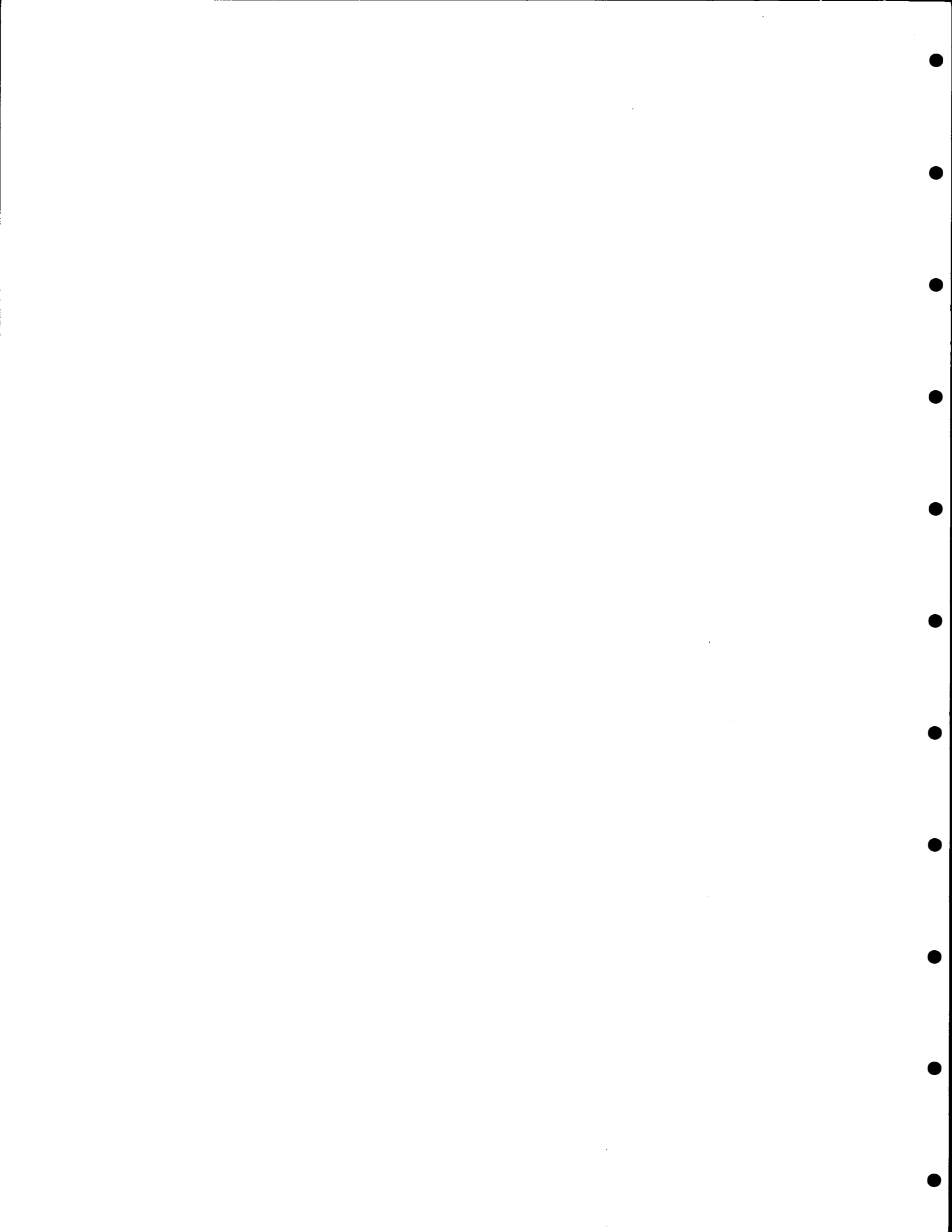


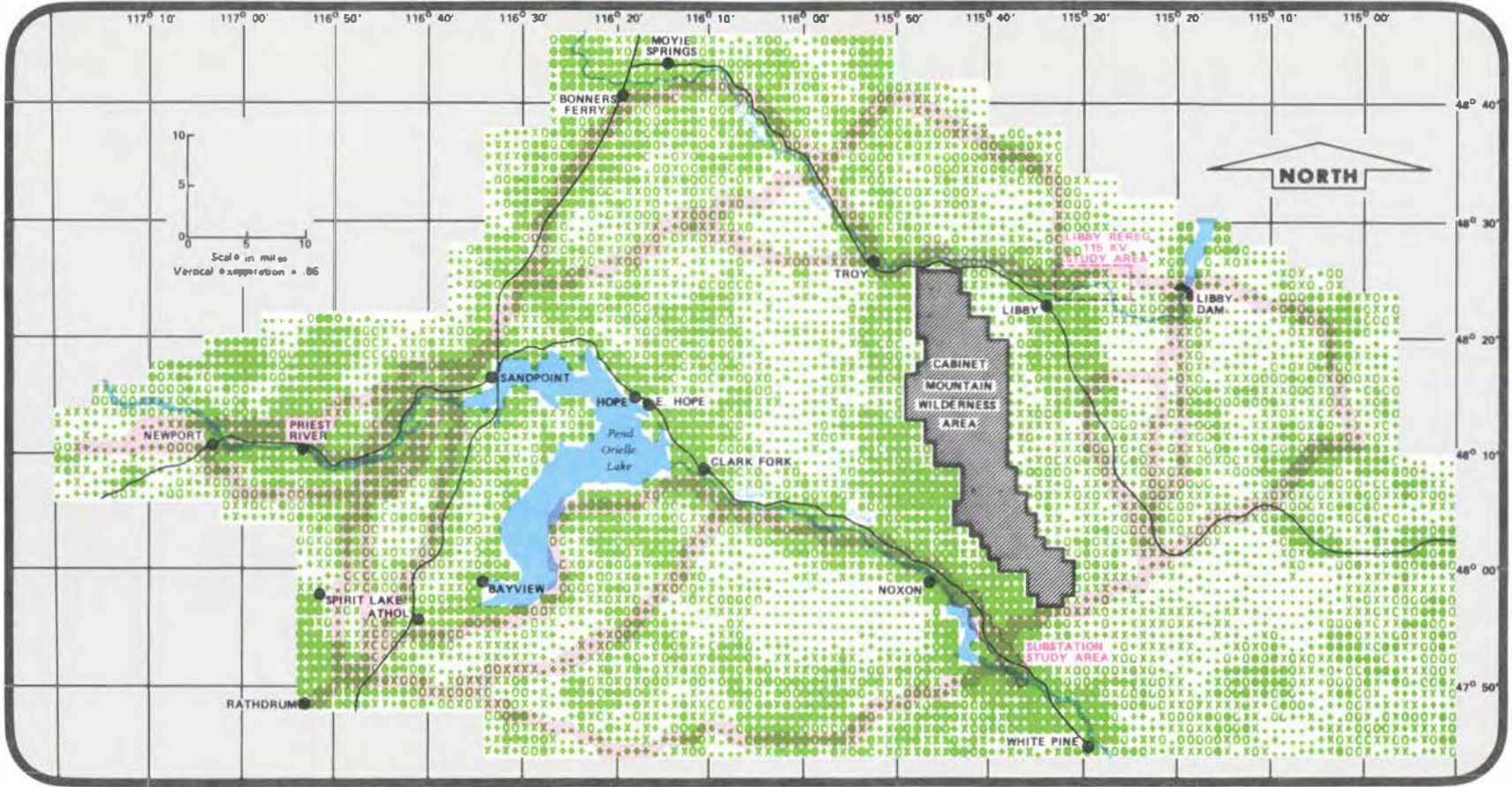
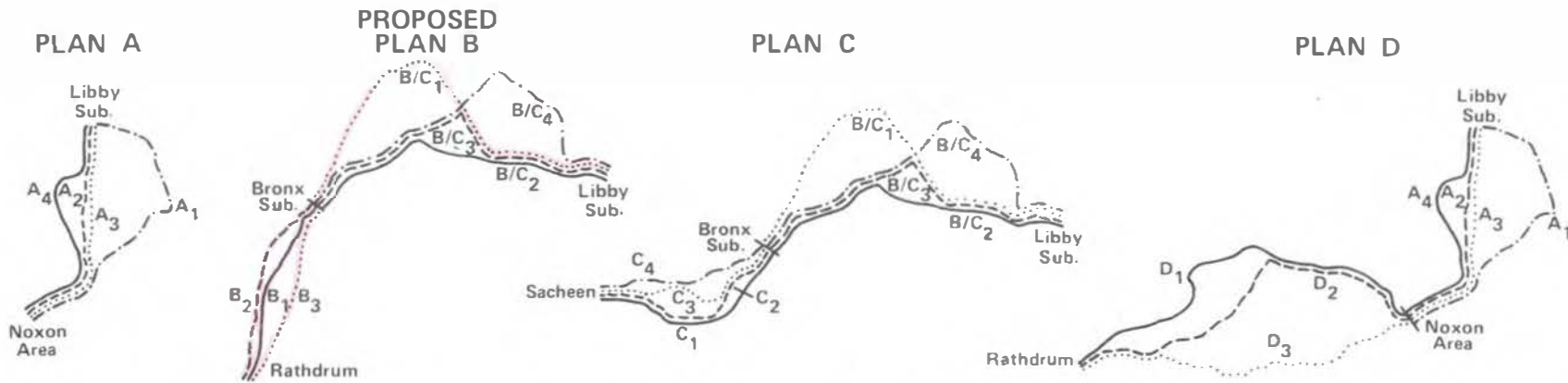


DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.



FIGURE 13
 POTENTIAL VISUAL ALTERATION
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DARKER SYMBOLS INDICATE HIGHER POTENTIAL FOR IMPACT.



FIGURE 14
 POTENTIAL VIEWER CONTACT
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 80-3



site, several rivers and streams, and portions of Sandpoint and nearby residences. The corridor could parallel an existing 115-kV transmission line through this area, which would cause less impact than creating an entirely new corridor.

Corridor B/C₃ is similar to B/C₂ except that it crosses an area of lower visual quality than the alternate segment of B/C₂. The potential for viewer contact would be similar for the two segments.

Corridor B/C₄ crosses part of the Purcell Mountains where the visual quality is moderately high to very high. It is highly possible that portions of the corridor in the Purcells may be viewed from recreation/scenic roads, recreation trails and sites, a winter sports area near Libby, and recreation rivers/streams and lakes. Between the Kootenai River and the Cabinet Mountains corridor B/C₄ joins corridor B/C₃ in an area of lower visual quality and low potential for viewer contact. This portion of the corridor may be visible from a recreation trail and stream. Otherwise, impacts between the Cabinet Mountains and Sandpoint would be similar to those described for corridor B/C₂.

Plan B corridors B₁-B₃ between Sandpoint and Athol pass through areas of relatively high visual quality. South of Athol the corridors enter the Purcell Trench where scenic quality is generally lower. Corridors B₁ and B₂ would have less impact on areas of high visual quality. Conversely, corridors B₁ and B₂ are in more accessible areas with greater viewer contact with highways, trails, scenic railroads, historic sites, and residences. Corridor B₃ may parallel portions of U.S. Highway 95, which is routed through a scenic area south of Sandpoint. All three corridors may be visible from several lakes, recreation rivers and streams, residences, historic properties, resorts, highway waysides, a State park, historic trails, and recreation trails.

Plan A - corridors offer options that would result in moderately low visual impacts. Impacts would primarily affect users of highways and scenic roads (Table 7 and Figs. 13 and 14).

All corridors pass through areas of high visual quality east and south-east of the Cabinet Mountain Wilderness (Fig. 13). Transmission lines would likely be visible to numerous travelers and recreationists using the several primary highways and scenic recreation roads. Portions of each corridor would be visible from hiking trails and a scenic railroad.

South of the Cabinet Mountain Wilderness, all corridors could parallel existing transmission facilities, reducing the potential visual impact in that area. Although corridor A₁ would visually impact a larger number of resources (Table 7), the actual impact would be less than that resulting from opening a new corridor. An additional line would, however, increase the width and the visual complexity of the corridor.

The proposed Noxon substation, depending upon final location, may be visible from U.S. Highway 20. The substation would be adjacent to an existing transmission line where visual impacts are already apparent.

Plan C - consists of eight reference corridors between Libby and Sacheen. The range of impact would be from moderate to high. These corridors are long and affect a large and diverse number of viewers. They are located in areas of very high visual quality (Table 7 and Figs. 13 and 14).

Corridor segments common to plans B and C (B/C₁-B/C₄) are discussed under plan B. All of the corridors between Sandpoint and Sacheen (C₁-C₄) are geographically close and in areas of very high potential viewer contact. Corridor C₁ passes through a mountainous area of moderately high visual quality southeast of the Pend Oreille River. On the northwest side of the Pend Oreille River, corridors C₂-C₄ cross areas of moderate scenic quality where the visual impact would be slightly lower. West of Priest River, all of the corridors pass through areas where the visual quality is uniformly low. Most plan C corridors would be visible from a number of areas (Table 7).

Plan D - consists of seven reference corridors between Libby and Rathdrum. Impacts from these corridors will range from moderate to high. Portions of the corridors pass through areas of very high visual quality but of low potential viewer contact. Other portions would affect a large and diverse number of viewers (Table 7 and Figs. 13 and 14).

Impacts between Libby and Noxon (corridors A₁-A₄) are discussed under Plan A.

Reference corridor D₁ parallels U.S. Highway 20 and a scenic railroad which pass through highly scenic Cabinet Gorge. Between Noxon and Clark Fork the corridor parallels an existing transmission line. The existing line is fairly compatible with the landscape of the gorge because of vegetative screening, flat terrain and the backdrop provided by the gorge walls (Jones & Jones 1976). In this area, a right-of-way would be visible from numerous rural residences and other urbanized land use areas near U.S. 20.

West of Clark Fork corridor D₁ continues to parallel the existing line near the impressive east shore of Pend Oreille Lake. Portions of the corridor may be visible from the lake and from the resort communities of Lakeview and Bayview.

West of Pend Oreille Lake, corridor D₁ enters the flat, open terrain of the Purcell Trench. In this area the corridor may be seen from portions of a state park. It would also be seen from the communities of Athol and Rathdrum and from U.S. Highway 95, State Highway 53, and nearby residences.

Reference corridor D₂ parallels D₁ almost to Clark Fork. From here, most of the remainder passes through a distinctive portion of the Coeur d'Alene Mountains, an area of low visual compatibility between the transmission line and the landscape. There are few roads here but access is provided by hiking trails. Therefore, potential viewer contact is low. Near Hayden Lake the corridor may be visible from a resort area. It would also be seen from residences near the community of Rathdrum and from U.S. Highway 95 and State Highway 53.

Corridor D₃ is entirely nonparallel. From Noxon, the corridor crosses a highly scenic mountain area where potential viewer contact is mainly from hiking trails. The remainder of the corridor is in an area where extensive logging has significantly reduced scenic quality.

All three reference corridors would be visible from numerous hiking trails, as well as many streams, rivers, and lakes used for recreational activities. All corridors could possibly be seen from an historic site near Rathdrum.

Recreation

A wide variety of outdoor recreational opportunities exists in the area. The impact of the proposed transmission facilities on recreationists depends largely on the type of recreation and the surroundings where the activity occurs. The transmission facilities are expected to be less compatible with recreation in undeveloped areas as compared to areas with numerous man-made elements. Thus, paralleling will often result in less impact than routing a line through high quality undeveloped areas. Figure 15 shows natural environmental areas most sensitive to impacts. In many cases, the primary impact would be on the visual component of the recreational experience, as discussed under "Esthetics."

Since BPA's analysis of alternatives was made, the Forest Service initiated the second phase of its Roadless Area Review and Evaluation (RARE II). The proposed plan of service, with designation of B/C₁ as the preferred corridor from Libby to Sandpoint, reflects consideration of RARE II areas in BPA's decision. Although alternative plans and alternative corridors within the proposed plan would cross inventoried roadless areas, the proposed corridor would not.

Table 7 shows the expected degree to which each reference corridor encounters the various recreational resource categories. These encounters allow estimation of the relative potential impact of each corridor. The nature of the impacts is discussed below.

All four plans require reconductoring the existing 115-kV Albeni Falls-Libby line. This would cause primarily minor short-term impacts on recreationists, such as noise and dust during construction.

All four plans require constructing a 115-kV transmission line between PP&L's Libby Substation and the Libby Reregulating Dam. The line would probably parallel an existing line and/or existing roads. Although some clearing would be required, the visual impact of the wood-pole line on recreationists is not expected to be high, nor should the amount of new access affect recreationists.

Plan B (Proposed Plan) - options range from moderately low to moderately high impact. Although the corridors present options for paralleling, several possibilities also exist for routing a line through high quality recreational areas. Many of these areas used by recreationists are essentially roadless. The most significant impacts would result from

creating new access and introducing adverse visual effects (Table 7 and Fig. 15).

Plan B has seven reference corridors. Corridors between Libby and Sandpoint (B/C₁-B/C₄) cross a variety of recreational resource areas. The relative impacts on various recreational categories can be determined by referring to Table 7 and to the following discussions. The more significant impacts are described below.

Corridors B/C₂-B/C₄ could open up additional access into presently remote country, including some nearly roadless areas (Fig. 15). This could result in adverse impacts to wildlife resources. Although not creating new access, corridor B/C₁ is located along roads travelled heavily by recreationists. A line in such areas could add to the visual impacts from existing transmission lines.

All corridors encounter a number of streams (Table 7). Streams and associated wetlands are utilized for many recreational activities including fishing, hunting, photography, and scenic viewing. The proposed line could impact the physical setting where these activities occur and create additional access.

Between Sandpoint and Rathdrum (B₁-B₃), each corridor contains a small amount of land designated as a wildlife management area. Waterfowl hunting and wildlife viewing are some of the recreational uses. Corridor B₂ has the greatest potential for affecting wildlife management areas. The Riley Creek management area is located across most of the corridor near the Pend Oreille River crossing. A transmission line through or bordering aquatic and wetland habitat could create adverse visual impacts to recreationists and interfere with hunting activities.

There are at least six lakes within or near the reference corridors. Corridor B₁ has the most potential for visually impacting users of these lakes. Depending on final line location, a right-of-way through the corridor could be near Round, Cocolalla, Kelso, or Granite Lakes.

There is a potential for impacts - primarily visual - to recreational trails and roads. The corridors also cross some big game hunting areas. The most significant effect of a transmission line in hunting country would be creating new access. Transmission line access roads can be intensively used during hunting seasons (Goodwin 1975), a positive recreational benefit for some hunters. Others view the increased access, with the resulting larger number of hunters, as undesirable.

Additional recreational resources which have a potential for being impacted are shown in Table 7.

Plan A - options would have relatively little impact on recreation. There is also an opportunity for paralleling existing facilities. The greatest impacts would occur where new lines could be located in high quality recreation areas such as near the Cabinet Mountains and the Kootenai River. Visual intrusion in scenic recreational areas and increased access into presently remote areas are key elements in the level of impact (Table 7 and Fig. 15).

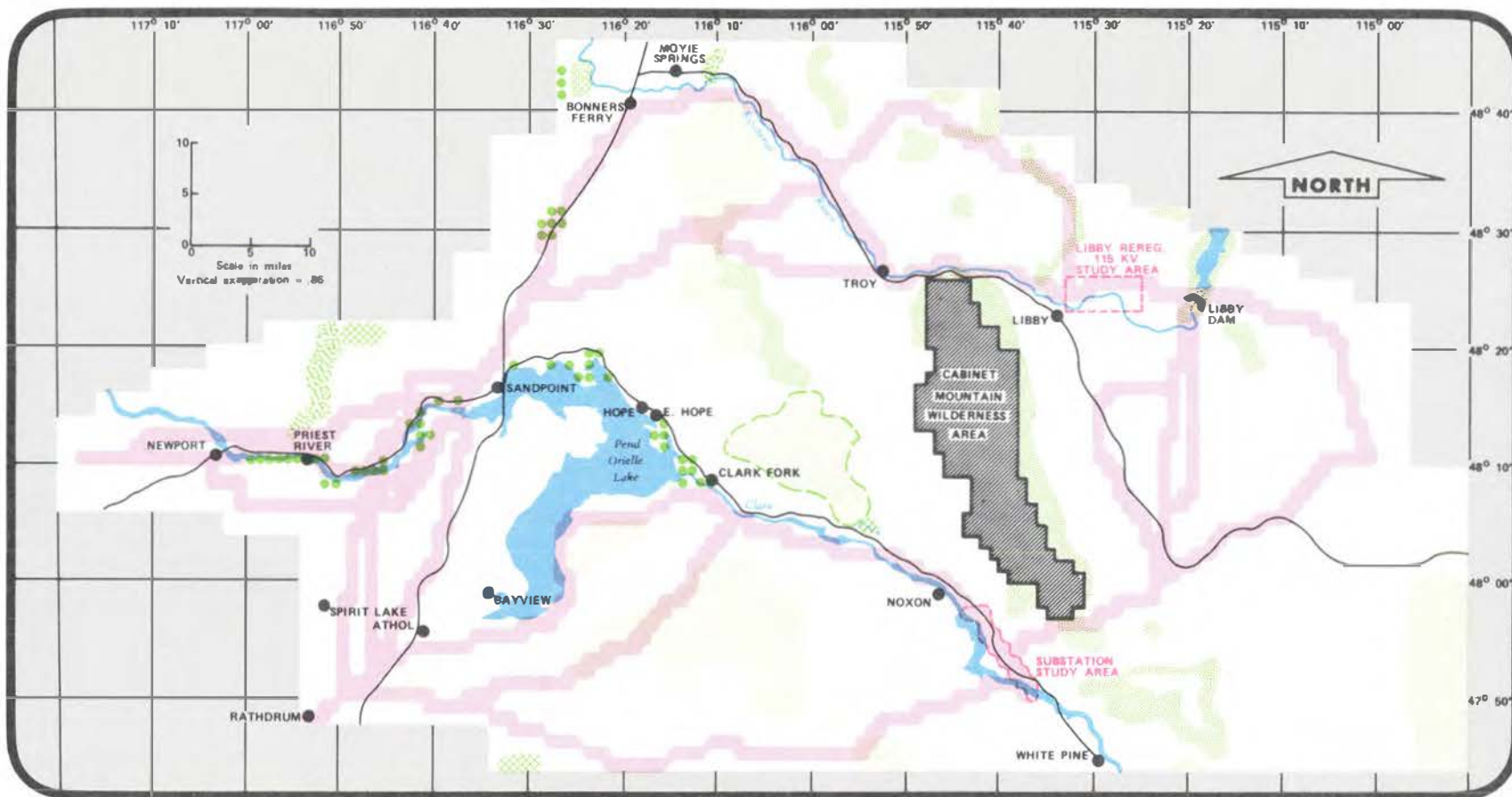
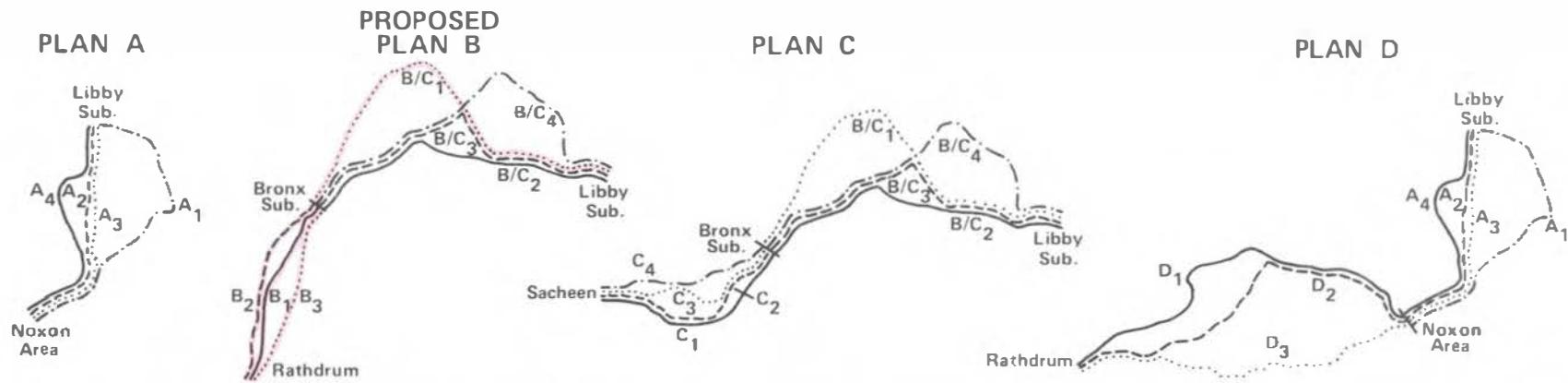
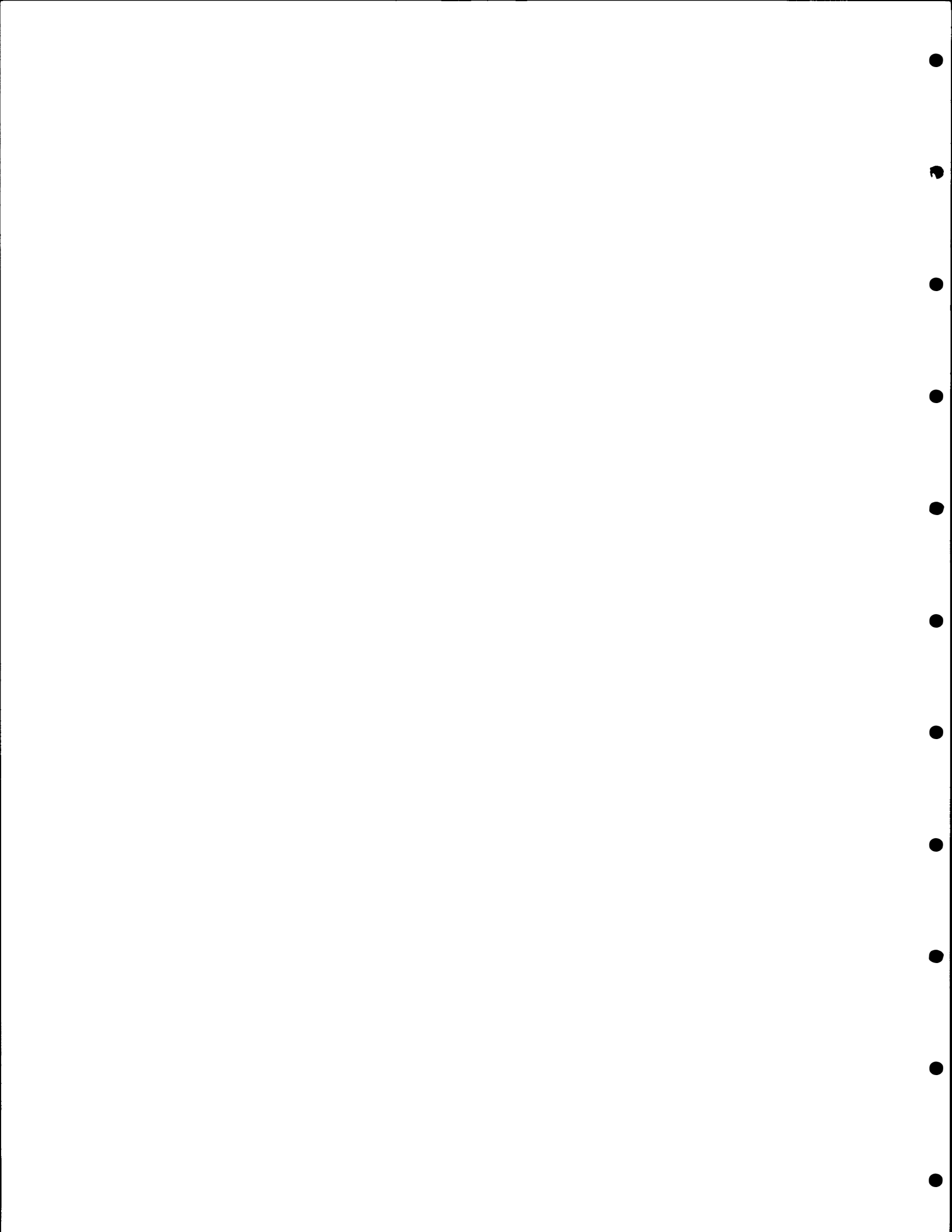


FIGURE 15
 NATURAL ENVIRONMENTAL AREAS
 LIBBY INTEG. & N.W. MONT./N. IDA. SUPPORT
 80-3



All corridors cross designated viewing/recreation resource areas. The most significant impacts would occur near the Kootenai River where a transmission line could create highly noticeable visual impacts in relatively undisturbed areas. South of Cabinet Mountain Wilderness, existing transmission facilities could be paralleled, greatly reducing the impact on the recreational value of the area. During construction, noise, smoke, and dust could have short-term adverse impacts on recreationists.

The corridors pass near some small lakes. As shown on Table 7, however, the number of lakes encountered is low, with A₄ crossing the fewest. There is a potential for visual impacts to recreationists using the lakes and a potential for increasing the access to some remote lakes.

Plan A corridors cross a large number of recreational trails. A₁ encounters the highest number of trails, although most occur where existing transmission lines could be paralleled. In such areas the existing impact would be increased. The extreme northern part of corridor A₁ and the central portions of A₂-A₄ encounter established trails in areas not presently crossed by transmission lines. The proposed line could create adverse visual impacts on recreationists using the trails in relatively pristine environments. The proposed new right-of-way could also be used as a hiking trail, a positive impact for some persons.

All reference corridors could impact users of recreational and scenic roads in the northern portion of the corridors.

Plan A corridors cross a number of fishing streams including some class II, III, and IV streams. The transmission line could decrease the quality of the natural setting surrounding fishing areas. Also, new roads could increase access to certain sections of fishing streams.

Most of the land crossed by Plan A is excellent big game hunting country. Impacts would be similar to those described for the Proposed Plan.

A substation in the Noxon area is expected to have no direct impact on recreationists, other than possible visual impacts.

Plan C - options present a range in impact from moderately low to high, including two of the highest impact corridor combinations of all four plans. Among the options are one corridor combination allowing for completely paralleling existing lines (C₃-B/C₁) and several combinations allowing partial paralleling.

The greatest impacts would occur along corridor segments common to Plans B and C (B/C₁-B/C₄) as discussed under Plan B above. The recreational resources affected and the nature of the impacts would be similar to those described for Plans A and B. However, two Plan C corridors (C₃ and C₄) cross the Priest River, a study river identified in the Wild and Scenic Rivers Act. The impact on this river would depend on whether it is classed as a "recreation," "wild" or "scenic" river. A transmission line across the Priest River could jeopardize its chances for classification as "wild" or "scenic."

Plan D - presents options ranging in impact from low to moderate, with most options being of relatively low impact. One corridor combination (D₁-A₁) would allow for totally paralleling existing facilities and several others could allow partial paralleling. The level of impact would be determined by the amount of new access and visual intrusion created in presently remote areas, particularly parts of two highly sensitive roadless areas identified by the U.S. Forest Service (Table 7 and Fig. 15).

Impacts on recreation between Libby and Noxon (A₁-A₄) are discussed under Plan A. Between Noxon and Rathdrum (D₁-D₃), impacts would be similar, as shown in Table 7. Significant impacts are as follows.

Corridor D₂ passes through a roadless and undeveloped area southeast of Pend Oreille Lake (Fig. 15). Corridor D₃ encounters such an area to a lesser extent. Since both areas have been identified as roadless areas by the U.S. Forest Service, allowing line construction on either corridor would be subject to Forest Service land use planning analysis.

Visual impacts in high quality recreation areas could result from all three corridors, especially along the Clark Fork River and along a scenic road south of Lake Pend Oreille. Paralleling would add somewhat to present impacts in these areas.

Corridor D₂ encounters recreational areas along the Clark Fork River and crosses some popular hiking trails in the Panhandle National Forest. Impacts on the trail users could be especially significant because presently there are no transmission lines through these areas.

All three corridors cross numerous fishing streams. Corridor D₁ would intensify the existing adverse visual effects without impacting additional fishing areas. Corridors D₂ and D₃, however, could increase accessibility to presently remote fishing areas. Although this could be a positive impact for those who prefer driving to fishing areas, the net impact would be adverse because the more pristine areas are relatively scarce.

Historical, Architectural, and Archeological

The overall impact on historic and architectural resources is expected to be minimal for all four plans. At this stage in the planning process, no direct impacts to known archeological resources are expected from any of the plans. Encountering either historic properties on the National Register or areas of known or potentially discoverable archeological resources - especially along major stream valleys - are key factors in predicting the level of impact.

Impacts on archeological resources are long-term and involve covering up or otherwise disturbing archeological sites. Additional access from new roads can lead to increased vandalism or pothunting, thus potentially impacting archeological resources in some areas. The overall degree of impact varies with the number of sites and their respective value as evidence of past cultures. Impacts are discussed further in Appendix B, Role EIS, Chapter VII.

Numerous archeological sites have been discovered in the study area. Only Plans B and C along the Pend Oreille River valley (C₁-C₃) and the Kootenai River Valley (B/C₁-B/C₃), encounter areas with known sites. However, for all four plans, the potential for further discovery is high along these and other major streams and moderate in areas within narrow stream valleys. In addition, under Plan A it is possible that archeological sites may be located in the vicinity of the Noxon substation study area.

To avoid impact to potential sites, an archeological survey will be conducted at the location stage. Should a site be discovered during construction, work would be halted until the site has been evaluated. BPA will comply with the requirements of the National Historic Preservation Act of 1966 (P.L. 89-665), as well as Executive Order 11593. Procedures applicable to these laws are described in the Historic and Archeological Appendix to the Fiscal Year 1980 Program Statement.

For historic properties, impacts would be primarily visual in nature, although short-term exposure to noise, smoke, and/or dust is also a factor. These impacts are more fully discussed in Appendix B, Role EIS, Chapter VII.

Neither reconductoring the existing 115-kV line between Albeni Falls and Libby, or constructing a 115-kV line between Libby Substation (PP&L) and Libby Reregulating Dam is expected to impact historic properties.

Plan B (Proposed Plan) - a second 230-kV line between Libby and Rathdrum may have some indirect effect on historic properties. The Rathdrum State Bank, the Sandpoint Burlington-Northern Railway Station, the Harvey Mountain Quarry and any of the historically significant buildings in Sandpoint and Bonners Ferry could experience very minor short-term visual effects. Corridor B/C₁ could result in impacts on historic properties in Bonners Ferry. Although a line would cross Wildhorse Trail near Sandpoint (B/C₁-B/C₄), no impact is expected as only traces of the trail remain. Potential for impacts on the Kootenai Post II site would be negligible.

