Klickitat Cogeneration Project

Final Environmental Assessment

U.S. Department of Energy

Bonneville
POWER ADMINISTRATION

DOE/EA-0765
September 1994

DEPARTMENT OF ENERGY

Bonneville Power Administration

Finding of No Significant Impact and Floodplain Statement of Findings for the Klickitat Cogeneration Project

AGENCY: Bonneville Power Administration (BPA), Department of Energy (DOE).
ACTION: Finding of No Significant Impact (FONSI) and Floodplain Statement of Findings.
SUMMARY: To meet BPA's contractual obligations to supply electrical power to its customers, BPA proposes to acquire power generated by the Klickitat Cogeneration Project (Project). BPA has prepared an environmental assessment (DOE/EA-0765) evaluating the proposed project. Based upon the analysis in the EA, BPA's proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969 for the following reasons: (1) the proposed project will not have a significant impact on land use, upland vegetation, wetlands, water quality, geology, soils, public health and safety, visual quality, historical and cultural resources, recreation and socioeconomics, and (2) impacts to fisheries, wildlife resources, air quality, and noise will be temporary, minor, or sufficiently offset by mitigation. Therefore, the preparation of an environmental impact statement (EIS) is not required and BPA is issuing this FONSI.
ADDRESS: For copies of this FONSI, please call BPA's toll-free document request line: 800-622-4520.
FOR FURTHER INFORMATION, CONTACT: Katherine S. Pierce, NEPA Compliance Officer, Bonneville Power Administration, P.O. Box 3621-RAE, Portland, Oregon 97208-3621; telephone (503) 230-3962, fax number (503) 230-4973.

Public Availability: This FONSI will be distributed to all persons and agencies known to be interested in or affected by the proposed action or alternatives.

For information on DOE NEPA activities, contact Carol M. Borgstrom, Office of NEPA Oversight, EH-25, U.S. Department of Energy, 1000 Independence Avenue SW, Washington, D.C., 20585, telephone (202) 586-4600 or (800) 472-2756.
SUPPLEMENTAL INFORMATION: BPA is required to meet contractual obligations to supply requested electrical power to its customers. As part of this obligation, BPA proposes to offer the Klickitat Energy Partners (KEP) a contract to acquire firm power generated by the Project. Under the no-action alternative, BPA would not enter into an agreement for the proposed action, foregoing the opportunity to reduce BPA's projected energy deficit by approximately 49.5 average firm megawatts annually. KEP has indicated that the Project may not be built without BPA's commitment to purchase the output.

The cogeneration facilities of the project would be built at the existing SDS Lumber Company in Klickitat County, Washington in the city of Bingen. The gas pipeline and the electrical substation would be constructed in rural southwestern Klickitat County.

The proposed Project consists of cogeneration, gas transmission, and electrical transmission components. Major cogeneration components consist of the following: a 42 megawatt gas turbine generator coupled with a new heat recovery steam generator (HRSG); a 24.4 m (80 foot) tall steel emission stack; and a 1.55 million liter (0.4 million gal) fuel oil storage tank. The major natural gas transmission components consist of the following: a new gas metering station; A 15.2 cm (6 in) diameter gas "spur" line to the White Salmon meter station located approximately 2 kilometers (km [1.25 mi]) west of the turbine site; and a 6.0 km (3.7 mi) long, 15.2 cm (6 in) outside diameter steel gas "loop" line connecting the White Salmon metering station with the existing Ignacio-to-Sumas gas transmission line approximately 5.6 km (3.5 mi) north of the White Salmon metering station. Major electrical components consist of the following: A new 12.47/69-kilovolt (kV) step-up transformer station, and a 152.4 meter (500 ft) long 69-kV overhead transmission line on the SDS Lumber Mill property, connecting to an existing Pacific Power and Light 69-kV overhead transmission line east of the facility site; and a new 0.23 ha (0.62 ac) BPA electrical substation with switches, a switch stand, a transformer, and three 69-kV racks; transmission line connections to the substation which includes placing seven 24 m (80 ft), four 26 m (85 ft) new wood poles, removal of two 26 m (80 ft) wood poles, and replacing 244 m (800 ft) of 69-kV conductor with 610 m (2,000 ft) of new 69-kV conductor.

Land uses at the proposed Project site are characteristic of a partially to fully developed area. At the cogeneration facility site, the land is zoned for heavy industry with an existing sawmill. The gas transmission loop line route parallels an existing gas line for much of its length, crossing residential land, pasture, croplands, and forest. Almost half of the land that would be affected by the gas spur line is currently in industrial/commercial use. The additional space required for the proposed gas loop line would permanently convert 2.5 ha (6.4 ac) of pasture and forest lands to grass-covered right-of-way (ROW). The proposed substation would convert approximately 0.24 ha (0.62 ac) of pasture/shrubland to industrial use. Neither of these amounts is significant, relative to the local abundance of each of the land use types.

Essentially no vegetation is present at the cogeneration facility site, and therefore there is no impact. Approximately 5.24 ha (13.1 ac) of upland vegetation would be temporarily cleared for pipeline construction, although only 1.54 ha (3.9 ac) is forested habitat. Approximately 0.4 ha (0.9 ac) of forested habitat would be permanently converted to shrubland/grass habitat. At the substation site, 0.25 ha (0.62 ac) of pasture would be permanently altered. The above amounts are not considered to be significant because of the abundance of similar habitat in the area.

Approximately 0.24 ha (0.59 ac) wetland vegetation along the proposed gas spur and loop line ROWs would be disturbed, although none would be permanently filled or drained. Due to the temporary nature of the disturbance, and the use of native species in

revegetation, no significant impact to wetlands is anticipated. Wetlands adjacent to construction areas, but not directly in the ROW will be protected from sedimentation by using standard erosion and sediment control techniques. There is no wetland vegetation at the substation site, and therefore no impact.

Water quality and quantity would not be affected significantly by the proposed project. Minor amounts of erosion and sedimentation would occur during pipeline, substation, and power plant construction. This impact will be minimized, however, by best management practices (BMPs) that include installation of erosion and sediment control features. In addition, construction will primarily take place during the dry season, and all disturbed areas along the pipeline ROW will be reseeded. Erosion and sedimentation will therefore be reduced to a level of non-significance. Water will be taken from the Columbia River using an existing intake and fish screens. Water will be returned to the Columbia using existing outfall and modified diffuser. Return water will be of nearly identical composition and quantity as the river water itself, with the exception of a slight increase in chlorine. The concentrations of this chemical will be kept to within Washington state guidelines to protect river quality, and thus are not expected to have a significant impact.

The use of National Marine Fishery Service (NMFS) and Washington Department of Wildlife and Fisheries approved fish screens and screen surface area to minimize intake velocity at the intake structure will prevent protected anadromous species and most other fish from being entrained, although some underyearling resident species and anadromous American shad might be small enough to get through the screens. These fish are currently not protected by screen requirements. Water temperature would be returned at 8.3 °C (15 °F) higher than the ambient water temperature at the diffuser. The diffuser structure will be extended farther and deeper into the Columbia River and will meet NMFS temperature guidelines to protect down migrating protected andromous species from thermal plume impacts. Therefore, the project will not have significant impacts to fisheries resources and have no-effect to protected andromous fish species.

The cogeneration facility site is devoid of wildlife habitat, and therefore there are no impacts. Most of the spur section of the gas pipeline route is currently disturbed, and any wildlife disturbance would be temporary. Although the gas loop line and substation would result in a small amount of lost shrub and grass habitat, the abundance of this type of habitat in the region makes this impact not significant. Raptors will be protected from electrocution by constructing power lines following guidelines of the Raptor Research Foundation.

Impacts related to geology and soils are also expected to be not significant. The main impact would be a temporary increase in erosion and sedimentation during construction of the pipeline. However, due to planned implementation of BMPs, these impacts would be minimal. The Project would be built to withstand the maximum credible earthquake calculated for the area.

The concentrations of criteria air pollutants from the project will not exceed National Ambient Air Quality Standards and are below Prevention of Significant

Deterioration emission levels, thus protecting human health and the environment, and not having a significant impact. Listed toxic air pollutants (including ammonia) expected to be emitted from the project will not exceed any acceptable source impact level, and will not have a significant impact.

Visibility modeling for the project shows no significant adverse impacts on visibility for the Mt. Adams, Goat Rocks, Mt. Jefferson, and Mt. Hood Wilderness areas, as well as Mt. Rainier National Park.

With regard to possible adverse impacts from the project on visibility in the Columbia River Gorge Scenic Area (Gorge), a visibility mitigation plan was prepared by KEP and SDS Lumber and accepted by Ecology providing for a 36 percent reduction in suspended particulates emitted from the existing SDS Lumber hog fuel boiler during the time when the proposed cogeneration project is in operation. This will result in a net benefit to the visibility in the Gorge with the implementation of the proposed project.

Several aspects of the proposed project could propose a risk, albeit remote, to public health and safety. Large moving equipment, open trenches, and construction debris pose a degree of hazard. However, with proper site management and public access restrictions, these hazards are negligible.

Because the state of the scientific evidence relating to electric and magnetic fields (EMF) has not established a cause and effect relationship between electric and magnetic fields and health effects, BPA is unable to state with absolute scientific certainity the health risks, if any, related to exposure to EMF. We are, however, able to conduct exposure assessments of magnetic fields from the transmission line. Magnetic field calculations were made for homes and commercial buildings along the transmission lines, as detailed in the enviromental assessment. The magnetic field exposure levels are only indicators of how this proposed project may affect the magentic field enviroment and *not* measures of risk or impact on health. Based upon an examination of the exposure assessment, the Project, and a comprehensive understanding of the scientific studies on EMF exposure, it is BPA's opinion that the change in EMF levels associated with this project does not represent a significant effect on the human environment.

Handling of hazardous materials at the cogeneration facility and at the substation (during construction) will be done in accordance with hazardous materials safety plans. Precautions would be taken to prevent the spill or leakage of such materials and to contain any materials that do leak. Under such plans, the risk of public exposure to hazardous materials is very low.

Visual quality effects by project components would be minor, temporary and mitigated. The impact of the cogeneration plant itself is considered minimal due to the existing highly industrial character of the Bingen area. However, all steel structures at the site will be coated with non-reflective material to reduce glare. The visual impact of the gas pipeline will be mitigated by minimizing the amount of land cleared and by revegetating with native species. At the White Salmon Bluffs, a highly visible part of the ROW, special care will be taken to retain as much existing vegetation as possible, and to plant large saplings and mature shrubs. The Bald Mountain substation site is relatively

small and is currently dominated visually by power lines. It is not a highly visible area, and the addition of the substation is not expected to decrease visual quality of the area significantly.

The Project would benefit socioeconomics by increasing the tax base of Klickitat County and the City of Bingen by approximately $40 million dollars and would also create eight new jobs in a county with high unemployment.

All effects of the project on recreation would be insignificant.

The impacts to noise levels in the Bingen area by the cogeneration facility would be mitigated to be within the levels allowed by Washington State Department of Ecology which limit noise levels to non-significant levels by the use of insulation material, mufflers, silencers, and physical barriers.

PUBLIC AVAILABILITY: This FONSI will be distributed to all persons and agencies known to be interested in or affected by the proposed action or alternative.

FLOODPLAIN STATEMENT OF FINDINGS: This is a Floodplain Statement of Findings prepared in accordance with 10 C.F.R. Part 1022. A floodplain assessment was incorporated into the Environmental Assessment. The U.S. Army Corps of Engineers determined that the 100-year floodplain elevation for the Columbia River along this reach is 27 m (89 feet) above mean sea level (MSL) at river mile 171. Portions of the gas spur line are slightly below 27 m (89 feet) MSL. The total distance of the segments below this level is about 177 m (580 feet). Other alternatives where considered, but had greater environmental impacts to wetland and archeological resources, were not cost-effective, and would have greater traffic congestion impacts. Therefore, there is no practical alternative to locating these segments in the floodplain. Because the pipeline will be buried, and the contours restored to their original configuration, the floodplain topography will not be altered. Furthermore, there is no vegetation along the parts of the pipeline route that are in the floodplain; therefore vegetation will not be altered or removed. The pipeline will be buried at least three feet deep, and should the Columbia River have a 100 year flood, it is highly unlikely that the river would scour down to the pipeline. This is because the flow along the spur line would probably not have the shear velocity necessary for significant scouring. Construction of the pipeline would occur during the dry season, when it is highly unlikely for the river to flood. The proposed action conforms to applicable state and local floodplain protection standards.

DOE will allow 15 days of public review after publication of the statement of findings before implementing the proposed action.

DETERMINATION: Based on the information in the EA, as summarized here, BPA determines that the proposed action is not a major Federal action significantly affecting the quality of the human environment within the meaning of the NEPA 42 U.S.C. 4321 et seq. Therefore, an EIS will not be prepared and BPA is issuing this FONSI.

Issued in Portland, Oregon, on September 19, 1994.

Randall W. Hardy
Administrator

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ACRONYMS

aMW	Average megawatts
ASIL	Acceptable source impact level
BA	Biological assessment
BACT	Best available control technology
BPA	Bonneville Power Administration
CERCLA	Comprehensive Environmental Response, Compensation, And Liability Act
CO	Carbon monoxide
CO_2	Carbon dioxide
dBA	A-weighted decibels
EA	Environmental assessment
EIS	Environmental impact statement
EMF	Electric and magnetic fields
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESCP	Erosion and sedimentation control plan
FEMA	Federal Emergency Management Act
FERC	Federal Energy Regulatory Commission
FONSI	Finding of no significant impact
GIS	Geographic Information System
HRSG	Heat recovery steam generator
HWMP	Hazardous waste and materials plan
ISCST2	Industrial source complex short term
KEP	Klickitat Energy Partners
NAAQS	National ambient air quality standards
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NO	Nitrogen monoxide
NO_2	Nitrogen oxide
NOC	Notice of construction
NO_x	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NWP	Northwest Pipeline Corporation
NWPPC	Northwest Power Planning Council
O_3	Ozone
ODF&W	Oregon Department of Fish and Wildlife
OSP	Oil spill prevention
PCB	Polychlorinated biphenyl
PM	Particulate matter
PM_{10}	Particulate matter less than 10 microns in diameter
PP&L	Pacific Power And Light
PPMV	Parts per million by volume
PSD	Prevention of significant deterioration
PUD	Public Utility District
RFP	Request for Proposal

ACRONYMS (continued)

ROW	Right-of-way
RTDM	Rough terrain dispersion model
SCR	Selective catalytic reduction
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Office
SO_2	Sulfur dioxide
SPCC	Spill prevention, containment, and countermeasures plan
SR	State Route
TPQ	Threshold planning quantity
TSCA	Toxic substances control act
TSP	Total suspended particulate
UBC	Uniform building code
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	Unites States Geological Survey
VOC	Volatile organic compound
WAC	Washington Administrative Code
WDF	Washington Department Of Fisheries
WDFW	Washington Department Of Fish And Wildlife
WDNR	Washington Department Of Natural Resources
WDP	Washington Department of Parks
WDW	Washington Department Of Wildlife
WNHP	Washington Natural Heritage Program

1.0 PURPOSE AND NEED

Bonneville Power Administration (BPA), a Federal power marketing agency, has statutory responsibilities to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. In 1991, BPA embarked on the competitive acquisition process for additional conservation and generation resources. An underlying need for acquiring new resources was to avoid electricity deficits caused by growing customer loads. Since that program began, BPA is reassessing its role and the need for resources through the Competitiveness Project. That process is still very much in a developmental stage. However, it has provided preliminary indications that BPA's load growth may not be as high as was predicted in the 1990 and 1992 Resource Programs. BPA has examined the Klickitat Cogeneration Project (being proposed by Klickitat Energy Partners [KEP]) in light of these conclusions and finds that even if preliminary projections become reality, it is still needed and justified. This project helps meet BPA's need to firm non-firm hydroelectric power so that it can be sold as higher value firm power. Because it offers highly efficient and cost-effective cogeneration, this project also helps BPA maintain a commitment to the acquisition priorities of the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act) and the Northwest Power Planning Council's (NWPPC's) Northwest Power Plan.

BPA has several purposes in satisfying this need:

- Meet contractual obligations to supply requested, cost-effective electric power to BPA's customers;
- Assure consistency with BPA's statutory responsibilities, including the Northwest Power Act, while taking into consideration the Pacific Northwest Power Planning Council's NWPPC's Conservation and Electric Power Plan, and its Fish and Wildlife Program;
- Restore and enhance environmental quality, and avoid or minimize potential adverse environmental effects; and
- Test implementation of BPA's competitive acquisition program.

One method that BPA uses to acquire resources is a competitive Request for Proposals (RFP). BPA's 1990 Resource Program proposed an initial competitive solicitation for 100 average megawatts (aMW) as an acquisition test. BPA originally issued its competitive RFP in January 1991 for the acquisition of 100 aMW. In April 1991, BPA revised its solicitation upwards to test the acquisition of 300 aMW. As a result of this solicitation, BPA received 103 proposals from 54 sponsors and evaluated them on technical, economic, and environmental criteria. As a result of this evaluation, three generation projects were selected for further review, of which this is one, as well as all cost-effective conservation projects. Each of these projects is being evaluated independently because they are not alternatives to one another and they are not connected, cumulative, or similar actions, to the extent that the agency need examine them in a single National Environmental Policy Act (NEPA) document.

2.0 ALTERNATIVES

2.1 NO ACTION

Under this alternative, BPA would not acquire the energy output associated with the Klickitat Cogeneration Project, foregoing the opportunity to reduce BPA's projected energy deficit by 49.5 firm aMW annually. If BPA does not acquire the energy from the proposed project, it is unlikely that the developer would proceed to construction without a commitment from another party to acquire the energy.

2.2 PROPOSED ACTION

BPA proposes to acquire 49.5 aMW of firm power from the Klickitat Cogeneration Project, and thereby reduce BPA's projected energy deficit. Power from the proposed project would be derived through components of an existing wood waste-fired cogeneration system and new gas-fired turbine and heat recovery steam generator (HRSG) system. The existing and proposed project components are described in the following paragraphs.

Cogeneration Components (Constructed by KEP)

- An existing 30,390 kilogram/hour (kg/hr) (67,000 pounds/hour [lb/hr]) wood waste-fired boiler, currently used by SDS Lumber to run either of two existing steam turbine generators to offset mill electrical load and to meet the mill's steam needs. Fuel for the boiler, referred to commonly as hog fuel, is derived from scraps (hogged fuel) produced by the sawmill. The existing boiler will remain in the possession of SDS Lumber and will not be part of the project. It will be used by SDS Lumber primarily as a standby source of steam when the gas-fired cogeneration system is not available.

- A new 42.5 MW gas turbine generator coupled to a new HRSG producing up to 68,027 kg/hr (150,000 lb/hr) of steam would be located adjacent to and east of the existing boiler and turbine facility at Township 3N, Range 11E, Section 30, southeast quarter. The new system would take steam from the HRSG and supply it to a newly installed refurbished 12.5 MW steam turbine generator and to the SDS mill. It is anticipated that 24.1 percent of the energy output would be used for thermal (steam) needs. The overall efficiency of the cogeneration project is 48.6 percent.

- The new gas generator system would consist of a gas turbine engine and an electric generator housed in a sound-attenuated steel enclosure approximately 17.4 meters (m) long, 4.3 m wide, and 4.6 m high (57 feet [ft] x 14 ft x 15 ft). An intake air house approximately 9.1 m (30 ft) wide by 15.5 m (51 ft) long and extending to 11 m (36 ft) above grade would be mounted above the turbine enclosure. The new HRSG would be an outdoor structure approximately 18 m (60 ft) high, 31 m long (100 ft) and 4.6 m (15 ft) wide.

- One new steel emission stack 24 m (80 ft) tall would be placed at the west end of the HRSG.

- A newly refurbished and installed 12.5 MW condensing steam turbine generator would receive approximately 54,421 kg/hr (120,000 lb/hr) of steam from the HRSG. This turbine generator set, along with its associated surface condenser and other auxiliaries would be housed in an extension of the existing steam turbine hall (approximately 15.2 m x 27.4 m [50 ft x 90 ft]) at the east end of that building.

- The existing 3.0 MW and 5.0 MW steam turbine generators, which are located in the existing turbine hall and are currently used to offset mill electrical load, would be used primarily as backups to the newly installed 12.5 MW steam turbine generator.

- A new 1.55 million liter (l) (410,200-gallon [g]) fuel oil storage tank approximately 14 m (45 ft) in diameter and 9.1 m (30 ft) high would be constructed south and east of the new cogeneration facilities. High quality/low sulfur fuel oil will be retained to use as a back-up fuel for emergencies. Maximum fuel oil usage will be 240 hours per year. This above-ground storage tank would be placed on a liner, surrounded by an impervious berm designed to contain the entire contents of the tank, with enough freeboard to handle the major storm event of record, should they occur simultaneously.

- An existing 107-centimeter (cm) (42-inch [in]) diameter cooling water intake line from an existing intake structure south of the proposed turbine facility would be used for the new system. The turbine system would require up to 95.5 million liters per day (mld) (25 million gallons per day [mgd]) of cooling water drawn from the Columbia River through the existing intake structures. An additional pump would be installed in the intake structure to supply the full amount of water required by the expanded facility. The intake piping at the turbine building area would be extended underground approximately 15.2 m (50 ft) to tie into the condenser of the 12.5 MW turbine.

- An existing 91-cm (36-in) diameter 488-m (1,600-ft) long cool-down water discharge line, connecting to an existing 76-cm (30-in) diameter 31-m (100-ft) long diffuser in the Columbia River south of the turbine facility would be used for the proposed system. The diffuser structure will be extended approximately 48.8 m (160 ft) into the Columbia River, and the existing ports will be sealed. The discharge piping at the turbine building area would be extended underground approximately 15.2 m (50 ft) to tie into the condenser of the 12.5 MW turbine.

Gas Transmission Components (Constructed by Northwest Pipeline Corporation)

- A new gas metering station, 4.6 m (15 ft) high by 18.3 m (60 ft) long by 18.3 m (60 ft) wide, located adjacent to the new cogeneration facility.

- Approximately 2,591 m (8,500 ft) of 15.2-cm (6-in) or 20-cm (8-in) outside-diameter steel gas spur supply line to the existing White Salmon meter station located approximately 2.6 kilometers (km) (1.6 miles [mi]) west of the turbine

site, just north of the Hood River bridge (Figure 3). The eastern half of the line would be located on the mill property. The western half of the new gas spur supply line would be located adjacent to State Route (SR) 14, on the south side of the roadway in Township 3N, Range 10E, Section 25, northeast quarter, and Township 3N, Range 11E, Section 30, northwest quarter. Northwest Pipeline Corporation (NWP) will generally require a permanent and construction 6.2-m (20-ft) right-of-way (ROW). This narrower-than-normal ROW will minimize disturbance to residences and commercial buildings.

- A new 6.0-km (3.7-mi) long, 15.2-cm (6-in) outside-diameter steel gas loop line connecting the White Salmon metering station to the existing 66-cm (26-in) diameter Ignacio-to-Sumas gas transmission line approximately 5.6 km (3.5 mi) north of the station in Township 3N, Range 10E, Section 25, northeast quarter; Section 13, southeast quarter; Township 3N, Range 11E, Section 18, southwest and northwest quarters; Section 7, northwest and southwest quarters; Section 6, southwest and northwest quarters (Figures 4a, 4b, 4c). The new loop line would be constructed within the ROW of the existing Hood River gas line lateral owned and maintained by NWP. NWP maintains a 9.1 m (30 ft) ROW for the existing lateral, and would be expanding the permanent operational ROW to 18 m (60 ft) to accommodate the new loop line. Typically, construction of the loop line will use a 23-m (75-ft) construction ROW.

Electrical Transmission Components (Constructed by BPA)

- A new 12.47/69-kilovolt (kV) step-up transformer station, and a 152-m (500-ft) long 69-kV overhead transmission line (supported by one or two 12 m (40-ft) high wooden poles), on the SDS Lumber Mill property, connecting to an existing Pacific Power and Light (PP&L) 69-kV overhead transmission line east of the proposed cogeneration facility. BPA and/or Klickitat County Public Utility District may enter into a potential option agreement with PP&L to share in ownership or purchase the 69-kV transmission line. However, regardless of ownership, all environmental impacts of the proposed project would be the same.