Plan A - under Alternative A, the addition of a second 230-kV line between Noxon and Libby Substation will not affect any National Register property. The Kootenai Post II site on the Kootenai River, south of Libby substation, is of local importance. Any impacts to this site would be indirect. From the Post site there is a remote chance that a transmission line may be visible.

A substation at Noxon would not affect any known historic properties.

Plan C - impacts between Libby and Sandpoint (primarily corridor B/C₁) are discussed under Plan B above. It is unlikely that any of the corridors between Sandpoint and Sacheen (C₁-C₄) would impact Hanson's Cabin, northeast of Sacheen Substation. Depending upon line location, corridor C₄ could visually affect the historic viewpoint on Highway 31 near the Pend Oreille River. No effect is expected on the Kalispell Trail Road as only scattered traces remain.

Plan D - impacts on historic properties between Libby and Noxon (A₁-A₄) are considered under Plan A. No effect on historic properties is expected from the construction of a transmission line between Noxon and Rathdrum (D₁-D₃).

NONCONSTRUCTION

Bonneville Power Administration is required by legislative mandate to transmit power from hydroelectric generation developed by the U.S. Army Corps of Engineers. The Corps plans to install four additional generators at Libby Dam by November 1983. These generators will have a peaking capability of 483 megawatts which will bring the total peaking capability of Libby Dam to 966 MW. In addition, the Corps plans to build a reregulation dam about 10 miles downstream on the Kootenai River which will have an installed capacity of 87.9 megawatts. The purpose of the reregulation dam is to regulate the downstream flow due to rapid changes in water flow from the main dam. In identifying the consequences of not implementing the proposed transmission plan, BPA assumes that the additional Libby generating units will be installed as planned. If these units are not added, BPA could delay its proposal.

As a result of load growth in the northern Idaho and northwestern Montana area, BPA identified transmission plans to integrate more generation at Libby and alternatives for strengthening the transmission system in the area. The recommended plan of service, therefore, considers transmission requirements for additional Libby generation and immediate and long-range support to the northern Idaho and northwestern Montana loads. Three transmission lines now terminate at Libby Substation; one Libby-Sacheen 115-kV line and two 230-kV lines. One 230-kV line goes to Noxon and the other to Conkelley. Without any new transmission, the 115-kV transmission line must be sectionalized to prevent overload due to through-flow power as a result of more generation at Libby. Through-flow power is that power which flows on a transmission line regardless of the amount of power which flows on the line to serve intermediate tap loads along the line.

Sectionalizing the 115-kV line degrades the type of service presently provided to the area and also causes low voltages to occur during periods of heavy loading. The result of degrading service to an area generally means the risk becomes greater that an unplanned outage will result in dropping some loads. With proper emergency procedures, the length of outage could be held to a few hours; the severity of a transmission outage depends on the length of outage and the type of loads being served.

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BPA
The 230-kV Libby-Noxon and Libby-Conkelley lines each have a 480 MW winter rating and 255 MW summer rating. With both 230-kV lines in service and the 115-kV system sectionalized, the generation at Libby could be peaked (966 MW) in the winter months but would be limited to four units (483 MW) in the summer. With one 230-kV line out of service, the winter peaking capability would be reduced to four units (483 MW) and the summer peaking capability to two units (242 MW). Operating Libby generation in this manner would restrict its use as a peaking resource. Based on a U.S. Department of Energy publication ^{1/} dated May 1978, this restriction

^{1/} Power Outlook through 1988-89, U.S. Department of Energy, Bonneville Power Administration, May 1978.

on peaking generation may not be serious in the 1982-83 period but becomes worse each year, especially if there are delays in presently scheduled thermal plants. Restricting the peaking capability of Libby generally would not result in loss of any energy associated with the Libby generation but would affect the ability to schedule peaking power. Flexibility in terms of emergency reserves would also be diminished.

Power transmission system losses for January 1985 for the nonconstruction alternative are about 30,000 kW higher than for the proposed plan. This represents an annual loss of about \$1,650,000 for the first few years; value of losses would increase in succeeding years.

The nonconstruction alternative requires dropping more generators at Libby for unexpected transmission outages than alternative plans. The ability of the transmission system to remain connected to generators and loads after a faulted line has been disconnected from the system is a measure of the stability of the system. The number of generators that must be dropped to avoid opening additional lines with possible loss of loads is one measure of the transient stability of the transmission system; the lower the number of generators that must be dropped for line faults, the better the transient stability performance. To maintain stability for three-phase faults near Libby on one of the 230-kV lines, at least six of the eight generators would have to be dropped. Four generators would have to be dropped for a one line-to-ground fault near Libby on the Libby-Conkelley 230-kV line; this would be reduced to one generator unit in the case of a one line-to-ground fault on the Libby-Noxon 230-kV line which uses a single-pole switching scheme.

*less than
10% of
time*

The consequences of relying on generator dropping schemes to maintain stability may not be critical initially but will become more serious as peaking resources are not able to keep up with peak demand and the need to keep these generators connected to the main grid transmission system becomes essential.

If the nonconstruction alternative were to be implemented, the 115-kV system would be sectionalized as earlier discussed. If the northern Idaho and northwestern Montana loads continue to be served as they are now, then the Albeni Falls-Sandpoint 115-kV line section would experience overloads by about January 1988. By the mid-1990's, the entire 115-kV line would have to be reconducted and operated at 230-kV to serve the area loads. This modified system would serve local loads for several more years (to about 2010), and the level of reliability for integrating Libby generation above what is now provided would not change significantly.

OTHER ALTERNATIVES CONSIDERED

Other alternatives considered were:

1. Construct a double-circuit Libby-Noxon 230-kV line on existing right-of-way. This construction involves retiring the existing 230-kV Libby-Noxon line. Additional support is required to avoid overloads for certain outages. This support could be a 500/230-kV substation at Noxon, which assumes a Hot Springs-Bell 500-kV line via Noxon, or a Noxon-

Rathdrum 230-kV line. During construction of the double-circuit line, loss of the Libby-Conkelley 230-kV line or the Libby-Albeni Falls 115-kV line would result in dropping generation at Libby Dam. This plan is more expensive than alternative plans presented.

2. Upgrade the 115-kV line between Libby and Sandpoint to 230-kV, a distance of 93 miles. An additional 48 miles of new 230-kV line between Sandpoint and Rathdrum would be required. The maximum size conductor the present 115-kV wood-pole structures can handle is Drake equivalent which has a 900 ampere (360 megawatts) nominal rating. Due to through-flow power from Libby during peaking periods, this line would become overloaded. This problem could be eliminated by sectionalizing the line or reducing generation at Libby. This plan is an expensive plan and is only slightly better electrically than the nonconstruction alternative. All the 115-kV customer service substations along the line would have to be retired and replaced with 230-kV substations.

SUMMARY OF PLAN OF SERVICE ANALYSIS
INTRODUCTION

Resources and uses identified as important, critical, or unique are given special attention in planning and construction of transmission facilities. Predictions of potential impacts to these important features, as discussed in the narrative, are summarized in Table 8. These predictions are based upon past BPA experience, information from numerous agencies and individuals, and on the expertise of interdisciplinary environmental specialists within BPA.

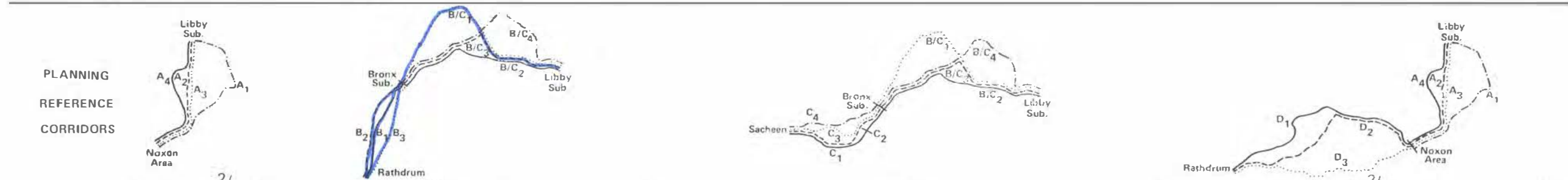
The impact predictions in the table can be used to determine the overall range of expected impacts, the major environmental differences within and between plans, and the relative potential impact on each of twelve resource categories. The Summary Table should facilitate comparisons of the environmental aspects of system alternatives which, at this stage, are represented by planning reference corridors. More precise quantification of impacts follows when alternative line locations for a proposed plan are identified, then assessed in BPA facility location supplements to the environmental statement.

The ratings in Table 8 consider both the expected degree and magnitude of impact. Numbers are used to show relative impact expected on a particular resource. The scale is as follows:

no impact	least potential	most potential
	for impact	for impact
0	1	10

These figures were derived from: 1) a corridor-by-corridor comparison of each resource category, and 2) an interdisciplinary evaluation comparing the expected impacts on one resource (e.g., Vegetation) with the expected impacts on another (e.g., Esthetics). These steps ultimately resulted in the set of numeric rankings or indices of relative impact used in the table.

Table 8. - Summary Table ^{1/}



IMPORTANT RESOURCES ^{3/}	PLAN A ^{2/}				PROPOSED PLAN B												PLAN C								PLAN D ^{2/}												AVERAGE								
	A ₁ +	A ₂	A ₃	A ₄	B ₁				B ₂				B ₃				C ₁				C ₂				C ₃ ⁺				C ₄				D ₁ ⁺					D ₂				D ₃			
	A ₁ +	A ₂	A ₃	A ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	B/C ₁ +B/C ₂	B/C ₂ B/C ₃	B/C ₃ B/C ₄	B/C ₄	A ₁ +	A ₂	A ₃	A ₄	A ₁ +	A ₂	A ₃	A ₄		A ₁ +	A ₂	A ₃	A ₄				
(1) ATMOSPHERE	1	1	1	1	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	2	2	1	1	1	2	1	1	1	2	1	1	1	2	1	1	1	1
(6) GEOLOGY/SOILS	2	2	2	2	4	6	6	7	4	6	6	7	4	6	6	7	4	6	6	7	4	6	6	7	4	6	6	7	4	6	6	7	3	4	4	4	3	4	4	4	3	4	4	4	5
(5) HYDROLOGY	1	1	1	1	2	2	2	5	4	2	4	6	4	4	4	5	4	4	4	5	5	4	4	6	4	5	4	6	4	2	2	4	2	2	2	2	6	6	6	6	5	5	5	5	4
(6) VEGETATION	2	2	2	2	7	4	7	7	7	4	6	7	7	4	7	7	6	4	6	7	6	4	6	7	6	4	6	7	4	3	4	6	7	6	6	6	7	4	4	4	7	6	6	6	6
(8) WILDLIFE	2	2	2	2	2	6	9	6	2	6	7	6	2	6	7	6	2	6	7	6	2	6	9	6	4	7	9	7	2	6	7	6	4	4	4	4	4	4	4	4	4	4	4	4	5
(2) DEMOGRAPHIC & ECONOMIC	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
(4) AGRICULTURE & RANGELAND	1	1	1	1	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	4	3	3	3	4	3	3	3	4	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	3
(9) FORESTRY	2	2	2	2	6	6	6	8	6	6	6	8	8	6	8	8	8	8	8	10	8	8	8	10	8	6	8	8	8	8	8	10	10	8	8	8	10	10	10	10	10	8	8	10	8
(4) URBAN & RESIDENTIAL	1	1	1	1	4	3	3	3	4	3	4	3	4	3	3	3	4	3	3	3	4	3	4	3	4	4	4	4	4	2	3	2	2	2	2	2	3	2	2	2	2	2	2	2	3
(9) ESTHETIC	2	2	2	2	4	8	8	10	4	6	8	8	4	8	8	10	6	8	10	10	4	8	8	10	4	8	10	10	4	8	10	10	4	4	4	6	6	6	6	8	4	6	6	6	7
(8) RECREATION	2	2	2	2	3	3	5	7	5	5	7	7	3	3	5	3	3	3	5	5	3	5	5	5	7	7	9	9	7	5	7	7	3	3	3	3	3	5	5	5	2	3	3	3	5
(2) HISTORIC & ARCHEOLOGIC	0	1	1	1	3	2	2	1	3	2	2	1	1	1	2	1	1	1	2	1	1	1	2	1	3	2	3	1	2	1	1	1	1	1	1	1	0	1	1	1	0	1	1	1	1
SUMMARY IMPACT SCORES																																													
AVERAGE (CORRIDOR)	2	2	2	2	6	6	8	8	6	6	8	8	6	7	8	8	6	6	8	8	6	7	8	8	7	7	9	9	6	6	7	8	6	5	5	6	6	6	6	6	6	6	6	6	6
AVERAGE (PLAN)	2				7												7								6																				
LEAST	2				6												6								5																				
MOST	2				8												9								6																				
RANGE	2				6-8												6-9								5-6																				

^{1/} The table displays relative impact scores that measure greater, lesser, or equivalent levels. Differences in quantity can not be estimated from this chart. The figures on the summary table simply rank order expected levels of impact.

^{2/} Plan A assumes that the proposed Hot Springs-Bell line is built on one of the alternative routes that pass by the Noxon Area. Plan D assumes that the Hot Springs-Bell line will bypass the Noxon Area, or that the nonconstruction option is selected. The Hot Springs-Bell project is part of a proposed East-West Transmission System that would (a) integrate electrical power produced from coal-fired generating plants in Colstrip, Montana, and (b) provide reinforcement to Spokane and Northwestern Montana load areas. Environmental impacts of this project were evaluated in a Draft Facility Location Supplement to the Fiscal Year 1977 Environmental Statement (September 1975)

^{3/} Numeric weights that were used to help compare the relative impacts between general resource categories are shown in parentheses. Higher numeric values indicate higher potential for impact.

Note: + Parallel to an existing right-of-way



Table 8 arrays each major resource category against the possible corridor variations in each plan. Within the matrix, both horizontal comparisons (comparisons between or within plans) and vertical comparisons (comparisons between resources) of impacts are possible. Horizontal comparisons indicate the "trade-offs" among plan variations having similar overall scores. They also indicate relative overall environmental impacts from all of the reference corridor variations. For instance, the table shows that although corridor combinations C_4-B/C_1 , and C_4-B/C_2 have about the same overall expected impact (score: 6), the two differ substantially in their expected impact on certain resource categories, particularly Esthetics, Wildlife, Urban/Residential and Recreation. At the same time, both corridors are expected to have a similar level of impact on such resources as Forestry and Atmosphere.

Similarly, the Summary Table allows vertical comparisons of expected impact among resource categories with similar average scores. As seen on the table, the average potential impact is about the same for both Wildlife and Recreation (score: 5). However, corridor combination C_2-B/C_3 , for example, has a significantly greater potential for impact on Wildlife (score: 9) than it does on Recreation (score: 5). Conversely, combination C_3-B/C_1 affects Recreational resources to a greater extent than Wildlife resources (scores: 7 vs. 4). Portraying the options and choices in this manner allows comparison of the environmental aspects of the alternatives on a plan-by-plan or corridor-by-corridor basis. This aids in the process of identifying a proposed plan of service.

Plan A corridor options vary in length from 45 to 70 miles (72-113 km). They are substantially shorter than the options for the other alternative plans, because Plan A assumes the construction of the proposed Hot Springs-Bell line through the Noxon area (BPA 1975). As a result, no high impacts are expected for any of the resources; the overall impact should be relatively low (score: 2) (Table 8). Plan A offers the opportunity to parallel an existing line.

Plan B corridor options vary in length from 120 to 140 miles (192 - 225 km). Paralleling the existing line from Libby to Sandpoint would result in relatively lower impact levels than the nonparallel options. Overall, the expected impact is moderately high (score: 7). There is a range in impact levels among Plan B corridor options, with higher impacts from options which pass through relatively undeveloped areas. Forestry, Wildlife and Esthetic resources would experience the greatest impact.

Plan C corridor options are from 115 to 140 miles (185 - 225 km) long. There is one corridor combination for complete paralleling and a number of combinations for partial paralleling of existing facilities. The range in levels of expected impact among Plan C options is significant. Although the plan has the highest expected impact among individual corridor options (score: 9), the majority of options are comparable in expected impact to other options among the alternative plans (Table 8). As in Plan B, expected impacts from Plan C are highest on Esthetic, Forestry and Wildlife resources.

Plan D corridor options vary from 115 to 145 miles (185 - 233 km) in length. Plan D differs from Plan A in that it assumes that the proposed Hot Springs-Bell line will either bypass the Noxon area or will not be constructed (BPA 1975). The mileage increase over Plan A represents connecting generation from Libby to the power grid at Rathdrum. The expected impact from Plan D (scores: 5-6) is moderate; on the average, the expected impact levels are lower than those for Plans B and C. (Table 8). Impacts to Forestry resources are expected to be high.

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

Proposed and/or alternative locations for transmission line facilities will be presented in the draft and final facility location supplements. Proposed locations will be identified on the basis of comments received on previous facility supplements, field reconnaissance, and additional environmental and engineering analysis.

DESCRIPTION OF THE
SUBSTATION AND/OR PROJECT-RELATED
FACILITY SITES, THEIR POTENTIAL
IMPACT AND MITIGATION

Alternative locations for substation facilities will be presented in draft and final facility location supplements. The locations will be identified on the basis of comments received on the facility planning supplement, field reconnaissance, and on further environmental and engineering analysis.

POTENTIAL UNAVOIDABLE
ADVERSE IMPACTS

Temporary and permanent adverse impacts will result from the construction phase. Building processes will create noise, dust, and visual impacts, adversely affecting the area's residents and wildlife populations. Increased erosion and sedimentation can be expected. Tree cover within the right-of-way will be removed and long-term productivity will be lost. Some impact may be expected to agricultural, urban, and residential land uses; overall, the effects on these resources will be slight. Direct or indirect impact is also likely to recreation and cultural resources.

RELATIONSHIP BETWEEN
SHORT-TERM USE OF THE ENVIRONMENT
AND LONG-TERM PRODUCTIVITY

The plans discussed in this supplement would bring additional power generated at Libby Dam into the Pacific Northwest grid system. Current

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BPA plans also call for East-West transmission facilities between coal-fired generating plants in Colstrip, Montana and the Spokane area (BPA 1975).

Alternative Plan A would connect with this planned extra high voltage (EHV) line, thus reducing the overall line length for the 230-kV circuit from Libby. Plans B, C, and D would not connect with this planned East-West EHV transmission line.

It can be speculated that future development of Montana-Wyoming coal fields could mean that additional power will have to be transmitted from eastern generating sites to western load centers. This will require additional power transmission capacity for established corridors within the study area.

Based on present technology, the transmission lines and associated facilities have a service life of 40 years. The electric industry is one of considerable change. There is the potential in the near future that technological advances may alter the need for this facility. However, none are apparent at this time. *

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The steel, aluminum, copper, and other materials used directly in construction of the facilities will be committed to transmission uses. If any of the equipment should later be retired, materials used in their construction can generally be reused elsewhere or recycled. Manpower and fuel for construction equipment will be irretrievably committed.

CONSULTATION AND COORDINATION WITH OTHERS

PLANNING COORDINATION

Before engineers can plan the orderly development of a transmission system, they must know what energy is required to meet loads, what resources will be used to supply the energy, and what transmission facilities will be required to integrate the energy into a transmission system. (These three requirements are studied to determine feasible electric plans.) Location and environmental studies are then initiated to evaluate the plans on the basis of economic, engineering, and environmental considerations. Planning and coordination activities for this particular project are discussed below.

System Planning

Feasible electric plans for the Libby Integration and Northwest Montana/North Idaho Reinforcement Project were identified for additional environmental and engineering analysis in the spring of 1975. The load estimates and feasible electric plans of service were determined jointly by BPA and

an ad hoc committee. Utility members on the committee represented Northern Lights, the Washington Water Power Company, the Pacific Power and Light Company, and several other smaller utilities. The needs of the transmission system were evaluated without regard for utility ownership. Load estimates were based on load growth projected several years into the future. The load and resource information presented in the Systems Requirements section was a result of these studies.

Environmental Analysis

The environmental resource analysis and siting process for this project was completed with the aid of a prototype computer analysis system. The development and implementation of this process involved considerable coordination and consultation. More than 120 agencies and concerned environmental groups were contacted to identify concerns or issues related to the location of transmission corridors. These concerns were then incorporated in location models. The models were evaluated and revised in workshops by resource specialists. Workshops for the project area were held in Missoula, Montana and Portland, Oregon. In addition, a number of contacts with Federal, State, and local agencies were made to collect data.

Since more than two-thirds of the land involved is under the jurisdiction of the U.S. Forest Service, the Forest Supervisor for Region 1 agreed to participate in the corridor study. Subsequently the Forest Service provided a substantial amount of resource data and assisted in its evaluation. The Forest Service also provided a coordinator who worked with the BPA study team and coordinated the study with the Kootenai and Panhandle National Forests.

AGENCIES REQUESTED TO COMMENT ON THE
DRAFT PLANNING SUPPLEMENT
(An asterisk * indicates that comments were received)

Federal Agencies

U.S. Advisory Council on Historic Preservation
U.S. Department of Agriculture
 *Forest Service
 Soil Conservation Service
U.S. Department of Interior
 Bureau of Indian Affairs
 Bureau of Land Management
 Bureau of Mines
 *Bureau of Outdoor Recreation
 *Fish and Wildlife Service
*U.S. Environmental Protection Agency

State Agencies

Idaho Division of Budget, Policy Planning, and Coordination
Idaho Historical Society
Idaho State University Museum
Montana Office of Budget and Program Planning
*Montana Department of Natural Resources and Conservation
Montana State Historic Preservation Officer
University of Montana Statewide Archeological Survey
Washington Office of Program Planning and Fiscal Management
Washington Archeological Research Center
Washington State Advisory Council on Historic Preservation
Washington State Department of Ecology

Local Agencies

Bonner County, Idaho
Boundary County, Idaho
Kootenai County, Idaho
Shoshone County, Idaho
Flathead County Planning Board, Montana
Lincoln County Planning Board, Montana
Sanders County Planning Board, Montana
Pend Oreille County, Washington

Other

*Northwest Citizens for Wilderness	Idaho Environmental Council
National Wildlife Federation	Friends of the Earth
Idaho Wildlife Federation	Sierra Club
Montana Wildlife Federation	The Wilderness Society
Montana Wilderness Association	Natural Resources Defense Council
Federation of Western Outdoor Clubs	
Western Montana Environmental Protective Association	

COMMENTS RECEIVED DURING REVIEW PROCESS

PUBLIC LETTERS

Northwest Citizens for Wilderness (November 1, 1977)

Comment: Portions of Routes B/C3, B/C2 and B/C4, Plan B, and those same routes Plan C, pass through wildlands upon the Idaho Panhandle Forest's proposed for wilderness study by our organization, therefore would be unacceptable.

Portions of Routes A4, A2 and A3, A1 pass through wildlands identified during the RARE II process as potential additions to the Wilderness System. This same area, plus roadless lands within the Silver Butte drainage (i.e., Owl Peak RARE #186, Barren Peak RARE #183 and Allen Peak RARE #185) are presently being evaluated for possible recommendation to the U.S. Forest Service by this organization for inclusion into the wilderness system through the RARE II process.

Response: The RARE II studies were initiated after the analysis for the Libby Integration and Northwestern Montana/North Idaho Support Draft Planning Supplement was completed. However, all inventoried roadless lands were considered in our analysis.

As you point out, several reference corridors do cross lands included in the recent RARE II process. The results of the RARE II, that is whether these lands are: 1) recommended for immediate wilderness, 2) recommended for multiple resource use other than wilderness, or 3) recommended for further study, will certainly have a bearing on the feasibility of several corridor options.

RARE II evaluations as they are now set up do not include evaluation of areas inventoried as Roadless in the original RARE process that now have approved land use plans. RARE 183, 185 & 186 are in this category, having approved land use plans (the Fisher River-Silver Butte Cr. portion of Plan A). Alternative B is a similar situation. Here again the original RARE areas have been included in an approved land use plan and are therefore not included in the RARE II inventory.

We understand that the Boulder unit plan and a portion of the Callahan unit plan which include parts of Plan B are in the process of administrative appeal by your organization and the Sierra Club. There is the possibility that the land use allocations of these two plans could change as a result of the appeal decision. This would affect the Plan B alternatives.

Alternative A shows the four corridor options having a common section from Fisher River-Silver Butte Creek to the Clark Fork Valley. The portion from Silver Butte to the Clark Fork Valley passes between two areas inventoried for RARE II (1-676 & 1-677). In this common section the corridor would be limited to the existing transmission line route until the RARE and land use planning processes are complete.

BPA is in close contact with the Forest Service and will be able to adjust plans as necessary to the outcome of the RARE process and the appeal decision.

The RARE II process will be a decision factor in plan selection. It will also be a consideration during preparation of the draft location supplement when detailed alternative routes will be studied for the proposed plan.

USDI, Fish & Wildlife Service (November 29, 1977)

Comment: After examining these alternative plans we concluded all of them contain at least one corridor that may jeopardize the continued existence of the grizzly bear or result in the destruction or adverse modification of its critical habitat.

To summarize, only Plan B, Corridor 1, does not cross occupied grizzly habitat, although it does pass along the edge of the proposed critical habitat area. If we assume the transmission line right-of-way will be the only intrusion, then Plan B, Corridor 1, which parallels an existing line and does not cross occupied habitat, may be preferable to the other plans and corridors depending on how large a right-of-way is required and exactly where it would run.

Response: These comments are consistent with the information on the grizzly presented in the draft planning supplement. The final planning supplement includes further information on the grizzly including the results of BPA's consultation with the U.S. Fish and Wildlife Service as required by Section 7 of the "Endangered Species Act of 1973."

USDI, Fish & Wildlife Service (November 29, 1977)

Comment: If there are access roads planned for Plan B, Corridor 1, then we need information on them and on whether and where access roads would be for the other corridors to allow evaluation of their relative potential effects. We would also need to know your plans for access road closures and other means of restricting public access.

Response: If Plan B were selected as the proposed plan, access road estimates would be prepared. The access road estimate would include road closure plans and other means of restricting public access to critical grizzly bear habitat. This information ~~is to be~~ forwarded in continuation of our formal consultation under the Endangered Species Act of 1973.

*was
FWS for Plan B is of concern not likely to affect grizzly -*

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: He (BPA representative) stated further that building transmission lines to satisfy contingency, i.e. the loss of one transmission

line, is standard utility practice. Whether this utility practice should be followed in this case was not a question addressed by BPA either in the Planning Supplement or in the public meeting.

Response: The application of the single contingency reliability standard is current BPA policy. That criteria is considered consistent with good utility practice. A discussion of BPA's reliability criteria including comparison with Federal Power Commission requirements and estimates of the consequences of accepting different reliability standards is contained in a Power Transmission Appendix to the Draft Environmental Statement titled The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System, Including Its Participation in the Hydro-Thermal Power Program: A Program Environmental Statement and Planning Report (Role EIS).

The reliability criteria used by BPA is constantly being reviewed and updated.

BPA reliability criteria for peaking generation, the case for transmission requirements from Libby dam, is being reviewed. The results of this study could affect transmission plans proposed in the Draft Facility Planning Supplement.

USDA, Forest Service (November 29, 1977)

Comment: A discussion on reliability standards and the tradeoffs for less reliability is also needed for the reader's understanding.

Response: Such a discussion is presented in Appendix B of the Role EIS. This appendix on BPA Power Transmission should be reviewed in conjunction with the Facility Planning Supplement on the Libby Integration Project.

Our reliability criteria for peaking generation, the case for transmission requirements from Libby dam, is being reviewed. The results of this study could affect transmission plans proposed in the Draft Facility Planning Supplement.

USDA, Forest Service (November 29, 1977)

Comment: We feel that the following alternative should be included in evaluation:

- (1) Reconductoring existing 230-kV lines to higher capacity to handle new generation.
- (2) Rebuilding existing 230-kV lines to higher voltage to handle the new generation. Both alternatives make use of the existing right-of-way.
- (3) Stacking the existing 115-kV line along the Kootenai River with a new 230-kV line on the existing right-of-way.

Response: The first alternative, reconductor the existing 230-kV line to higher capacity, has a number of technical and economic problems. It

would require larger conductors not only on the Libby-Noxon and Libby-Conkelley line but also on the Conkelley-Hot Springs and Noxon-Bell lines. Line modification between Noxon and Bell would not be required if there was a connection to the proposed 500-kV Hot Springs-Bell line in the Noxon area. When the expense of modifying tower structures and the cost of stringing wire is tallied, this alternative comes out substantially more expensive than other plans.

Some of the technical difficulties include: 1) The Libby-Albeni Falls 115-kV line would have to be operated sectionalized to avoid overloads when one of the 230-kV lines from Libby is out of service; 2) voltage control would be worse, requiring shunt capacitors for outage conditions; 3) generation capability would be curtailed during construction; 4) a fault on one of the lines from Libby would require dropping much more generation to maintain stability than in plans which include a new 230-kV line; 5) during peaking operation transmission line megawatt losses would be higher than with an additional circuit.

Overall the alternative to reconductor existing 230-kV lines to higher capacity is costly and would be a very weak solution in terms of meeting reliability and stability requirements.

The second alternative to rebuild existing lines to a higher voltage again has both cost and technical problems. Rebuilding to higher voltage could be done at either 345-kV or 500-kV.

A 500-kV rebuild would be very costly because both the Libby-Noxon and Libby-Conkelley lines would have to be reconstructed and few, if any, of the existing structures could be used. Two expensive substations would be required, and the electrical system in the Flathead Valley would have to be reinforced in order to maintain stable, reliable service. Other lines would be needed or would have to be rebuilt, as in the first alternative.

Because of the tremendous expense involved and the fact that this solution essentially requires tearing down the existing 230-kV system before adding integrating lines to Libby dam, a 500-kV rebuild plan is unacceptable.

Rebuilding to 345-kV requires essentially the same amount of line modification as the first alternative with the addition of two expensive substations. Except for winter peak loads, not all generation capability could be transmitted unless the conductor size as well as voltage were increased. The higher voltage lines are relatively short (that is, they have higher impedance or hindrance to flow due to the step-up transformers) and would require series compensation to avoid deterioration of stability when an aperiodic disturbance occurs. Therefore, the options for rebuilding to a higher voltage are costly, technically complicated, and extend far beyond modifying the existing 230-kV lines out of Libby dam.

In either the first or second alternative, outage of the Libby-Noxon line may cause overloading problems on the 115-kV system in the Flathead Valley. This could occur even with increased 230-kV line capacity between Conkelley and Hot Springs.

The third alternative to build a double circuit line along the right-of-way of the existing 115-kV line is the strongest of the three solutions. This option would have one side at 115-kV and one side at 230-kV. Considering the long line involved, it would be an expensive integration plan, but it would provide an adequate transmission system. For some transmission facility faults at or near Libby dam, some generation capability would have to be dropped to maintain system stability. However, it would be possible to transmit all the Libby power under steady state conditions even with a long outage of any one facility. The alternative of stacking the existing rebuilt 115-kV line with a new 230-kV line is a location and design option for either Plan B or C in the statement.

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: The second concern raised at the meeting was the possibility of upgrading existing transmission lines so that no new lines and separate rights-of-way would be required. The pros, cons, and technical feasibilities of upgrading should be discussed, including the need for and expense of new transformers and the timing and duration of any outages to existing electricity customers necessary to rebuild the lines.

Response: Upgrading existing transmission lines to higher capacity was considered, note previous comment and response. As a minimum, both 230-kV lines out of Libby would have to be rebuilt to either handle a larger conductor or be operated at a higher voltage. This construction would require at least one line being out of service over a two to three-year period. When the remaining 230-kV line was out of service, all Libby generation would be lost. Such a system would not be adequate in itself in that if the existing line to Noxon was out, too much power would flow toward Conkelley and would overload transmission lines between Conkelley and Hot Springs. Also the 115-kV system out of Libby would have to be operated in sections to prevent overloads for outages on the 230-kV system. This would degrade the service on the 115-kV system with temporary intervals of radial service, low voltages, and loss of some loads.

Mrs. John R. Hennessy (November 11, 1977)

Comment: If it is maintained that it is cheaper to build new lines than modify existing ones, I would like to know why.

Response: In general it is cheaper to add a larger conductor to an existing line rather than build a new line. If modifications to existing structures are required, then additional support structures are generally needed. This additional cost could approach or exceed the cost of a new line depending on such factors as land costs, clearing, and access roads for the new line. Land, clearing, and access road costs vary with terrain and land use activity.

In many cases rebuilding an existing line to carry more power will cause overload conditions to occur on other parts of the power system when the

rebuilt line is disconnected from the system. This then means other lines in the system have to be rebuilt.

An essential cost factor of alternative plans is what effect they have on the overall power system, that is, will other parts of the system subsequently have to be reinforced.

USDA, Forest Service (November 29, 1977)

Comment: We feel that Alternative Plan D does not show all possible route alternatives. The last Hot Springs-Bell route proposal indicated a route alternative in the Prospect Creek drainage. This parallels the new WWPC 230-kV proposal. If the route is feasible for a 500-kV line and the WWPC 230-kV line, it should be evaluated as a potential Libby Integration alternative.

Response: The additional corridor option you suggest for Plan D would be a marginal electrical solution. Although a line could be built along the general routing noted, such a plan would incur greater energy losses, cost substantially more than other options, and offer minimal system reliability support under certain outage conditions.

Brad Black, M.D. (November 11, 1977)

Comment: I am very much against an additional corridor after attending the BPA meeting at the First National Bank of Libby and reading the literature provided. I would support usage of the present pathway with reconductoring.

Stu Swenson (November 11, 1977)

Comment: I am opposed to any new corridors - Land is not cheap. The initial cost for using existing lines may be more but the long run costs of land and loss of tree growing land base has to be considered.

Lynn Robson (November 11, 1977)

Comment: I want to register my strongest objection to construction of any new power line corridors for high voltage lines from the Libby dam and rereg dams into BPA grid. I urge with the Kootenai National Forest to consider reconductoring the existing lines using current right-of-way.

Glenda Marita (November 11, 1977)

Comment: We need no new power corridors through Lincoln County; we should use existing corridors to transmit power from the Libby dam and the future transmission from the rereg dam.

Lyle Olson (November 11, 1977)

Comment: The thought of another power line corridor in Lincoln County is intolerable. Run it in the same corridor - come hell or high water. We've had enough.

Ann Gubman (November 11, 1977)

Comment: I strongly oppose the construction of any new power corridors in Lincoln County. I urge reconstruction of current lines and corridors.

Mike Dele (November 11, 1977)

Comment: I support using the existing power corridors to integrate new power into the BPA electrical grid system from the Libby dam and the rereg dam.

Gary Morton (November 11, 1977)

Comment: I support using the existing power corridors to integrate new power into the BPA electrical grid system from the Libby dam & rereg dam. I oppose the BPA plans for High Voltage Lines into Pipe Creek, 17 mile & Yaak, Fisher.