- A new Bald Mountain electrical substation, which will be owned and operated by BPA, is located on land presently owned by PP&L. This location is approximately 305 m (1,000 ft) north of the existing Condit Hydroelectric Project's power house on the White Salmon River, approximately 6.8 km (4.2 mi) northwest of the SDS Lumber Mill site, in Township 3N, Range 10E, Section 10, southeast quarter. The proposed substation would occupy a 0.25-hectare (ha) (0.62-acre [ac]) area within a 2.4-ha (6-ac) parcel that would be acquired from PP&L to accommodate the substation and transmission line modifications (Figure 5). Structures within the substation would include switches, switch stand, transformer, and three 69-kV racks. Structures would not exceed 16 m (53 ft) in height and would be unpainted galvanized steel construction, surrounded by a 2.1-m (7-ft) chainlink fence. Land leveling, including up to a 4.6-m (15-ft) cut and 2.7-m (9-ft) fill, would be required for the substation. Transmission line modifications would include rerouting the

existing PP&L 69-kV Glenwood and Bingen lines through the proposed substation, as shown in Figure 5. This involves erecting seven 24-m (80-ft), and four 26-m (85-ft) new wood poles; and removing two 26-m (85-ft) wood poles as indicated. Also involved would be removal and replacement of approximately 244 m (800 ft) of 69-kV conductor with approximately 610 m (2,000 ft) of new 69-kV conductor to accommodate rerouting. The substation would intertie power from the proposed gas turbine generator (via the existing PP&L 69-kV line) into the BPA 115-kV grid system. A wheeling agreement would be developed between BPA and PP&L to allow power to be wheeled over the existing 69-kV PP&L line from the Klickitat Cogeneration Project facility to the proposed Bald Mountain Substation.

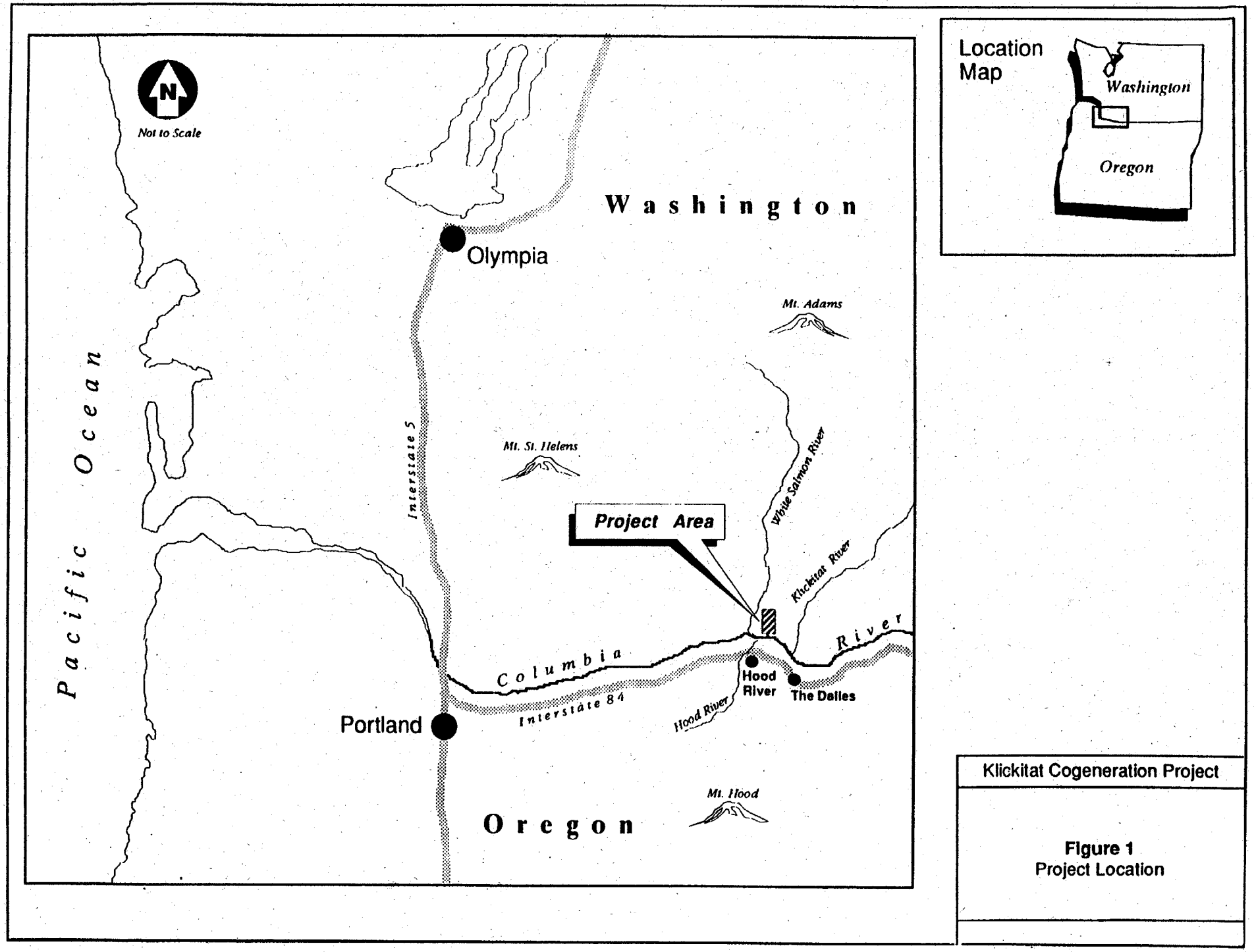
2.3 OTHER ACTIONS

Applicants in the competitive acquisition program develop each potentially qualifying action independently and submit them to BPA separately. Therefore, collective consideration of all potential actions is not practical. However, implementing the proposed action would not foreclose future consideration of other potential BPA energy resource actions by means of the competitive acquisition program and other resource acquisition mechanisms. In fact, because the proposed action would merely reduce—not eliminate—the need for power, other resources independent of the proposed action would likely be considered (pursuant to NEPA) regardless of whether or not BPA implements the proposed action. Resource types potentially available to meet future load growth include:

- Conservation (commercial, residential, and industrial sectors)
- Renewables (hydropower, geothermal, biomass, wind, and solar power)
- Cogeneration
- Combustion turbines
- Nuclear power
- Coal

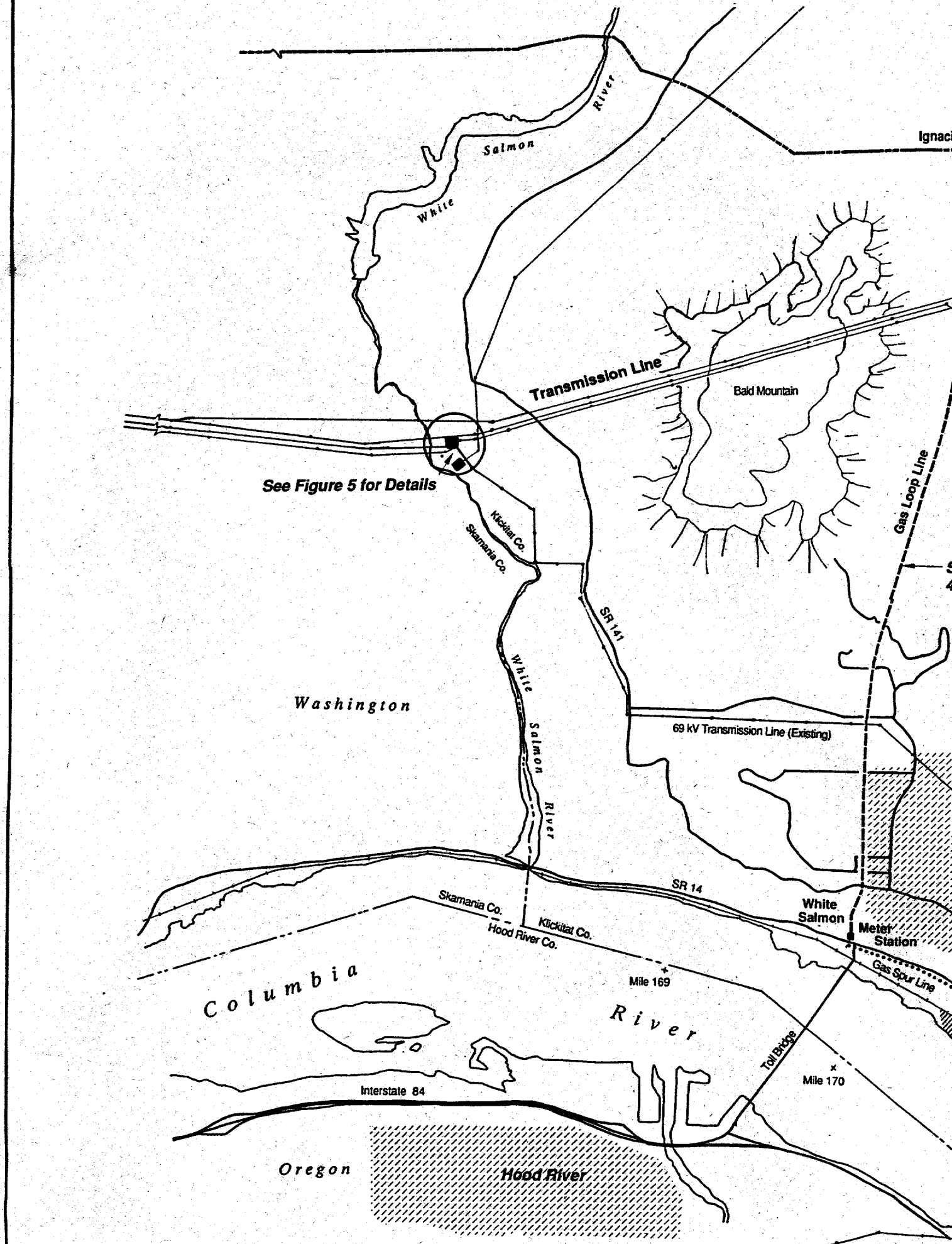
To comparatively evaluate these resource types, BPA has prepared a Resource Program Environmental Impact Statement (DOE/EIS-0162) released in February 1993. In addition, every two years BPA prepares a Resource Program that communicates how BPA proposes to meet its expected load obligations. For each program, alternatives composed of different combinations of energy resource types from BPA's resource stack are examined. The resource stack is the list of resources, ordered generally by cost, forecast to be available to meet electric power needs. BPA's planning model relies on this resource stack in simulating resource acquisitions and serves as a basis for BPA's resource planning decisions.

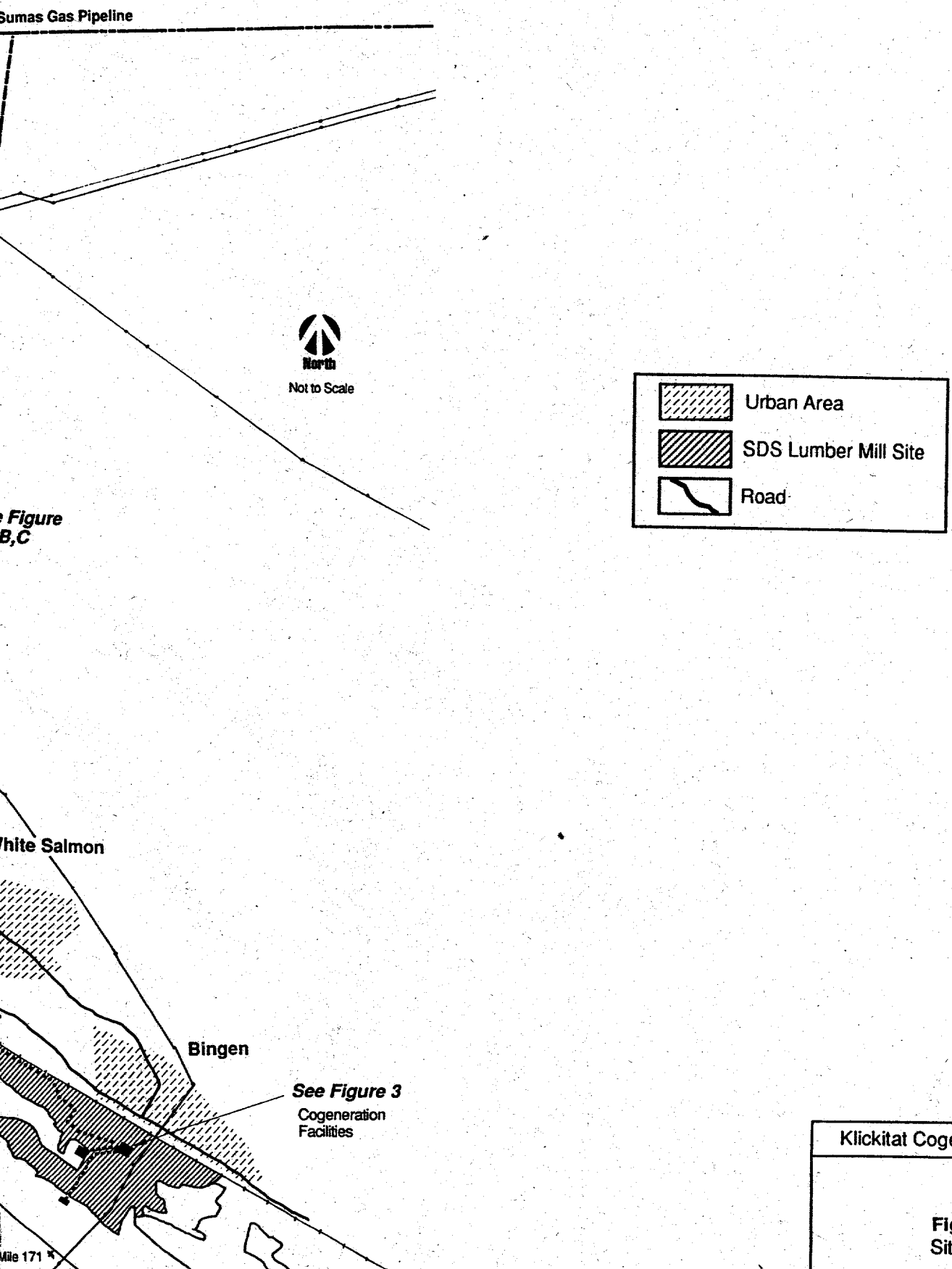
In developing a Resource Program, BPA prepares load forecasts jointly with the NWPPC. A range of forecasts is prepared to reflect uncertainties about future load growth. Next, a range of load/resource balances is prepared by comparing the capability of the existing Federal system resources to the range of projected Federal system loads over the next 20 years. In a parallel process, BPA and NWPPC develop new resource supply forecasts to plan acquisition of cost-effective resources as needed to meet load growth. Pursuant to this formula, resources other than the proposed action would be examined and evaluated in the future for their eligibility and capability to satisfy BPA's future needs.



Klickitat Cogeneration Project

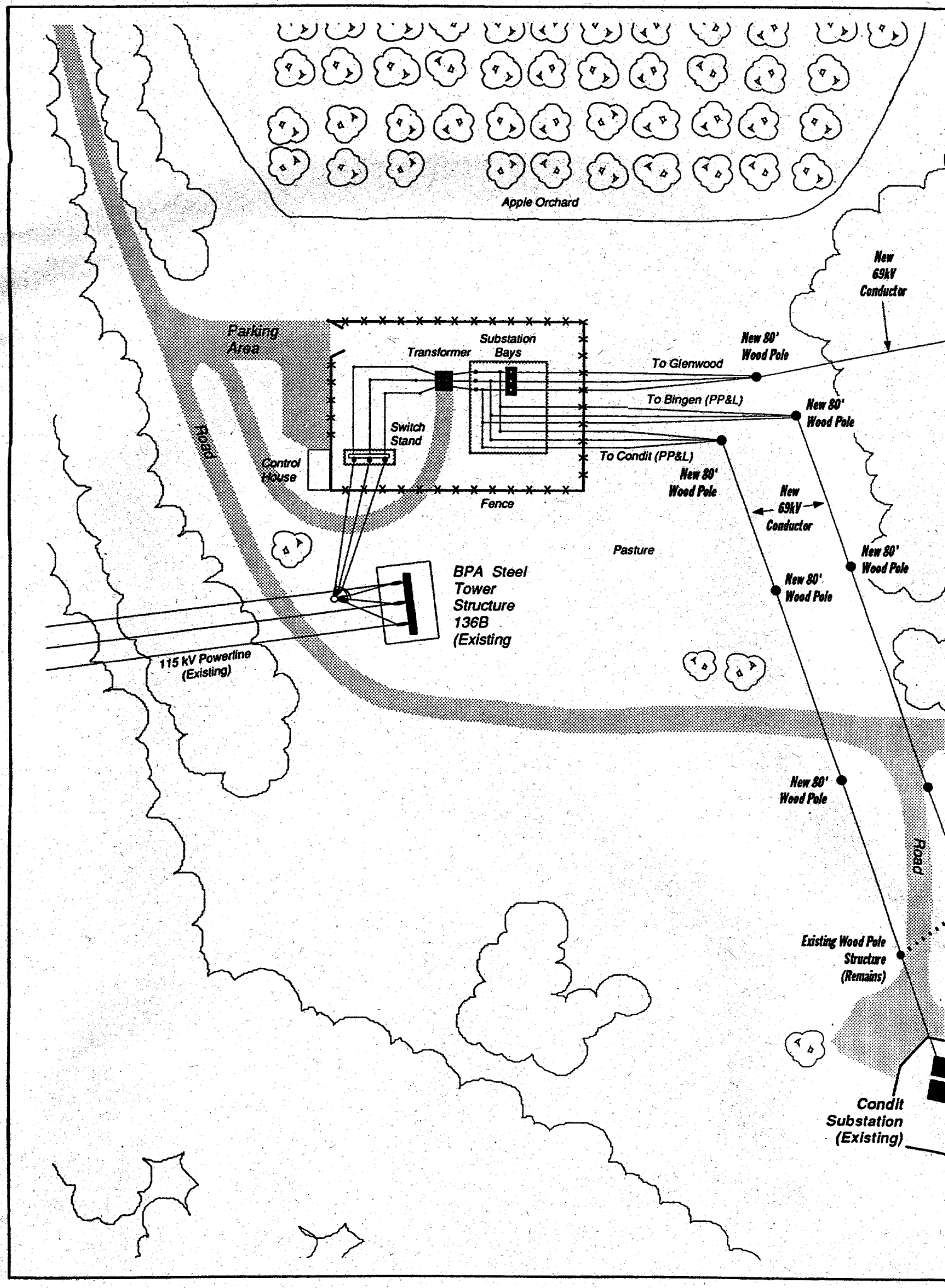
Figure 1
Project Location

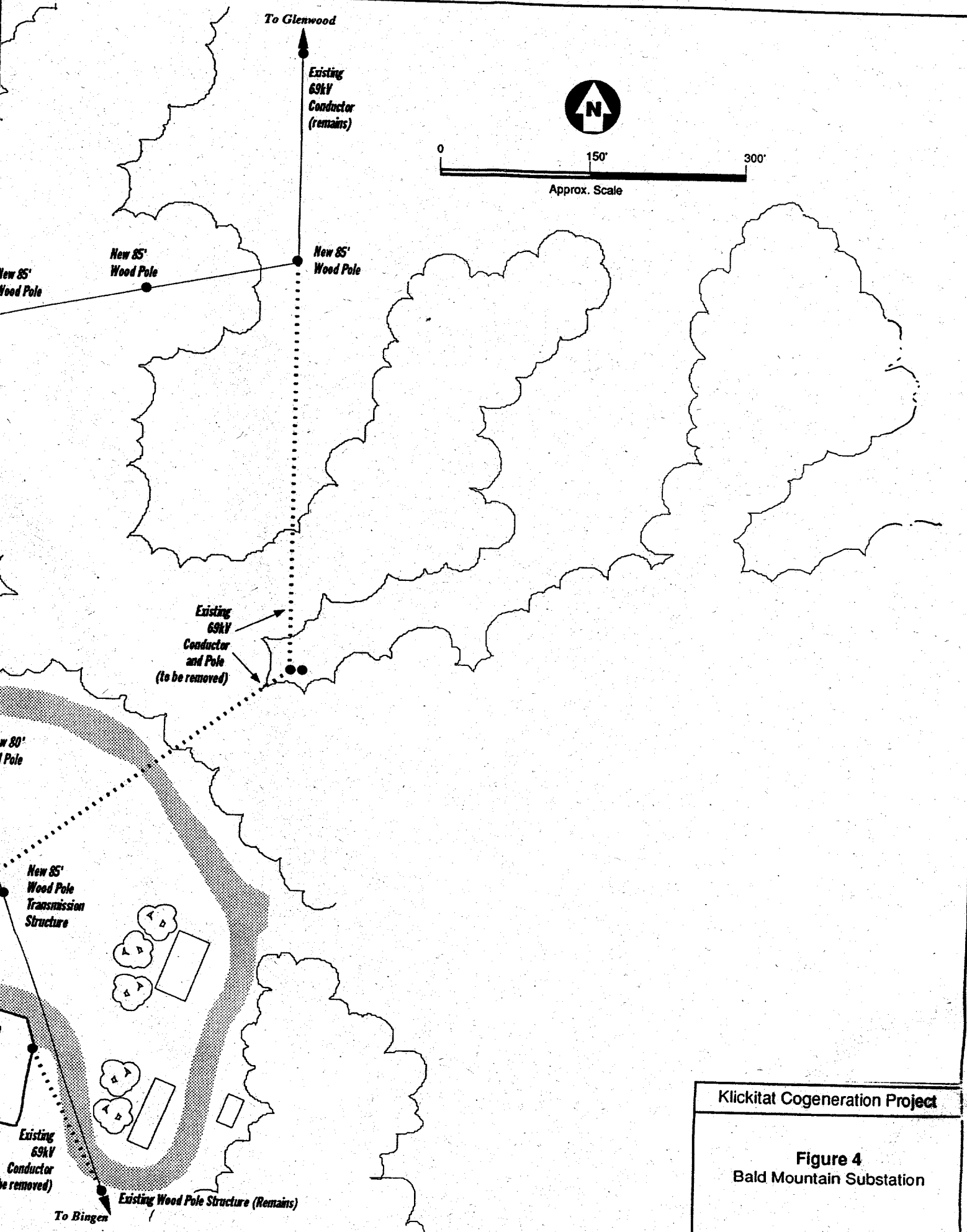

White Salmon River
Ignaci
Transmission Line
Bald Mountain
See Figure 5 for Details
Gas Loop Line
Klickitat Co.
Skamania Co.
SR 141
White Salmon River
Washington
69 kV Transmission Line (Existing)
SR 14
Skamania Co.
Klickitat Co.
Hood River Co.
White Salmon
Meter Station
Gas Spur Line
Mile 169
Columbia River
Toll Bridge
Mile 170
Interstate 84
Oregon
Hood River



Klickitat Cogeneration Project

Figure 2
Site Plan


Apple Orchard
New 69kV Conductor
Parking Area
Substation Bays
Transformer
New 80' Wood Pole
To Glenwood
To Bingen (PP&L)
New 80' Wood Pole
Switch Stand
Road
Control House
To Condit (PP&L)
New 80' Wood Pole
New 69kV Conductor
Fence
Pasture
New 80' Wood Pole
New 80' Wood Pole
BPA Steel Tower Structure 136B (Existing
115 kV Powerline (Existing)
New 80' Wood Pole
Road
Existing Wood Pole Structure (Remains)
Condit Substation (Existing)



Klickitat Cogeneration Project

Figure 4
Bald Mountain Substation

Bingen power plant wins last permit to build

By JEANIE SENIOR
Correspondent, The Oregonian

The Washington Department of Ecology has issued an air quality permit for a contested $40 million natural gas cogeneration plant in the Columbia River Gorge at Bingen, Wash.

The permit is the final one needed by Klickitat Energy Partners, which plans to build the 53.5 megawatt cogeneration plant adjacent to SDS Lumber Co.'s sawmill and plywood plant at Bingen.

Operating at full capacity, the plant will generate enough electricity to power more than 20,000 households. It also will furnish steam to operate the mill complex, whose owners hold a 46 percent interest in the partnership.

Bonneville Power Administration already has a 20-year contract to buy most of the power the operation produces. The fees are on a sliding scale that starts at 4½ cents a kilowatt hour and grows to nearly 9½ cents by the contract's end.

Air quality engineer Robert Swackhamer said the ecology department's Yakima office got a considerable public response to the plant's air quality permit application — 242 letters, faxes and telephone calls.

He said the majority of comments came from individuals or organizations who had concerns about the project.

The appeal period for the permit is 30 days. Several environmental groups, including the Columbia Gorge chapter of the National Audubon Society, Columbia River United

Committee Inc., have voiced opposition to the plant.

Ivan Lewis Gold, a Portland attorney who is a member of Klickitat Energy Partners, said he hopes construction of the cogeneration plant can begin by summer.

"We're going forward regardless," he said. "We are extremely confident that the order can withstand any challenge."