Mike Czerwinski (November 2, 1977)

Comment: As I stated at your October public meeting at Noxon, I do not think that your alternatives adequately explored using higher voltage lines and/or thicker cable on EXISTING power corridors.

Barbara Ann Roy (November 11, 1977)

Comment: Why have you not considered reconductoring the existing lines? Why not, if a new line must be built, run it through existing corridors or roadways? Our forest land is too important to waste by new corridors.

Steven J. Rodgers (November 15, 1977)

Comment: I support using existing power corridors for new power generated from the Libby dam. Please, no new power corridors and accompanying roads to reduce our forest size and yield.

Response: In evaluating the alternative ways to transmit the additional power from Libby dam, the construction of new facilities on existing rights-of-way rather than new rights-of-way is a principal consideration. There are benefits to greater use of rights-of-way currently under easement, such as lessening the amount of land removed from timber production. At times there are opposing factors that influence the feasibility of upgrading existing power corridors. Some of the pros and cons are listed below.

	<u>PROS</u>	<u>CONS</u>
Replacement or upgrading of existing lines	eliminate need for new right-of-way	remove existing line from service during construction
Build parallel to existing line	net reduction of right-of-way required	additional risk of a simultaneous outage for the parallel lines
	avoid creating a new linear corridor	possible increase in line length & electrical losses if parallel routing is less direct

These factors and technical information specific to this project will continue to be evaluated in plan selection, route identification, and design work. Additional discussion of upgrading existing corridors is contained in the section OTHER ALTERNATIVES CONSIDERED.

Russell H. Hudson, St. Regis Paper Co. (November 3, 1977)

Comment: My major concern deals with your lack of objectivity in regards to the proposed diversion of part of Kootenai River by Canada. If this is done by the B.C. Hydro authority, I see it would reduce the yield at Libby by 400 million kilowatt hours annually. With that loss of electric generation capability, I would see no reason to proceed with either the reregulating dam or the Integrating Transmission System.

Response: BPA has the responsibility to integrate generation from the U.S. Corps of Engineers hydro generating plants into the Northwest Transmission system. The need for new generating facilities is based on long range studies of loads and resources made by the Pacific Northwest Utilities Conference Committee (PNUCC).

The installation of four additional generator units at Libby dam and construction of a reregulation dam on the Kootenai River is the responsibility of the U.S. Army Corps of Engineers. Their offices are in Seattle, Washington.

Future diversions of the Kootenai River by Canada are permitted by the Columbia River Treaty in years 1984, 2024, and 2044. River flow at the reregulation dam was adjusted for the 1,500,000 acre-feet first phase Canadian diversion prior to computing energy benefits. Energy benefits after the last two diversions were included in the study for comparison purposes only, since these diversions were not expected to occur due to the reported high diversion costs.

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: Although BPA has set forth several different transmission system and routing alternatives for public review and comment at an early planning stage, an important decision concerning the need for the facility has apparently already been made, and without public input.

Response: BPA has a responsibility for maintaining a reliable main transmission grid and, therefore, identifies where additional transmission facilities are required. BPA's transmission planning and design process is summarized on pages II-1 to III-1. The need for a project is first identified after careful examination of load estimates, proposed new generation sources, and the flow of energy on the transmission system. Engineering studies are then made to formulate alternative plans. The environmental consequences of these plans are compiled. Then a draft planning supplement is prepared for major new facilities. The public and agency review of this part of BPA's annual program environmental statement provides the public with an early opportunity to comment on different alternative plans as well as the need for a project.

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: This discussion (of nonconstruction) is not sufficient for the public or BPA to rationally decide if applying the single contingency design standard is worth it in this case. It certainly does not constitute the cost-benefit analysis of need required by the National Environmental Policy Act.

Reporting in detail on impacts of alternative routings without a similarly detailed discussion of the issues surrounding need implies to the public the BPA has predecided the need issue.

Response: A benefit to cost analysis of need per se is not required by the National Environmental Policy Act. Engineering studies applying present reliability criteria have been made which document the need for additional facilities to carry power from Libby dam. More information has been added to the NONCONSTRUCTION section to show the consequences of no action. Additionally, studies are in progress to determine the economic value of this peaking capability and its effects on Northwest energy reserves if it was not available.

Mrs. John R. Hennessy (November 11, 1977)

Comment: Further, I would like to know the total cost for each of these proposed new routes, along with an estimate of what it would cost to restructure current lines to carry the additional load.

Response: The average cost of a 230-kV single circuit steel line as planned for the Libby Integrating Transmission is about \$175,000 per mile.

The cost to rebuild the existing 230-kV line to a higher capacity would require extensive modifications to existing structures with additional intermediate structures. The cost would approach that for a new line less those costs for land and access roads; average costs would be in the order of \$120,000 per mile. In the case of Libby transmission both the Libby-Noxon and Libby-Conkelley 230-kV lines would have to be rebuilt. The rebuilding of these lines to higher capacity would require the Hot Springs-Conkelley 230-kV line to be rebuilt also. This involves rebuilding approximately 225 miles of 230-kV line.

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: Obviously, the BPA cannot precisely estimate the costs of the proposed transmission lines before the lines are designed and before specific alternative routes are identified. However, the BPA should provide at least order of magnitude cost estimates so that the public can get some appreciation of the relative project costs. Surely BPA can estimate if the project will cost on the order of 10 or 100 million dollars. The BPA should also be able to estimate the relative costs of the transmission alternatives identified in the Draft Supplement. By estimating the line lengths of the different voltage lines and the different substation requirements, BPA should be able to at least rank and provide some idea of the cost variability among the different alternatives.

Response: Information summarizing environmental, economic, public input and technical considerations is included in the section PROPOSED PLAN OF SERVICE. Cost estimates will be portrayed in the evaluation of alternative routes that appears in the draft location supplement, the next step in our EIS Process.

Montana Department of Natural Resources
and Conservation (November 1, 1977)

Comment: Page 3 states that "Alternative Plan A assumes that the proposed Hot Springs-Bell line is built on one of the alternative routes that pass by the Noxon area." Will the Libby Integration Project influence the choice of routes for the Bell-Hot Springs line? Since Plan A will be the least costly alternative to construct, will this plan be listed as a justification for routes in the Noxon area?

Response: We recognize the interaction between the Libby Integration project and choices of routes for the Bell-Hot Springs line. Engineering and environmental studies have taken these various choices of routes into consideration. The final decision on routes would have to take all factors into consideration; see the discussion in the PROPOSED PLAN OF SERVICE.

USDA, Forest Service (November 29, 1977)

Comment: The basic assumption of Alternative Plan A is a tie with the proposed 500-kV line from Hot Springs to Bell and that construction and energization of this line will be complete by 1983. In view of the litigation and delays on Colstrip 3 and 4 generation plants, this does not appear to be a valid alternative.

Response: Basic planning assumptions must be made to meet scheduled energization dates for planned projects. The assumption that the proposed Hot Springs-Bell line passes by the Noxon area is clearly pointed out in the supplement. Should this assumption prove invalid, one of the other alternative plans would be selected. We agree that litigation and delays of scheduled generation can and do have an effect on the decision-making process.

USDA, Forest Service (November 29, 1977)

Comment: The EIS needs to speak to the interrelationship between the proposed 500-kV Hot Springs-Bell transmission line, Washington Water Power proposed 230-kV line from the Clark Fork Valley to Pinehurst, Idaho, and the additional Libby dam generation in this proposal. This discussion should include the economic feasibility, relationship to the northwest power grid, and reliability criteria.

Response: The EIS does point out the relationship between Hot Springs-Bell transmission and Libby transmission. Additional information included in the PROPOSED PLAN OF SERVICE section addresses the interrelated transmission requirements in this section of the northwest power grid. Transmission being planned by The Washington Water Power Company provides additional support to the loads in the Wallace-Kellogg area and is not related to main grid proposals of BPA.

USDA, Forest Service (November 29, 1977)

Comment: System Requirements (page 2) should include figures for Wallace, Kellogg, and Coeur d'Alene, Idaho, in the peak loads table. These are necessary to get the overall picture of loads in the study area. This is especially true in view of The Washington Water Power Company's (TWWPCO) request for an additional 230-kV line from the Clark Fork Valley to Pinehurst, Idaho.

Response: The alternatives presented in the EIS for Libby Integration have no relationship to transmission required by TWWPCO to serve their loads in the Pinehurst area. The Washington Water Power Company has determined that their loads would not be served via connection in the Noxon area to one of the Libby Integration alternatives. Therefore, these loads were not included in the load table.

Barbara Ann Roy (November 11, 1977)

Comment: More and more land in the U.S. is becoming roads, which means there is less viable land, I am certain that the forest where you propose to send your line is more productive than an unnecessary line would be.

Response: To the extent possible existing roads are used for construction and maintenance access. Access road plans will be thoroughly coordinated with landowners to keep land disturbance at a minimum. The line itself would disrupt forest productivity where new right-of-way clearing is required. We strive to reduce forest disruption through environmental analysis and centerline location procedures.

Russell H. Hudson, St. Regis Paper Company (November 3, 1977)

Comment: Also, I find it alarming that you are proposing to run lines from Libby to Noxon via the Fisher River. These routes were investigated in the late 60's for the Libby Loop line and abandoned because of poor geologic conditions. What has changed your thinking in this area?

Response: A number of factors contributed to the Fisher River not being used for a transmission line location for the project mentioned. When the Fisher River was examined, the plan under consideration included a transmission line directly between Noxon and Libby dam. Later, a loop from the existing Noxon-Conkelley line was deemed more appropriate, and the route down the Fisher River was less feasible than a route heading east over Hornet Ridge and then south. Poor soils along the Fisher River valley are found mainly in the lower few miles near the Kootenai River. These lacustrine soils are on the lower western slopes and river bottom and could be avoided if a transmission route were picked to go through the valley. The original Libby-Noxon line, located in the late 60's, would have avoided these areas.

The relocation of the Burlington Northern railroad along the Fisher River and Wolf Creek also influenced the decision. Quite a bit of this route was along the BN proposed location.

EPA Region X Seattle, Washington (November 4, 1977)

Comment: The analysis and information therein have led us to believe that Alternative Plan A would be most environmentally acceptable, assuming that the Hot Springs-Bell transmission line is built as planned. In that regard it would be useful if this planning supplement discussed the current status of the Hot Springs-Bell 500-kV Transmission Line, in

that it has been nearly two years since its Draft Facility Location Supplement was issued and no final location supplement has yet been issued.

Response: The status of the Hot Springs-Bell 500-kV Transmission Line is discussed briefly in the new section titled PROPOSED PLAN OF SERVICE.

EPA Region X Seattle, Washington (November 4, 1977)

Comment: Page 6: The discussion of atmospheric conditions and air quality should indicate how good or bad mixing conditions are in the study area.

Response: Atmospheric mixing conditions throughout the 5,800 sq. mi. study area would be classified as "good". Appropriate revision has been made to the text.

EPA Region X Seattle, Washington (November 4, 1977)

Comment: Page 7: The discussion of reservoir storage should indicate the total storage available in those reservoirs and the distribution among the reservoirs.

Response: The narrative has been modified to include this information in tabular form; this should be used in conjunction with Figures 3 and 4 of the supplement.

Russell H. Hudson, St. Regis Paper Company (November 3, 1977)

Comment: In regards to your analysis of forest productivity, you have not gone into depth enough. The ownership and hence the forest management intensity and goals will have a very important influence on the yields from those lands. An example being the highly productive foothills of the Cabinet mountains. Most of these areas owned by the U.S.F.S., are becoming buffer areas for the wilderness and will not be harvested. Conversely, some of the private lands in the Fisher River on drier sites, are very intensively managed and are producing more forest benefits than those Cabinet foothills.

Response: The potential timber habitat types in the relatively large study area fall into one of the most complex forested regions in North America (Habeck, 1967). Forest composition is complicated by such factors as varying land use, wildlife and domestic grazing. These factors interact with climate, topography, and timber-species range limitations to create highly variable timber habitats. Therefore, since the study area is so large and complex, the potential productive capacity by habitat types was the principle consideration used to estimate impacts. It does provide a common frame of reference to judge potential loss of productivity. Forest management intensity, a variable that is

subject to change from one location to another and over time, was not introduced at this early stage in planning. More in-depth analysis considering this and other factors is to be included in the facility location supplement after a proposed plan is selected and specific route locations have been identified.

Montana Dept. of Natural Resources and Conservation (Nov. 1, 1977)

Comment: On page 1 in the footnote to Table 1 the ASARCO mining load is listed as 9.5 MW. A preliminary copy of Northern Lights, Inc. application to this Department for a 115-kV transmission line to serve the ASARCO mine projects the ASARCO load to be "...approximately 18 MW..."

Response: Our official load forecast shows ASARCO load of 9.3 MW through 1997.

Montana Dept. of Natural Resources and Conservation (Nov. 1, 1977)

Comment: Page 2 lists the capacity of the proposed Kootenai Falls project as 160 MW. The application for a preliminary permit from the Federal Power Commission filed by Northern Lights, Inc. lists the installed capacity as 140 MW. No mention is made of a third 20 MW turbine.

Response: The preliminary permit from the FPC on the proposed Kootenai Falls project lists the installed capacity as 140 MW. Engineering studies assumed the maximum capacity as 140 MW. Most generators do have an overload rating 15% over nameplate. Since the engineering studies used 140 MW, the installed capacity in the EIS is now listed as 140 MW.

Barbara Ann Roy (November 11, 1977)

Comment: I am totally against said project. The construction would mean that another roadless area would have a road, meaning the displacement of yet more wildlife.

Response: It is a possibility, but not a certainty, that construction of a new line from Libby dam would cross a roadless area. Should a roadless area be crossed, it is likely that some wildlife would be displaced. The topic is discussed in the wildlife section. Displacement of wildlife is a concern, and we will explore ways to avoid or mitigate potential adverse impacts.

Russell H. Hudson, St. Regis Paper Co., (November 3, 1977)

Comment: In closing, I do not see any landowners listed among those who were consulted or coordinated with. These are the people most adversely affected by your actions. We would all feel better to have had an early part in expressing our concerns.

Response: Landowners usually are not contacted directly at this level of the EIS process. Once a plan of service has been selected, location of alternative routes is begun for the proposed plan. Landowners become closely involved as these more precise locations are determined. One purpose of the Draft Environmental Statement is to inform the public, including landowners who could potentially be affected, early in our planning. Announcements are made in local papers regarding the availability of the document for review and comment. Notification is also made for all public meetings on the environmental statement. Since it is early in our planning we have not identified a preferred plan nor a proposed route. We are looking at several plans and broadly defined corridors.

USDA/Forest Service (November 29, 1977)

Comment: Table 8 is hard to use and understand. Horizontal comparisons are easy but the vertical comparisons are difficult. The averages are not understandable without knowing the weighting used.

Response: The weights are a relative impact index. They have been added to the final summary table to make it more understandable.

USDA/Forest Service (November 29, 1977)

Comment: The original plan of work agreement between the Forest Service and BPA called for a step 5 involving the weighting of the models within the PERMITS system. Under the optimization routine, this would give the decisionmaker a ranking of the alternatives to choose from. A satisfactory method of weighting was not found and this step was eliminated from the process. The resulting corridor alternatives are with all the models having equal weight. This is a less than finished product as originally envisioned.

Response: A satisfactory method of weighting between corridor location models was not found. Step 5 of the work agreement was not completely followed because of this problem. Corridors were identified without the use of differential weighting between resource models. The corridor options for each plan typify the range of possible solutions, rather than a set of corridors as originally envisioned.

PUBLIC MEETING COMMENTS

Mike Comola (October 13, 1977)

Comment: As we proceed with the RARE II process we are developing several other roadless proposals on the Kootenai Forest and several of them happen to be in the proximity of the corridors. One would cross

the Noxon-Conkelley line in the process of evaluation. Again, what is going to be the problem of RARE II in placing the corridors, or the decisionmaking process on the corridors for the disposition of the roadless areas throughout RARE II.

Response: The RARE II studies were initiated after the analysis for the Libby Integration and Northwestern Montana/North Idaho Support Draft Planning Supplement was completed. However, all inventoried roadless lands were considered in our analysis.

As you point out, several reference corridors do cross lands included in the recent RARE II process. The results of the RARE II, that is whether these lands are: 1) recommended for immediate wilderness, 2) recommended for multiple resource use other than wilderness, or 3) recommended for further study, will certainly have a bearing on the feasibility of several corridor options.

RARE II evaluations as they are now set up do not include evaluation of areas inventoried as Roadless in the original RARE process that now have approved land use plans. RARE 183, 185 & 186 are in this category, having approved land use plans (the Fisher River-Silver Butte Cr. portion of Plan A). Alternative B is a similar situation. Here again the original RARE areas have been included in an approved land use plan and therefore not included in the RARE II inventory.

We understand that the Boulder unit plan and a portion of the Callahan unit plan which include parts of Plan B are in the process of administrative appeal by your organization and the Sierra Club. There is the possibility that the land use allocations of these two plans could change as a result of the appeal decision. This would affect the Plan B alternatives.

Alternative A shows the four corridor options having a common section from Fisher River-Silver Butte to the Clark Fork Valley. The portion from Silver Butte to the Clark Fork Valley passes between two areas inventoried for RARE II (1-676 & 1-677). In this common section the corridor would be limited to very nearly the existing transmission line route until the RARE and land use planning processes are complete.

BPA is in close contact with the Forest Service and will be able to adjust plans as necessary to the outcome of the RARE process and the appeal decision.

The RARE II process will be a decision factor in plan selection. It will also be a consideration during the draft location supplement when detailed alternative routes will be studied for the proposed plan.

Mike Comola (October 13, 1977)

Comment: In reference to the Great Bear or the study proposal drafted by the Flathead National Forest with BPA input, that particular section, it indicates figures that haven't come out tonight and I am curious what relationship these figures have with this 230-kV transmission corridor.

Response: The study that you refer to looks at east/west transmission requirements far into the future beyond 1996 to about the year 2020. It is still in the formulative stage. There are many if's: if you have this kind of growth, if the generation for the Northwest comes from coal, and if the coal is located east of the Continental Divide. It is a first step between a utility organization, Bonneville in this case, and a Federal land management agency, the Forest Service, trying to look together to see where their mutual responsibilities might conflict in the future. A lot of work remains to be done to determine whether there are sufficient corridors for energy use. Do they even exist? If so, could that much power be moved across the Divide? There are no recommendations on how to move the coal energy. It could be on railroads; it could be via pipeline; it could be on power transmission lines. There are no specific proposals in connection with this long range study.

The planning engineers who are working on Libby have an immediate problem, that is to move Libby power into the grid system when the generators come on line, and to bolster transmission se vice to people who are living here right now and who have need for it. If there is a connection between the long range study and this project, it would be that a line from Libby to the west could later be upgraded, or a parallel line may be brought in as part of a future major east/west connection. Right now the long range energy picture is fuzzy. In other words, there is not a direct connection between the lines being planned for Libby dam and an east/west transmission system that might be needed in the future.

Gene Kalkoske (October 13, 1977)

Comment: In other words, isn't some of that (963 MW) power going to Canada, or isn't it supposed to go to Canada?

Response: Under treaty provision the Canadians get percentage share of the downstream benefits from the treaty dams. The treaty authorized Libby dam in exchange for power rights gained on downstream plants. The Canadians do not directly get a share of Libby power, but they get a share of the downstream benefits based on expansions that are made possible by the additional water the Canadian treaty dams will release.

Joe Roberts (October 12, 1977)

Comment: Is it possible to upgrade the capacity of any of the existing lines or any combinations of the existing lines to meet the increased capacity from the new generators and meet the reliability criteria that you have established?

Response: Yes, it would be possible. The topic of upgrading is considered in the preceding comments and the section OTHER ALTERNATIVES CONSIDERED.

Doug Ferrell (October 13, 1977)

Comment: Referring to the Libby/Noxon line, you haven't considered that as an option, upgrading the existing 230-kV to carry enough power to not have to build a new line, why isn't this possible?

Response: Upgrading existing transmission lines to higher capacity was considered, note previous discussion on this topic and the section OTHER ALTERNATIVES CONSIDERED. As a minimum, both 230-kV lines out of Libby would have to be rebuilt to either handle a larger conductor or be operated at a higher voltage. This construction would require at least one line being out of service over a two to three-year period. When the remaining 230-kV line was out of service, all Libby generation would be lost. Such a system would not be adequate in itself in that if the existing line to Noxon was out, too much power would flow toward Conkelley and would overload transmission lines between Conkelley and Hot Springs. Also the 115-kV system out of Libby would have to be operated in sections to prevent overloads for outages on the 230-kV system. This would degrade the service on the 115-kV system with temporary intervals of radial service, low voltages, and loss of some loads.

Mike Comola (October 13, 1977)

Comment: What is the relationship on the 500 (kV) Hot Springs to Bell transmission facility, is this still pending, the completion date, is it still pending on the outcome of (Colstrip) 3 and 4?

Response: Yes, the route selection decision on the Hot Springs to Bell transmission line is still pending. No route has been chosen. The uncertainties surrounding the Colstrip 3 and 4 project and its schedule have a bearing on decisions for proposed BPA transmission facilities. The EIS points out the relationship between Hot Springs-Bell transmission and Libby transmission; the reader is referred to the PROPOSED PLAN OF SERVICE section.

Mike Czerwinski (October 13, 1977)

Comment: Will the selection of one of these four routes (Plans) be dependent on that other line, whether it comes through the Noxon area, I

believe the Bell (to Hot Springs) line, I believe you called it, will this be decided before that is decided, or what is the relative time frame.

Response: The route decision on the Bell-Hot Springs circuit is pending. This decision may or may not be made prior to the selection of a proposed plan on the Libby Integration project.

Clyde Blake (October 13, 1977)

Comment: How does the 230 proposal from Noxon westward relate to Washington Water Power's more recent proposal to take and provide additional 230 service from Noxon to their Pine Creek Substation? (Pinehurst Area).

Response: The alternatives presented in the EIS for Libby Integration have no relationship to transmission required by TWWPCO to serve their loads in the Pinehurst area. The Washington Water Power Company has determined that their loads would not be served via connection in the Noxon area to one of the Libby Integration alternatives.

Joe Roberts (October 12, 1977)

Comment: Well, then, I guess the question I am getting to is, why isn't one of the alternatives that you are considering not building any line?

Response: It is considered under the section titled NONCONSTRUCTION. This discussion documents to the extent possible the consequences of no action. For this project not adding energy transmission capability would depart from BPA's current reliability criteria. Without reinforcing the transmission system, part of the generation from Libby dam would be unavailable as reserve capacity for the region and some loads may be shed temporarily on the 115-kV system. This situation may occur during certain outage conditions on the existing 230-kV lines. These criteria are established to help insure a dependable electricity supply in the Pacific Northwest. Other consequences are discussed in the text.

Mr. D. W. Engel (October 13, 1977)

Comment: Is there a possibility you already have two rights-of-way available from Noxon going west, you've got a 230 (kV) line presently and you've got the possibility of another line on that, are we looking at the possibility of three different lines, or is it going to end up with two lines from Noxon west?

Response: BPA does have a vacant unused right-of-way paralleling the existing line. This unused right-of-way may or may not be used, although it is being considered as an option for either the Hot Springs to Bell 500-kV transmission line or the 230-kV transmission line to integrate

new power from Libby dam. Therefore, we are still looking at only two possible power lines for this existing corridor.

Gordon Cordes (October 13, 1977)

Comment: I didn't hear any mention about Hot Springs, it seems like everything leads to Hot Springs, but is any of the Libby power now going to Hot Springs or will any of it go to Hot Springs?

Response: The power on an electrical transmission system flows anywhere on the system that it is needed, including Hot Springs. Most of the power generated at Libby is consumed in the Northwest Montana area.

Mr. Harp (October 12, 1977)

Comment: What I am saying, do these new corridors have anything to do with the fact that there may be a new proposed dam at Kootenai Falls, is there an answer, either one of you?

Response: The potential for the Kootenai River Project was a consideration in the electrical plans to serve the area, but it is not the reason new facilities are proposed. Electrical service in Northwest Montana and North Idaho currently needs reinforcement to maintain adequate service. All of the plans presented in the document address this need. The plans do have enough capacity to carry power from a dam near Kootenai Falls, if it is built.

Craig Beresford (October 13, 1977)

Comment: You mentioned that the decisionmakers look at the data you collect and pick the best possible choice. Who are the decisionmakers, I am a little naive as far as this type of thing?

Response: The decisionmaker on this project is Bonneville's Chief Engineer. He is the person who reviews the alternative plans and their consequences, then selects a course of action.

Stanley Bogosian (October 13, 1977)

Comment: I was wondering if this (Plan C) will, first of all, require any additional expansion of Sacheen station, and if it doesn't require any additional expansion, will there be any increased noise level or any expansion within the existing site, in other words, first, is there going to be any land acquisition involved and second, if there isn't, will there be any increased noise as a result of higher power in the station?

Response: We need to expand what is inside the substation. There should be adequate fenced area to add a terminal facility. There will be some noise associated with the construction work, but no noise from the addition itself.

Earl Hussell (October 13, 1977)

Comment: I presume from the conversations that have been going on here, this is a net energy exporting area, is that true?

Response: That part of Montana west of the Continental Divide is basically a net import area for electric energy. There are times of the day and times of the year when power flows the other way, but historically power generation in Western Montana does not supply the total energy needed. With the development of coal generation in Eastern Montana the situation would change, a large amount of power would be exported to western load centers.

Gene Kalkoske (October 13, 1977)

Comment: Why can't we go north though, and tie into the Canadian grid, don't they have a grid up there, or do we do all their gridding and then sell them the power back.

Response: There are electrical interchange points with Canada; however, a 230-kV line North into Canada would be required with additional reinforcement to the Canadian grid. This option was not considered a viable solution to providing additional peaking capability for the Northwest power system.

Russ Hudson (October 12, 1977)

Comment: When we were working on the original Libby Loop line one consideration was a route up the Fisher River straight south from Libby dam to Conkelley; this was abandoned because of unstable soils. I see three of the proposals in Alternative A are currently back in that area. I wonder if the soils are changed, or what has happened?

Response: A number of factors contributed to the Fisher River not being used for a transmission line location for the project mentioned. When the Fisher River was examined, the plan under consideration included a transmission line directly between Noxon and Libby dam. Later, a loop from the existing Noxon-Conkelley line was deemed more appropriate, and the route down the Fisher river was less feasible than a route heading east over Hornet Ridge and then south. Poor soils along the Fisher River valley are found mainly in the lower few miles near the Kootenai River. These lacustrine soils are on the lower western slopes and river bottom and could be avoided if a transmission route were picked to go through the valley. The original Libby-Noxon line, located in the late 60's, would have avoided these areas.

The relocation of the Burlington Northern (BN) railroad along the Fisher River and Wolf Creek also influenced the decision. Quite a bit of this route was along the BN proposed location.

Clyde Blake (October 13, 1977)

Comment: What weighting between models is proposed to help come to a final choice from the various alternatives?

Response: We are proposing no additional weighting between corridor location models to help obtain a final choice from the various alternatives.

SUMMARY: PUBLIC AND AGENCY COMMENTS

P U R P O S E

The purpose of this study was to extract and summarize substantive, formal public and agency response to the Draft Planning Supplement. Sources included official transcripts of public hearings at Noxon, Montana (October 11, 1977); Libby, Montana (October 12, 1977); Sandpoint, Idaho (October 13, 1977); and written comments on the project that BPA received between September 1, 1977 and November 29, 1977.

D A T A S U M M A R Y ¹

Number of individuals and agencies commenting - 46

Number of statements recorded - 226

<u>Number of Commentors</u>	<u>Number of Different Comments</u>	<u>Major Areas of Concern</u>
31	27	Power Corridor Plans
19	19	Existing Transmission Corridors
18	27	Other Construction
10	13	Proposals in Study Area
7	13	RARE II and Roadless/ Wilderness Areas
6	11	System Reliability
5	5	Costs/Benefits of Proposed Project
2	12	Need for Project
5	6	Wildlife
9	19	Forest Products
4	5	Preparation of Draft Planning Supplement
5	10	Kootenai River Diversion
4	13	Conservation/Consumption
6	10	Herbicides
11	36	Miscellaneous - (Project-Related)
		Other

^{1/} An overview of the comment analysis method, including an explanation of terms, is appended to this report.

The following pages provide a more detailed examination of the content of the public response. Note that "Frequency" indicates the number of times the same specific comment was made as opposed to "Number of Commentors", which refers to the number of people who commented on each major area of concern.

MAJOR AREAS OF CONCERN

POWER CORRIDOR PLANS: GENERAL

Number of commentors: 15

Frequency

Summary of Comments

- | | | |
|----|-----|--|
| 11 | 1. | Object to new power line corridor. ² |
| 2 | 2. | Strongly object to Libby Integration project. ³ |
| 1 | 3. | Object to additional line through property near Laclede. |
| 1 | 4. | Object to changing existing line to higher capacity. |
| 1 | 5. | "Do nothing" alternative is acceptable. |
| 1 | 6. | Dissatisfied with the four proposed alternatives. |
| 2 | 7. | Which plan does BPA favor? |
| 1 | 8. | Does or will any Libby power go to Hot Springs? |
| 1 | 9. | What are BPA's plans in the Sandpoint area? |
| 1 | 10. | Does Plan A require a tie with the proposed 500-kV line at Noxon, whereas Plan D extends the 230-kV circuit to Rathdrum if the 500-kV system is not routed near Noxon? |
| 1 | 11. | Will the proposed alternatives handle all future power from Libby and Rereg. Dams? |

POWER CORRIDOR PLANS: PLAN A

Number of commentors: 11

Frequency

Summary of Comments

- | | | |
|---|----|--|
| 2 | 1. | Plan A is the most environmentally acceptable. ⁴ |
| 1 | 2. | Plan A should discuss decision date for Hot Springs-Bell line because that decision and Libby integration are interrelated. |
| 1 | 3. | Plan A appears invalid because it does not address impacts of Noxon-Bell 500-kV line. |
| 1 | 4. | The proposed route in Plan A that parallels the existing line apparently removes more forest land from production than other alternatives, despite reduced right-of-way (ROW) needs. |
| 3 | 5. | Why is BPA proposing a route near Fisher River when that area was declared unsuitable for an earlier project due to unstable soils? |
| 2 | 6. | BPA representatives know why Fisher River route was not used before and should have disclosed the reasons during this public meeting. |
| 1 | 7. | The Fisher River Route is shorter than the one that was finally used. |
| 2 | 8. | Does a proposed Libby-Noxon alternative partially or completely parallel the existing line? |

2/ in Clark Fork Valley; in Lincoln County, MT; from Libby & Rereg. Dams; up Yaak River; up Pipe Creek and 17-Mile Creek; up Fisher River.

3/ Because no consideration given to using present corridors.

4/ If Hot Springs-Bell line is built; when all resources are weighted equally.

- 1 9. Because it appears least costly, will Plan A be used to justify routes in the Noxon area for Hot Springs-Bell line?
- 1 10. Why does part of one Libby-Noxon corridor show a 3-pronged loop?
- 1 11. Will three corridors be needed in Plan A?

POWER CORRIDOR PLANS: PLAN B

Number of commentors: 3

Frequency

Summary of Comments

- 1 1. RARE II studies and appeals regarding the roadless area crossed by Alternatives B₁ and B₂ will not be settled in time to meet BPA's energization schedules; therefore, B₁ and B₂ should be dropped as alternatives.
- 1 2. If Libby's citizens knew that a corridor is proposed in the Yaak area, this meeting would be packed.
- 1 3. What are BPA's plans for a corridor in Pipe Creek and 17-Mile Creek areas?

POWER CORRIDOR PLANS: PLAN D

Number of commentors: 2

Frequency

Summary of Comments

- 1 1. Plan D should consider a route in Prospect Creek drainage.⁵
- 1 2. How many transmission lines⁶ is BPA planning to build west of Noxon, including Hot Springs-Bell?

EXISTING TRANSMISSION CORRIDORS

Number of commentors: 19

Frequency

Summary of Comments

- 9 1. Prefer using or reconductoring existing corridors/roadways.
- 7 2. Upgrading,⁷reconductoring, or rebuilding existing facilities should be evaluated.
- 2 3. Most viable alternative is to upgrade existing facilities (as opposed to new facilities).
- 1 4. Right-of-way sharing between a new 230-kV line and the existing 115-kV line should be evaluated.
- 1 5. BPA is not "selling" the nonconstruction alternative.
- 1 6. Conversion of existing equipment to higher voltage is not one of the four alternatives being presented.
- 3 7. What does reconductoring the Libby-Albeni Falls line mean?
- 3 8. Why doesn't BPA consider upgrading or reconductoring existing lines in the area instead of building new ones?

5/ This area was considered feasible for Hot Springs-Bell and TWPCO's 230-kV line.
6/ Speaker owns land west of Noxon that will be crossed by a transmission line.
7/ Including pros, cons, technical feasibility; because this alternative is most attractive to Libby's citizens, who must bear the environmental effects of a new corridor; especially when a key reason for a new corridor is to minimize service interruptions.

- 1 9. Is a question of flexibility involved in BPA's desire to build a new line rather than upgrade an existing one?
- 1 10. Why doesn't BPA present nonconstruction equally with the other four alternatives?
- 1 11. Was conversion of existing lines and substations to higher voltage an alternative?
- 1 12. Must BPA do more than reconnector the existing Libby-Albeni Falls line?
- 1 13. Does Plan D call for reconductoring a line to increase its capacity?
- 1 14. Seeks clarification on location of 115-kV line from Libby.
- 1 15. If existing lines were rebuilt, how many kV's could they accommodate?
- 1 16. What is meant by "paralleling" a transmission line?
- 1 17. What is the total right-of-way width of a paralleling line?
- 1 18. Does BPA have an easement for another corridor adjacent to existing Noxon-Conkelley line?
- 1 19. How many transmission lines now exit from Libby Dam?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
HOT SPRINGS-BELL TRANSMISSION LINE

Number of commentors: 5

Frequency

Summary of Comments

- 3 1. The planning supplement should discuss the status of Hot Springs-Bell.⁸
- 1 2. If Hot Springs-Bell is not routed through Noxon, then a completely new corridor may have to be bulldozed for Libby Integration - a significant alternative in terms of the amount of land removed from production, etc.
- 1 3. Is the completion date for Hot Springs-Bell dependent on the Colstrip 3 and 4 decision?
- 1 4. Has a route been chosen for Hot Springs-Bell?
- 1 5. What is relationship, time-wise, between Hot Springs-Bell and Libby Integration route decisions?
- 1 6. Would a substation be required at Noxon whether or not Hot Springs-Bell connects with Libby Integration at Noxon?
- 1 7. Will 15 acres be needed for a substation at Noxon if Hot Springs-Bell is routed there?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
KOOTENAI FALLS DAM

Number of commentors: 7

8/ Because that decision & Libby Integration are interrelated; because relative impacts of proposed alternatives cannot be assessed adequately without knowing route of Bell-Hot Springs.