According to ecology department figures, the plant will put more than 200 tons of pollutants into the atmosphere annually, including 71 tons each of nitrogen oxide and ammonia, and 61 tons of carbon monoxide. But the department says that no single emission will emerge in a quantity sufficient to qualify the plant as a major pollution source.

Gold said conditions contained in the air quality permit and restrictions ordered by the City of Bingen should result in reduced emissions from the SDS mill and less noise. Among its restrictions, the air quality permit requires the partnership to monitor ambient ozone levels.


North
G13
G11/A
G12
G11/B
G11/C
G17/A
Key
4C
4B
4A
Columbia R.

Klickitat Cogeneration Project

Figure 4a
Gas Loop Line from
Hood River Metering Station
to North Main Avenue


Key
4C
4B
4A
Columbia R.

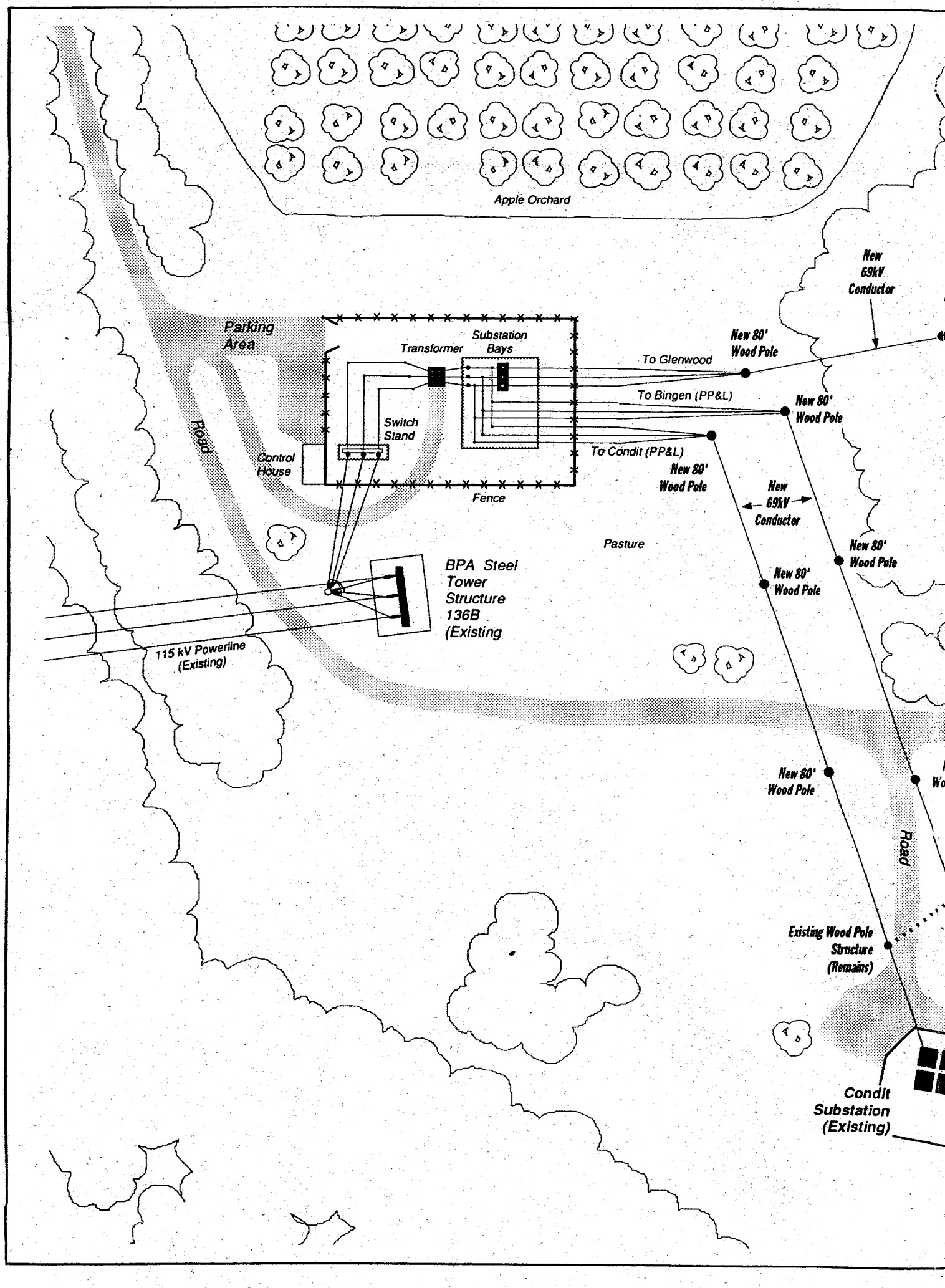
Klickitat Cogeneration Project

Figure 4b
Gas Loop Line from
North Main Avenue to Walker's
Property


BLOCK VALVE 75-2
M.P. 0.00
REGULATOR STATION
BLOCK VALVE 75-1
M.P. 4.01
15
17
Key
4C
4B
4A
Columbia R.

Klickitat Cogeneration Project

Figure 4c
Gas Loop Line from Walker's Property to Ignacio/Sumas Gas Line


Apple Orchard
New 69kV Conductor
Parking Area
Substation Bays
Transformer
To Glenwood
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New 80' Wood Pole
Switch Stand
Road
Control House
To Condit (PP&L)
New 80' Wood Pole
Fence
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Pasture
New 80' Wood Pole
New 80' Wood Pole
BPA Steel Tower Structure 136B (Existing
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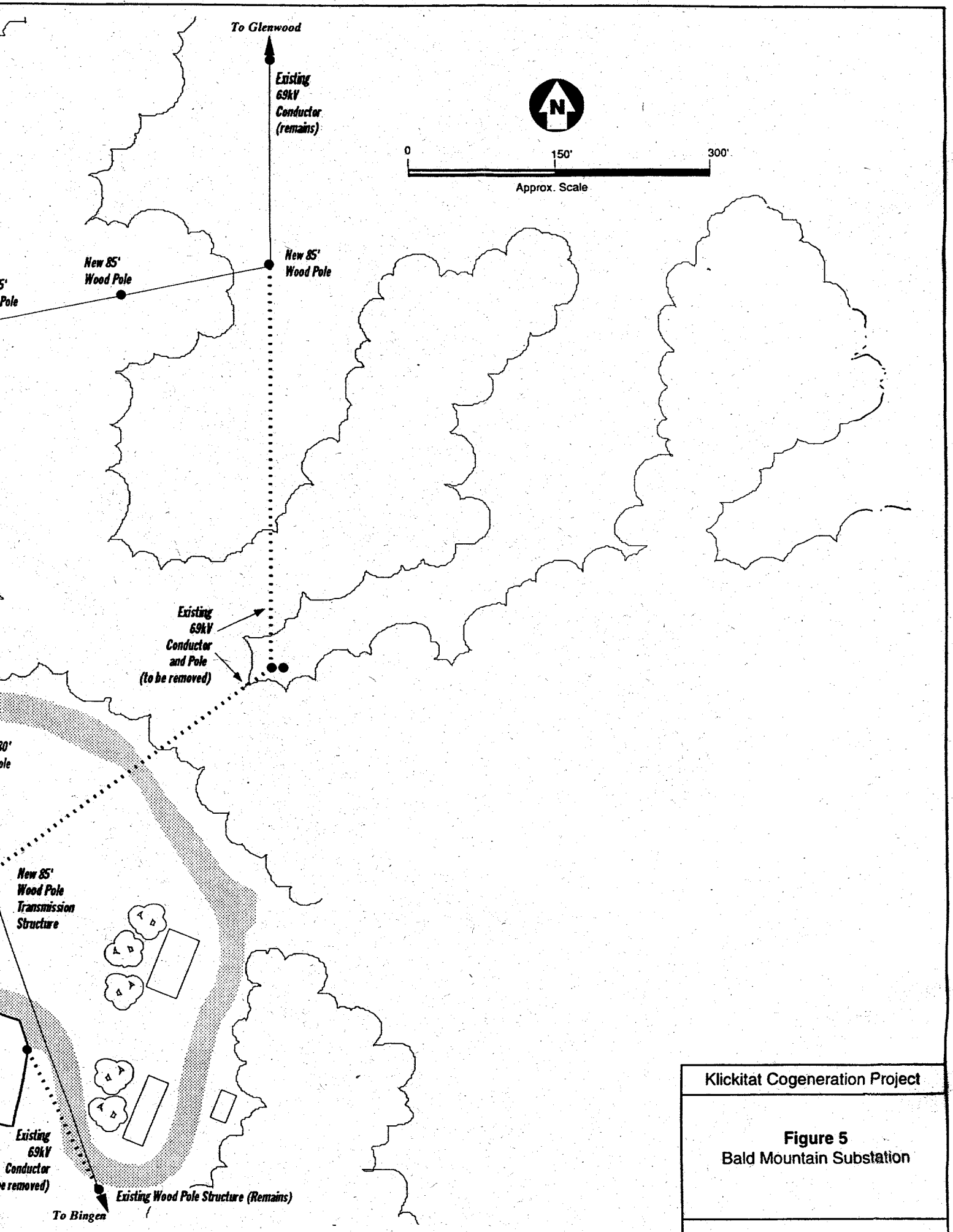
New 80' Wood Pole
Road
Existing Wood Pole Structure (Remains)
Condit Substation (Existing)



Klickitat Cogeneration Project

Figure 5
Bald Mountain Substation

3.0 ENVIRONMENTAL IMPACTS AND MITIGATION OF THE PROPOSED ACTION AND ALTERNATIVES

3.1 PROPOSED ACTION

3.1.1 Land Use

Project Components

SDS Lumber Mill Site

The cogeneration elements as well as the 12.47-kV/69-kV step-up transformer and intertie to the existing PP&L transmission line, the gas metering station, and eastern half of the gas spur line would be located on the existing SDS Lumber Mill (Figure 3). The mill site is located within the city of Bingen, Washington, and zoned heavy industrial/ manufacturing. The proposed cogeneration facilities would occupy approximately 1.6 ha (4.0 ac) on the lumber mill site (Figure 4). The transformer substation and intertie to the PP&L line would require approximately 0.1 ha (0.25 ac), while the gas metering station and eastern half of the gas spur line ROW would include approximately 2.3 ha (5.6 ac).

Gas Spur Line

The western half of the proposed gas spur line would be located south of and parallel to but outside of the ROW of SR 14, connecting to the existing NWP White Salmon metering station just north of SR 14 and west of the intersection with the Hood River toll bridge (Figure 2). Existing land uses adjacent to the proposed route are light industrial associated with rail access, large-lot residential, and strip commercial. This area is zoned Riverfront District, which allows public facilities, light manufacturing, tourism, commercial, and residential uses. This portion of the gas spur line ROW would include approximately 1.2 ha (2.9 ac).

Gas Loop Line

The southern one-third of the proposed gas loop line would be located parallel to the existing NWP Hood River Lateral, mainly within its existing ROW that passes through a portion of the city of White Salmon that is zoned urban residential. Several residences are located in proximity to this portion of the existing ROW. The northern two-thirds of the proposed loop line would traverse an unincorporated area within Klickitat County, still remaining, however, mainly within the existing Hood River Lateral ROW, connecting with NWP's existing Ignacio-to-Sumas pipeline (Figures 4a, 4b, 4c). Zoning in this area includes suburban residential, rural residential, open space, extensive agricultural, and forest resource land. Within the vicinity of the existing ROW are small pockets of privately owned pasturelands and orchards as well as several homes. The existing Hood River Lateral ROW occupies approximately 11 ha (27 ac) and an additional 2.8 ha (7 ac) would be added to accommodate the proposed loop line.

Bald Mountain Substation

The substation would be located on a southerly sloping knoll approximately 305 m (1,000 ft) north of the existing Condit Powerhouse, approximately 3.2 km (2 mi) upstream from the mouth of the White Salmon River and approximately 4.8 km (3.0 mi) northwest of the city of White Salmon. The site is within existing BPA and PP&L transmission line

corridors and is pastureland that is owned and maintained by PP&L. The land is zoned Forest Resource Land. Adjacent land uses surrounding the proposed substation site include an apple orchard to the north, pastureland to the east, and an existing gravel PP&L access road and second-growth forested and understory areas to the south and west sloping into the White Salmon River gorge. The proposed substation would occupy approximately 0.25 ha (0.62 ac). See Section A.5 of Appendix A for additional information regarding local zoning and land use plans.

Mitigation

Three site-specific erosion and sediment control and revegetation plans will be prepared: 1) as required by the Washington Department of Ecology (Ecology) for the National Pollutant Discharge Elimination System (NPDES) permit for the cogeneration site, (2) as required by the Federal Energy Regulatory Commission (FERC) for the gas transmission lines, and (3) as required by BPA for the Bald Mountain Substation. These plans will ensure that the physical and vegetative integrity of the land forms in the project area are maintained and aquatic resources are protected. Federal and local licensing and permitting requirements associated with construction of the gas spur and loop lines by NWP (e.g., FERC RM 90-1-000; 18 CFR, Part II) will ensure proper mitigation measures are taken to protect and restore disturbances to residences, other buildings, and land uses adjacent to the ROW.

Unavoidable Impacts

Additional ROW required for the gas transmission lines would permanently convert 7.6 ha (19 ac) from mixed suburban and rural residential, agricultural and forest resource land use to pipeline ROW. Land required for the Bald Mountain Substation would permanently convert 0.25 ha (0.62 ac) of non-prime agricultural land to industrial use. This conversion does not represent a significant impact because similar agricultural land use is abundant in the surrounding area.

3.1.2 Vegetation

General Upland Vegetation

The entire project lies within a Pacific Northwest vegetation transition zone found only in the Columbia River Gorge. Vegetation in this zone is a mixture of plant species characteristic of the western hemlock zone of the western Cascade Mountains (a wetter climate) and the Ponderosa pine zone of the eastern Cascade Mountains (a dryer climate) (Franklin and Dyrness, 1973). Natural plant communities here are dominated by needle-leaved, evergreen tree species such as Douglas-fir (*Pseudotsuga menziesii*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), and ponderosa pine (*Pinus ponderosa*). Other dominant tree species may include Garry oak (*Quercus garryana*), red alder (*Alnus rubra*) and big-leaf maple (*Acer macrophyllum*). Garry oak tends to occur in scattered patches of oak woodland, particularly on south-facing or excessively drained soils. Red alder and big-leaf maple are frequent in riparian communities and as lesser components of coniferous forest habitats in the vicinity of the project.

Typical understory vegetation in undisturbed areas in this transition zone consists of shrub species such as salal (*Gaultheria shallon*), oceanspray (*Holodiscus discolor*), dewberry (*Rubus ursinus*), Oregon holly-grape (*Mahonia · aquifolium*), poison-oak (*Toxicodendron diversiloba*), and snowberry (*Symphoricarpos albus*). Herbaceous species

commonly include sword fern (*Polystichum munitum*), vetch (*Vicia* sp.), and sweet-cicely (*Osmorhiza chilensis*). In general, this vegetation zone is characterized by a moderate-to-high diversity of plant species.

Specifically, the project elements described in Section 2.2 are located in a diversity of environments and vegetation types described below.

SDS Lumber Mill Site

The cogeneration facilities are located in disturbed industrial areas on the SDS Lumber Mill site. These areas have virtually no vegetation except for occasional weeds and patches of weeds. Former riparian vegetation associated with the Columbia River at this site has been displaced by areas of fill and by industrial development.

Gas Spur Line

About half of the length of the proposed gas spur line is located on the SDS Lumber Mill site, in areas that have virtually no vegetation except for weeds and occasional weed patches. The remainder of the gas spur line would be constructed through disturbed lands, pastures, and grassy areas associated with light industrial and large-lot residential land uses adjacent to SR 14. Clearing and grading for pipeline construction will temporarily affect 0.04 ha (0.1 ac) of forested upland.

Gas Loop Line

The gas loop line is located in an existing and maintained natural gas transmission ROW. While the existing ROW itself was built through a variety of natural habitats, particularly mixed conifer forest and oak woodlands (as described above), the maintained ROW currently supports grassland dominated by non-native pasture grasses such as bluegrass (*Poa* sp.), timothy (*Phleum pratense*), bentgrass (*Agrostis* spp.), fescues (*Festuca arundinacea* and *F. rubra*), and orchard grass (*Dactylis glomerata*). A smaller portion of the maintained ROW is dominated by shrub species such as Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), and Himalayan blackberry (*Rubus discolor*).

Vegetation impacts would be caused primarily by two factors: (1) the initial temporary clearing and grading of the ROW for pipeline construction; and (2) the long-term maintenance and control of ROW vegetation during pipeline operation. This component will temporarily affect a maximum of 1.5 ha (3.8 ac) of forested upland and 3.7 ha (9.2 ac) of shrub-dominated upland habitat. Approximately 0.4 ha (0.9 ac) of the impacted forest habitat will be permanently converted to shrub- or grass-dominated habitats.

Proposed Bald Mountain Substation

The proposed Bald Mountain Substation is located on intensively grazed agricultural land with annual bluegrass (*Poa annua*) and bulbous bluegrass (*Poa bulbosa*). Portions of the area are overgrown with Himalayan blackberry, rose (*Rosa* sp.) (non-native), and teasel (*Dipsacus sylvestris*). The associated new electrical transmission lines near the substation would be constructed over dense thickets of shrubs, using existing dirt access roads. Either a small amount or no area of this shrub habitat would be permanently cleared for purposes of construction, operation, or maintenance.

Wetland Vegetation

No wetlands are located at or within 30 m (100 ft) of the proposed new cogeneration facilities on the SDS Lumber Company property, nor at the site of the proposed Bald Mountain Substation. However, six wetlands are crossed by the routes of the gas loop line and the spur lines. These six wetlands are palustrine habitats dominated by trees, shrubs, and/or herbaceous perennial plant species. Most are structurally diverse and support more than one wetland class. These wetlands are outside of the 61-m (200-ft) jurisdictional area of the State Shoreline Management Act for the Columbia River. Additional technical information on the plant communities, soil characteristics, and hydrology for each of these wetlands is contained in NWP (1994).

The loop line and the spur line would also cross four intermittent and two perennial streams within the Jewett Creek watershed. The perennial or intermittent status of affected streams was determined during field surveys by NWP and through agency consultation. One of the intermittent streams is crossed three times. One of the perennial stream crossings is Jewett Creek, but this crossing is located where Jewett Creek is contained in a 3 m (10 ft) diameter culvert. The culvert is buried sufficiently deep to allow the pipe to be installed over the culvert without disturbing either the stream or the culvert. No riparian vegetation is present at this crossing. Additional technical information on these stream resources is contained in NWP (1994).

Construction of the gas spur and loop lines would impact these wetlands by the temporary alteration of wetland vegetation and/or short-term changes in wetland hydrology, wetland function, water quality, aesthetic character, or wildlife habitat. Pipeline construction would not result in the permanent filling or draining of any wetlands. Thus, no wetland habitats or functions will be permanently lost as a result of pipeline construction.

Approximately 0.24 ha (0.59 ac) of wetland vegetation would be temporarily disturbed during construction. This includes 0.04 ha (0.09 ac) of emergent vegetation, 0.11 ha (0.27 ac) of scrub-shrub/emergent vegetation, and 0.09 ha (0.23 ac) of forested wetland. Approximately 0.04 ha (0.1 acre) of forested wetland will be permanently converted to scrub-shrub and/or emergent wetland habitat. All other affected wetland areas will be allowed to restore to preconstruction vegetation types.

Sensitive Plant Species

There is currently one Federally listed threatened plant species in Washington (Nelson's checker-mallow [*Sidalcea nelsoniana*], Cowlitz County), which is unlikely to occur in habitats found in the project area. The swamp sandwort (*Arenaria paludicola*) is listed as a Federally endangered plant species in Washington, but is thought to be extirpated from Washington (WNHP, 1994).

NWP consulted with the U.S. Fish and Wildlife Service (USFWS) and the Washington Natural Heritage Program (WNHP) regarding federally listed, proposed, and candidate endangered and threatened plant species potentially occurring in the gas pipeline portion of the project area. No Federally listed or proposed plant species were identified by USFWS as potentially occurring in the vicinity of the these pipeline routes (Frederick, 1994). However, USFWS identified five candidate Category 2 species that may occur in the vicinity of the proposed project: Suksdorf's desert-parsley (*Lomatium suksdorfii*), white meconella (*Meconella oregana*), liverwort monkey flower (*Mimulus jungermannioides*), Barrett's beardtongue (*Penstemon barrettiae*), and persistentsepal yellowcress (*Rorippa*

columbiae). In addition, WNHP identified numerous state-listed sensitive plant species that may potentially occur in the project area (Norwood, 1993)

Rare plant surveys were undertaken by Ebasco Environmental in early May 1993 at the proposed cogeneration facilities site and at the proposed Bald Mountain Substation site. Additional rare plant surveys were conducted by Ebasco Environmental in early August 1993 along all but about 0.8 km (0.5 mi) of the presently 9.1 m (30 ft) cleared portion of the existing Hood River gas lateral ROW and along four alternative routes being considered for the gas spur line. Rare plant surveys of the construction ROW for the gas loop and spur lines were conducted by Enserch Environmental in May 1994. No sensitive plant species were located during these surveys. See Section A.2 of Appendix A for additional information regarding sensitive plants.

Mitigation

Upland Vegetation

Vegetation impacts resulting from pipeline construction would be relatively short-term. The construction ROW and associated staging and work space areas would be temporary. Thus, the duration of impact would be limited to the time needed to restore plant communities. Grass-dominated habitat types generally return to their original condition within 1 to 3 years following project construction. Woody-plant dominated habitats regenerate more slowly.

During project construction, NWP and BPA will avoid unnecessary removal of vegetation, especially trees and snags. Existing cleared ROW will be used to the greatest extent possible.

The erosion and sedimentation control plan (ESCP), to be prepared by BPA for electrical transmission components, will describe actions to revegetate all temporarily disturbed areas. The plan should, in particular, describe actions to restore temporarily disturbed natural forested and shrub-dominated upland areas to their previously native forested and shrub habitat conditions.

For erosion and sedimentation control, NWP will follow procedures described in the FERC Erosion Control, Revegetation, and Maintenance Plan dated 25 June 1992.

NWP has also prepared a site-specific restoration plan for the gas transmission components, in consultation with the Soil Conservation Service (NWP, 1994). No restoration plan is required for the cogeneration components because no vegetation will be disturbed in the construction of those facilities.

Disturbed areas caused by construction of gas transmission components in agricultural, orchard, and residential areas will be restored to their near-original grade and seeded with desirable pasture or turf grasses. Forested and shrub habitats being permanently converted to maintained grass habitats within the ROW for the proposed gas spur and gas loop lines will be graded to their near-original grade and seeded with desirable erosion control grasses. Forested and shrub habitats being temporarily disturbed will be graded to their near-original grades and seeded with appropriate erosion control species and native plant species.

Wetland Vegetation

Approximately 0.24 ha (0.59 ac) of wetland vegetation would be disturbed during construction of the gas transmission facilities. This includes 0.04 ha (0.09 ac) of emergent vegetation, 0.11 ha (0.27 ac) of scrub-shrub/emergent vegetation, and 0.09 ha (0.23 ac) of

forested wetland. Approximately 0.04 ha (0.1 acre) of forested wetland would be permanently converted to scrub-shrub and/or emergent wetland habitat. All other affected wetland areas will be allowed to restore to preconstruction vegetation types.

NWP will minimize tree and stump removal in forested wetlands. During clearing operations, wetland vegetation will be cut at ground level to minimize root damage. If the removal of tree roots in wetlands is necessary outside of the trenchline for the gas pipelines (for safety reasons), NWP will develop and submit to FERC (within 90 days of the completion of construction in wetlands) site-specific mitigation plans to ensure successful reestablishment of woody plant communities.

In addition, the top 3 cm (12 in) of soil in wetlands will be stripped, stockpiled, and replaced following backfilling of the gas pipeline trench. For erosion and sedimentation control, NWP will follow procedures described in the FERC Erosion Control, Revegetation, and Maintenance Plan dated 25 June 1992. All wetlands will be reseeded with native wetland plant species and allowed to revert to their original condition following construction.

Sensitive Plant Species

No sensitive plant species were located within or adjacent to any of the project components. Thus, there will be no impacts to sensitive plant species. Therefore, no mitigation is required.

Unavoidable Impacts to Upland Vegetation

SDS Lumber Mill Site

The cogeneration facilities are located in disturbed industrial areas on the SDS Lumber Mill site. These areas have virtually no vegetation except for occasional weeds and patches of weeds. Thus, there are no unavoidable impacts to vegetation.