<u>Frequency</u>	<u>Summary of Comments</u>
1	1. Northern Lights proposed the dam.
1	2. Approximately a half mile of new line would be needed to connect dam with existing line.
1	3. The Kootenai Falls project would have an installed capacity of 140-MW; no mention of a third 20-MW turbine.
4	4. What is relationship of Libby alternatives to Kootenai Falls Dam? ⁹
2	5. Will BPA have to build new corridors to transmit power from the dam?
1	6. Can proposed corridors handle all power coming from the dam?
1	7. Was Kootenai Falls Dam proposed by Northern Lights?
1	8. Will the dam tie into Northern Lights' transmission system or BPA's?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
THE WASHINGTON WATER POWER CO.'S NOXON-PINE CREEK LINE

Number of commentors: 1

<u>Frequency</u>	<u>Summary of Comments</u>
1	1. BPA's and TWWPCO's proposals call for two additional 230-kV lines in the same area.
1	2. TWWPCO's plans for Pine Creek circuit should be part of decision on future transmission in the area.
1	3. What is relationship between the proposed 230-kV line westward from Noxon and TWWPCO's proposal?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
ASARCO MINESITE NEAR TROY

Number of commentors: 2

<u>Frequency</u>	<u>Summary of Comments</u>
1	1. ASARCO's mine load is projected to be 18-MW.
1	2. If it takes 115-kV to serve the minesite, then the four other proposed mine projects will require several additional power lines and generation sources.
1	3. How many kilovolts would it take to service the minesite?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
REREGULATION DAM

Number of commentors: 1

9/ Are corridors proposed because of new generation from dam; does construction depend on choice of one Libby alternative over another?

Frequency

Summary of Comments

- 1 1. Will power from Rereg. Dam be separate or included in Libby Integration Plans?
- 1 2. Is PP&L a recipient of power from Rereg. Dam?

OTHER CONSTRUCTION PROPOSALS IN STUDY AREA
MISCELLANEOUS

Number of commentors: 2

Frequency

Summary of Comments

- 1 1. The EIS should address the relationship between Bell-Hot Springs, TWPCO's Pine Creek circuit proposal, and the additional Libby generation. ¹⁰
- 1 2. What is relationship of Libby Integration plans to long-range east-west corridor studies and the four Colstrip lines?
- 1 3. Will Libby transmission be integrated with Bonners Ferry and Kootenai Low Dam?
- 1 4. Seeks information on future integration of Libby transmission with Corps of Engineers' inventory site in the Yaak area.

RARE II ROADLESS/WILDERNESS AREAS

Number of commentors: 10

Frequency

Summary of Comments

- 3 1. Several RARE II areas are crossed by or are near proposed transmission corridors. ¹¹
- 1 2. Until status of RARE II lands in Upper Fisher-Silver Butte areas is resolved, work on parts of Alternative A cannot be undertaken unless existing or immediately adjacent rights-of-way are used.
- 1 3. The power corridor south of Cabinet Wilderness opened up places previously inaccessible by vehicle.
- 1 4. Construction of new lines would bring roads into another roadless area.
- 1 5. Don't hide new powerlines in roadless areas; rather, build them along existing highways where people can see them and take responsibility for their existence.
- 2 6. Were any RARE II lands considered for transmission corridors?
- 2 7. What effect will RARE II proposals have on transmission corridor location? ¹²
- 2 8. What effect will the decision on transmission corridor location have on disposition of RARE II lands? ¹²
- 2 9. Could defacto roadless or wilderness areas have transmission towers placed by helicopter?
- 2 10. Was consideration given to current wilderness proposal for Rattle Mt. Roadless Area when potential transmission corridors were located?

10/ Including: economic feasibility, relationship to Northwest power grid, and reliability criteria.

11/ Boulder Creek Drainage and Kootenai National Forest: Alternatives B₁ and B₂ cross land presently under study by USFS and appeal by environmental groups.

12/ In general; in Bonners Ferry area.

- 2 11. Will RARE II be considered in future transmission corridor evaluation?¹³
1 12. Are any of the potentially impacted roadless areas in Kootenai or
Panhandle N.F.s?
1 13. Could some proposed corridors be incompatible with future RARE II land
use classifications?

SYSTEM RELIABILITY

Number of commentors: 7

Frequency

Summary of Comments

- 1 1. Single contingency reliability standard was not discussed adequately
for this project.
1 2. Increased system reliability is desirable.
1 3. Loss of a 230-kV line after installation of new Libby Dam generators
may not always result in insufficient transmission capacity, loss of
Libby generation, and loss of power to consumers.
1 4. BPA should examine historic outage statistics¹⁴ for comparisons with
projected generation loads.
1 5. The real economic and environmental costs of reliability standards and
tradeoffs required for less reliability should be discussed.
1 6. BPA should re-examine reliability standards and maybe change them to
allow an occasional outage in Seattle, if that would prevent another
power corridor being built in NW Montana.
2 7. Under normal circumstances could existing system transmit present and
future power from Libby Dam?
2 8. Can any existing lines or combination thereof be upgraded to meet
increased capacity from the new generators and also meet BPA's reliability
criteria?
1 9. Is main reason for new line from Libby to prevent service interruptions?
1 10. Must power be disrupted to convert a 115-kV line to 230-kV?
1 11. Would substations or the entire line structure be affected by conversion
from 115 to 230-kV?
1 12. Upgrading two or three existing lines to meet reliability standards is
not a proposed alternative?
1 13. What happens if you double the capacity of a major line and then lose
it?

COSTS/BENEFITS OF PROPOSED PROJECT

Number of commentors: 6

Frequency

Summary of Comments

- 2 1. BPA's claim that upgrading existing facilities is too expensive is not
documented with actual figures comparing costs and tradeoffs between
that option vs. building another transmission corridor.

^{13/} In general; for Rattle Mt. Roadless Area.

^{14/} Including number, duration, and timing of outages.

- 2 2. People should pay more for power from Montana to ameliorate the environmental costs Montanans have paid to provide power to Washington.
- 1 3. Benefits of project appear to be: reduced probability of Libby Dam generation loss and resulting inconvenience, capital and productivity losses to consumers; and reduced transmission line losses.
- 1 4. Project costs appear to be construction, operation, and maintenance dollar costs and the adverse natural and cultural environmental impacts.
- 1 5. Concerned by absence of relative cost comparisons between alternatives.
- 1 6. BPA should pass on to consumers the costs of upgrading a line if that would help preserve Montana's natural environment and teach people to conserve energy.
- 3 7. What is total cost of each proposed route?
- 1 8. What is total cost to reconstruct existing lines?
- 1 9. Does BPA say it is cheaper to build new lines than modify existing ones, and why?
- 1 10. Are alternative corridors being evaluated, first minus cost factor, then with all factors together?
- 1 11. Would BPA or the utilities bear expense of upgrading existing facilities?

NEED FOR PROJECT

Number of commentors: 5

Frequency

Summary of Comments

- 1 1. BPA pre-decided need for facility without public input.
- 1 2. Nonconstruction option does not meet NEPA requirements: it should analyze benefits and cost to determine need.
- 1 3. Proposed additions to transmission system are necessary for present and future citizens of the area.¹⁵
- 1 4. Pacific Northwest's increased electrical needs should be balanced with needs for more forest products, recreation areas, and esthetic values.
- 1 5. Why is another Libby-Noxon line needed, given history of Noxon-Conkelley line and original Libby integration lines?

WILDLIFE

Number of commentors: 2

Frequency

Summary of Comments

- 1 1. Every plan contains at least one corridor that may jeopardize grizzly bear existence or critical habitat.
- 1 2. In Plan A, all corridors cross occupied grizzly habitat south of Cabinet Wilderness and could create more access for illegal grizzly kills.
- 1 3. Last legal grizzly kill occurred just off existing corridor in Cabinets; hunter traveled access road.

^{15/} Because of continued load growth due to increased consumption, new customers, and a presently inadequate system.

- 1 4. Road closures and restricted human access are necessary to prevent adverse impacts on grizzly; in Plan A, Corridor 2 appears least desirable in this regard.
- 1 5. Pipe Creek-17 Mile-Yaak area supports small, viable grizzly population which Plan B₄ could adversely impact with new access and increased human activity.
- 1 6. Calder Mountain and north fork of Callahan Creek is proposed critical grizzly bear habitat, currently containing no access; Corridors 2, 3, and 4 in Plan B could affect future grizzly bear management.
- 1 7. Corridor 1, Plan B, passes along edge of, but not through, proposed grizzly critical habitat.
- 1 8. Effects of Plans C and D are the same as for Plans B and A, respectively.
- 1 9. If transmission corridor will be the only intrusion, Plan B, Corridor 1, may be preferable, depending on its size and exact location.
- 1 10. If access roads are planned, USFWS needs more information on them for all plans.
- 1 11. USFWS needs information on plans for restricting public access to evaluate impacts on grizzly bear and Rocky Mt. wolf.
- 1 12. Construction would displace more wildlife because roads allow man's intrusion.

FOREST PRODUCTS

Number of commentors: 5

Frequency

Summary of Comments

- 2 1. Long term costs of removing land from tree growing base have to be considered¹⁶ when deciding between upgrading existing lines and building new ones.
- 1 2. BPA should use existing ROWs through National Forest land, if possible.¹⁷
- 1 3. Forest land is more productive than an unnecessary line through it would be.
- 1 4. Analysis of forest productivity should be more detailed.¹⁸
- 1 5. BPA does not propose higher towers so trees could grow underneath because it does not pay full value for its easements.
- 1 6. Object to new power corridors and roads that reduce forest size and yield.

PREPARATION OF DRAFT PLANNING SUPPLEMENT

Number of commentors: 9

Frequency

Summary of Comments

- 2 1. Weighting between models was the final step in the original work agreement with USFS.

^{16/} Including future social values foregone, which are not presently a part of BPA's concept of fair market value, thus making it appear that building a new line is cheaper than reconductoring existing ones.

^{17/} Because allowable cut and employment have been reduced too much already.

^{18/} Including ownership, forest management intensity, and goals.

- 1 2. The EIS should be rewritten.
- 1 3. The Libby Integration portion of the F.Y. '79 Draft EIS is particularly thorough and well-prepared.
- 1 4. Items 2 & 3 of all four plans are alike; their impacts could be discussed under Alternative B₃.
- 1 5. The peak loads table should include figures for Wallace, Kellogg, & Coeur d'Alene.
- 1 6. In Table 8, horizontal comparisons are easy but vertical ones are not, and the averages are not meaningful without knowing weightings used.
- 1 7. Routing decision on Libby Integration is more difficult with elimination of final weighting between models.
- 1 8. Nine models, weighted within themselves, were used in the computer-aided environmental analysis.
- 1 9. Transmission line length seems nearly synonymous with cost of construction and thus should be considered equally with other line impacts.
- 1 10. Information on former route problems should have been part of analysis in order to inspire confidence in validity of alternatives.
- 2 11. Did or will BPA weight between the nine models?
- 1 12. Who writes, interprets, and checks data for BPA's EISs?
- 1 13. What is meaning of model entitled "Problems with Transmission Systems"?
- 1 14. Were problems of physical environment addressed in models other than Model 9 and thus counted twice?

- 1 15. Did BPA compile a map showing impacts of all models combined, and what did it show?
- 1 16. In the computer analysis, were the various environmental factors, represented by the maps in the EIS, weighted equally or differently within the study area?
- 1 17. When did BPA begin data collection for this study?
- 1 18. How many cells were checked to verify data bank accuracy?
- 1 19. Has the portion of original study plan calling for weighting between models been declared invalid?

KOOTENAI RIVER DIVERSION

Number of commentors: 4

Frequency

Summary of Comments

- 1 1. BPA lacks objectivity regarding Kootenai River diversion.
 - 1 2. Generation losses²⁰ resulting from diversion make Rereg. dam and transmission line additions unnecessary.
 - 2 3. Did BPA account for lower flow of the river in making power supply projections?
 - 1 4. Won't diversion leave too little water for new generators at Libby Dam and preclude need for Rereg. Dam?
 - 1 5. How much information can BPA give regarding proposed diversion?
- 19/ Description of existing environment well-prepared; potential impacts section adequate; tables showing resource acres impacted by each alternative and number of cells per alternative in which resources occur are especially good.
- 20/ Up to 400 million kWh annually.

CONSERVATION/CONSUMPTION

Number of commentors: 5

<u>Frequency</u>	<u>Summary of Comments</u>
2	1. BPA could influence consumptive excesses by not providing power.
2	2. We can cut electrical consumption and maintain living standard.
1	3. People should be instructed to conserve energy.
1	4. BPA is not trying hard enough to encourage conservation.
1	5. BPA's public presentations are "eyewash" until it stops trying to "sell" people something.
1	6. BPA's projected growth rate and energy consumption figures are unrealistically high, cannot be sustained, and reflect deficient planning.
1	7. The National (sic) Resource Defense Council's <u>Alternative Scenario</u> realistically calls for people to be less concerned with growth, to want less, and to take responsibility for their actions.
1	8. BPA's energy consumption projection confirms speaker's opinion that Americans are energy addicts.
1	9. What will BPA and DOE do to implement conservation rather than provide more power for the excessive consumption that is reflected by a 5% annual growth rate in electrical use?
1	10. What assumptions are BPA's electrical consumption projections based on?

HERBICIDES

Number of commentors: 4

<u>Frequency</u>	<u>Summary of Comments</u>
1	1. The ROW management section of EIS should reference the USFS-BPA joint agreement regarding vegetative control and herbicide use.
1	2. Vegetation could be controlled without spraying herbicides, which have no beneficial effects.
1	3. Concerned that BPA sprays herbicides anywhere in its service area. ²¹
1	4. Land owners with timber near ROWs will be concerned with BPA's herbicide applications.
1	5. What are the reasons for spraying west of Cascades?
1	6. Will there be ground applications of herbicides in Idaho or Montana in F.Y. '79 along the general path of transmission lines?
1	7. Are conifers the chief target of herbicides?
1	8. What chemical would BPA use?
1	9. If a landowner removes conifers that threaten lines, can his land be spared from herbicide applications, or would crews make routine applications anyway?
1	10. Will a landowner be notified before an herbicide application?
1	11. Would BPA spray herbicides in the area of a stream used for irrigation?
1	12. Are the chemicals in BPA's herbicides water soluble?
1	13. Requests information on rate of water flow on a steep hillside because there is a steep hillside with an irrigation project on it in Noxon

^{21/} Because natural systems are interrelated; when only threat to lines is tall trees; when humans and wildlife are sprayed.

area, and the half-life of an herbicide (how long it remains active in environment) is unknown.

MISCELLANEOUS: (PROJECT-RELATED)

Number of commentors: 6

<u>Frequency</u>	<u>Summary of Comments</u>
1	1. Landowners, the people most adversely affected, should be consulted (regarding corridor location).
1	2. Proposed project has great potential for affecting recreational environment.
1	3. Feel random hostility due to increased development in Libby area and great sacrifices NW Montanans have made to provide power to rest of country.
1	4. People in Seattle who worry about power outages also don't want their favorite recreation areas in Idaho and Montana ruined.
1	5. Who makes final route selection?
1	6. How does power flow between Libby, Noxon, and Conkelley?
1	7. Would Sacheen substation site be expanded if a new line were built to it?
1	8. Would another 230-kV line to Sacheen substation double the noise level there and why?
1	9. Would no new transformers be added to Sacheen substation?
1	10. Where are the Libby Integration hearings being held?

OTHER

Number of commentors: 11

These comments represent a selected sample of the 36 different statements and questions that BPA received on a variety of topics not directly related to this project or the draft EIS.

<u>Frequency</u>	<u>Comment Sample</u>
2	1. BPA should not disclaim responsibility for Libby Dam because it does not operate the facility; after all, BPA does reap benefits from the dam.
1	2. Libby Dam is part of the NW Grid System; if BPA doesn't build a transmission line directly from the dam to Canada, the Canadians will take their power from another part of the system.
2	3. Does Montana import 50% of its energy, or does that figure represent power that is produced in Montana, exported to a grid system, and re-sold to Montanans?
1	4. Is it possible to open Libby Dam's penstock and empty the impoundment? The dam has severe cracks

- 1 5. If the light metals industry uses about 25% of BPA's electricity, what effect will its contract renegotiations have on electrical use and conservation measures in the Pacific Northwest?
- 1 6. Is acreage for a substation acquired as an easement?

CONTENT ANALYSIS METHODOLOGY

In broad terms, the objective of content analysis methodology is to systematically quantify and categorize the manifest content of information. The method applied to the public and agency comments on the Libby Draft Planning Supplement involved several steps.

The first step was the designation of context units: independent units of written or voiced communication that differ in context or source from companion communications. In the case of written comments, an entire letter comprises a context unit. In the public meeting transcripts, one speaker's completed utterance(s) on a specific topic defines a context unit; a substantive topic change or a new, non-BPA speaker indicates a different context unit.

The next step involved the designation of recording units: partial or complete statements that represent the core idea within the context units. Recording units were listed on the basis of the communicator's intent to: (1) seek clarification, or (2) impart information. Each recording unit then was summarized into a single question or statement representing the perceived core meaning. Finally, broad subject categories were identified. Recording units were assigned to appropriate categories and their frequency of occurrence determined. The number of people who commented on each broad subject also was identified.

RELIABILITY ESTIMATION OF CONTENT ANALYSIS PROCEDURES

The reliability of content analysis procedure depends on the extent of agreement between trained analysts with respect to their independent judgments. The reliability estimation is a cross-validation check to measure consistency and repeatability by different analysts. Without such an estimation, results of content analysis procedures can be viewed as suspect.

On December 20, 1977, a reliability estimation involving public responses related to the Libby Integration Project was conducted. A random sample* of designated recording units contained in the Transcript of Proceedings, October 12, 1977 public hearing, Libby, Montana was determined. A researcher trained in content analysis methodology re-analyzed this sample: (1) with respect to direction (i.e., seeking clarification or imparting information), and (2) substance of the manifest content. Comparison of results with the principal analyst revealed: (1) complete agreement on direction, and (2) agreement on substance of the manifest content except in one instance.

The reliability estimation yielded evidence of agreement well beyond that expected by chance, and it is reasonable to assume that the results of these content analysis procedures represent consistent independent judgments.

*Utilizing a table of random numbers, 25 of 156 (17%) designated recording units were selected for the reliability estimation.

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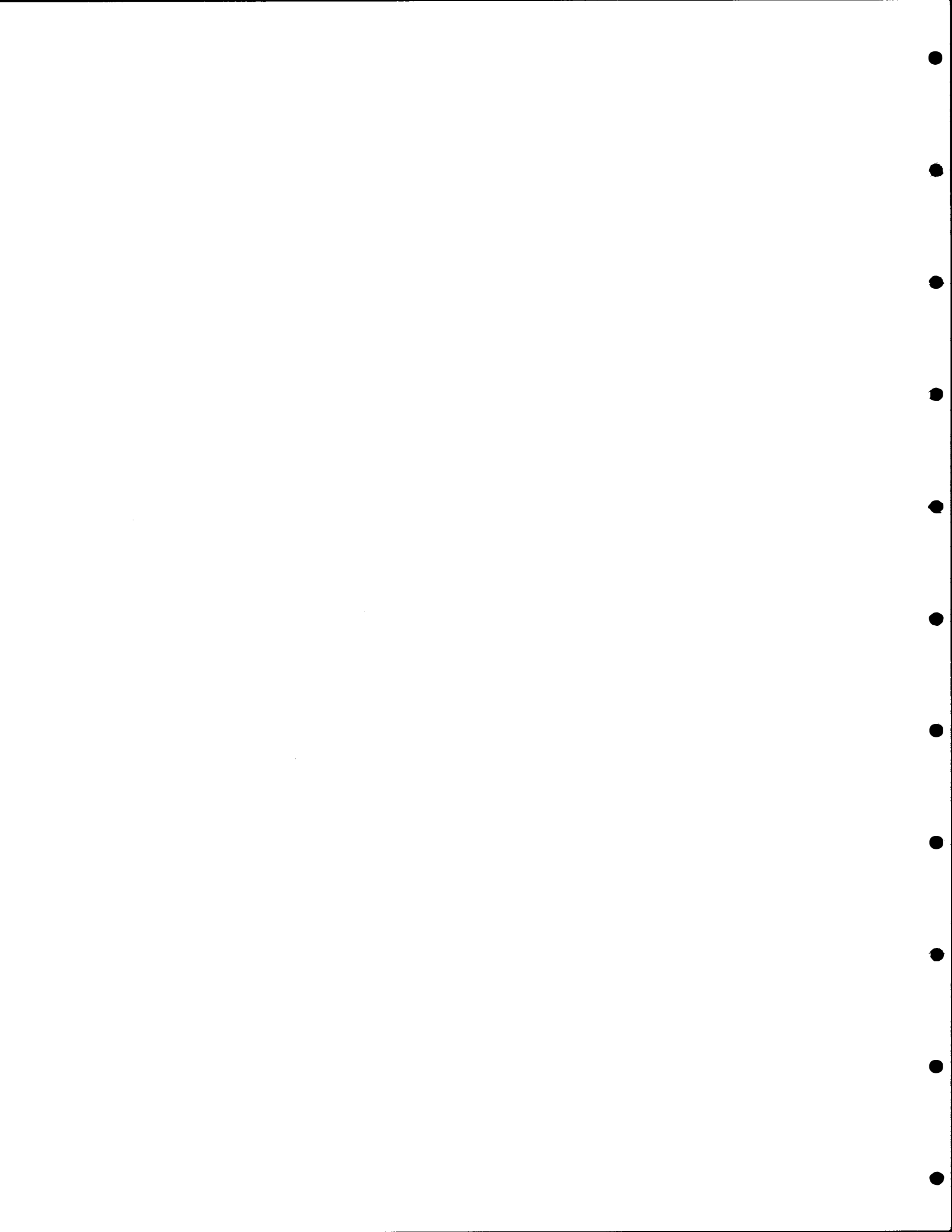
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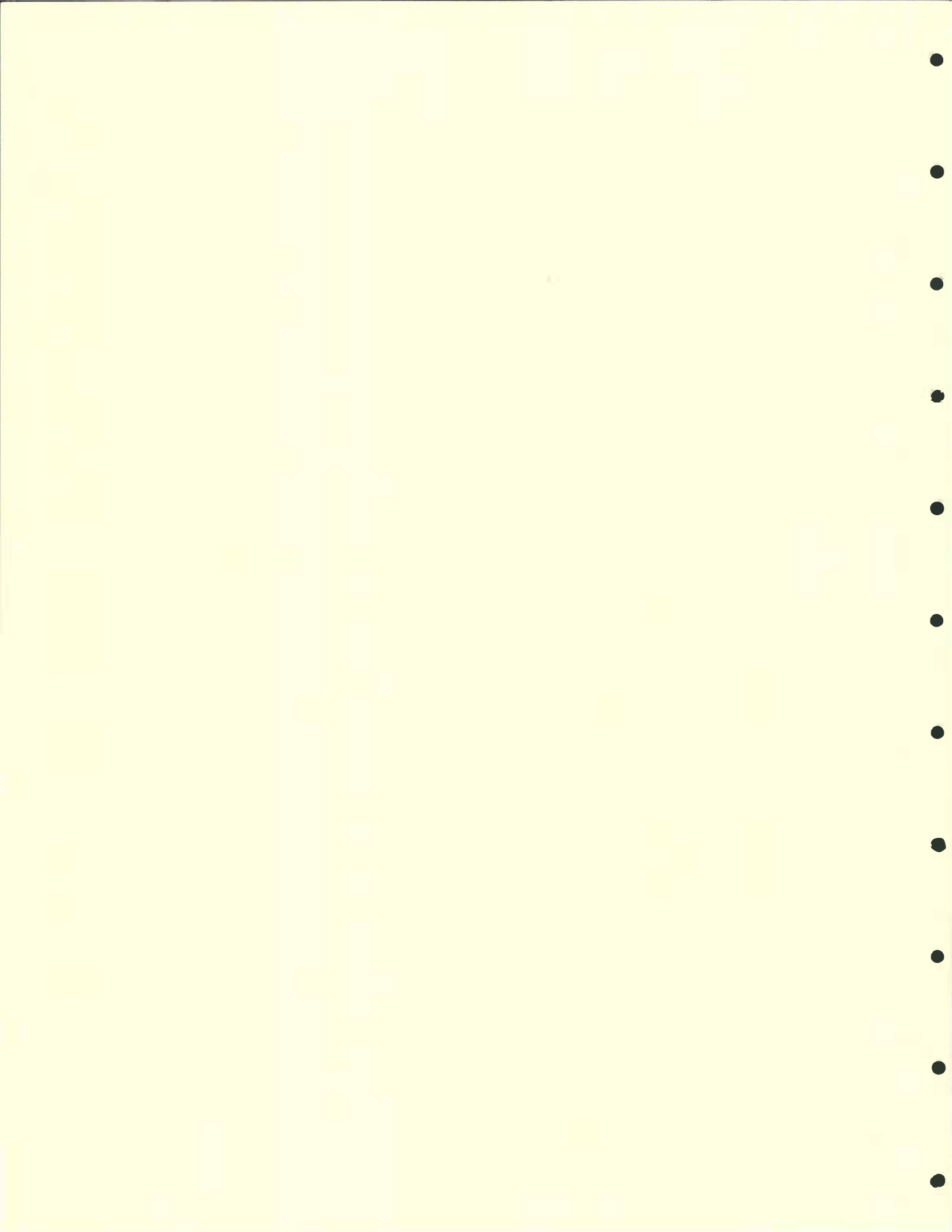
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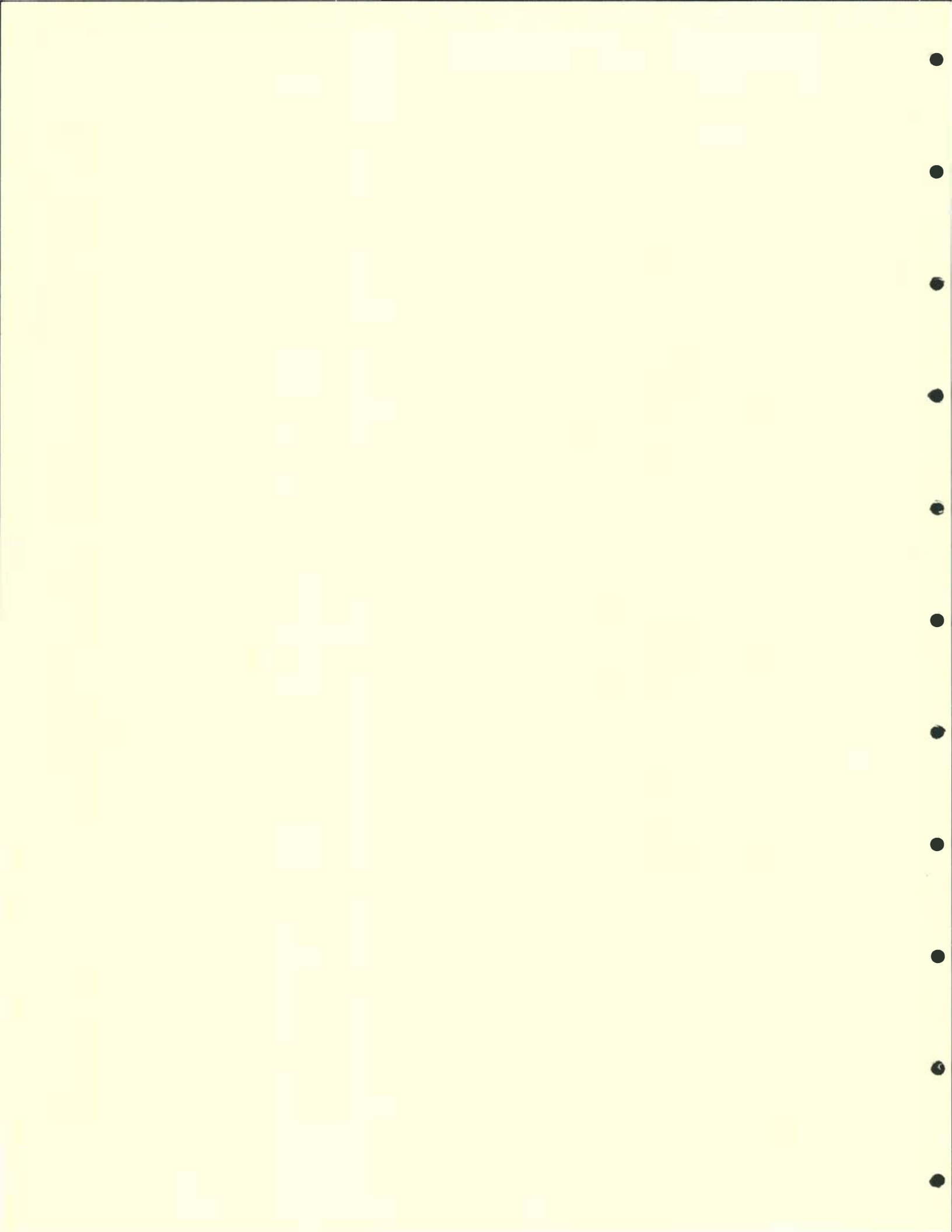


PRIOR FISCAL YEAR PROPOSALS



SA-79-1

Franklin Area
System Reinforcement



STATUS

FRANKLIN AREA SYSTEM REINFORCEMENT

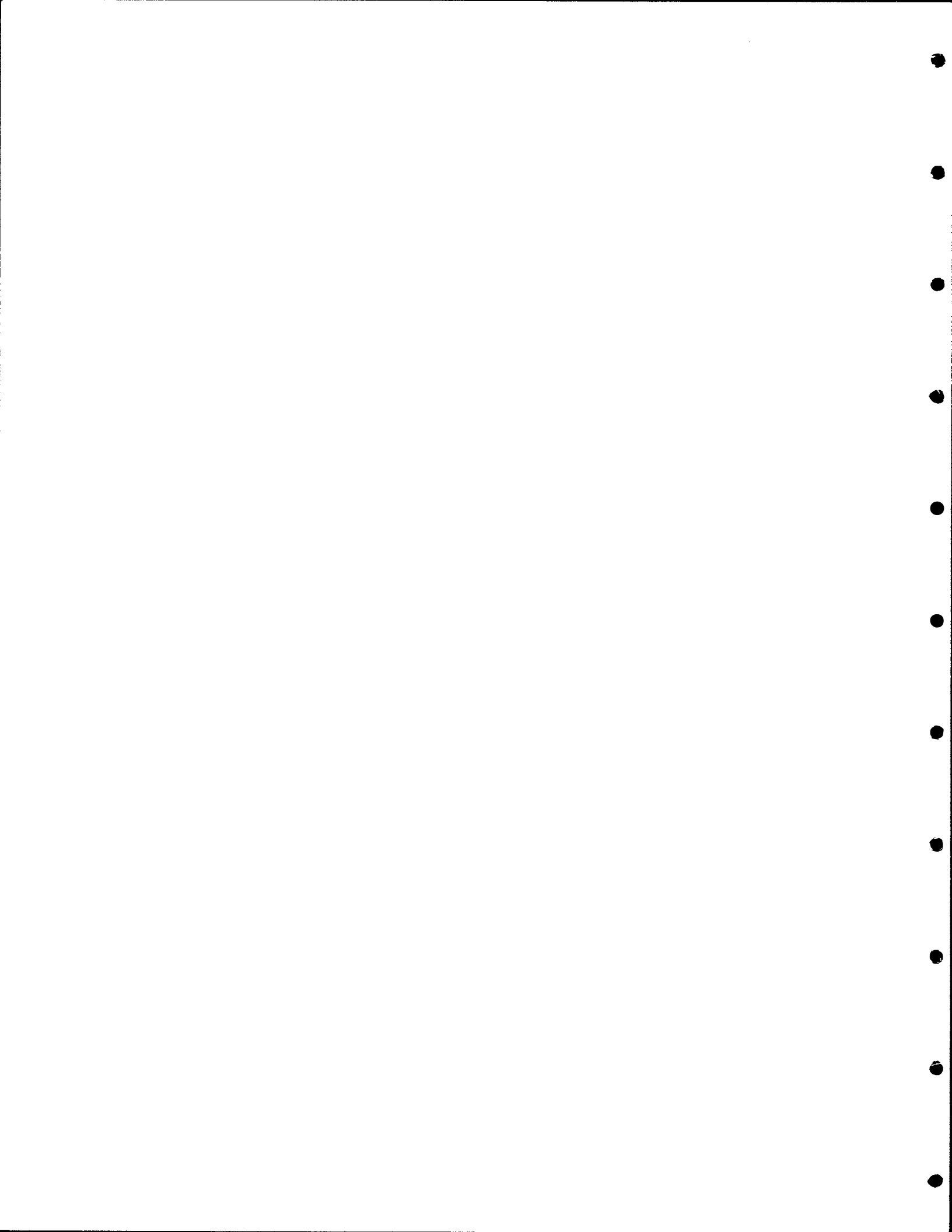
The Draft Facility Planning Supplement (Pages 1 - 21) was filed with the President's Council on Environmental Quality (CEQ) on September 1, 1977. A public meeting was held on October 25, 1977, at Pasco, Washington. Comments received during the public and agency review period which closed on November 18, 1977, were considered in the development of the Final Planning Supplement.

The Draft Facility Location Supplement (Pages 23 - 50) was filed with CEQ on August 30, 1978. A public meeting was held on October 17, 1978 at Burbank, Washington. Comments received during the review period which closed on October 27, 1978, were considered in the development of the Final Location Supplement.

After evaluating the principal economic, technical, and environmental factors associated with this project, and review of public and agency comments received on the Draft Planning Supplement, Alternative Plan B was selected as the Proposed Plan of Service. A Plan of Service Decision section has been included in the Final Planning Supplement under the Description of the Proposal. This Final Planning Supplement identifies the need for the facility, the Proposed Plan, Alternative Plans Considered, factors leading to the plan of service selection, and the predicted environmental impacts. The Facility Location Supplement evaluates the design and route location needs associated with the Proposed Plan of Service.