Gas Loop Line and Gas Spur Line

Approximately 11 ha (26 ac) of upland vegetation would be temporarily or permanently cleared during construction of the gas spur and loop lines, and therefore functionally lost until sufficient time passes for similar vegetation to become re-established. Specifically, construction of the new gas loop line and the gas spur line is estimated to temporarily clear approximately 1.3 ha (3.2 ac) of upland forested habitat (including both forested and oak woodland habitats), 3.7 ha (9.2 ac) of upland shrub habitat, and 5.3 ha (13 ac) of other habitat types (including pasture, agricultural areas, residential areas, and unvegetated areas). Only 0.4 ha (0.9 ac) of this area would be permanently altered by vegetation maintenance within the new operational ROW. All of this 0.4 ha (0.9 ac) area is forested habitat.

These temporary and permanent unavoidable impacts to upland vegetation are not considered to be significant because the upland vegetation that would be disturbed or displaced (primarily pasture and shrub communities) is relatively common in the vicinity of the proposed project and because habitat restoration measures will be implemented by NWP. The significance of the forest conversion is primarily related to wildlife habitat, which is discussed in Section 3.1.5 (Wildlife Resources).

Proposed Bald Mountain Substation

Approximately 0.25 ha (0.62 ac) of weedy upland pasture would be permanently lost with the construction of the proposed Bald Mountain Substation. This unavoidable impact is not considered significant due to the presence of abundant similar habitat adjacent to or near the project site.

Unavoidable Impacts to Wetland Vegetation

Approximately 0.24 ha (0.59 ac) of wetland habitat would be temporarily disturbed during construction. This includes 0.04 ha (0.09 ac) of emergent vegetation, 0.11 ha (0.27 ac) of scrub-shrub/emergent vegetation, and 0.09 ha (0.23 ac) of forested wetland. Approximately 0.04 ha (0.1 acre) of forested wetland would be permanently converted to scrub-shrub and/or emergent wetland habitat. All other affected wetland areas will be allowed to restore to preconstruction vegetation types. These temporary and permanent unavoidable impacts to upland vegetation are not considered significant because of the small size of the impacts and because wetland habitat restoration measures will be implemented by the NWP. In addition, pipeline construction will not result in the permanent filling or draining of any wetlands. Thus, no wetland habitats or functions will be permanently lost as a result of pipeline construction.

Unavoidable Impacts to Sensitive Plant Species

No sensitive plant species are located within or adjacent to any of the project components.

3.1.3 Water Quality and Quantity

The developer proposes to increase intake of Columbia River water from 0.46 cubic meters per second (cms) (16.3 cubic feet per second [cfs], 39.9 million liters per day [mld] 10.5 million gallons per day [mgd],) to 1.1 cms ([38.7 cfs], 95.5 mld [25.0 mgd]). This water would return to the Columbia minus 0.0006 cms (0.02 cfs). The average daily minimum flow for the Columbia River in this region typically exceeds 2,265 cms (80,000 cfs) and averages about 5,095 cms (180,000 cfs) (United States Geological Survey [USGS] gage data at The Dalles, Oregon). The developer is prepared, if necessary, to replace the lost water from well water sources at the site (KEP, 1994).

Water flow through the system would increase 8.3 degrees Celsius (C) (15 degrees Fahrenheit [F]) over ambient temperature (NPDES Permit application 29 July 1993).

Under current system design, chlorine concentrations would increase above normal river levels prior to mixing.

The installation of a new 32,173 lpm (8,500 gpm) pump and traveling screen in the existing intake structure will be accomplished with no in-river construction. The proposed gas spur line would cross one perennial creek (Jewett Creek). However, this crossing is located where Jewett Creek is contained within a 3.0-m (10-ft) culvert. This culvert is buried sufficiently deep to allow the pipe to be installed over the culvert without disturbing either the stream or culvert. Additionally, Jewett Creek tributaries will be crossed in five places by the gas loop line.

Mitigation

The use of the existing outfall line and 31-m (100-ft) long diffuser (located in the main flow area of the Columbia River) for discharge of the cooling water would help mix

and rapidly dilute discharged blowdown water. Currently the outfall line (with diffuser) extends 87 m (285 ft) into the Columbia River.

The existing system meets Washington State NPDES permit guidelines for this project requiring that water be within 0.3 degrees Celsius (C) (0.5 degrees Fahrenheit [F]) of ambient river temperature within 91 m (300 ft) of the diffuser. However, the National Marine Fisheries Service (NMFS) has expressed concern over the potential for thermal impacts to endangered fish species if the project utilizes the existing outfall line and diffuser. NMFS is therefore requiring additional mitigation to further protect these species. This mitigation is discussed in the section 3.1.4 Fisheries Resources.

Proposed chlorine concentration in the discharge water at the diffuser exceeds the state concentration limit of 19 μg/l within a 9.1-m (30-ft) mixing zone. Ecology is requiring the developer to modify their proposed chlorine discharge level or prove that it will meet the desired concentration limit (19 μg/l) in the mixing zone as part of receiving an NPDES permit (personal communication, Chuck Wallin, Ecology, 20 May 1994).

An ESCP is required by the NPDES permit prior to facility construction. The developer has submitted a letter stating the goals of reducing erosion from construction and that an erosion control plan will be developed prior to construction (Dames and Moore, 1993a).

The back-up fuel oil storage tank will be set on an impermeable liner and surrounded by an impermeable berm of sufficient height to contain the contents of the tank plus rainwater from the major storm event of record. This will prevent possible contamination of the Columbia River should the storage tank leak. An oil spill prevention plan will also be prepared, covering handling and storage procedures. A spill prevention control and countermeasures plan (SPPC) will also be developed, covering handling and storage of hazardous and non-hazardous chemicals. These are further discussed in Section 3.1.14.

The tributary crossings require special procedures to minimize sediment entry to the streams. The Washington Department of Fish and Wildlife (WDFW) (formerly the Department of Fisheries and the Department of Wildlife) has restricted construction to dry periods when fish spawning or fish eggs are not present (between June 15 and September 30) in the stream to minimize impacts from construction. Any streams flowing at the time of construction will be crossed using flumes or dam and pump methods to carry water over the pipeline trench. Implementation of these methods will be consistent with FERC procedures (see the next section for additional mitigation).

Unavoidable Impacts

Temporary increases in sedimentation would occur in the tributaries of Jewett Creek during gas loop line construction. However, all but one of the crossings will be in intermittent streams, all less than 0.9 m (3 ft) wide during high flow. Therefore, potential sediment input to Jewett Creek from pipeline construction that includes the planned mitigation measures would be very slight. Furthermore, there would be no adverse impact to the Columbia River because all Jewett Creek tributary crossings are at least 3.2 km (2 mi) above the confluence with the Columbia. Therefore, impacts on water quality would be minor.

3.1.4 Fisheries Resources

The Bonneville Pool area of the Columbia River, a portion of which is adjacent to the project area, provides habitat for a large anadromous salmon and steelhead resource. Major stocks present in the region during migration periods include spring, summer, and fall chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch)*, sockeye (*O. nerka)*, and summer and winter steelhead (*O. mykiss)*. Approximately 0.5 to 1 million adult salmon and steelhead pass this region annually on their upstream migration (WDF and Oregon Department of Fish and Wildlife [ODF&W], 1992). Additionally, tens of millions of juvenile salmon and steelhead smolts migrate downstream past this region in the spring, summer, and fall. Because this region of the river is currently a reservoir, no spawning of salmon or trout occur in the area and it is primarily a migration corridor for these fish. However, for up to a few weeks prior to outmigration, rearing would occur for some yearling fall chinook and upper Columbia River summer chinook in the Bonneville pool. Additionally, other anadromous fish stocks including American shad (*Alosa sapidissima)*, Pacific lamprey (*Entosphenus tridentatus)*, and white sturgeon (*Acipenser transmontanus)* migrate through this region. Resident fish are also present in the Bonneville pool year-round, including game species such as sunfishes (e.g., bass, crappie) and walleye. Jewett Creek contains steelhead and resident trout (personal communication, Lee Van Tussenbrook, WDFW, 27 July 1993).

The river intake pumphouse, located in a backwater inlet on SDS Lumber Mill property has a 5.5-m (18-ft) high roof, and is 10.1 m by 9.4 m (33 ft by 31 ft). It has two screen intake bays extending 7.6 m (25 ft) below ground level. A bar rack, to prevent debris from impinging on the traveling screen, is located in front of each screen bay. Each bay has a bottom elevation of 19 mean meters above sea level (mmsl) (62.0 mean feet above sea level (mfsl)). River level in this area ranges from 24 to 22 mmsl (78.0 to 72.5 mfsl). The effective screening depth at low pool elevation, which excludes the area of the angle bar hinges of the traveling screens, is 2.1 m (7.0 ft). The effective screen width in each intake bay is 2.7 m (8.8 ft), giving an effective screen area of 9 m^2 (97 ft^2) at low pool. Currently only one pump and one traveling screen exist in one intake bay. A new pump and traveling screen will be installed in the second bay for additional project water needs. Based on the WDFW allowable maximum intake screen velocity of 12.2 cm/s (0.4 f/s) to protect salmon and trout fry, the combination of the two traveling screens would allow for intake of up to 1.4 cms (49.4 cfs), even at low pool level.

Jewett Creek may contain steelhead, resident trout and possibly coho salmon. These fish would all be present near the creek mouth as fry, juveniles, and adults. In the headwater areas where the pipeline crosses the Jewett Creek tributaries, it is more likely that only resident trout would be present, as the streams are mostly intermittent. It is possible that some coho or steelhead fry, or steelhead yearlings would occur in the perennial Jewett Creek tributary and be present in the proposed crossing area (about 3.2 km [2 mi] upstream from the Columbia River). If any are present they could rear in the stream segment year round: as fry during their first summer and juveniles the remainder of the year. If coho were present they would migrate as smolts in the spring (mostly April and May) following their first summer. Any adult steelhead that may be present would likely enter the stream from late November to May, spawning possibly from January to May, with likely fry emergence from the stream gravel no later than mid-June. If coho adults were present they would likely enter the stream from late September to January, with spawning occurring from October to January, and fry emerge prior to late April.

Threatened and Endangered Fish Species

This region of the Columbia River is currently listed as part of the "critical habitat" for the Federally listed endangered Snake River sockeye salmon and threatened Snake River spring/summer and fall chinook which pass through this region annually during migration (Federal Register, Vol. 55, No. 232, 2 December 1992). Additional information is presented in Section A.2 of Appendix A.

Mitigation

The existing water intake screening system was inspected by WDFW and additional brush seals were installed to meet WDFW's accepted guidelines for protecting fry (fish smaller than 6.0 cm [2.36 in]) (Letters from John Easterbrook of WDFW to Dames and Moore dated: 3 February, 2 March, and 19 April 1994). These guidelines also require screen openings of no more than 0.32 cm (0.125 in) and approach water velocity of less than 12.2 cm/s (0.4 f/s). A second pump and screen will be installed in the same intake facility with appropriate seals, meeting WDFW guidelines to protect fry (KEP, 1994). The system will also meet the NMFS screening criteria for fingerling and larger fish (24.4 cm/s [0.8 f/s]).

In their letter to BPA dated 26 May 1994, and in subsequent discussions with BPA and the developer, NMFS expressed concern over potential adverse effects on migrating endangered salmonids in the Columbia River from the thermal plume associated with the existing outfall diffuser. The existing outfall line and diffuser extends approximately 87 m (285 ft) offshore, with the last 31 m (100 ft) containing nine diffuser ports to dissipate effluent water. The outfall line/diffuser rests on the river bottom with the diffuser at an approximate depth of 6.1 m (20 ft).

NMFS has specifically expressed concern that elevated water temperatures occurring in the water column above the diffuser could be injurious to endangered juvenile salmonids migrating downstream at a depth of 6.1 m (20 ft) or less. Therefore, to adequately protect these species from thermal impact, NMFS is requiring the developer to extend the outfall and diffuser along the bottom to provide sufficient depth in the water column above the diffuser to achieve 1.1°C (2°F) above ambient temperature at a depth of 6.1 m (20 ft), (personal communication, Dan Avery, NMFS, 20 July 1994). The developer has determined that the diffuser pipe will be extended 48.8 m (160 feet) to achieve the required temperature gradient to protect migrating salmonids (personal communication, Mike Gonnella, July 29, 1994). The inriver extension construction will be accomplished using barges and divers, without trenching or disturbing the river bottom.