The following tentative schedule dates for this project are:

Location Surveys	Winter 1978-1979
Land Acquisition	Summer 1979-Summer 1980
Construction	Summer 1980-Spring 1981
Energization	May 1981



FRANKLIN AREA SYSTEM REINFORCEMENT
STUDY AREA 79-1

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DESCRIPTION OF THE PROPOSAL

SYSTEM REQUIREMENTS

Overloads occur on the 230-kV and 115-kV lines in the vicinity of Franklin and McNary during outage conditions when Ice Harbor and McNary generators are peaking and local load is low. If one of the transmission lines serving the area is removed from service the area power requirements must be carried on the remaining lines. These remaining lines will open if overloaded and a large area would be without electric service.

When line loading limits are exceeded, Ice Harbor generation must be reduced to relieve the line overloads and avoid power outages. This means when streamflows are high, water will have to be spilled. The situation is particularly severe for an outage of the McNary-Franklin 230-kV line or one of the two Franklin-Benton 115-kV lines. If such an outage occurs during light load periods, especially during the seasons when irrigation pumps are off, sizable amounts (up to 200,000 kilowatts) of Ice Harbor generation must be cut back to control line loadings.*

A different condition occurs during the late summer peakload period. The area loads are high due to irrigation and the Ice Harbor generation is low. The 115-kV lines from Benton to Franklin will overload for outages between Midway and White Bluffs. Some lines may be opened to relieve the line overloads.

With increased capacity on the Pacific Interties, energy in the Northwest which is now wasted can be exported. The increased probability of energy shortages resulting from delays in thermal plant construction and the need to maximize the use of hydrogeneration, both to make up energy shortages and conserve fuel oil, makes it desirable to provide additional Ice Harbor transmission support and eliminate the waste of hydroenergy. Several alternate plans for accomplishing this have been considered.

THE PROPOSED PLAN OF SERVICE

Alternative Plan B has been selected as the Proposed Plan of Service.

The BPA Lower Monumental-John Day 500-kV line would be connected to the Sacajawea Substation by an approximate 6-mile (10 km) 500-kV tap line. The Sacajawea Substation is near Ice Harbor Dam on the south side of the river. A 500/115-kV transformer and substation terminal facilities would be installed at Sacajawea. This would require an additional 6 acres (2.4 ha) at Sacajawea Substation. The tap point would require 3 acres (1.2 ha) of land (see Figures 1 and 2 following page 2).

*The total amount of energy loss would be dependent upon the nature and duration of the outage in question.

ALTERNATIVE PLANS CONSIDERED

ALTERNATIVE PLAN A

The PP&L Vantage-Walla Walla 230-kV line would be connected to the Levey Substation by an approximate 5-mile (8 km) tap on the north side of the Snake River. The Levey Substation site is near Ice Harbor Dam on the north side of the river. A 230/115-kV transformer and substation terminal facilities would be installed at Levey. The substation would increase in size by about 2 acres (0.8 ha). (Figs. 1 and 2).

ALTERNATIVE PLAN C

A 6-mile (10 km) 115-kV double-circuit line would connect the Sacajawea Substation to a new substation at a tap point on the BPA Lower Monumental-John Day 500-kV line. Substation facilities would require an additional 2 acres (0.8 ha) at the Sacajawea Substation and 11 acres (4.5 ha) at the Lower Monumental-John Day tap point.

ALTERNATIVE PLAN D

A new 27-mile (43 km), 230-kV, single-circuit line would be constructed between McNary and Franklin Substations, adjacent to the existing McNary-Franklin 230-kV transmission line. Part of the existing McNary-Badger Canyon 115-kV transmission line could be removed to allow the construction of a portion of the new line on existing right-of-way. No substation land enlargement would be required.

ALTERNATIVE PLAN E

A new 20-mile (32 km), 230-kV, single-circuit line would be constructed between the McNary Substation and the Badger Canyon tap point. This line may replace part of the existing 115-kV line. No substation land enlargement would be required. However, 230/115-kV transformer additions will be required within existing BPA-owned land, at the Badger Canyon and Franklin Substations.

P L A N O F S E R V I C E D E C I S I O N

Alternative Plan B, 6-mile (10 km) 500-kV tap line with 6 acre (2.4 ha) Sacajawea Substation expansion, has been selected as the proposed Plan of Service. The following is a summary of the principal factors used in the selection of the Proposed Plan.

Economic and Engineering Factors

The alternatives were modeled on the BPA digital computer to simulate the actual operating conditions. Various conditions of possible loadings and outages were investigated to study the adequacy of service to the loads in the area. During the Final Facility Planning Supplement stage it was determined that Alternative Plan A, tap of the PP&L Vantage-Walla Walla

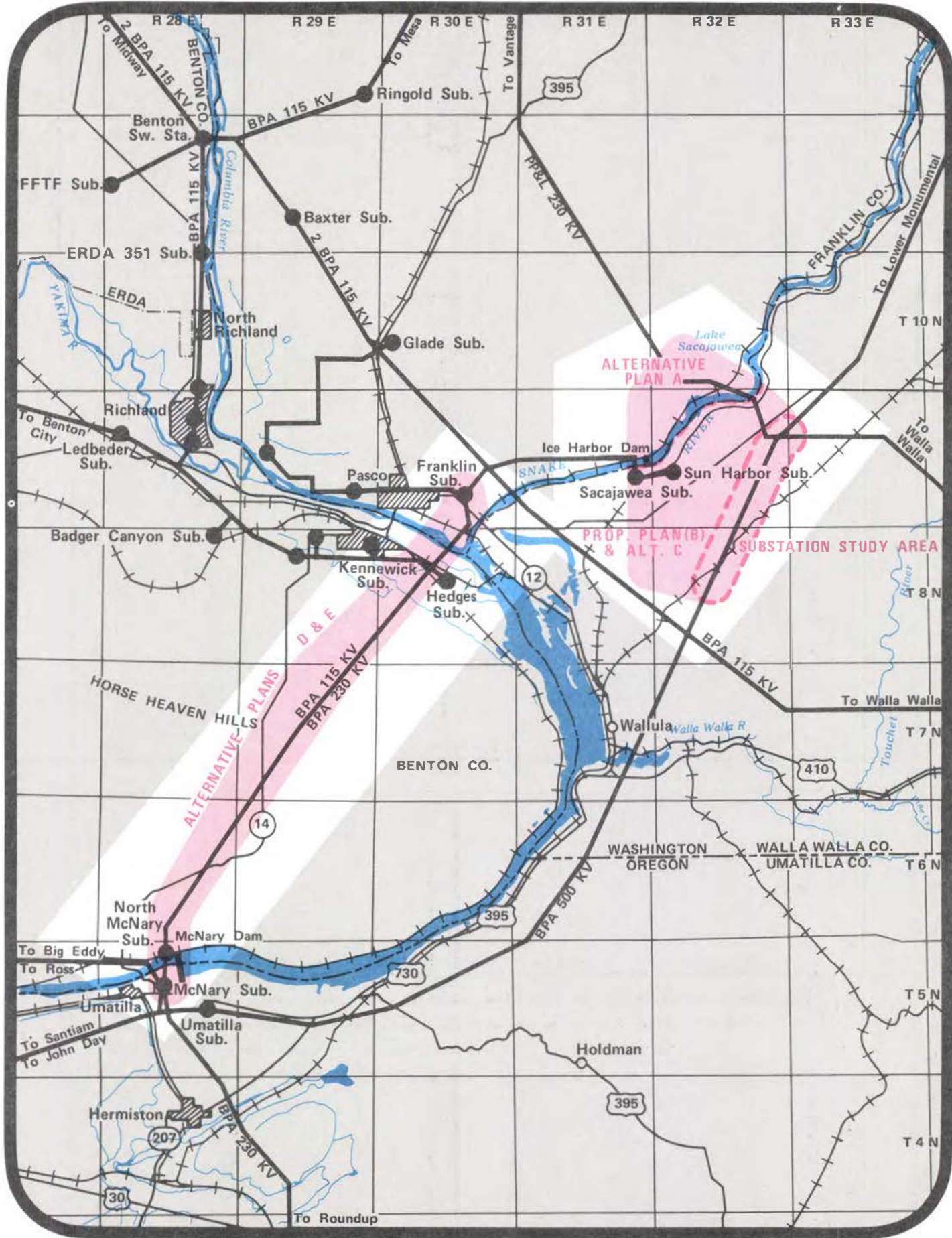


FIGURE 1
 PLANNING STUDY AREA
 FRANKLIN AREA SYSTEM REINFOR.
 79-1

PP&L 230 KV
VANTAGE-WALLA WALLA

115 KV

LEVEY SUB.
ADD 2 ACRES
(0.8 ha)

ALTERNATIVE
PLAN A

SACAJAWEA
SUB.
ADD 6
ACRES
(2.4 ha)

500 KV

ADD 3
ACRES
(1.2 ha)

BUILD
ON 3
ACRES
(1.2 ha)

PROPOSED PLAN
(ALTERNATIVE
PLAN B)

LOWER MONUMENTAL-JOHN DAY

BPA 500 KV

SACAJAWEA
SUB.
ADD 2
ACRES
(0.8 ha)

115 KV

ADD 11
ACRES
(4.5 ha)

BUILD
ON 11
ACRES
(4.5 ha)

ALTERNATIVE
PLAN C

LOWER MONUMENTAL-JOHN DAY

BPA 500 KV

ALTERNATIVE
PLAN D

BPA 115 KV McNARY-BADGER CANYON (RETIRE)

BPA 230 KV FRANKLIN-BADGER CANYON

McNARY
SUB.

BPA 230 KV FRANKLIN-McNARY NO. 2

FRANKLIN
SUB.

230 KV SINGLE CIRCUIT

ALTERNATIVE
PLAN E

BPA 115 KV McNARY-BADGER CANYON (RETIRE)

BPA 230 KV FRANKLIN-BADGER CANYON

McNARY
SUB.

REBUILD AT 230 KV SINGLE CIRCUIT

FRANKLIN
SUB.

BPA 230 KV FRANKLIN-McNARY NO. 2

BADGER CANYON
TAP POINT

EXISTING
CONSTRUCT

FIGURE 2
PLANS CONSIDERED
FRANKLIN AREA SYSTEM REINFORCEMENT
79-1

Franklin Area System Reinforcement
Study Area 79-1

230-kV line to Levey, would not provide sufficient support to the area. However, the Proposed Plan and Alternatives C, D, and E with connections to the BPA 500-kV grid at Sacajawea or McNary would provide adequate support to the area. Plans D and E with 20 miles (32 km) or 27 miles (43 km) of 230-kV line construction are one and one-half to two times more costly than Plans B or C with 6 miles (10 km) of 500-kV or 115-kV construction. Also, since it is more efficient to transmit power at higher voltages than lower voltages, Plan B has approximately 5,000 kilowatts lower losses. Losses are currently valued in excess of \$100 per kilowatt-year for a total loss of \$500,000 per year. The Proposed Plan is preferred over Plan C, as the 6 mile (10 km) 500-kV tap line can carry several times as much power as the double-circuit 115-kV line, and will eliminate the need for some future line construction as the load increases in the area. The Proposed Plan also avoids the development of a new substation at the tap point and associated development and equipment costs. The 3 acres (1.2 ha) of land required at the tap point is for less costly transmission structures. It is less costly to expand the existing Sacajawea Substation than to develop a new substation.

Environmental Factors

A public meeting was held at the Franklin Co. PUD Auditorium, Pasco, Washington, on October 25, 1977, to present the 5 Alternative Plans to the public. Responses to comments from two federal agencies, one county planning department, and comments of two interested citizens who attended the public meeting were also used in the Plan of Service selection.

A new transmission line corridor will be required for the Proposed Plan, 6 miles (10 km) total length, Alternative A, 5 miles (8 km) and Alternative C, 6 miles (10 km). Alternative Plans D and E may parallel existing transmission lines for 27 miles (43 km) and 20 miles (32 km) respectively (see Figures 1 and 2). Existing land uses in the Planning Study Areas of the Proposed Plan and Alternatives A and C are related to the use of sprinkler irrigation systems in the production of grapes, potatoes, sugar beets, alfalfa hay, and cereal grains. The above plans impact sprinkler systems, but do not impact recreational areas. Alternative Plans D and E generally do not impact sprinkler systems, but do moderately impact recreational areas (see Figure 3 on following page). Refer to Figure 4, following page 22, for the degree and likelihood of a plan-by-plan comparison of the environmental impacts in detail. The Proposed Plan and Alternatives A and C do not cross the Columbia River. Alternative Plan D has two crossings and Alternative E one (see Figure 1). BPA has carefully considered the relevant shoreline designations, policies, and regulations of Benton and Franklin Counties Final Shoreline Master Programs in selecting a Proposed Plan. Substation and terminal facilities construction or expansion will require 9 acres (3.6 ha) for the Proposed Plan. Alternatives A, C, D, and E will require 2 acres (0.8 ha), 13 acres (5.3 ha), 0, and 0, acres respectively.

Energy conservation is accomplished in two ways: First without additional Ice Harbor transmission support, water will have to be spilled and

Franklin Area System Reinforcement
Study Area 79-1

hydro-energy wasted during periods of high Columbia River stream flow (see System Requirements p. 1 and Nonconstruction p. 21). Second, it is more efficient (cost of construction vs return on investment and eventual savings to the consuming public) to transmit power at higher voltages than at lower voltages. The Proposed Plan at 500-kV is the most efficient. Alternatives A, C, D, and E are 115-kV double-circuit, 230-kV, and 230-kV respectively (see Figure 2).

D E S C R I P T I O N O F T H E E N V I R O N M E N T

PLANNING STUDY AREA

GEOGRAPHY

The Planning Study Area occupies approximately 350 square miles (906 sq. km) in southcentral Washington near the confluence of the Snake and Columbia Rivers (Fig. 1). Portions of Benton, Franklin, and Walla Walla Counties in Washington State and a very small section of Umatilla County in the State of Oregon are located in the Planning Study Area. The Pasco-Kennewick urban complex is adjacent to the study area boundary, however, only portions of the cities are included within the study area. The planning study area extends for approximately 40 miles (64 km) in the northeast/southwest direction with the southwestern corner encompassing McNary Dam on the Columbia River while the northeastern portion takes in Ice Harbor Dam on the Snake. The Horse Heaven Hills is the principal topographic unit located within the planning study area (Fig. 1).

CLIMATE

The Planning Study Area has a semi-arid climate which is characterized by low annual precipitation, large daily temperature variations, and substantial interseasonal temperature fluctuations. A summary of principal meteorological observations at Umatilla, Kennewick, and Ice Harbor Dam is provided in Table 1, page 5.

Summers are generally hot and dry. The cold winters are moderated by relatively warm air masses. However, extremely cold temperatures are occasionally produced by intrusions of arctic air. Recorded temperature extremes for Kennewick are a maximum of 115°F (45°C) and a minimum of -23°F (-31°C). The frost-free period in the study area varies from around 140 to 160 days per year.

Annual precipitation is less than 10 inches (254 mm) near the Snake and Columbia Rivers and increases to around 15 inches (381 mm) in the higher elevations of the Planning Study Area. Two-thirds of the annual precipitation normally falls from October through March. On the average, the study area receives about 10 inches (254 mm) of snow annually. This represents roughly 10 to 15 percent of the mean annual precipitation total. The prevailing direction of the wind is influenced by topography and varies with the change of seasons. In general, the direction varies

- ① SACAJAWEA STATE PARK
- ② TWO RIVERS PARK
- ③ HOOD PARK
- ④ McNARY RECREATIONAL AREAS
- ⑤ McNARY NATIONAL WILDLIFE REFUGE
- ⑥ McNARY WILDLIFE RECREATION AREA

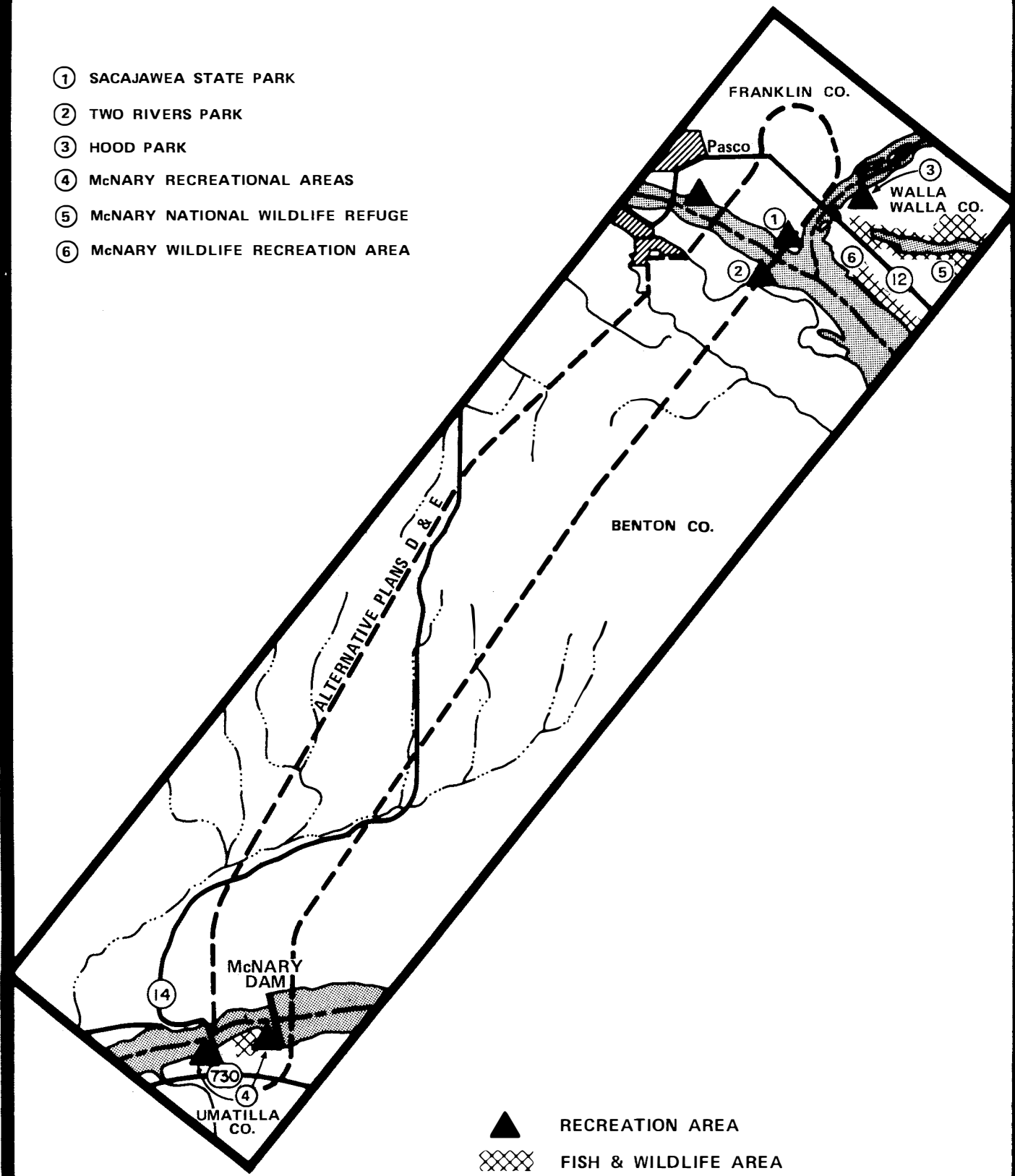
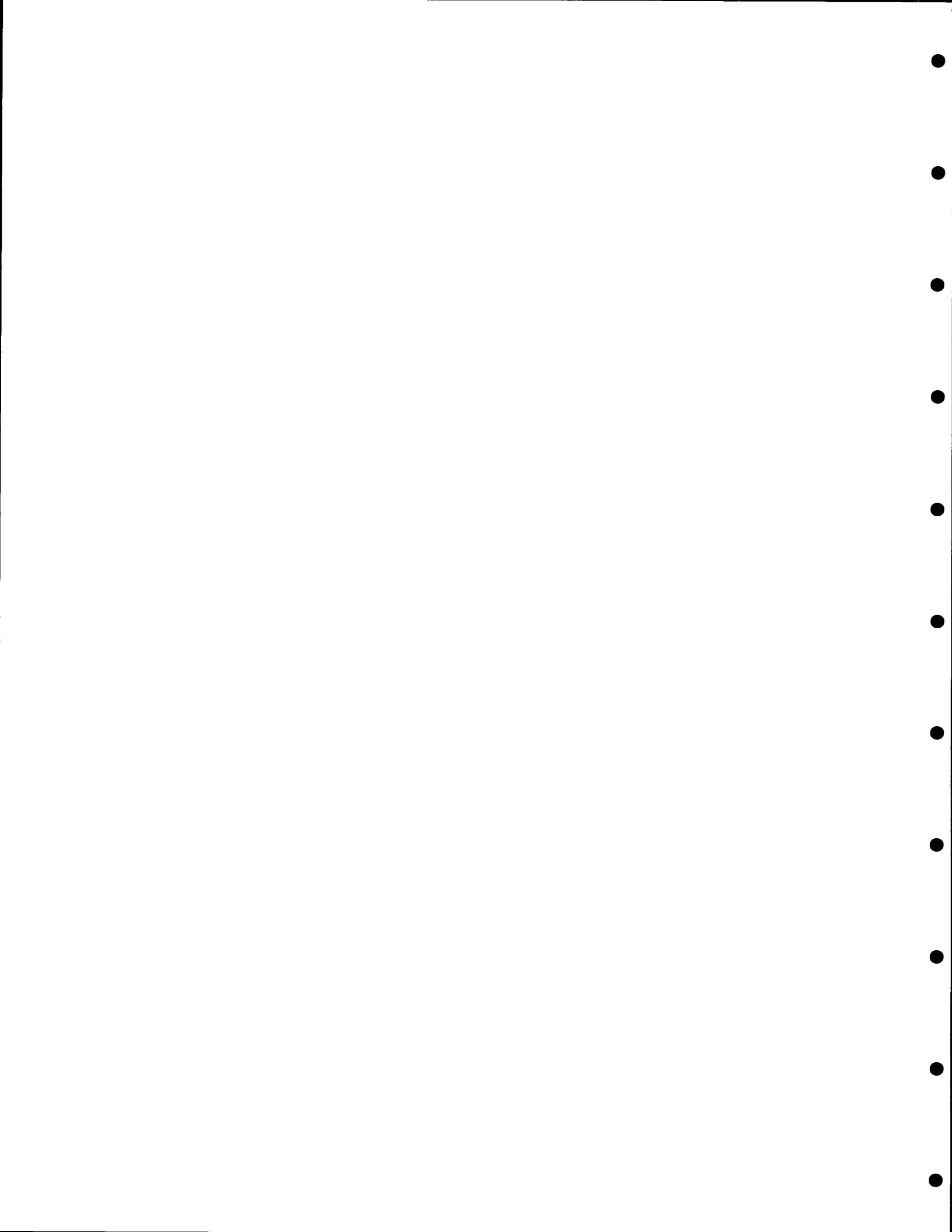


FIGURE 3
 IMPORTANT RESOURCES
 FRANKLIN AREA SYSTEM REINFORCEMENT
 79-1



Franklin Area System Reinforcement
Study Area 79-1

from south to west, with the higher velocities from the southwest or west. During spring and fall, rapidly moving weather systems result in dust storms.

Table 1. - Representative Climatological Data

Characteristic (Mean)	Station		
	Umatilla (1931-60)	Kennewick (1931-60)	Ice Harbor Dam (1957-65)
Annual Temp. (°F) (°C)	53.4 (11.9)	53.6 (12.0)	54.4 (12.4)
Max/Min Jan. Temp. °F (°C)	39.8/24.1 (4.3/-4.4)	38.3/25.0 (3.5/-3.9)	40.8/25.9 (4.9/-3.4)
Max/Min July Temp. °F (°C)	91.1/58.7 (32.8/14.8)	91.5/58.9 (33.1/14.9)	92.3/60.6 (33.5/15.9)
Annual Precip. (inches) (mm)	8.13 (207)	7.49 (190)	9.76 (248)
Jan. Precip. (inches) (mm)	1.08 (27)	1.05 (27)	1.08 (27)
July Precip. (inches) (mm)	0.18 (5)	0.17 (4)	0.16 (4)
Annual Snowfall (inches) (mm)	8.4 (213)	10.7 (272)	--

Source: PNRBC 1969, Climatological Handbook, Vols. I and II

NATURAL RESOURCES

The natural resources of the planning study area are characterized in this section. Their geographic location and distribution within the study area are shown and described. Man's use of the natural resources will be discussed in the section, Resource Use and Socioeconomic Resources.

ATMOSPHERE

Air quality throughout the planning study area is generally quite good. Pollutants associated with agricultural, urban, and industrial development are normally localized. The Kennewick/Pasco urban complex, with the many air pollution-producing activities that are related to it, is a major year-round source of air contamination adjacent to the study area. Agricultural activities contribute significantly to the deterioration of air quality during spring and fall.

The study area is subject to frequent, often strong winds which tend to parallel the Columbia River. Although this wind is beneficial for dispersing much of the urban and industrial types of pollution, it results in dust clouds in recently cultivated areas, disturbed areas, and along

Franklin Area System Reinforcement
Study Area 79-1

unsurfaced roads. Microscopic evaluation of samples obtained at the Umatilla background sampling station^{1/} indicates that about 80 percent by weight of the particulate samples are the result of windblown dust (DEQ 1975). Pollen is another primary source of particulate matter in the atmosphere.

An additional atmospheric factor influencing the quality of the ambient air in the study area is the amount of mixing that takes place. Low mixing or inversion heights tend to result in higher ambient concentrations, as do low wind speeds. These parameters usually undergo daytime variations, tending to be highest in midafternoon and lower in early morning. From a seasonal standpoint, average mixing heights are lowest in winter.

GEOLOGY, SOILS, AND MINERALS

The planning study area is located in the Columbia Basin Physiographic Province (Highsmith 1973). This province is characterized by extensive basalt flows of middle to late Tertiary age. These make up the vast Columbia River Basalt formation which underlies the entire region to great depths. The boundary between the Central Plains and the Yakima Folds subdivisions of the Columbia Basin Physiographic Province cuts across the planning study area in a northwestern to southwestern direction which roughly parallels the Columbia River below Kennewick. The northeastern portion of the study area falls in the Central Plains Subdivision which is a region of vast outwash plains and terraces which have moderate to very deep soils of high fertility. The southwestern portion of the planning study area crosses the east-west anticline known as the Horse Heaven Hills. These hills are part of the Yakima Folds subdivision and rise to elevations of over 2,000 feet (600 m) in the study area.

Earthquake epicenters with Richter magnitudes of 6.3 or less have been recorded within a 50-mile (80 km) radius. Seismic intensities anticipated from earthquakes of the magnitudes experienced near the planning study area do not exceed IX on the Modified Mercalli Scale (Shannon and Wilson 1972).

In general, all the soils were formed under a grassland or shrub-grassland vegetative complex from Plio-Pleistocene glacio-fluvial, lacustrine and/or wind-deposited materials (Franklin and Dyrness 1973). This has resulted in soils of fine sandy loam to silt loam texture of variable depth (CNP Staff 1971). The soils have developed under scant rainfall and are relatively fertile due to the high mineral content. Generally, they are suitable for agricultural production with dryland farming techniques or irrigation, if water is available. The loose, crumbly nature of the soil

^{1/} The Oregon Department of Environmental Quality operates a suspended particulate ambient air monitoring station at Umatilla.

in combination with its tendency for drought makes for erosion problems, especially from wind, in areas where the soil is exposed through cultivation or other disturbance.

HYDROLOGY

The Columbia and Snake Rivers dominate the surface hydrology of the Planning Study Area (Fig. 1). The southwestern corner of the study area encompasses McNary Dam on the Columbia and a portion of its reservoir, Lake Wallula. The Snake River passes through the northeastern section of the study area on the way to its confluence with the Columbia. A portion of Lake Sacajawea, which is a result of the backwater from Ice Harbor Dam on the Snake River, is also included.

Other hydrological features include Dalton Lake which is adjacent to Lake Sacajawea, Columbia Canals, No. 1, 2, and 3 situated southeast of Kennewick, and Smith Canyon Waterway. The Burbank Slough, a significant wetland area partially located in the study area, is administered as part of the McNary National Wildlife Refuge. See the Wildlife and Recreation sections for further discussions of this resource. In addition, a few intermittent streams and wet areas are located throughout the other portions of the planning study area.

VEGETATION

Major vegetation types are rangeland and riparian. Principal rangeland plant species include sagebrush, rabbitbrush, bluebunch wheatgrass, fescue, and cheatgrass. Cheatgrass, an annual that dominates overgrazed rangelands, has good initial holding ability against wind erosion but has little forage value for livestock.

Potholes, irrigation ditches, and the banks of the Columbia River support patches of riparian vegetation such as black cottonwood, willow, Russian olive, cattail, bullrush, and sedges. These species are common where water is available. Although sage and rabbitbrush are the most evident perennial species on the rangeland, spring brings an array of buttercups, balsam root, lupines, larkspur, and phlox.

There are no officially listed threatened and endangered plants in the study area. When a Federal list is adopted and officially published in the Federal Register by the U.S. Fish and Wildlife Service BPA will work with them to explore appropriate mitigation measures.

WILDLIFE

Aquatic habitat consists primarily of segments of the Columbia and Snake Rivers (Fig. 3). These rivers support large runs of anadromous fish including chinook, sockeye, and coho salmon and steelhead trout. The anadromous nonsalmonids, American shad and pacific lamprey are also present. Several resident species, including bass and crappie are found,

Franklin Area System Reinforcement
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especially in backwater areas. These rivers, associated riparian habitat and adjoining agricultural lands attract large numbers of waterfowl during migration and wintering periods. Other concentration areas include McNary National Wildlife Refuge, McNary Wildlife Recreation Area, and the Smith Canyon Canal. Common species include mallard, pintail, greenwing teal, widgeon, coot and Canada goose. A variety of shore and songbirds also inhabit these same areas. Mammals found in or near watercourses include beaver, muskrat, otter, and mink.

Other wildlife habitat within the area consists primarily of shrubs/grass and irrigated and dryland crops. Extensive areas of cover are scarce and deer populations are generally low and uniform throughout the area. Birds found in these areas include large populations of ring-necked pheasant, valley quail, and mourning dove. Other birds characteristic of the area include, horned lark, magpie, and several species of birds-of-prey. The Northern long-billed curlew occurs in the area, however, habitat of this bird is being lost to agricultural development. The Federally endangered American peregrine falcon may also be present at times. Small mammals characteristic of the area include black-tailed jackrabbit, Townsend ground squirrel, badger, deer mouse, kangaroo rat, and pocket gopher.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

The following sections relate man's use of the natural resources previously described.

DEMOGRAPHIC AND ECONOMIC CONSIDERATIONS

Table 2 provides some basic demographic information on the three incorporated cities located adjacent to the planning study area boundaries. Although all three cities experienced growth from 1970 to 1975, the population of Umatilla more than doubled. The study area has an agricultural economic base, however, the urban areas provide a diverse range of other job opportunities.

Table 2. - Population Statistics

Location	Number of People			Percent Change		
	1960	1970	1975	1960-70	1960-75	1970-75
Kennewick	14,244	15,212	18,253	6.8	28.1	20.0
Pasco	14,522	13,920	14,450	-4.1	-0.5	3.8
Umatilla	617	679	1,620	10.0	162.6	138.6

Source: U.S. Bureau of Census, 1973. Census of Population, 1970, Vol. 1. Characteristics of the Population; Center for Population Research and Census (PSU); Population Studies Division (State of Washington).

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Between 1970 and 1975 the population for the City of Umatilla changed from 679 to 1,620. (See Table 2). Part of the population increase resulted from the October 1973 annexation of the McNary townsite. The population of the McNary townsite at the time of annexation was approximately 250. In the 6 months following annexation the townsite had grown by an additional 100 persons. A gradual population growth is likely to continue.

LAND USE

As part of the Environmental Analysis and Preliminary Planning, the Walla Walla, Franklin, Benton and Umatilla County Planning agencies were contacted for information on existing zoning and land use plans. Although all plans will impact to varying degrees land use in the affected counties, there was no expression of incompatibility in the A-95 review except from Franklin County. Franklin County felt that plan A would have an exceptionally high impact or conflict with agricultural land. The compatibility of the proposed facilities with state and local land use plans are presented further in the Draft Facility Location Supplement portion.

Agriculture

Soils are sandy and require irrigation water for production, water must be applied by a sprinkler irrigation system. Side roll, central pivot and solid set systems are the predominant types used. Irrigation water is pumped from the Snake and Columbia Rivers. Typical irrigated crops such as grapes, early potatoes, late potatoes, sugar beets, alfalfa hay, and cereal grains are grown. Per acre yields range, for grapes from 3-1/2 to 5 tons (3 to 5 MT), early potatoes 22 to 25 tons (20 to 23 MT), late potatoes 23 to 27 tons (21 to 24 MT), sugar beets 25 to 30 tons (23 to 27 MT), alfalfa hay 6 to 9 tons (5 to 7 MT), and wheat 80 to 100 bushels (28 to 35 hl). (Bill Ford, Franklin County Extension Agent). These yields compare favorably with the Lower Yakima Valley and exceed the production for the main Columbia Basin. The study area is at a lower elevation and has a longer growing season.

Additional irrigation development is continuing. The area was used for dryland grazing prior to the present irrigation development. Evidence indicates it was over-grazed. Areas with very shallow soils, and steep or odd shaped parcels are still in rangeland vegetation. These areas are not fenced and are not being utilized for grazing. In the Study Area much of the farmland is Class 3 (U.S. Soil Conservation Service Classification); with the application of irrigation water most of the land, not presently being irrigated, may become Class 1.

Forestry

There are no forest-related lands or activities located within the study area.

Urban and Residential

Plan B
Urbanized land uses do not constitute a significant portion of the study area except for several locations near the Snake and Columbia Rivers. In Walla Walla County there has been a recent increase in residential development near the community of Burbank and in the vicinity of Ice Harbor Dam. Near Burbank there is some concentration of industrial land use. Otherwise, the Walla Walla County land in the study area is used and zoned for agriculture.

In Franklin County there is a similar pattern of residential and urban land use near the confluence of the Snake and Columbia Rivers. The area within 1.5 miles (2.4 km) of the Snake River upstream to Ice Harbor Dam is zoned for industry. The remaining portion of Franklin County in the study area is zoned for agriculture.

In Benton County, just southeast of Kennewick, there has been a considerable amount of residential development. This area, with a zoning designation of unclassified, is expected to continue a process of conversion of agricultural land to residential uses. There is also a small area of residential land use near the town of Plymouth one mile northwest of McNary Dam.

Only a very small portion of Oregon's Umatilla County is in the study area. Along the Columbia River the zoning designation is for Open Space and Farm Zone. Residential development located nearby is on the fringe of the town of Umatilla.

Other

The major highway transportation routes through the study area are Washington State Highways 12 and 14 and U.S. Highways 395 and 410, (see Fig. 1). The two railroads with routes within the study area are the Burlington Northern and the Union Pacific. The Burlington Northern follows the Columbia River to Pasco where it turns and parallels the Snake River. The Union Pacific has tracks on the south side of the Columbia River in the central portion of the study area and on the south side of the Snake River in the north portion.

Scattered throughout the study area are canals and water tanks. There are several utility pole lines and an aquaduct. There are many sand and gravel pits in the study area. These constitute the only mining operations within the study area.

ESTHETIC

The landscape in the study area is primarily one of rolling hills with a cover of grasses, sagebrush, and similar vegetation typical of a dry climate. The Snake and Columbia Rivers are major visual features, but when out of view their positive influence on the landscape is lost.

Form, color, and texture, created by diverse topography, waterforms and vegetation are major determinants of many methodologies for the evaluation of visual quality. Using these criteria for judgment, the scenic quality of the study area is generally low. We recognize, however, that esthetics is an area of great subjectivity. Therefore, individual reactions to this or any other landscape can vary widely.

A new and growing element in this landscape is irrigation development. The color and texture contrast afforded by these changes are modifying the appearance of the land. In time they may change the visual character of the landscape from "rangeland" to "rolling farmland."

RECREATION

Much of the recreation within the Planning Study Area is related to the Columbia and Snake Rivers. Both of these rivers are of Statewide significance as defined by the Shorelines Management Act of 1971. In the southern end of the area, the Corps of Engineers maintains McNary Wildlife Park, McNary Beach, boat ramps, picnic areas, viewpoints, and fish viewing facilities (Fig. 3). Water-oriented recreation developments in the north include Sacajawea State Park, Hood Park, and Two Rivers Park. Fishing, boating, swimming, and camping opportunities are available. The study area contains high-quality waterfowl habitat and opportunities for viewing, photographing and hunting waterfowl exist throughout. Particularly important areas for waterfowl and other wildlife are McNary National Wildlife Refuge and McNary Wildlife Recreation Area. Ring-necked pheasant, quail, and mourning dove are hunted in and near the agricultural areas. Water, bicycle, and foot trail corridors have been identified in the area by the Interagency Committee for Outdoor Recreation for planning purposes (IAC 1974).

HISTORICAL, ARCHITECTURAL, AND ARCHEOLOGICAL

In the planning study area of Benton County the following properties are eligible for inclusion in the National Register of Historic Places: Paris archeological site, Wooded Island archeological district, Rattle Snake Springs sites, Ryegrass archeological district, Hanford Island archeological site, Hanford north archeological district, Locke Island archeological district, Snively Canyon archeological district, and Benton County Courthouse. Glade Creek site has been nominated for listing in the National Register. In Franklin County, Strawberry Island Village archeological site has been nominated for listing in the National Register. Savage Island archeological district, and Franklin County Courthouse are eligible for inclusion in the National Register.

The Oregon Historic Preservation Officer reports the Umatilla Landing Site, the Cold Springs Landing Site, and the Umatilla River Arch as historical properties on the Statewide Inventory of Historic Places. He has also reported several archeological sites in the Oregon portion of the study area, mapped by the Smithsonian Institution in 1974.

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Nominations to the Washington Statewide Inventory include the James Moore House, the B. B. Horrigan House, Pentecostal Church of God, Franklin County Courthouse, and the Pasco-Kennewick Highway Bridge, all located at Pasco; the Pasco Reclamation Company Pumping Plant, British Imperial Claim Site at Sacajawea State Park, and the Burlington Northern Railroad Bridge, are also in the study area, east of Pasco.

BPA will comply with the requirements of the National Historic Preservation Act of 1966 (P.L. 89-665), as well as Executive Order 11593. Procedures applicable to these laws are described in Section XII, Historic and Archeological Appendix to the Fiscal Year 1979 Program Statement.

P L A N O F S E R V I C E A N A L Y S I S

POTENTIAL IMPACT OF THE PROPOSAL

The Draft Facility Planning Supplement was submitted for public and agency review on September 1, 1977. BPA has identified Alternative Plan B as the Proposed Plan. The following discussion of impacts relate to that plan. Alternative Plans A, C, D, and E retain this original letter designation and are discussed as well.

The range and duration of potential impacts from the Proposed Plan (Alternative B) would be limited primarily to Agriculture. Grape vineyards and sprinkler irrigation systems may entail a high degree of impact and a high likelihood of impact occurrence (see Figure 4).

A more complete discussion of impacts typically associated with transmission facility construction and maintenance can be found in Appendix B, Chapters V, VI, and VII of the Role EIS.

NATURAL RESOURCES

Atmosphere

Construction, operation, and maintenance activities related to the Proposed Plan would contribute small amounts of air pollutants. Primary pollutants would be fugitive dust raised by moving equipment and vehicles and exhaust from construction equipment and motor vehicles. Substation expansion and the establishment of access roads will result in some windblown dust. These pollutants would be concentrated in the immediate vicinity of construction activities and would occur at intermittent intervals. The new access roads could result in some long-term impacts if the roads remain unsurfaced. Besides the impact on air quality, such pollution could have an esthetic impact because of dust and exhaust visibility. However, the pollutants would be quickly dispersed and the impact short-lived. The mitigating measures normally taken by BPA or the contractors they engage to lessen these impacts are discussed in BPA's Role EIS, Appendix B.

The atmospheric impacts related to the construction, operation, and maintenance activities associated with Alternative Plans A and C would be essentially the same as those described for the Proposed Plan. Atmospheric impacts for Alternative Plans D and E would be similar to those discussed for the proposed Plan, however, the accumulative impacts would be greater due to the additional line length.

Geology, Soils, and Minerals

The anticipated impacts to the geologic and soil resources in the planning study area for the activities required in the Proposed Plan are similar to those described for Alternative Plan A below. However, the transmission line in the Proposed Plan is 6 miles (10 km) and the expansion at Sacajawea Substation will require 6 acres (2.4 ha).

No impact to the geology of the study area is expected from the construction of the facilities in Alternative Plan A. The impacts to the soil environment resulting from the facilities required in Alternative Plan A are expected to be short-term and relatively minor. One of the principal disturbances will occur in the expansion of the Levey Substation. Approximately 2 acres (0.8 ha) of land will be altered at that location for adding the necessary facilities. Another impact could occur if access roads for the 5 miles (8 km) of new transmission line are needed. The dry, light weight soils in the study area are relatively stable, provided the vegetative cover is not disturbed or removed. Once the soil is exposed, it is subject to erosion especially from wind. Spring and fall can be critical times because frost action causes some soil disturbance, especially where the soil is bare. In winter, frozen soils prevent water from percolating downward and erosion in exposed areas can be a problem. Compaction would be a consideration where heavy construction equipment crosses agricultural land. Transmission line impacts to the soil environment should be minor and related primarily to the placement of structures. The mitigating measures normally taken by BPA to keep impacts to a minimum while constructing these facilities are discussed in the Role EIS.

Alternative Plan C will require an additional 11 acres (4.5 ha) for a tap point at the Lower Monumental-John Day line.

No substation expansions are required in Alternative Plan D, however the transmission line is 27 miles (43 km) long. Consequently, the cumulative impacts could be significant even though the anticipated impacts will be similar to those described for the previous plans. Alternative Plan E, will require 20 miles (32 km) of transmission line. Access road impacts for both Alternative Plans D and E, should be reduced if existing rights-of-way and roads are used.

Hydrology

The Proposed Plan and Alternative Plan C are not expected to impact the hydrologic resources of the study area in any way different than described for Alternative Plan A below.

No significant impact to the hydrologic resources in the Planning Study Area are anticipated from Alternative Plan A. Construction and maintenance activities and vehicular movement may cause some minor soil erosion which could result in turbidity and sedimentation to local water bodies. For a discussion of the standard mitigating measures taken by BPA to keep hydrological impacts to a minimum, see BPA's Role EIS.

Alternative Plans D and E will have similar impacts to those described for Alternative Plan A. However, the transmission line required in Alternative Plan D will cross the Columbia River twice--once below McNary Dam and once just above the confluence of the Snake and Columbia Rivers. In addition, this line will have to cross the Columbia Canals Nos. 1, 2, and 3 southeast of Kennewick. Alternative Plan E will only cross the Columbia River once below McNary Dam. No significant impacts to these resources are anticipated with proper location and installation of the structures.

Vegetation

Although the approximate 6 mile (10 km) transmission line required for both the Proposed Plan and Alternative Plan C is slightly longer than Plan A, overall impacts to vegetation would be similar to those described for Plan A. An additional 2 acres (0.8 ha) of grassland habitat will be removed at the existing Sacajawea Substation, and 11 acres (4.5 ha) at the Lower Monumental-John Day tap point for Plan C. Similar habitat to that being removed is abundant nearby.

Approximately 5 miles (8 km) of transmission line required for Alternative Plan A would cross some grassland habitat. Minimal habitat type modification would occur and impacts on natural vegetation are expected to be low. An approximate 2 acre (0.8 ha) additional increase in the Levey Substation required for Plan A would remove some grassland.

Twenty-seven miles (43 km) of 230-kV line for Alternative D and 20 miles (32 km) of 230-kV line for Alternative E would also result in minimal impact on the natural grassland vegetation. If, however, the existing lines are not paralleled or replaced, new access roads may be required with increased vegetation disturbance. Riparian vegetation on the wetlands of the two Columbia River crossings for Plan D would be left if at all possible. Plan E would require only one river crossing near McNary Dam, where riparian vegetation is relatively low growing and probably would not have to be disturbed.

Wildlife

Although the approximately 6 mile (10 km) long transmission line required for the Proposed Plan is slightly longer and of higher voltage than Plan A, overall impacts to wildlife would be similar to those described for Plan A. Relatively little habitat modification would be required for construction of the line. The plan would require removing an additional 6 acres (2.4 ha) of habitat at the existing Sacajawea Substation. Similar habitat to that being removed is abundant nearby and no significant impact on wildlife is expected.

The approximately 5 mile (8 km) long transmission line required for Alternative Plan A would cross primarily crop and grassland habitat. Minimal habitat modification would occur in such areas and impacts on wildlife are expected to be low. Construction activities could cause short-term disturbances to wildlife, however, most species would probably adapt to this temporary intrusion. If construction occurred during the spring, localized disturbance of ground nesting birds could result. No noticeable impacts on such populations are expected. The construction of access roads could result in removal or modification of habitat. In addition, new roads could result in increased human access to wildlife habitat with possible long-term disturbances to wildlife. The line would cross the Smith Canyon Canal, and could result in a slight potential for waterfowl collision mortality. The approximate 2 acre (0.8 ha) increase in Levey Substation required for Plan A would remove some grassland habitat. No noticeable impact on wildlife is expected. Plan A should result in no impacts to endangered or threatened species.

The transmission line and substation enlargement required for Alternative Plan C, would result in impacts to wildlife not significantly different from those of the Proposed Plan. Plan C, however, would require approximately 11 acres (4.5 ha) for a tap point at the Lower Monumental-John Day line. Some habitat would be removed, however, because of the relatively small amount and the abundance of similar habitat in the surrounding area, no significant impact on wildlife is expected.

As with the above plans, the transmission line required for Alternative Plan D would cross primarily grass and cropland where relatively little habitat modification would occur. Because of its longer length, approximately 27 miles (43 km), cumulative modification would be greater. If the line were located parallel to existing lines, existing access roads could probably be used. If however, the line were not parallel, new roads required would increase habitat modification and result in increased human access into the area. Such access, both authorized and unauthorized could result in increased disturbance to wildlife. The transmission line would cross the Columbia River at McNary and at Pasco. The crossings would be in areas of high waterfowl concentrations and could result in some collision mortality. This potential would be somewhat reduced if the crossings were near existing lines. There is no indication that any

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significant collision mortality has resulted from existing line crossings in the area. No significant increase in sedimentation should result from the river crossings and no noticeable fishery impacts are expected.

Although 7 miles (12 km) shorter, the transmission line required for Alternative Plan E would potentially be located in the same area and result in similar wildlife impacts as the line in Plan D. Plan E would require only one Columbia River crossing and would have a lower potential for waterfowl collisions than Plan D.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

Demographic and Economic Considerations

The Proposed Plan would have socioeconomic implications similar to those described for Alternative Plan A below.

The temporary population increase expected from the construction of the facilities proposed in Alternative Plan A is estimated to be between 10 and 20 people (Table 3 on next page). These individuals will require room and board for a 2 to 3-month period. Motels are normally used by construction crews if they are available. It is also estimated that some 5 to 11 temporary jobs would be available to local residents for the duration of the construction projects required in Alternative Plan A. If these people are not available locally, they will have to be recruited elsewhere. The potential income from these jobs to the planning study area is estimated to be about \$45,000.

BPA and the contractors they engage make an effort to use local facilities and equipment whenever it is convenient. Although the multiplier effect of providing services and supplies for these construction projects and their personnel has not been taken into consideration in Table 3, it could be significant.

Alternative Plan C would require 4 to 6 months for completion of the work and the potential income to the local area would be approximately \$68,000 (Table 3).

Alternative Plan D would require 6 to 8 months to complete the job and the potential income to the local area would be about \$58,000. Alternative Plan E would require 4 to 6 months to complete the work and the potential income to the local area would be around \$43,000 (Table 3). Otherwise, the socioeconomic implications from both aspects of Alternative Plans D and E would be similar to those described for Alternative Plan A.

Land Use

Agriculture

Grapes are a perennial crop grown in the study areas of the Proposed Plan, as well as Alternatives A and C. A permanent solid set irrigation system

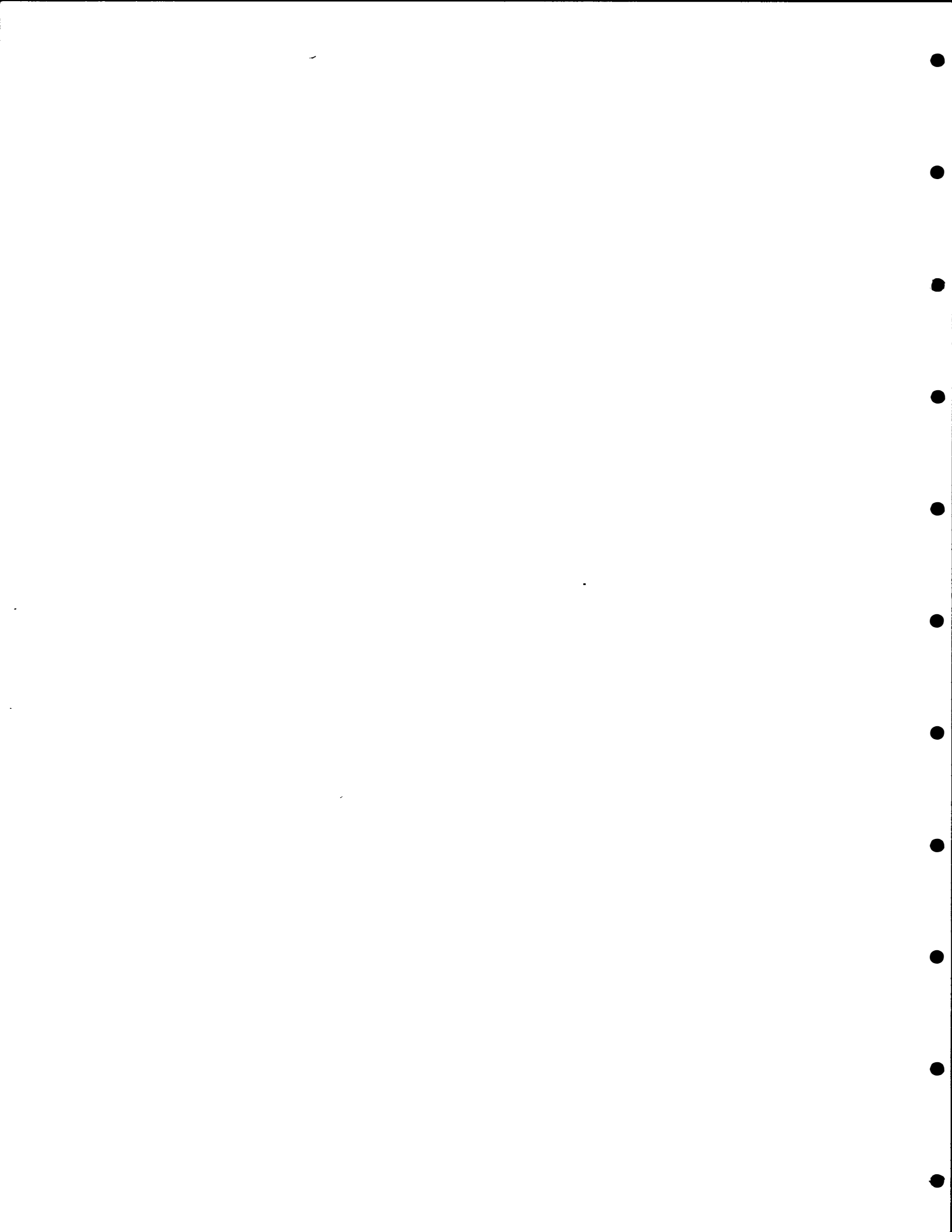
Table 3. Socio-Economic Considerations Related to Construction *

Considerations	Alternative Plan A		Proposed Plan (Alternative Plan B)		Alternative Plan C		Alternative Plan D	Alternative Plan E
	Substation Expansion	Line Construction	Substation Expansion	Line Construction	Substation Tap Point Expansion	Line Construction	Line Construction	Line Construction
Total Number Employed	10-12	10-20	10-12	10-20	10-12	10-20	10-20	10-20
Number Hired From Local Area	3-6	2-5	3-6	2-5	3-6	2-5	4-5	4-5
Length of Job (months)	2-3	2-3	2-3	2-3	4-6	2-3	6-8	4-6
Average Wage (\$ per hour)	8.00	9.00	8.00	9.00	8.00	9.00	9.00	9.00
Est. Potential Increase to Local Area (\$)	23,000	21,600	23,000	21,600	46,000	21,600	57,600	43,200

* Although this information is very general in nature, it is intended to provide some indication of the potential socio-economic impacts associated with substation and line construction.

** This does not take into consideration the income derived from services (i.e., food, entertainment, etc.) provided to construction crews by local businesses.

Source: Line and Substation Construction Sections, Branch of Construction, BPA.



provides the water. Mains and laterals are buried with risers extending above the grapes. The grapes are harvested with a mechanical harvester requiring a radius of 30 feet to turn. A tower in the vineyard would not only require irrigation modification but may eliminate 4 rows of grapes for a distance of 80 feet per tower site.

Agriculture would have a short term impact in the construction phase as the Proposed Plan and each of the alternatives will cross over cultivated farmlands and native grassland. Some farming operations may have long term impacts from the transmission line corridor and substation projects. Alternative Plan A may require about 5 miles (8 km) of 230-kV transmission line and 2 acres (0.8 ha) of additional land at Levey Substation. Alternative Plan C includes 6 miles (10 km) of 115-kV line and will require 2 acres (0.8 ha) at Sacajawea Substation and 11 acres (4.5 ha) of land at Lower Monumental-John Day tap line. Alternative Plan D will include 27 miles (43 km) of 230-kV and Alternative Plan E is planned for 20 miles (32 km) of 230-kV line. Each of these alternatives have similar relationships in that they cross agricultural farmlands and/or native sagebrush-grasslands consisting primarily of Big Sagebrush, rabbitbrush, needle and thread grass, and Indian ricegrass. The length of the line and more towers increases the impact effect.

All of the agricultural lands are irrigated because of the low precipitation of about 7 inches (179 mm). Irrigation provides for high yields and checks wind erosion. The principal irrigation systems are center pivot, side roll, and solid-set. Transmission line towers will be on the edge of circles to minimize any disruption of their use.

The transmission lines could affect safety in aerial application of herbicides, insecticides, fungicides, and fertilizer. Extreme precaution must always be practiced in handling and upending irrigation pipe to avoid contact with the conductor.

Some soil erosion could occur in the disturbed construction areas but can be eliminated in a short period of time by grading, diversion ditches, and seeding. Much of the grape acreage is irrigated by solid-set systems, which can be affected by transmission line tower location. The effects are greater with high value cash crops.

Urban and Residential

Construction of facilities under the Proposed Plan is not expected to have any impact on urbanized land uses.

Construction of facilities under Plan A would not have any direct impact on urbanized land uses. The expansion of Levey Substation would be visible from several nearby rural residences. Depending on final location, the transmission line may be seen from a limited number of rural residences.

Impacts from Plan C would be similar to the Proposed Plan.

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Construction of facilities under Plan D would result in the intrusion of new transmission facilities near the confluence of the Snake and Columbia Rivers. Because this area is undergoing residential development it is likely that there would be visual, noise, and dust impacts on nearby residents. Near McNary Dam the transmission line could have similar impacts on residential land in the vicinity of Plymouth, Washington.

Under Plan E the impacts to urbanized land uses would be limited to the vicinity of Plymouth, Washington, as described above. If the existing 115-kV line were replaced there would be no reduction in the amount of land available for residential development.

Audible noise levels for a 500/115-kV or 500/230-kV transformer at the proposed substation, when energized would be about 76 dB(A) measured at a distance of 100 feet from the noise source, 70 dB(A) at 200 feet, 64 dB(A) at 400 feet, and 58 dB(A) at 800 feet. Because the substation would be located at a considerable distance from any residences, commercial businesses or offices, recreational facilities (camps, parks, or resorts), or other noise-sensitive property, exposure to the transformer noise emissions would not be a source of annoyance. Operational noise levels are specified in the Washington Administrative Noise Code (WAX-173-60-040). The maximum permissible noise level for a substation (industrial noise source) is 70 dB(A) measured at the property boundary of the agricultural land.

Other

Other land uses are not expected to be impacted as a result of the construction or operation of the proposed facilities.

Esthetic

Under the Proposed Plan the transmission line would cross State Highway 124 where, due to the terrain and lack of vegetative cover, it could be visible for several miles. There are a few farm residences in the area from which the line could be seen. The additions to Sacajawea Substation would be visible from the south access road to Ice Harbor Dam. The changes, however, would not be apparent to the casual viewer.

Under Plan A the transmission line would likely cross the Pasco-Kahlotus Road where, due to the terrain and lack of vegetative cover, it would be visible for several miles. The line could also be visible from some of the limited number of residences in this portion of the study area. Depending upon final location, portions of the line could be seen from the Snake River. The additions at Levey Substation would be visible from the

north access road to Ice Harbor Dam and several nearby residences. Because of the existing visual impacts created by the substation and transmission facilities, the additions would not be readily apparent. Portions of the transmission line may parallel an existing line with a reduction in the overall visual impact of the new line.

Under Plan C the impacts would be similar to the Proposed Plan except for the additional impact of the substation facilities at the Lower Monumental-John Day tap point. The substation might be visible from a farm residence near the existing line.

Under Plan D, the transmission line would cross the Columbia River twice and would be situated in growing residential areas southeast of Kennewick. Although there are existing transmission facilities in this area, the close proximity to residents and users of the Columbia River would cause the addition of new facilities to be readily apparent. In other portions of the study area the additional transmission line would not significantly increase existing visual impacts. If the new line were not parallel to an existing line, visual impacts could increase because of the intrusion of a transmission line into a new area. It is unlikely that a new corridor could entirely avoid the congestion of residential development southeast of Kennewick and near the confluence of the Snake and Columbia Rivers.

Under Plan E the visual impacts on residential areas southeast of Kennewick could be avoided. If the 20 miles (32 km) of new line replaced an existing transmission line there would likely be no change in existing conditions. A route parallel to the existing line would add to the visual complexity of the corridor but should not significantly alter existing conditions. If the new line were not parallel to existing lines the visual impact would be greater because of the intrusion of a transmission facility into a previously undisturbed area.

Recreation

The facilities required for the Proposed Plan and Alternative C could result in some visual impact on hunters as described below for Plan A, but would be less likely to affect recreationists using the Snake River. The transmission line would cross Highway 124 which is used by recreationists, possibly resulting in additional visual impact.

Alternative Plan A is not expected to have any direct impact on developed recreational areas. The facilities would be located in an area used by upland bird and waterfowl hunters. The facilities could interfere with hunting activities in localized areas. This interference would involve the effect of the facilities on the visual component of the recreational experience. Depending on the final alinement there also could be visual

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impacts to recreationists on and near the Snake River. Visual impacts are covered in the section, "Esthetics."

Alternative Plans D and E would have impacts similar to those described for Plan A. The potential for both short and long-term visual impacts to recreationists using the Columbia and associated recreation areas is greatest for Plan D as this would require two river crossings. Such impacts, for both D and E, would probably be less if the crossings were adjacent to existing lines. The transmission line in Plan D would probably cross Sacajawea State Park in a corridor with existing transmission lines. The line would add to the long-term visual impact created by the existing lines. Short-term impacts resulting from noise and dust would occur in the park during construction.

Historical, Architectural, and Archeological

At this stage in the planning process no effect is expected on the Strawberry Island Village Archeological Site, now pending nomination to the National Register. Historic sites identified in the Washington Statewide Inventory of Historic Places are not expected to be affected by the Proposed Plan or Alternatives A or C. There is a low likelihood that Alternatives D and E may be viewed from the three historical properties on the Oregon Statewide Inventory of Historic Places, depending on ultimate line location.

An archeologic and historic evaluation will occur at the Facility Location stage. Should any additional properties be discovered during this process, procedural steps and protective measures as described in BPA's Role EIS would be taken. Additionally, contract specifications require that if a site is discovered during construction, work would be halted until the site has been evaluated.

NONCONSTRUCTION

Nonconstruction of the above described facilities will result in overloads on Ice Harbor transmission lines during outage conditions and when Ice Harbor generators are peaking and local load is low. Overloading will occur when stream flow and Ice Harbor generators are low but irrigation demand is high. Without additional Ice Harbor transmission support, water will have to be spilled and hydroenergy wasted during these periods of high stream flows especially during periods of nonirrigation or outages on other nearby lines. With additional transmission support it would be possible to utilize all of the energy from the area which is now wasted.

SUMMARY OF PLAN OF SERVICE ANALYSIS

INTRODUCTION

Resources and uses previously identified as highly important, critical or unique are given special attention in planning and construction of

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transmission facilities. Predictions of potential impacts to these important features (Fig. 4) are based upon past BPA experience, information from numerous agencies and individuals, and on the expertise from environmental specialists within BPA. Predictions of possible impacts are meant to facilitate comparisons of the environmental aspects of system alternatives which at the planning stage are represented by broad corridors.

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In Figure 4, on the next three pages, two factors are considered in evaluating impacts (1) the likelihood of an impact occurrence, and (2) the expected degree of impact.

LIKELIHOOD OF IMPACT OCCURRENCE

The following designations are used to evaluate the likelihood of an impact and are provided to facilitate understanding of the tables in Figure 4:

- Low - Resources or use is a point source or occupies a small portion of the study area and could be avoided in final alinement. Low includes those resources and uses in degree of impact category None.
- Medium - Resource or use partially occupies a corridor and may be impacted in final alinement.
- High - Resource or use entirely transverses a corridor and would be impacted if final alinement were within the presently defined corridors.

DEGREE OF IMPACT

These designations are used to evaluate the degree of impact:

- Slight - Modifications as a result of construction and maintenance activities with no noticeable long-term changes in conditions expected.
- Moderate - Modifications as a result of construction and maintenance activities with noticeable long-term changes in conditions possible.
- High - Modifications as a result of construction and maintenance activities with highly noticeable long-term changes in conditions possible.
- None - Due to the compatibility of the resource with transmission facilities, or the low likelihood of an interaction between the resource and the transmission facility, we expect no significant measureable adverse impacts.
- Unknown - Due to the nature of the resource, or lack of available data, we are unable to predict impacts.

Alternative Plan A

Proposed Plan
(Alternative Plan B)

Impact
Adverse

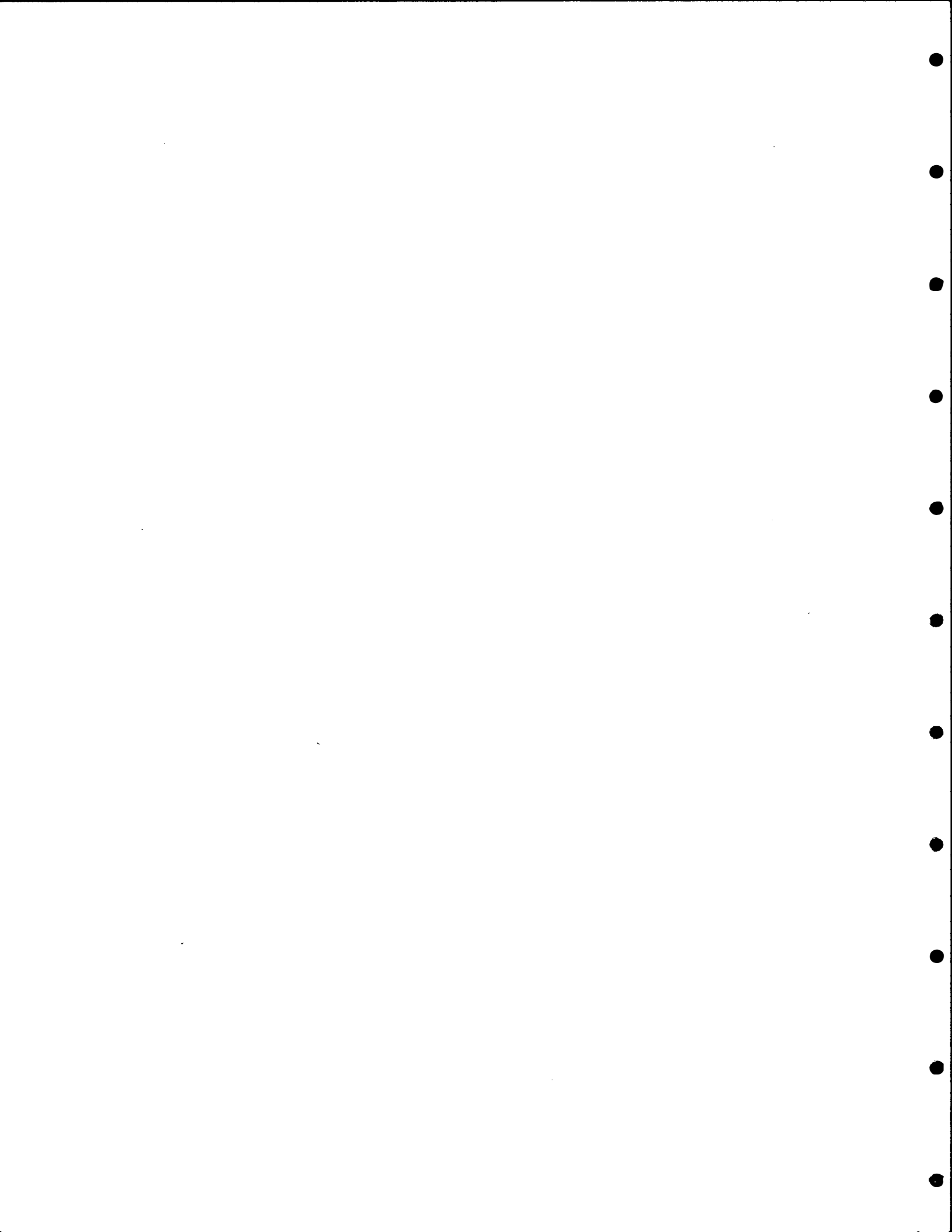
Impact
Adverse

	High	Mod	Sli	None	Unknown	High	Mod	Sli	None	Unknown
<u>Agriculture:</u>										
Grape Vineyards	●					●				
Soils			●					●		
Sprinkler Irrigation Systems	●					●				
Hydrology			◐					◐		
<u>Recreation:</u>										
Sacajawea State Park				○					○	
Two Rivers Park				○					○	
Hood Park				○					○	
McNary Recreational Areas				○					○	
McNary National Wildlife Refuge				○					○	
McNary Wildlife Recreation Area				○					○	
Urbanized Land Uses				○					○	
<u>Wildlife:</u>										
Anadromous fishery				○					○	
Waterfowl			◐					○		
Upland birds			○					○		
Endangered Peregrine falcon				○					○	

Likelihood of Impact Occurrence:

- = Low
- ◐ = Medium
- = High

Figure 4. - Potential Adverse Impacts on Important Resources and Uses Within the Planning Study Area (the nature of the impacts is described in the narrative).



Alternative Plan C
Impact
Adverse

Alternative Plan D
Impact
Adverse

	High	Mod	Sli	None	Unknown	High	Mod	Sli	None	Unknown
<u>Agriculture:</u>										
Grape Vineyards	●								○	
Soils			●					●		
Sprinkler Irrigation Systems	●							○		
Hydrology			◐					◐		
<u>Recreation:</u>										
Sacajawea State Park				○			●			
Two Rivers Park				○			●			
Hood Park				○				○		
McNary Recreational Areas				○			◐			
McNary National Wildlife Refuge				○					○	
McNary Wildlife Recreation Areas				○					○	
Urbanized Land Uses				○			◐			
<u>Wildlife:</u>										
Anadromous fishery			○						○	
Waterfowl			○				◐			
Upland birds			◐					◐		
Endangered Peregrine falcon				○					○	

Likelihood of Impact Occurrence:

- = Low
- ◐ = Medium
- = High

Figure 4. - Potential Adverse Impacts on Important Resources and Uses Within the Planning Study Area (the nature of the impacts is described in the narrative).

Alternative Plan E

Impact
Adverse

	High	Mod	Sli	None	Unknown
<u>Agriculture:</u>					
Grape Vineyards				○	
Soils			●		
Sprinkler Irrigation Systems			○		
Hydrology			◐		
<u>Recreation:</u>					
Sacajawea State Park				○	
Two Rivers Park				○	
Hood Park				○	
McNary Recreational Areas		◐			
McNary National Wildlife Refuge				○	
McNary Wildlife Recreation Area				○	
Urbanized Land Uses		○			
<u>Wildlife:</u>					
Anadromous fishery			○		
Waterfowl		○			
Upland birds			◐		
Endangered Peregrine falcon				○	

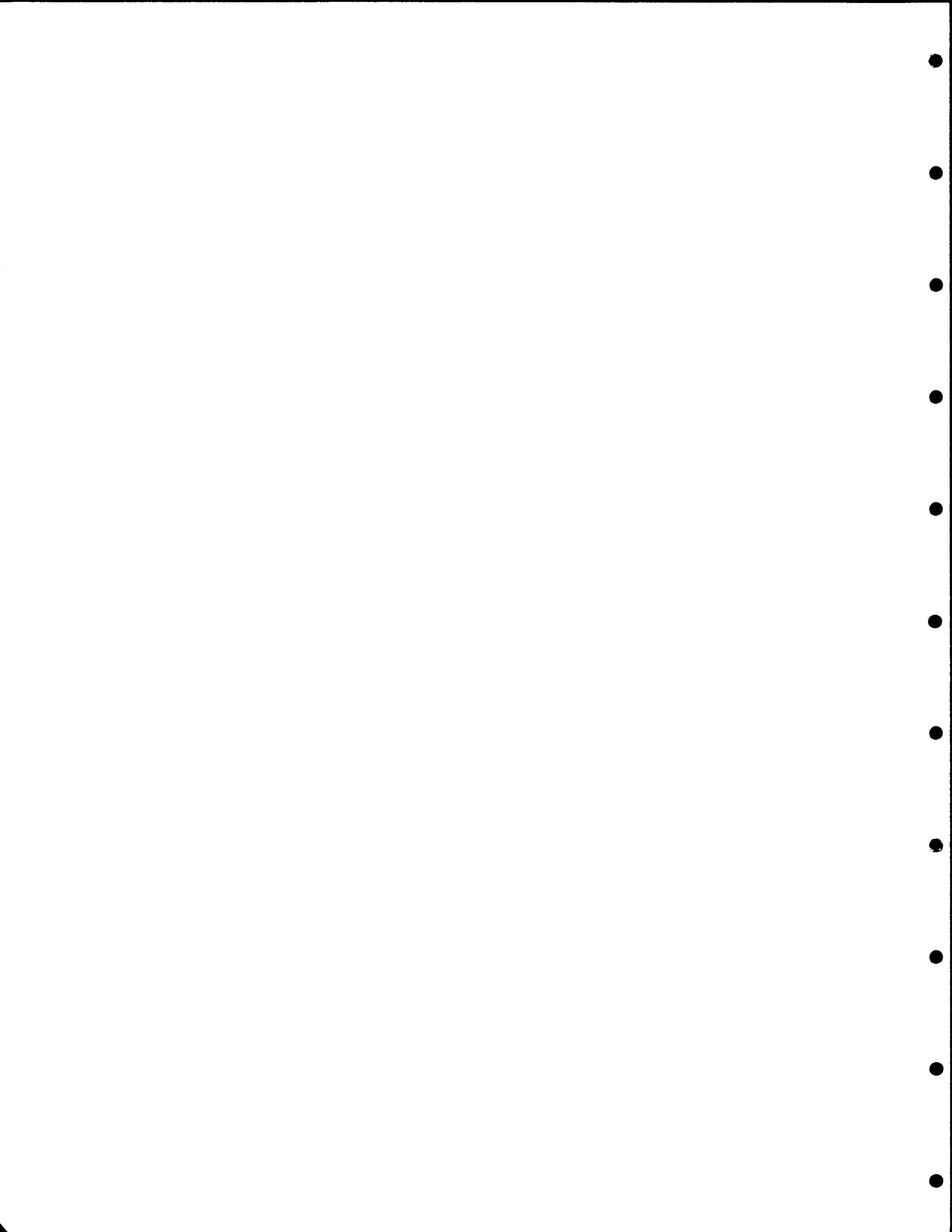
Likelihood of Impact Occurrence:

- = Low
- ◐ = Medium
- = High

Figure 4. - Potential Adverse Impacts on Important Resources and Uses Within the Planning Study Area (the nature of the impacts is described in the narrative).

FINAL FACILITY LOCATION PHASE
FOR
FRANKLIN AREA SYSTEM REINFORCEMENT

FY 79-1



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

Two alternative transmission line routes were identified for the Proposed Plan of Service Plan B. A proposed route has now been selected from these two. Environmental, economic, and engineering studies have been completed and public and agency inputs received and evaluated.

DESCRIPTION OF ROUTES CONSIDERED

INTRODUCTION

Route 1 and Proposed Route 2 have been evaluated. Other routes satisfying Plan B would either impact homes, interfere with a private airstrip, cross more dryland or irrigated cropland, cost more, or a combination of these.

The area studied and routes identified are shown on Figure 6 following Figure 5 on the next page. Natural and socioeconomic resource information presented in the previous section may be supplemented in some of the impact discussions to follow. Appropriate sections will identify impacts, routes, and specific mitigating measures as they relate to resources.

LOCATION DESCRIPTION

Note Figure 6 with following discussion. Both routes will require an additional 6 acres (2.4 ha) at Sacajawea Substation. The tap point would require 3 acres (1.2 ha) of land.

Route 1. This 5.2-mile (8.4 km) route would begin at the existing Sacajawea Substation, 0.5 miles (0.8 km) southwest of Ice Harbor Dam, and proceed southeast for 1.6 miles (2.6 km). Route 1 would then turn due east along a section line for 3.6 miles (5.8 km) to where it would tap the existing single-circuit Lower Monumental-John Day 500-kV line.

Proposed Route 2. This 6-mile (9.7 km) route would also begin at the Sacajawea Substation and proceed one mile (1.6 km) southeast, 1.3 miles (2.1 km) due south along the range line between R31E and R32E, and 3.7 miles (6.0 km) due east along township line separating T8N and T9N to a tap point on the Lower Monumental-John Day 500-kV line.

GENERAL CONSTRUCTION REQUIREMENTS

Tower Design and Material Requirements

The steel towers of the Lower Monumental-John Day 500-kV single-circuit line, as shown on Figure 6 following Figure 5 are similar to the towers

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that would be used for Route 1 or Proposed Route 2. The tower steel would average 90 tons (81.63 metric tons) per mile and the conductor 32 tons (28.5 metric tons). A 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 required at each tower site for tower assembly and erection. Along the routes, it is unlikely that terrain would warrant blading of tower sites.

Right-of-Way Requirements

Either route would be on new right-of-way, neither replacing or paralleling an existing electrical transmission line. Right-of-way width would be 125 feet (37.5 m) or 15.2 acres per mile (62. ha per km). Note summary Table 4 on the next page.

Access Road Requirements

For construction and maintenance, access would be required to each tower site. Existing roads will be used where possible. BPA acquires easement on existing private roads where needed. In agricultural areas the property owner would also be paid for crop damage caused during construction, and during subsequent operation and maintenance of the transmission line. Development of the access road system would be coordinated with landowners to accommodate their present and future road requirements to the extent possible. The 2 miles (3.2 km) of line to be constructed on the east end of Route 1 is through cultivated dry wheatland with potential for irrigation. Due to the fragile sandy soils in this area and heavy equipment needed for construction of the line, a gravel base, 16 feet (4.9 m) wide will be required for part or all of the road. The road will be built on or near the section line. All other roads required during construction or maintenance will be kept to the minimum width possible. A 20-foot (6 m) wide easement would be acquired on existing private roads. New access roads would need a right-of-way 16 feet (4.8 m) wide plus cuts and fills. (See Table 4 on next page.)

Other Construction Characteristics

For details on construction activities, their sequence, and scope, see Chapter V of Appendix B of the Role EIS. No clearing would be necessary except for tower sites, access roads, and pulling and reeling sites. No trees are in the study area. Pulling and reeling sites could be located at Sacajawea Substation, the tap point and two or three sites between.

Cost Requirements

Note Table 4 for route cost comparison. Due to its greater length and additional angle structures, Proposed Route 2 is more expensive.

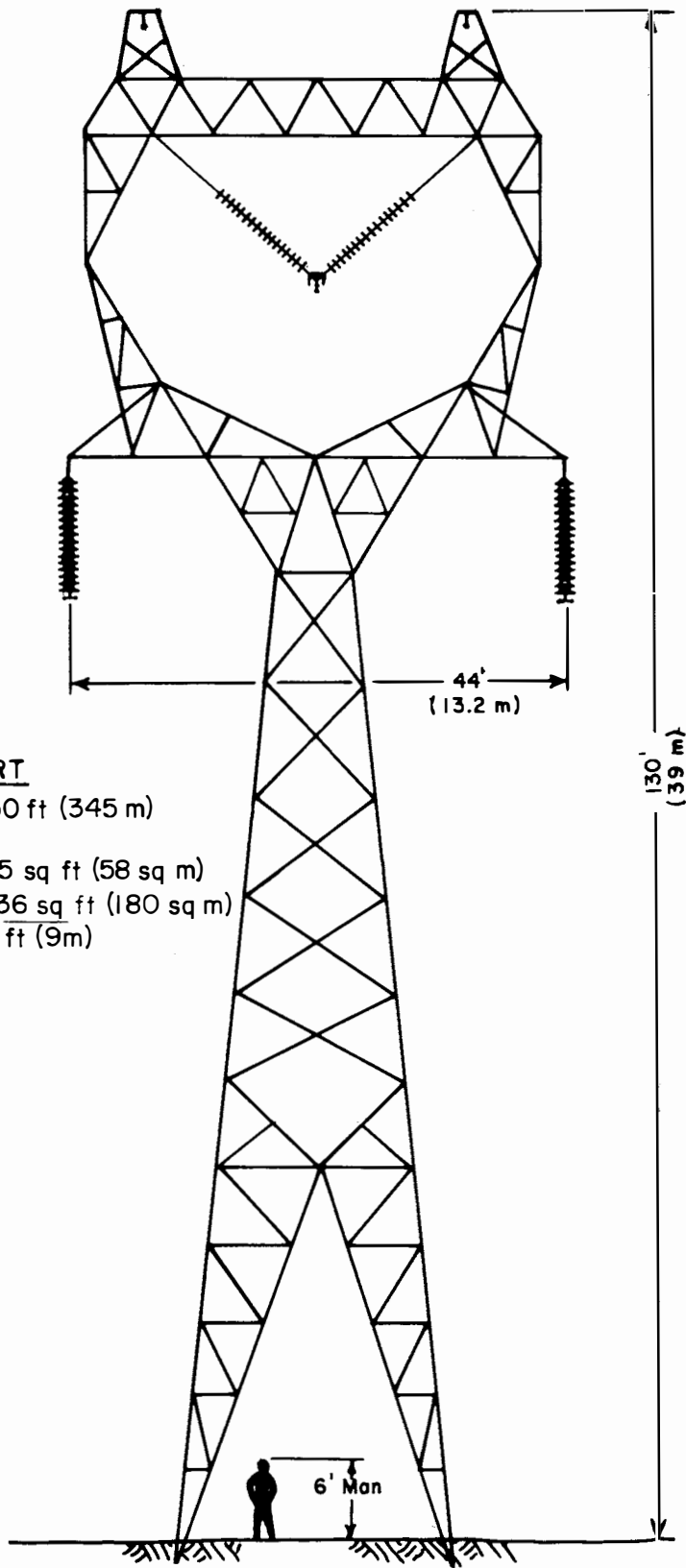
OPERATION AND MAINTENANCE REQUIREMENTS

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



FIGURE 5
 POTENTIAL ROUTES
 FRANKLIN AREA SYSTEM REINFORCEMENT
 79-1





TOWER DESIGN CHART

Avg. Span Length = 1150 ft (345 m)
 Tower Base Dims.
 (Suspension) = 625 sq ft (58 sq m)
 (Dead End) = 1936 sq ft (180 sq m)
 Min. Ground Cl. = 35 ft (9m)

TYPICAL 500 KV
 SINGLE CIRCUIT SUSPENSION TOWER

NOT TO SCALE

FIGURE 6
 TYPICAL TOWER CONFIGURATION
 FRANKLIN AREA SYSTEM REINFORCEMENT
 79-1



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Table 4. -- Route Construction Requirements Summary

Requirement		Route 1	Proposed Route 2
Line length (miles/kilometers)	<u>1/</u>	5.2/8.4	6.0/9.6
Tower height, average (feet/meters)		125/37.5	same
Conductor to ground clearance, minimum (feet/meters)		35/10.5	same
Tower sites area required for construction total (acres/hectares)		12/4.9	14/5.7
Tower bases, total permanent area required (acres/hectares)		0.5/0.2	0.6/0.2
Tower Steel, total (tons/metric tons)		484/439	580/526
Conductor, total (tons/metric tons)		170/154	197/179
Pulling and reeling sites, maximum number		4	5
Transmission line right-of-way (R/W) <u>2/</u> requirements (acres/hectares)		79/32.0	91/36.9
Tower type; steel single-circuit Delta 500-kV		same	same
Access Roads (miles/kilometers):			
Existing private roads			
on R/W		1.4/2.2	3.7/5.9
off R/W		0.3/0.5	0.7/1.1
Permanent new roads			
on R/W		2.1/3.4	none
off R/W		none	none
Temporary roads			
on R/W		0.5/0.8	0.8/1.3
off R/W		0.7/1.1	0.5/0.8
Cost of transmission line		\$1,510,000	\$1,770,000

1/ All values are estimates

2/ R/W - Right-of-way

THE POTENTIAL IMPACTS OF THE ROUTES AND THEIR MITIGATION

NATURAL RESOURCES

Discussions to follow will describe routes, impacts, and specific mitigation measures to important natural resources found in proximity to each alternative route. Refer to the "Description of the Environment" and "Plan of Service Analysis" sections for basic information.

Atmosphere

Atmospheric conditions and potential impacts have been described in the planning supplement.

Geology, Soil, and Mineralization

The geology and soil resources along each route are similar. Limited gravel extraction has occurred adjacent to this area, but gravel extraction has not occurred, nor is it anticipated along the alternate routes.

Both routes are on old Snake River terraces approximately 100 feet (30 m) above the current river level. Elevation along the routes ranges from 500 feet (150 m) near Sacajawea Substation to 980 feet (294 m) near the southern tap point. Slopes on these terraces range from 0 to 10 percent.

From Sacajawea Substation, southeast, 1.5 miles (2.4 km), the two routes are identical. In this area fine sands and sandy loam soils would be crossed. These soils are 1 to 2 feet (0.3 to 0.6 m) deep and overlie 10 to 20 feet (3 to 6 m) of silt and sand intermixed with gravel deposits. Near the substation, small outcrops of basalt would be crossed. These soils have a low to moderate production capability and are currently used for rangeland and irrigated crops.

Eastward from the point where the two routes separate, rock exposures are rare.

Soils in this area are of the same texture, but generally greater than 5 feet (1.5 m) deep. Locally, gravel deposits occur in the subsoil. Soils in this area have a moderate production capability and are currently used for irrigated crops.

Impacts to the geology and soils would be slight along these routes. Refer to Table 4 for access road requirements. Temporary access roads would reduce the time soil is exposed and limit the potential of wind erosion. Construction of access roads would produce minimal soil disturbances in this area.

Excavation for tower footings would be necessary and could include blasting in basalt to achieve adequate tower footings. Vehicle operation

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and tower footing excavations would disturb the soil surface and increase the potential for wind erosion.

The use of access roads could produce slight compaction; exposed soil could be subject to wind erosion; and soil exposed near irrigation systems could be subject to water erosion. These potential impacts would be mitigated as set forth in the Role Statement, Appendix B, Chapter VIII.

Hydrology

The Snake River is the major hydrologic resource in the area. A minor aquifer of undetermined extent was identified by the Corps of Engineers during test boring near Ice Harbor Dam. The aquifer had an artesian effect and yielded 37 gallons per minute (140 litres per minute). Neither of these resources would be directly impacted by construction of the transmission line.

Vegetation

Much of the natural vegetation along both routes has been displaced by irrigated farmland. Approximately 5.1 acres (2 ha) of natural vegetation would be temporarily disturbed with 0.5 acres (0.2 ha) permanently lost. Impacts would be minimal except for the possible spread of noxious weeds resulting from the disturbance of soil during the construction phase of the transmission line. BPA would follow any noxious weed program as identified by local agencies.

Every effort is taken by BPA to prevent or minimize adverse impacts to endangered and threatened plants, pursuant to the Endangered Species Act of 1973 (PL 93-205), and Oregon State Law "Wild Flowers", Chapter 564, 1963. BPA is also working with the U.S. Fish and Wildlife Service to explore appropriate mitigation measures.

To date 15 endangered and 2 threatened plants have been listed on the "U.S. List of Endangered and Threatened Wildlife and Plants" (Federal Register, August 11, 1977 and Federal Register, April 26, 1978). From the best information known to date, none of the 17 plants are in the study area.

Wildlife

Route 1 and the Proposed Route 2 are primarily irrigated or dryland cropland habitat with minor amounts of shrub/grassland.

Habitat modification from construction along both routes should be minimal with only temporary disturbance. If construction occurred during the spring, disturbances of ground-nesting birds could result. Slight mortality would occur, but overall populations are not expected to be

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significantly impacted. Impact to ground-nesting birds would be less if construction was not scheduled in April or May. Although the endangered American peregrine falcon may be present at times within the area, no impacts are expected to it or any endangered or threatened species listed by the U.S. Fish and Wildlife Service. Raptors could benefit from using the towers as perches and nesting sites. BPA did not do any studies of bird flights specifically for this project, but based on a recent study by Meyer (1978) ^{1/} we would not expect any biologically significant mortality due to collisions. We are not aware of information that the study area (Figure 6) is a highly used flyway.

A recent study conducted by James R. Meyer (WICHE) was prepared for BPA. The study was on the effects of transmission lines on bird flight behavior and collision mortality, and included areas in eastern Washington. This study concluded bird mortality due to collisions with the transmission lines was not biologically significant. However, there did appear to be a conflict or interference between transmission lines and waterfowl hunting.

RESOURCE USE AND SOCIOECONOMIC RESOURCES

Discussions to follow will describe impacts to socioeconomic resource use found in proximity to each alternate route. Refer to the "Description of the Environment" and "Plan of Service" sections for basic information.

Demographic and Economic Considerations

All of the routes in this plan are relatively short and would require about four months to construct. The size of the construction crew would be 12 to 15 persons. This would depend on the contractor who does the work.

The nearest incorporated cities to the study area are Pasco, Kennewick, and Richland, about 10 miles (16 km) away. Population statistics for these cities are shown on Table 2 on page 8.

Because of the lack of transient facilities in the study area, the crew would probably reside in motels or mobile home parks in Pasco or Kennewick.

Crane operators, iron and other skilled workers, from the Tri-Cities area may be utilized for this project.

1/ 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. 201pp.

Land Use

We have reviewed the Walla Walla County Land Use Plan and we have determined that both of the routes are compatible with the Land Use Plan. Refer to the "Consultation and Coordination with Others" section for additional planning coordination information. Agriculture is the dominant land use proposed in the local land use plan. BPA activities would not substantially affect agricultural activities, but it could have a localized impact in a few areas. Mitigation efforts will include designing and locating structures along field lines to reduce impacts. BPA believes implementation of these mitigation measures and those in the Role EIS Appendix B will bring this project substantially in compliance with the local land use plan. Land use changes where the transmission towers are located. Suspension tower bases require 625 sq. ft. (2.3. m²).

Dead-end tower bases require 1,936 sq. ft. (4.0 m²). The remainder of the easement is not changed.

Agriculture

Prime and Unique Farmland

This resource is addressed in compliance with Section 102(2)(C), the National Environmental Policy Act (NEPA) and Council on Environmental Quality (CEQ) memorandum to heads of Federal agencies August 30, 1976.

The Walla Walla Soil and Water Conservation District has evaluated farmland crossed by the proposed transmission lines. The vineyard has been classified as Unique farmland.

With Route 1, approximately 3/4 of an acre of Unique farmland would likely be removed. Fair compensation is required in the appraisal and negotiation of easement rights. National and regional importance of the proposed line is the reason for the irreversible conversion of Unique farmland. The national interest is to increase the supply and reliability of power during the irrigation season and to get power out the remainder of the year.

Mitigation measures will be used wherever possible. These include the location of towers between irrigation circles in dryland. Existing roads will be used wherever possible. Towers will be located along field, section, and property lines where appropriate.

The overall commercial productivity of the land in the easement area will not be significantly changed.

Route 1. It leaves Sacajawea Substation in a southeasterly direction across nonagricultural farmland for less than 0.5 miles (0.8 km). The next 1.6 miles (2.6 km) the line spans or is adjacent to three center

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pivot irrigation systems. It is planned that tower locations would be outside of these systems. This route would cross a vineyard for a distance of 1 mile (1.6 km). The route will cross the largest vineyard in the State of Washington. This vineyard is classified as Unique farmland.

Within the vineyard, the line would be on the south side of an existing access road 28 feet (8.4 m) wide. It is estimated possibly five towers would be in the vineyard. Due to machine harvesting a 30-foot (9 m) turn space is required between the towers and end of the rows, also a space of about 15 feet (4.5 m) on each side of a tower. An area 60 feet x 100 feet (18 m x 30 m) for each tower would likely be removed. Up to 8 rows would be impacted for each tower site. New anchors would have to be set for each row. The rows are 9 feet (2.7 m) apart. It is not likely this area would be replanted. East of the vineyards the apparent section line (field line) is 120 feet (36 m) south of the vineyard access road. Route 1 would continue east across wheatland with irrigation potential for a distance of about 2.3 miles (3.7 km). The line would likely be on the north side of the section line to accommodate side wheel irrigation. Towers could be spaced to permit future center pivot irrigation systems.

Impacts on this 2.3 miles (3.7 km) will be severe due to heavy vehicle traffic. This distance of line will have to either be rocked or heavily watered and graded to remain usable.

Proposed Route 2. It leaves Sacajawea Substation in a southeasterly direction across no agricultural land to an angle point 1 mile away. It then turns south on the east side of an existing road. It crosses a new orchard in which there may be one or two towers. The line turns east on the south side of an existing road to the tap point. Structures will be located to not interfere with the operation of existing circles.

The orchard is considered Prime and Unique farmland. Crossing this portion of orchard was necessary to avoid a large buried irrigation pipeline and pump station. The overall agricultural impact on this route is minimal.

Urban and Residential

Sun Harbor Estates housing development is the principal urbanized land use in the study area as shown in Figure 5. The Estates, on the south bank of Lake Sacajawea in the northern part of the study area, would not be impacted by the transmission line. Sun Harbor Estates plot no. 1, filed with the Walla Walla assessor's office reveals continued residential development south of the existing dwellings. If fully developed, the plot shows a network of roads serving 100 potential home sites.

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In the Walla Walla comprehensive plan, the area from Sun Harbor Estates to State Highway 124 displays residential potential. The land south of the planned development shown in Sun Harbor Estates plot no. 1 is presently yielding grapes. It seems unlikely, due to the life span of the grapes, that any extensive residential development would be undertaken in the foreseeable future.

Both routes traverse agriculturally zoned land for their entire length.

Noise, dust, and other construction or maintenance impact could occur to the farm workers along the routes.

Little potential for any radio or television interference exists on either route.

Route 1 would cross within 4,200 feet (1,260 m) of the end of a private airstrip used by agricultural spray planes. This airstrip is not listed with the FAA.

Esthetics

The visual quality along both routes is essentially the same. The contrasting elements of line, color, and texture of the vineyards and center pivot irrigated land provide visual variety in the area. However, the overall scenic quality is still considered to be low. The introduction of a transmission line upon this landscape would have unavoidable visual impacts. Expansive and uninterrupted views of either route would be possible from within the study area. Views of skylined towers would range from foreground to background depending upon the location of the observer.

Both routes cross Washington State Highway 124, designated a scenic highway with a BX classification. This classification identifies the highway as having above average scenic quality but does not restrict the construction of overhead transmission lines. A more detailed explanation of this rating system can be found in the Washington State Department of Highways Utilities Accommodation Policy. Recent traffic counts for Highway 124 indicate most users of this highway are visitors to Ice Harbor Dam, Charboneau Park, or are local residents, as shown on Figure 5, page 34. Access to these areas would require them to pass underneath the line.

Route 1. Impacts would be the same as those described above. These impacts would be greater along the initial segment of this route because of its close proximity to public roads and homes. Also, the possible disruption to existing vegetative patterns is more prevalent here. Farther east, the line is more isolated and would follow existing land patterns creating minimal visual disruptions.

Proposed

Route 2. Impacts are essentially the same as described for Route 1.

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Recreation

No impacts to recreational activities are anticipated. Hunting is the primary recreational activity in close proximity to either route and would not be affected. Other recreational activities such as swimming, fishing, waterskiing, and boating take place on Lake Sacajawea out of view of the line.

Historical, Architectural, and Archeological

No adverse impacts to cultural resources have been identified. BPA is consulting the Washington State Historic Preservation Officer concerning the status of the Ice Harbor Indian Memorial. A historic/archeologic survey of the proposed route will be accomplished through contract with the Washington Archeological Research Center prior to construction.

Proposed Route 2. This route would affect cultural resources the same as Route 1.

ROUTE ANALYSIS SUMMARY

INTRODUCTION

Resources and uses previously identified as highly important, critical, or unique are given special attention in planning, location, and construction of transmission facilities. Predictions of potential impacts to these important features (see Figure 7) are based upon past BPA experience, information from numerous agencies and individuals, and the expertise from interdisciplinary environmental specialists within BPA.

The significance of the resources in Figure 7, in relation to each other within the study area follows in decreasing order of importance: Agriculture, Esthetics, Soil Erosion, Soil Compaction, Natural Vegetation Removal, Alteration of Wildlife Habitat, Recreation, Historic-Archeologic, and Demographic Characteristics.

In Figure 7, two factors are considered in evaluating impacts: (1) the likelihood of an impact occurrence; and (2) the expected degree of impact.

LIKELIHOOD OF IMPACT OCCURRENCE

The following designations are used to evaluate the likelihood of an impact:

- Low - Resource or use is a point source or occupies a small portion of the study area and could be avoided in final alinement. Low includes those resources and uses in degree of impact category None.
- Medium - Resources or use partially occupies a route and may be impacted in final alinement.
- High - Resource or use entirely transverses a route and would be impacted if final alinement were within the presently defined corridors.
- Beneficial - Resources or use is enhanced or helped in some way.
- None and Unknown - Due to the compatibility of the resource with transmission facilities, or the low likelihood of an interaction between the resource and the transmission facility, we expect no significant measureable adverse impacts. Due to the nature of the resource, or lack of data, we are unable to predict impacts.

DEGREE OF IMPACT

These designations are used to evaluate the degree of impact:

- Slight - Modifications as a result of construction and maintenance activities with no noticeable long-term changes in conditions expected.
- Moderate - Modifications as a result of construction and maintenance activities with noticeable long-term changes in conditions possible.
- High - Modifications as a result of construction and maintenance activities with highly noticeable long-term changes in conditions possible.
- None - Due to the compatibility of the resource with transmission facilities, or the low likelihood of an interaction between the resource and the transmission facility, we expect no significant measurable adverse impacts.
- Unknown - Due to the nature of the resource, or lack of data, we are unable to predict impacts.

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FIG. 7 - SUMMARY OF POTENTIAL IMPACTS AND REQUIREMENTS FOR ROUTE ALTERNATIVES






ALTERNATE TRANSMISSION LINE ROUTING SUMMARY IMPACT MATRIX

<u>Impacts</u>	ROUTE 1					PROPOSED ROUTE 2				
	S	M	H	N	U	S	M	H	N	U
Agriculture	■	■				■				
Soil Erosion	■					■				
Soil Compaction	■					■				
Esthetics	■	■	■			■	■	■		
Natural Vegetation Removal	■					■				
Alteration of Wildlife Habitat	■					■				
Recreation					●					●
Historic - Archeologic				●					●	
Demographic Characteristics				●					●	

Degree of Impact

- S - Slight
- M - Moderate
- H - High
- N - None
- U - Unknown

Likelihood of Impact Occurrence

-  - Low
-  - Medium
-  - High
-  - Beneficial
-  - None and Unknown

NOTE: Definitions of these designations are provided in the preceding section. Impacts are project specific and a direct comparison between different BPA projects is to be avoided. Impact predictions assume BPA standard mitigating measures as outlined in the Role EIS Appendix B, and are being carried out.

Fig. 7 (continued)

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	PROPOSED PLAN B			
	Route 1		(Proposed) <u>1/</u> Route 2	
	Temporarily Disturbed	Removed	Temporarily Disturbed	Removed
<u>Agriculture</u>				
A. Prime and Unique Farmland (acres/hectares)	2/.8	.75/.3	0	04/.016
B. Farmland (acres/hectares)	4/1.6	.2/.08	0	0
<u>Natural Vegetation and Wildlife Habitat</u>				
A. Substation expansion and Tap Point (acres/hectares) <u>2/</u>	0	9/3.6	0	9/3.6
B. Transmission Line (acres/hectares)	5/2.	.5/.2	5/2	.5/.2
<u>Esthetic</u>				
(Washington State Highway 124, B above average scenic quality)	Crossed		Crossed	

1/ The Washington State office of the Soil Conservation Service encourages selection of Route 2 in a letter dated September 12, 1978. A comment by Mr. Gary Scrimsher (Manager of the Snake River Vineyard) at a public meeting on October 17, 1978, also favors Route 2. The Columbia Rural Electric Association, Inc. favors Route 2 in a letter dated September 8, 1978. There were no public meeting comments or letters favoring Route 1.

2/ 6 ac (2.4 ha) for Sacajawea Substation expansion and 3 ac (1.2 ha) for the tap point at the Lower Monumental-John Day 500-kV line.

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THE 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 alternatives will have an expected useful life of 50 years. Experience in the past years has shown that, in most cases, transmission corridors are upgraded to higher capacity in response to technological advancements and energy demands. This will likely result in a long-term use of this corridor. However, if required, complete removal of these transmission facilities, including the tower footings, would be possible in order to make the land available for other uses.

THE IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENTS OF RESOURCES

Unreclaimable steel, aluminum, and other materials used for conductors and other facilities would be irretrievably committed. Manpower and fuel for construction equipment would be irretrievably expended.

Although it would be possible to remove the entire facility at a future time, it is likely that the land used for transmission corridor would be irreversibly committed. The land used for tower sites and access roads would be unavailable or limited for any other land use.

The vegetation removed during construction, the wildlife eliminated, and the soil lost by erosion would be irretrievably committed.

CONSULTATION AND COORDINATION
WITH OTHERS

PLANNING COORDINATION

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

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Federal

U.S. Army Corps of Engineers	Walla Walla, WA
Federal Aviation Administration	Seattle, WA
Department of Agriculture	
Soil Conservation Service	Walla Walla County, WA
Soil Conservation Service	Franklin County, WA

State

Department of Highways	Yakima, WA
Advisory Council on Historic Preservation	Olympia, WA
Washington Archeological Research Center	Pullman, WA

County

County Engineer	Walla Walla, WA
County Planner	Walla Walla, WA
County Extension Agent	Franklin County, WA
County Planning Department	Franklin County, WA
County Planning Commission	Benton County, WA
County Planning Commission	Umatilla County, OR

CONSULTATION AND COORDINATION IN THE DEVELOPMENT OF THE PROPOSAL

The Draft Facility Location Supplement of Franklin Area System Reinforcement (79-1) discusses the proposed and alternative locations for the new facilities and the environmental impact associated with each location. This project was proposed in the Fiscal Year 1979 Program and was discussed in BPA's Fiscal Year 1979 Program Environmental Statement which was filed with CEQ as a draft on September 1, 1977.

In preparing the Draft and Final Planning and Location Supplements for Fiscal Year 1979, BPA consulted with various Federal, regional, and local planning agencies. A Draft Planning Supplement for the facility was sent to numerous Federal, State, and local agencies, environmental groups, and the public, for review and comment. Public information meetings were held in Pasco, Washington, on October 25, 1977 and in Burbank, Washington, on October 17, 1978. Comments received during the review periods were considered in the preparation of the Final Location Supplement.

COORDINATION IN THE REVIEW OF THE DRAFT FACILITY LOCATION SUPPLEMENT

The FY 1979 Draft Facility Location Supplement was sent to Federal agencies, State clearinghouses, and to local clearinghouses where these have been established by States, or to County or metropolitan planning

(An asterisk * indicates that written comments were received)

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commissions and environmental agencies where local clearinghouses have not been established. These agencies are listed below. A notice of availability of the Draft Facility Location Supplement was placed in the Federal Register and in local news media in advance of the public meeting.

AGENCIES REQUESTED TO COMMENT ON THE DRAFT FACILITY PLANNING SUPPLEMENTS

Federal Agencies

U.S. Department of the Interior
Fish & Wildlife Service
Bureau of Mines
*Bureau of Indian Affairs
Bureau of Land Management
Heritage Conservation and Recreation Service
National Park Service
Geological Survey
Bureau of Reclamation
U.S. Department of Agriculture
*Forest Service, Region 6
*Soil Conservation Service
U.S. Department of Health, Education and Welfare
U.S. Department of Housing and Urban Development
*U.S. Environmental Protection Agency
Federal Energy Regulatory Commission
Federal Aviation Administration
*Advisory Council on Historic Preservation
U.S. Department of the Army
*Army Corps of Engineers, Walla Walla District
U.S. Department of Transportation
*U.S. Coast Guard

State Agencies

Washington State
*Office of Financial Management
Office of Program Planning and Fiscal Management
Office of Community Development
*Department of Ecology
*Department of Transportation
Historic Preservation Commission
Archeological Research Center
*Parks and Recreation Commission

(An asterisk * indicates that written comments were received)

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Oregon State

- *Historic Preservation Officer
- *Intergovernmental Relations Division
- Department of Energy
- Department of Fish and Wildlife

Local Agencies

- *Benton-Franklin Governmental Conference
- Walla Walla Regional Planning Commission
- East Central Oregon Association of Counties

Other

- Washington Environmental Council
- Environmental Defense Fund
- Pacific Northwest Conservation Council
- Sierra Club, Pacific Northwest Chapter
- National Wildlife Federation
- Federation of Western Outdoor Clubs
- Friends of Earth
- Natural Resources Defense Council
- The Wilderness Society
- Natural Resources Law Institute
- Oregon Environmental Council

(An asterisk * indicates that written comments were received)

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Comments Received During Review Process
U.S. Department of Interior, Regional Office (October 27, 1978)

Comment: "General Comments"

Visual and other impacts of locating a transmission line along a new route are generally much greater than those created in following an existing route. We do not believe the draft supplement adequately discusses and substantiates the need for a new route in this case, nor does it adequately compare the relative visual and other impacts of the proposed location and existing routes. We suggest the final supplement reflect a concerted effort by BPA to make maximum use of existing rights-of-way, with specified system reliability requirements, and avoid the proliferation of new routes. Impacts of the proposed action on selection of future routes should also be discussed.

Response:

BPA has a policy of paralleling existing lines (corridor) whenever possible. In the study areas of Alternative B (Routes 1 and 2) as well as Alternative A and C of the Facility Planning Supplement, there are no existing transmission lines that we can parallel. In view of BPA's policy, a number of other factors need to be considered in selecting one of the five alternatives in the Facility Planning Supplement. These include such things as overall adverse environmental impact (including visual), existing land use patterns, economic cost, engineering factors, and reliability.

There are no plans to build another line parallel to the Proposed Route 2 of Plan B in the foreseeable future.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

The final supplement should contain evidence of consultation with the State Historic Preservation Officer pursuant to 36 CFR 800. Consultation should include a determination of need for survey(s) to locate additional properties eligible for inclusion on the National Register and a determination of effect on cultural properties within the area of potential environmental impact.

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Response:

The Washington State Historic Preservation Officer was consulted at the Facility planning stage. The request for an archeological survey has been initiated by BPA and will be completed shortly after an engineering survey determines the centerline. Determinations of effect will depend upon the results of the archeological survey.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

The document does not discuss measures that will be used to compensate for project-caused environmental losses. Executive Order 11514, Protection and Enhancement of Environmental Quality, states that agencies shall develop programs and measures to protect and enhance environmental quality in carrying out their activities. Compensation or enhancement measures are not included in the supplement.

Response:

Compensation: BPA will pay the landowner for any reduction in the fair market value of his property when the easement is acquired.

Mitigation/Enhancement: Rock, straw or seeding will be used to prevent wind erosion of soil around tower sites at the option of the property owners.

A more complete discussion of compensation, mitigation and enhancement measures associated with transmission facility construction and maintenance can be found in Appendix B, Role EIS. 1/

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment: "Specific Comments"

Summary. The summary of environmental impacts at the front of the draft supplement lists acreages and miles of native vegetation and agricultural lands involved in each alternative. The data and parameters are diverse and unclear, and appear to conflict with other statements, such as on

1/ Appendix B is a volume on BPA Power Transmission. It is part of a draft program environmental statement and planning report on The Role of the Bonneville Power Administration in the Pacific Northwest Power Supply System Including It's Participation in the Hydro-Thermal Power Program (Role EIS).

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page 15 (wildlife). The summary appears to indicate less acreage permanently lost (0.5 acres) than in the discussion on page 15 (6 acres); however, it is difficult to determine actual quantitative losses or changes of natural habitats by vegetative types. A suggested improvement is given in part for Figure 7, page 34 (see below).

Response:

The Final Facility Planning Supplement encompasses pages 1 through 22, the Facility Location Supplement, pages 23 through 38. The summary of environmental impacts at the front of the document refers only to pages 23 through 38. An additional table has been provided to facilitate an understanding of Figure 7.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Summary Sheet and page 37. Bureau of Outdoor Recreation has been renamed the Heritage Conservation and Recreation Service.

Response:

The supplement has been revised to reflect this additional information.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Page 2, Figure 1 (facing). Map locations of alternate transmission line locations are not clear. Existing and proposed routes should be clearly identified and there should be a suitable legend.

Response:

Figure 1 is part of the Facility Planning Supplement. More detailed maps are included in the Facility Location Supplement (Figure 5). There are no existing transmission line routes (corridors) along the alternative routes.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Pages 11, 12, 20, Historical, Architectural, and Archeological. The draft supplement identifies cultural sites in the study area which are either listed or eligible for inclusion on the National Register. However, these are not discussed in relation to proposed and alternate transmission routes, and this should be done in the final supplement.

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Response:

At the Facility Location Supplement level the two routes (Route 1 and the Proposed Route 2) of Alternative Plan B do not affect any cultural sites.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Also on page 20 is the statement that "At this stage in the planning process, no effect is expected on the Strawberry Island Village Archeological site..." This implies that later planning could result in an impact on the site. The final statement should be specific as to the relative locations of the site and proposed transmission line and the nature and extent of the probable impact of the latter on the former.

Response:

The supplement has been revised to reflect additional clarity. The two routes (Route 1 and the Proposed Route 2) of Alternative Plan B do not cross the Strawberry Island Village Archeological site.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

We disagree with the showing of no effect on historic and archeologic properties. At present, it is not known whether archeologic properties exist along the route; and the degree and likelihood of impacts are, likewise, unknown.

Response:

The supplement has been revised to reflect the concern. BPA has requested an archeological survey from WARC (Washington Archeological Research Center) which will be completed shortly after the engineering survey has determined the centerline.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Page 15, Wildlife. Other than the mention of Smith Canyon Canal, the supplement should state whether there was any effort to identify low-level routes or flight of migratory birds that would indicate a potential for collision with power lines. Concerns regarding this type of mortality have been expressed in many past reviews of BPA programs, including the draft EIS on the Role of BPA in the Pacific Northwest Power Supply System.

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Response:

No, BPA did not do any studies of bird flights specifically for this project, but based on a recent study by Meyer (1978) we would not expect any biologically significant mortality due to collisions. We are not aware of information that states the Facility Location Supplement (Figure 5) study area is a highly used flyway.

The referenced study, conducted by James R. Meyer (WICHE) for BPA, was to determine the effects of transmission lines on bird flight behavior and collision mortality, and included areas in eastern Washington. This study concluded that the bird mortality due to collisions with the transmission lines was not biologically significant. However, there did appear to be a conflict or interference between transmission lines and waterfowl hunting.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

The loss of shrub-steppe wildlife habitat through construction of the project will only add to the cumulative impact of innumerable past developments which in total have drastically reduced this vegetative community in eastern Washington to a small fraction of its original extent. The cumulative impacts of many developments such as the proposed project are clearly significant. To state that such habitat is abundant, and that no noticeable impact on wildlife is expected, misrepresents the true general picture for this vegetative community and the dependent wildlife populations.

Response:

The losses of wildlife habitat are reflected in the wildlife section and Fig. 7 (continued).

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Page 17, Agricultural Land Use. It is noted that annual and perennial weeds in the transmission line right-of-way would be controlled by herbicides. The kinds of herbicides and methods of application should be mentioned in the environmental statement. Such information would be helpful in assessing effects on the water quality of the project area.

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Response

BPA would use no herbicides on the right-of-way unless requested to do so by the property owner. Such hand spraying would likely be confined to the area under the towers. Soil stabilization of the area under and around towers to prevent wind erosion would be provided in a manner satisfactory to the farmers affected. This use of herbicides should have no adverse effect on water quality in the project area.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Page 31, Esthetics. The first paragraph states that vineyards and irrigated land have enhanced the visual quality of the area. This is a value judgment which might be disputed by those who prefer a natural landscape. We suggest it be either omitted or qualified in the final statement.

Response:

The supplement has been revised to reflect this additional information.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

Page 34, Figure 7. Only a slight impact is shown on esthetics for both potential routes of the preferred alternative. We disagree with this assessment as we believe that a powerline along a new route, which traverses open country and crosses a highway, will have more than a slight esthetic impact.

Response:

The supplement has been revised to reflect this additional information.

U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

This summary impact matrix also provides only a very subjective and general evaluation of the extent of natural habitat affected by the alternatives and does not even reflect the acreage figures provided in the summary statement which were questioned in our comments above.

Response:

Figure 7 has been revised to reflect additional clarification.

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U.S. Department of Interior, Regional Office (October 27, 1978)

Comment:

The impact matrix could be substantially improved by including relative acreages involved where possible, expanding the breakdowns in terms of habitat types affected, further defining visual impact, and so forth. These changes would afford more efficient impact comparison and clarify the conflicting acreage values and diverse parameters utilized in the supplement.

Response:

Figure 7 has been added to reflect this additional information.

Columbia Rural Electric Association, Inc. (September 18, 1978)

Comment:

Route 2 appears to us to be more favorable than Route 1. The impact on present and future irrigation projects would be less under Route 2. Any Route chosen should provide locations along the new line that would enable Columbia REA to construct aerial power line crossings under the new 500-kV line. Sufficient clearances should be provided to allow crossings with clearances between the farmed ground and the REA distribution lines and the REA line to the BPA 500-kV line. We have experienced problems in the past of constructing our power lines under the BPA lines, for example under the LM-JD 500-kV line at Dodd Road and the Walla Walla-Franklin 115-kV line at Highway 124.

For your information, we plan to construct an aerial line from Highway 124 straight south to the "Water Pumping Station" along the west side of the private gravel road.

Response:

The proposed transmission line (Route 2) will be constructed to preclude problems as mentioned. The 500-kV line will follow the east and south side of the private road near the pump station, leaving the other side of the road open for a low voltage line. Proper electrical clearances will be provided for the REA line mentioned.

U.S. Army Corps of Engineers, Walla Walla District (October 18, 1978)

Comment:

Corps of Engineers permits for work and structures in streams may be required. For additional information on permits, contact Mr. Clarence L. Van Scotte, Chief, Navigation and Flood Control Branch, Walla Walla District, Corps of Engineers, Building 605, City-County Airport, Walla Walla, Washington 99362.

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Response:

Permits will not be required. There are no streams in either of the routes (Route 1 or the Proposed Route 2) of Alternative Plan B.

U.S. Army Corps of Engineers, Ice Harbor-
Lower Monumental Project (November 8, 1978)

Comment:

We have no objections to the route of the Proposed Plan of Service. However, we do have some concerns about the esthetic degradation which will be created by the towers and the additions to the Sacajawea Substation. Both of which would be visible from the south access road to Ice Harbor Dam.

To help lessen the visual impact, we request that the towers visible from the road and the substation be painted the same color as the existing substation. In addition, we request that the substation addition be kept at a low profile similar to the existing substation structure.

Response:

Substation Color - BPA concurs, painting the substation towers the same as the existing ones will aid in reducing the impacts. The Sacajawea Substation addition will have a color scheme similar to the existing substation.

Substation Design - It will be very expensive to attempt to keep the addition to a similar profile. The new 500-kV towers will be 114 feet tall, while the existing 115-kV towers are 53 feet high. Our current plans are to grade the 500-kV yard about 5 feet higher than the existing substation. This would result in the most economical balance for cut and fill. We could grade to the existing substation elevation and construct berms around the east, south, and west sides of the addition. However, our grading costs would be approximately 3 to 4 times more, probably in the \$150,000 to \$200,000 range, than currently estimated. This would not effectively reduce the appearance of the towers on the surroundings as at least 100 feet of the structures would still be exposed above the berms. Any attempts to maintain a similar profile are ineffective and too costly to justify.

Washington State Department of Transportation (September 14, 1978)

Comment:

On the Planning Study Area map (Figure 1) and the Important Resources map (Figure 3) SR 12 is shown as SR 410 and SR 14 south of Kennewick is shown as SR 12. The routes under the heading "Other" on page 10 should be corrected.

Response:

The supplement has been revised to reflect this additional information.

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Advisory Council on Historic Preservation
(National Office) (September 19, 1978)

Comment:

The final document should contain the State Historic Preservation Officer's concurrence with the BPA's determination of no effect.

Response:

The Washington State Historic Preservation Officer was consulted at the Facility planning stage. The request for an archeological survey has been initiated by BPA and will be completed shortly after an engineering survey determines the centerline. Determinations of effect will depend upon the results of the archeological survey.

Washington State Parks and Recreation Commission (October 2, 1978)
and Washington State Office of Financial Management (October 24, 1978)

Comment:

The Washington State Parks and Recreation Commission's staff has reviewed the above-noted document and concurs with the determination that Alternative D will have a negative impact on Sacajawea State Park.

Response:

Alternative Plan B (with Route 1 and Proposed Route 2) was selected at the Facility Planning level as the Proposed Plan. Your comment will be considered should Alternative Plan D be reevaluated as a future project.

Oregon Department of Fish and Wildlife (October 13, 1978)
and Oregon Intergovernmental Relations Division (October 24, 1978)

Comment:

The Oregon Department of Fish and Wildlife has no objection to Bonneville Power Administration's Proposed Plan of Service (Alternative plan B) for the Franklin Area Transmission System Reinforcement. Under this plan, construction and habitat modifications would be confined to the State of Washington and is outside this agency's jurisdiction. Since adequate alternatives exist we do not favor Alternatives D and E which require crossing the Columbia River.

Response:

Your comment will be considered should Alternatives Plans D or E be reevaluated as a future project.

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Public Meeting Comments
Mr. Van Walkley: (October 17, 1978)

Comment:

There are two things that I was noticing in the impact statement: One, is they did not mention on Route 1 that there was already a mile and a third of distributor line, or whatever it's called, along the eastern end of the line, and I did not mention it, or I did not hear it mentioned in the Impact Statement.

Response:

The supplement has been revised to reflect this additional information. The Proposed Route 2 will not adversely affect the distribution line.

Mr. Glenn Walkley (October 17, 1978)

Comment:

Now, a map, in drawing a line through there, does not tell the full story. For example, it does not show the distribution line and the 28 and 27, that line may not be on the section line. I question very much if it is on the section line because I don't know when a survey was made through that.

Response:

At the centerline location stage, BPA crews will determine the exact physical locations of the field lines. It is BPA's intent to create the least impact to present and future agricultural land, irrigated or dryland. The exact centerline of the proposed transmission line will be established at a later date.

NOTE: 28 and 27 of the above comment refers to sections.

Mr. Gary Scrimsher (October 17, 1978)

Comment:

One question we had is that if that line runs across our vineyard, how much static electricity might we have in our wires to where our workers could not work in the field. The terrain is quite irregular where Route 1 is proposed across the vineyard there, and I think the lines could be down fairly close to the vineyard wires in some places, although maybe the towers are designed with that in mind.

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Response:

Route 2 has been selected over Route 1 as the Proposed Route for some of the reasons that you have mentioned. It is BPA's policy to ground all metal buildings, wire fences, and wire trellises on hop and grape vineyards that are within specified distances of 500-kV lines.

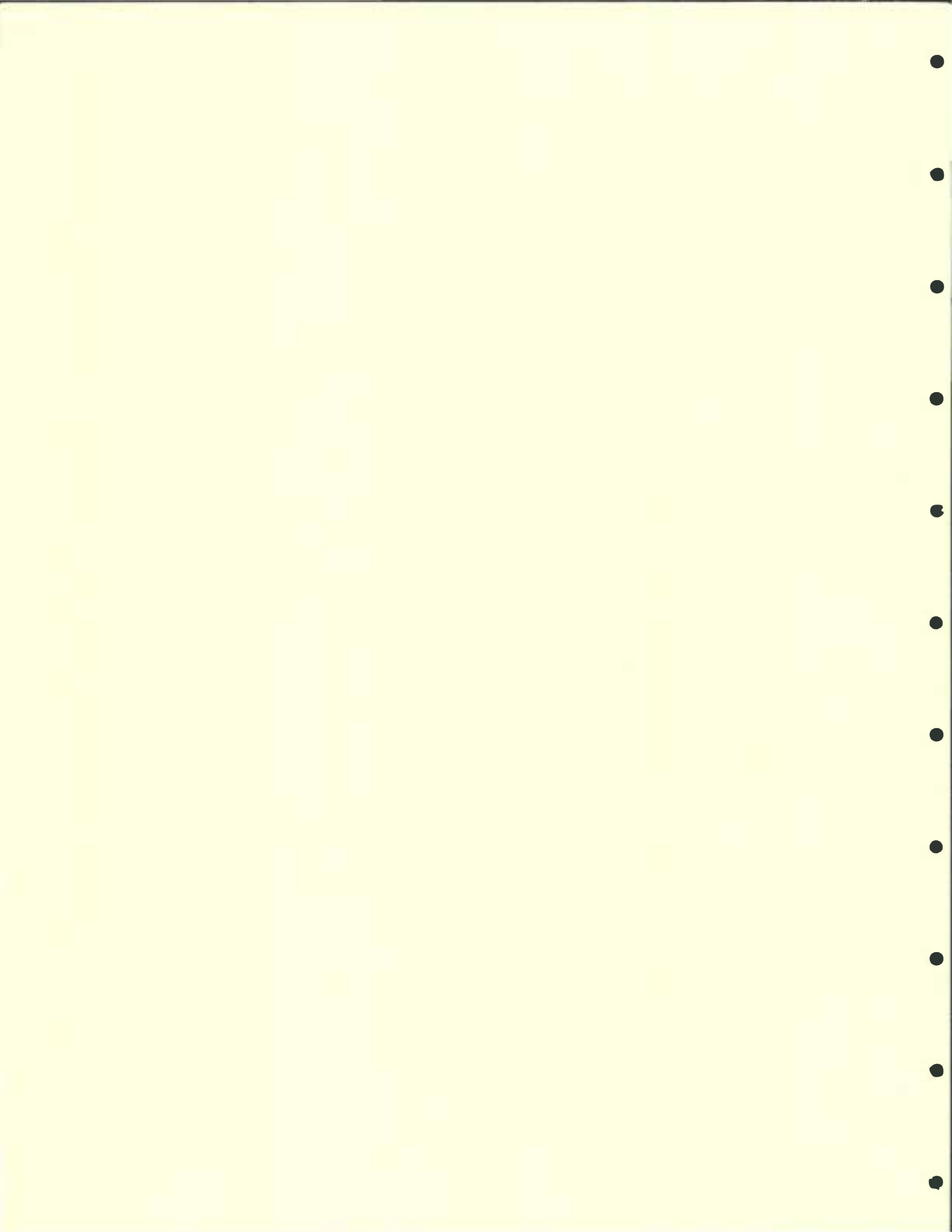
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Glossary



VII. GLOSSARY

ALLUVIUM - Soil material, such as sand, silt, or clay, that has been deposited by water.

ANADROMOUS FISH - Species that are hatched in fresh water, mature in salt water, and return to fresh water to spawn.

ANDESITE - A fine-grained, dark-gray rock of volcanic origin.

AQUIFER - A geologic rock formation, bed, or zone that may be referred to as a waterbearing formation or waterbearing bed.

ARABLE LAND - Land suitable for plowing and, hence, for producing crops.

BASALT - A dark, tough, fine-grained to dense, extrusive volcanic rock commonly occurring in sheetlike lava flows.

BEDROCK - Solid rock beneath the soil and superficial rock.

BROWNOUT - An intentional reduction of loads in an area by the partial cutting down of lighting loads.

BROWSE - Woody shrubs or trees, the sprouts, twigs, stems, vines, and leaves, of which are cropped by livestock and wildlife.

BUS - Metal tubing used to conduct electricity within a substation.

CALCAREOUS - Soil containing sufficient calcium carbonate (often with magnesium carbonate) to effervesce visibly when treated with hydrochloric acid. Soil alkaline in reaction owing to the presence of free calcium carbonate.

CLIMAX VEGETATION - The terminal community of a succession, which maintains itself relatively unchanged unless the environment changes.

COLDWATER FISH - Salmonid species that spend their entire life cycle in a freshwater environment.

COMMERCIAL FOREST - Forest land which is producing, or is capable of producing crops of industrial wood and not withdrawn from timber utilization by statute or administrative regulation.

CONFLUENCE - A flowing together of two or more streams; the place where they join.

CONIFEROUS - Referring to fir, pine, or other conifers (cone bearing).

CORONA - Electrical discharge caused by ionization of air near a high-voltage conductor. Sharp edges, points, abrasions, etc., precipitate discharge causing radio and TV interference. Extreme care in handling large conductors is required to avoid damage. All hardware is designed to eliminate as much corona as possible.

CORRIDOR - A broad path within a study area identified during early stages of transmission line planning and environmental analysis which represents a plan of service within which a line could be located as a result of further evaluation.

COULEE - A deep gulch or ravine, usually dry in summer.

CROPPING SEQUENCE - Growing crops in combination with needed cultural and management measures.

DIP - The angle at which a stratum of rock is inclined from the horizontal.

DIP SLOPE - A slope of the land surface which conforms approximately to the dip of the underlying rocks.

DOUBLE-CIRCUIT - Two single-circuits mounted on the same towers.

DRIFT - Detrital deposits. Any rock material, such as boulders, till, gravel, sand, or clay, transported by a glacier and deposited by or from the ice, or by or in water derived from the melting of the ice.

ECOLOGY - The interrelationships of living things to one another and to their environment or the study of such interrelationships.

ECOSYSTEM - The interacting system of a biological community and its nonliving environment.

EHV - (Extra High-Voltage) Commonly refers to voltages in the range of 500,000 to 700,000 volts.

ENVIRONMENT - The sum of all external conditions and influences affecting the life, development, and ultimately, the survival of an organism.

EPICENTER - The point on the earth's surface directly above the focus of an earthquake.

ESTUARY - An area where the fresh water meets salt water. For example, bays, mouths of rivers, salt marshes, and lagoons.

ETHNOGRAPHIC - The anthropological description of specific cultures, especially those of nonliterate peoples or groups.

EVAPOTRANSPIRATION - Water dissipated from a land area by evaporation from water surfaces, moist soil, and plant transpiration.

GLACIO-FLUVIAL - Pertaining to streams flowing from glaciers or to the deposits made by such streams.

GRADIENT - Ascending or descending with a uniform slope.

HABITAT - The sum total of environmental conditions of a specific place that is occupied by an organism, a population, or a community.

HARDPAN - A hardened or cemented soil horizon or layer. The soil material may be sandy or clayey, and it may be cemented by iron oxide, silica, calcium carbonate, or other substance.

HERBIVORE - An animal that feeds chiefly on plants.

HOLOCENE - The time period from present to about 15,000 years before present.

HYDROELECTRIC - Producing, or having to do with the production of electricity by water power or by the friction of water or steam.

IGNEOUS - Rocks formed by solidification from a molten or partially molten state.

IMPACT - To cause changes in something or the results of such changes.

INTERFACE - A surface that lies between two parts of matter or space and forms their common boundary.

INTERMONTANE - Between mountains.

INUNDATION - The covering by water of lands not normally so covered.

KILOVOLT-AMPERE - (kVA) 1,000 volt-amperes.

KILOWATT - (kW) A unit of electrical power equal to 1,000 watts.

LANDFORM - A terrain feature formed by natural processes that has a definable composition and range of characteristics that occur wherever that landform is found.

LACUSTRINE - Of or having to do with a lake or lakes.

LITHOLOGY - The physical character of a rock.

LITHOSOLS - Well-drained, shallow, generally stony soils over bedrock.

LOESS - Soil material consisting primarily of uniform silt particles that were transported and deposited by wind.

LOOP - To tie a substation into an existing line in such a manner as to complete the circuit along that line.

MEAN - Essentially the average; the sum of a set of individual values of any quantity divided by the number of values in the set.

MEAN ANNUAL RUNOFF - Average annual runoff adjusted for length of record by comparison with record at pivot stations.

MEGAWATT - (MW) 1,000 kilowatts or 1,000,000 watts.

METAMORPHIC ROCK - Rocks which have been altered from their original composition, texture, or internal structure by heat and/or pressure with or without the introduction of new chemical substances.

METASEDIMENTARY - Partly metamorphosed sedimentary rocks (rocks originally formed from the accumulation of sediment that have been partly altered in composition, texture, or internal structure by pressure, heat, and with or without the introduction of new chemical substances).

MITIGATE - To lessen the extent of an impact or to compensate for unavoidable impacts.

OUTWASH - Drift deposited by meltwater streams beyond active glacier ice.

OZONE - A form of oxygen, O₃, having the three atoms to the molecule. It is a blue gas with a penetrating odor formed by the passing of an electrical charge through air or oxygen.

PACIFIC FLYWAY - One of the four major routes followed by migratory birds through the United States which connect breeding grounds with wintering areas. The Pacific Flyway is defined as the region between the crest of the Rockies and the Pacific, between the borders of Canada and Mexico.

PERENNIAL GRASS - Grasses in which the underground parts last more than 1 year.

PERIGLACIAL - Refers to areas, conditions, processes, and deposits adjacent to the margin of a glacier.

PHASE - One wire (conductor) of a three-wire alternating current transmission system.

PHYSIOGRAPHIC PROVINCE - A region of similar structure and climate that has had a unified geomorphic history.

PLANT SUCCESSION - The process of vegetational development whereby an area becomes successively occupied by different plant communities.

PLEISTOCENE - The time period from 15,000 years to about 3 million years before present.

PRECIPITATION REGIME - The distribution of precipitation through the year.

PYROCLASTIC - Made up of rock material broken into fragments through volcanic or igneous action.

RAINSHADOW - The area of diminished rainfall on the lee side of a mountain or mountain range, where the rainfall is noticeably less than on the windward side.

RANGE MANAGEMENT - The art and science of planning and directing range use to obtain sustained maximum animal production, consistent with perpetuation of the natural resources.

RESIDUE MANAGEMENT - Using plant residues to protect cultivated fields during critical erosion periods.

RIGHT-OF-WAY - A strip of land acquired or used by an electrical utility for its transmission lines.

ROW CROP - Crops raised in rows designated by tilled soil between the rows.

SALMONID - Refers to fish of the family salmonidae. Includes salmon, trout, whitefish, and char.

SCABLAND - Used in the Pacific Northwest to describe areas where denudation has removed or prevented the accumulation of a mantle of soil and the underlying rock is exposed or covered largely with its own coarse, angular debris.

SECTIONALIZING - The connecting or disconnecting of sections of a transmission line. Permits isolating of equipment or line sections for locating trouble or doing work.

SEDIMENTARY - Descriptive term for rock formed of sediment, sediment being solid material, both mineral and organic, that is in suspension, is being transported or has been moved from its site or origin by air, water, or ice, and has come to rest on the earth's surface either above or below sea level.

SEMIARID - Characterized by little yearly rainfall and by the growth of short grasses and shrubs; said of a climate or region.

SHUNT REACTOR - A device to reduce the voltage rise on transmission lines to acceptable limits.

SILVICULTURE - The science and art of growing and tending forest crops, based on a knowledge of the life history and general characteristics of forest trees.

SINGLE-CIRCUIT - A transmission system made up of three separate conductors with each conductor carrying one phase of the power transmitted.

SOFTWOOD TIMBER - Wood produced by coniferous trees, such as larch, pine, cedar, spruce, and fir; characterized by absence of vessels.

SPINYRAY FISH - Fish such as bass, sunfish, perch, and others which typically have hardened spines in their fins.

SUBSTATION - A distribution point on an electrical transmission system. It serves the following purposes: (1) to reroute electric energy, (2) to reduce high-voltage to lower voltages, (3) to serve an individual customer, in BPA's case, private or publicly-owned utility or a heavy industry such as an aluminum plant.

TERMINAL FACILITIES - (A) Full terminal facilities - A complete bay including an overhead bridge, power circuit breakers, connecting bus, and power system control equipment which terminates the overhead line; (B) partial terminal facilities - a partial bay consisting of an overhead bridge and disconnect switches which terminate the overhead line.

TERTIARY AGE - Designating or of the first period preceding the Quaternary age in the Cenozoic Era comprising the Paleocene, Eocene, Oligocene, Miocene, and Pliocene Epochs.

THERMOGENERATION - A process of generating power utilizing heat to produce energy. Fossil fuels or nuclear energy may be used to produce the necessary thermal energy.

TOPOGRAPHY - The physical features of a district or region, such as are represented on maps, taken collectively, especially the relief and contour of the land.

TRANSMISSION GRID - An interconnected system of electric transmission lines and associated equipment for the movement or transfer of electric energy in bulk between points of supply and points of demand.

TURBIDITY - A condition of a liquid due to fine visible material in suspension which may not be sufficient size to be seen as individual particles by the naked eye, but which prevents the passage of light through the liquid.

UHV - (Ultra High-Voltage) Commonly refers to all voltages above 700,000 volts.

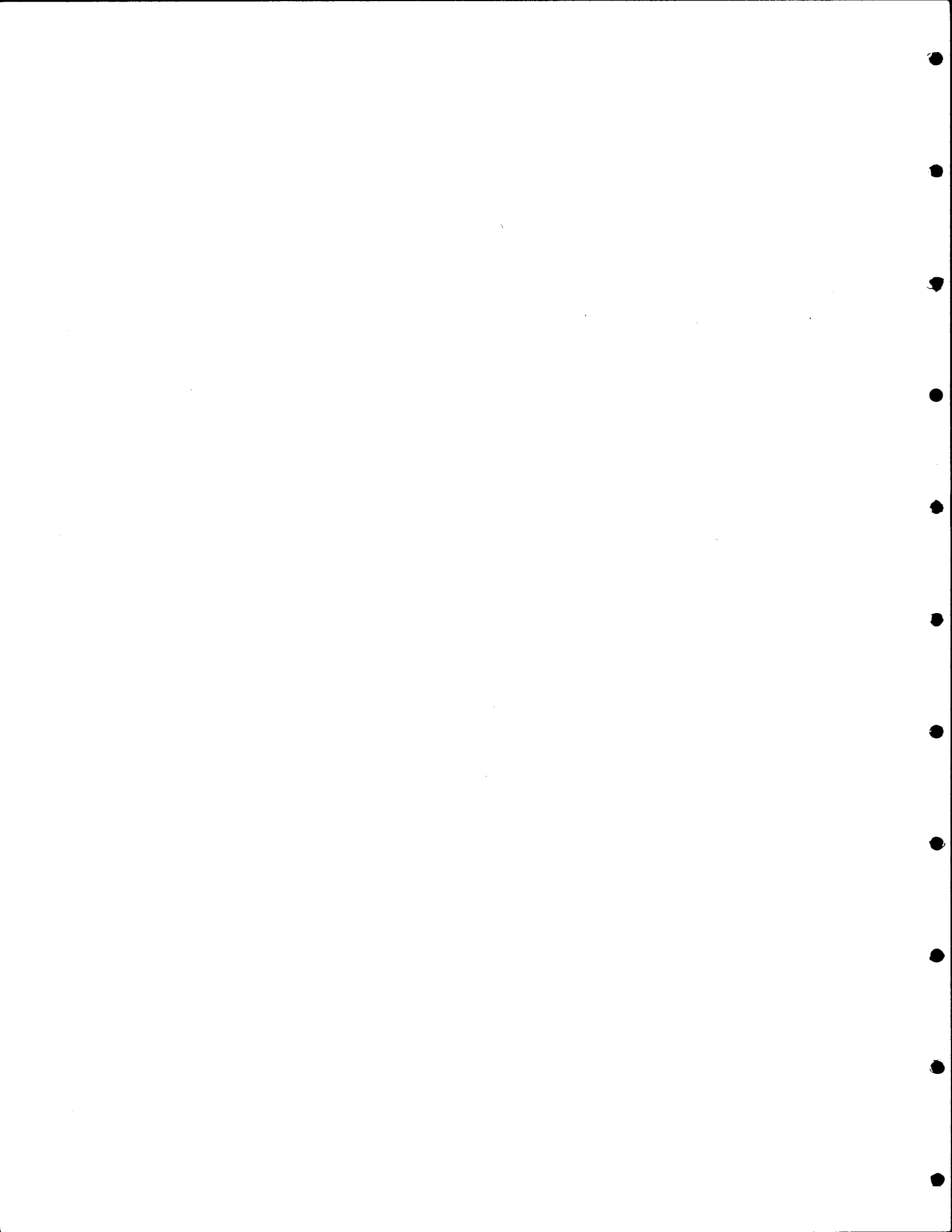
UNDERSTORY VEGETATION - Plants growing beneath the canopy of another plant. Usually refers to grasses, forbs, and low shrubs under a tree or brush canopy.

VISITOR DAY - A day or any part of a day spent visiting a feature or site in a particular region.

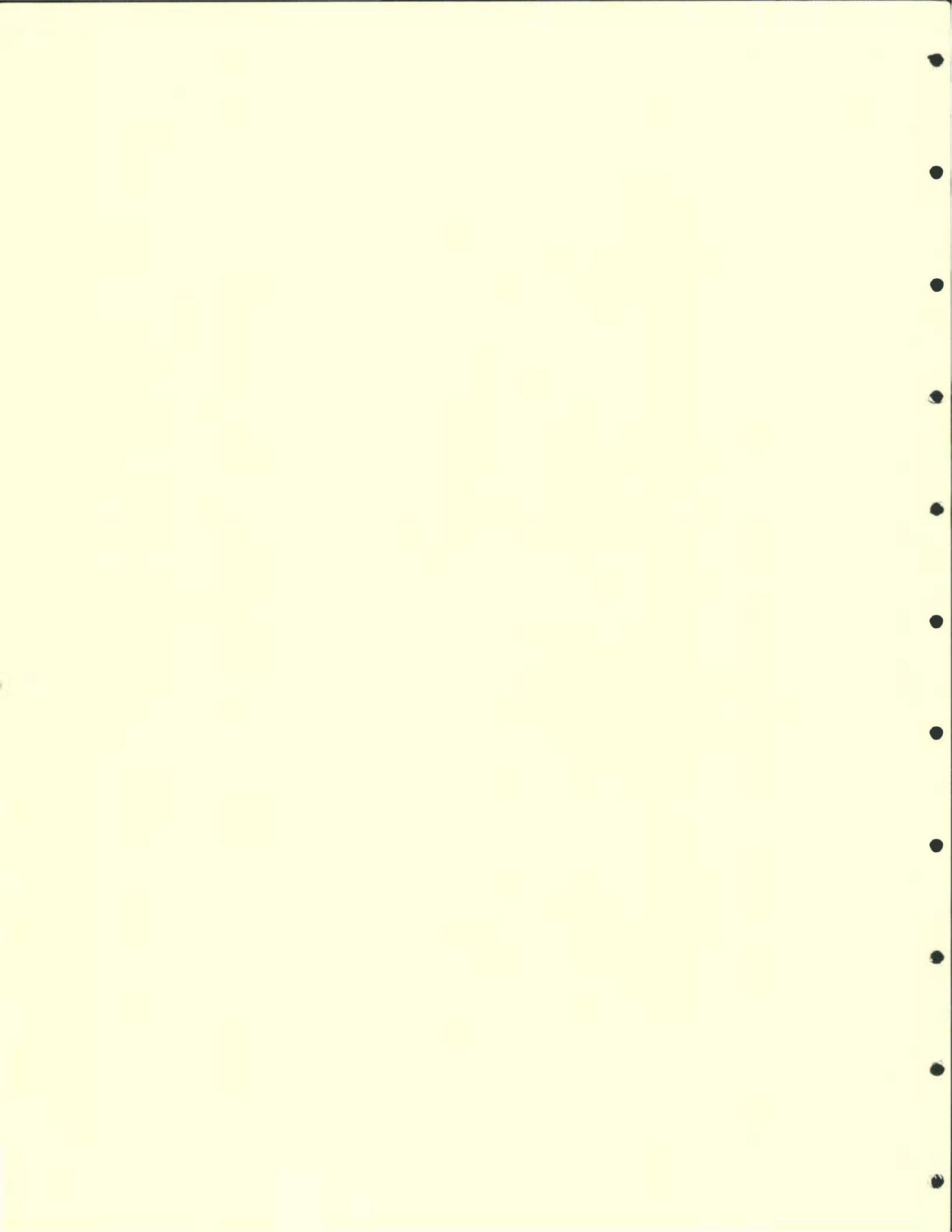
VOLTAGE - A measure of the difference in electrical potential between two points; the driving force that makes current flow in a circuit.

WATT - A unit of electrical power measurement that is the product of voltage and current.

WATERSHED - A term to signify drainage basin or catchment area.



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