The crossings of the Jewett Creek tributaries will be done using the Federal Energy Regulatory Commission (FERC) September 11, 1992 version of Wetland and Waterbody Construction and Mitigation Procedures (Procedures). Construction of crossings will take place between 15 June and 30 September (as prescribed by WDFW) to protect against sediment entering waters containing spawning salmonids. If any of the tributaries are flowing at the time of construction, dams, flumes, and pumping methods will be employed to continue water flow over the trench. Erosion and sediment control measures such as silt fences and bales will be installed at the stream banks, and stream banks will be restored to original contours, reseeded, replanted with native vegetation, and covered with jute matting immediately following construction. Permanent erosion control measures, as required, will also be installed at the crossings.

Unavoidable Impacts

Because of the increased water intake from 0.46 cms to 1.10 cms (16.3 cfs to 38.7 cfs) there would be some increase in intake of non-salmonid fish not protected by the current screen requirements. This would include some underyearling resident species and possibly anadromous American shad. No salmon or trout would be entrained or harmed because the screening installation will meet Washington State and NMFS screening guidelines designed to protect these fish. Construction of the gas loop line would result in minor increased sediment to headwater areas of Jewett Creek, temporarily reducing populations of benthic organisms that fish feed upon. Because all stream crossings that would disturb the bottom are at least 3.2 km (2 mi) upstream from its confluence with the Columbia River, no adverse effects would occur to the Columbia River. Although Jewett Creek is crossed by the gas loop line near its confluence with the Columbia River, the pipeline will pass above a culvert that carries the stream, not disturbing the stream or riparian areas in the lower reach of this stream, and having negligible impact.

Heated discharge (8.3°C [15°F] warmer than ambient) and possible elevated chlorine levels immediately adjacent to the diffuser could adversely affect some bottom organisms. Because of the great extent of similar substrate in the vicinity, this would have minor impact. Also, the slight variations in temperature and chlorine content in the mixing zone will have no effect on fish passing through the area. Therefore potential impacts to fisheries resources from the discharge would be minor. Because the diffuser is about 0.8 km (0.5 mi) upstream of Jewett Creek, the project will have no adverse effect on fish entering Jewett Creek.

3.1.5 Wildlife Resources

Project Components

SDS Lumber Mill Site

The SDS Lumber Mill site is heavily disturbed and essentially devoid of natural wildlife habitat. Log-holding ponds constructed on the Columbia River provide habitat for some species of waterfowl and shorebirds such as the gadwall (*Anas strepera*) and the great blue heron (*Ardea herodias*).

Gas Spur Line

Half of the gas spurline is located on the heavily disturbed SDS Lumber Mill site. The remainder of the gas spur line will be constructed through disturbed lands along SR 14, pastures, and grassy areas associated with light industrial and large-lot residential land uses. Wildlife species common to disturbed areas include the American crow (*Corvus brachyhynchos*), European starling (*Sturnus vulgaris*), and violet-green swallow (*Tachycineta thalassina*). The Columbia River system, along with its wetlands and riparian areas, supports a large number of birds including MacGillivray's warbler (*Oporornis tolmiei*), Nashville warbler (*Vermivora ruficapilla*), northern oriole (*Icterus galbula*), and red-winged blackbird (*Agelaius phoeniceus*).

Gas Loop Line

A significant length of the gas loop line lies in residential areas and croplands. However, approximately 1.6 km (1 mi) of the pipeline runs through forest dominated by Douglas-fir and big-leaf maple. Four intermittent streams and one perennial stream will

be crossed. These streams are associated with narrow bands of emergent or forested wetland/riparian vegetation. The existing ROW is composed primarily of grasses and shrubs. Expansion of the ROW to accommodate the loop line would result in the conversion of approximately 0.4 ha (0.9 ac) of the forest habitat to the grass/shrub habitat. This forest habitat would be expected to support a variety of wildlife species. Black-tailed deer *(Odocoileus hemionous)* and wild turkey *(Meleagris gallopavo)* were observed during one of the site visits.

Bald Mountain Substation

The location of the proposed substation is dominated by upland grasses and shrubs. An orchard and an existing transmission corridor are adjacent to the site. The area surrounding the substation site is predominantly Douglas-fir/big-leaf maple forest. Wildlife species commonly found in this forest type include raptors (osprey and red-tailed hawk were observed during the site visits), various song birds (i.e., black-capped chickadee [*Parus atricapillus*], Swainson's thrush [*Hylocichla ustulata*], black-headed grosbeak [*Pheuticus melanocephalus*], and rufous-sided towhee [*Pipilo erythrophthalmus*]), black-tailed deer, squirrel (*Citellus sp.*), and coyote (*Canis latrans*).

Threatened, Endangered, and Sensitive Wildlife

The USFWS Olympia office was consulted regarding Federally listed and proposed threatened and endangered species potentially occurring within the vicinity of the proposed project area. The USFWS reported the bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*) as the only listed species potentially occurring in the project area. The northern goshawk (*Accipiter gentilis*), black tern (*Chlidonias niger*), Northwestern pond turtle (*Clemmys marmorata marmorata*), spotted frog (*Rana pretiosa*), and Larch Mountain salamander (*Plethodon larselli*) are candidates for Federal listing identified by USFWS and WDFW as potentially occurring in the project area. Additional information, including habitat requirements and species occupancy within the project area, is presented in Section A.2 of Appendix A, and in NWP (1994).

Mitigation

Wildlife may be affected for the following reasons: (1) direct injury, death, or disturbance from construction, (2) loss of habitat, and (3) disturbance during operation. The majority of potential impacts will be associated with construction and operation of the gas pipelines. Excavation and vegetation removal will displace the more mobile wildlife species from the gas pipeline ROW and surrounding areas. Displacement of wildlife will be temporary and animals will likely return to the vicinity shortly after construction and activity has ceased. Some less mobile species, such as small mammals, reptiles, and amphibians, as well as bird nests in the ROW, could be disturbed, depending on the timing of the construction. Similar impacts could occur during vegetation maintenance during project operation.

The extent of the disturbance created from construction activities will vary. The majority of the construction will involve heavy machinery, which will cause moderate disturbance within a fairly confined area. Because construction will occur late in the breeding season, some destruction and abandonment of passerine bird nests may occur in and near the construction areas.

Wetlands and riparian habitat are the most important wildlife habitats in the proposed project area. Therefore, most of the mitigation for wildlife involves avoiding or minimizing impacts to those habitats. The chosen pipeline routes minimize the crossing of these habitats; however, a few wetland or stream crossings are unavoidable. Special construction techniques will be used to minimize impacts to wetlands and riparian areas. Impacts on these areas will receive the following mitigation measures: (1) keeping the area of disturbance to a minimum, (2) using adequate erosion control methods, and (3) revegetating riparian areas disturbed by construction. Mitigation measures for vegetation are described in Section 3.1.2.

An additional form of wildlife mitigation will involve revegetating the ROW with native plant species that are beneficial for deer as forage and small mammals and migratory birds for cover and forage. NWP has prepared a site-specific restoration plan for the gas transmission components, in consultation with the Soil Conservation Service. A restoration plan will be developed by BPA for the electrical transmission components.

Construction of replacement electrical transmission lines between the Bald Mountain Substation and an existing ROW could potentially pose collision and electrocution hazards to bald eagles and other raptors. These transmission lines will be designed to be safe for raptors using techniques recommended by Olendorff et al. (1981), thus reducing the potential collision and electrocution hazards for raptors.

Impacts to the Federally listed species potentially occurring in the vicinity of the project area, the bald eagle, peregrine falcon, and gray wolf, and proposed mitigation measures are discussed in the following sections.

Bald Eagle

Potential impacts to bald eagles from construction and operation of the project could include: (1) removal of perch trees, (2) alteration of bald eagle food sources, (3) disturbance of perching eagles due to noise, and (4) disturbance of winter roost sites.

The total amount of forest habitat to be removed would be approximately 2.1 ha (5.2 ac). No trees potentially used for perching along the potential foraging area of the Columbia River would be affected. Additionally, the forests that would be affected do not constitute preferred perching or roosting habitat because of the smaller, even-aged character of the stands. Therefore, there would not be any impact to bald eagle perching/roosting habitat.

Jewett Creek, a perennial stream, supports resident cutthroat and juvenile over-wintering steelhead that eagles might forage on. Construction techniques (see Section 1.0, 2.0) would be implemented that would ensure that the integrity of all streams, perennial, intermittent, and dry washes crossed is maintained after construction and does not affect forage in downstream areas.

The most effective mitigation measure for disturbance to wintering bald eagles is scheduling construction activities outside of the typical wintering period. Construction of the pipeline is scheduled to occur during the summer, with the majority of it to be completed between June 15 and September 30. Construction would be completed before wintering bald eagles typically occupy the project area vicinity (October 31 to March 31). Operation of the completed project is similar to the noise or human activity level already present in the heavy industrial/residential area and would not cause any reduction of prey. Hence, the project is not likely to adversely affect bald eagles (Letter from David C. Frederick, USFWS, 11 August 1994).

Peregrine Falcon

Potential impacts to peregrine falcons from construction and operation of the project include: (1) disturbance from pipeline construction, and (2) alteration of peregrine falcon food sources.

The project would not affect peregrine eyries (nests) or foraging habitat. Potential disturbances expected during construction of the gas pipeline would include noise from large equipment operation, site excavation, ROW clearing, and increased human presence. Such disturbances would be confined to the summer construction period and, therefore, should not create any additional disturbance to spring and fall peregrine falcon migrants. Since noise and activity levels would be similar to current levels in the vicinity of the project, the operation of the project would not affect waterfowl or shorebird abundance along the Columbia River or other areas where peregrines may forage (see appendix B). Hence, the project is not likely to adversely affect peregrine falcons (Letter from David C. Frederick, USFWS, 11 August 1994).

Gray Wolf

Potential impacts to gray wolves from construction and operation of the project include: (1) disturbance from pipeline construction, (2) alteration of gray wolf prey base, and (3) removal of habitat suitable for gray wolves.

Construction and operation of the project would not affect the gray wolf. The current degree of human disturbance in the vicinity of the project area precludes the area from supporting a wolf pack; this disturbance also prevents the likelihood of dispersing adults to temporarily occupy the project area. The total amount of forested habitat to be removed during construction of the pipeline is 2.1 ha (5.2 ac), an amount that is negligible when considering the size of the typical home range of wolves. Only temporary dispersal of ungulates (limited to black-tailed deer in the project area) is expected during the project construction; therefore, potential prey for wolves would not be affected. Hence, the project is not expected to affect gray wolves.

Unavoidable Impacts

Construction of the gas pipelines is expected to temporarily displace wildlife in the adjacent riparian, wetland, and shoreline areas. The most significant impacts on wildlife will be temporary and permanent loss of habitat. Approximately 2.7 km (1.7 mi) of the proposed loop line goes through forest habitat. Clearing of the construction ROW will result in the loss of approximately 1.7 ha (4.3 ac) of upland and wetland forest habitat. However, much of this forest habitat (1.3 ha [3.3 ac]) will be allowed to regenerate. The total amount of forest habitat that will be converted to grass/shrub habitat will be approximately 0.4 ha (1.0 ac). Disturbance associated with operation of the gas pipeline will be limited to maintenance of vegetation within the ROW.

Construction of the proposed Bald Mountain Substation would result in the loss of 0.25 ha (0.62 acre) of intensively grazed pasture. This habitat loss would mostly affect songbirds and small mammals that may reside and forage in the grasses and adjacent shrubs. This habitat loss is not considered significant because of the abundance of similar habitat in the surrounding area.

3.1.6 Geology and Soils

The project site is located in the Columbia River Gorge, in the Cascades physiographic province. The soils in Klickitat County have been partially mapped by the

Soil Conservation Service, but data on the soil units is incomplete (Blakeley, M., unpubl. data). There are no geologically unique or special areas at the mill site, along the gas line routes, or at the substation site.

Project Components

SDS Lumber Mill Site

The SDS Lumber Mill site is located on the banks of the Columbia River, where natural material has been buried by dredged material and crushed rock (Dames and Moore, 1977). The angular crushed rock layer is between 0.6 and 1.2 m (2 and 4 ft) thick in the immediate vicinity of the proposed cogeneration facilities. This layer is also underlain by dredging spoils, mainly to the south, toward the river.

Gas Transmission Lines

The gas loop line route lies mostly in Tertiary and Quaternary basalts and andesites with a colluvium layer between 0 and 1.2 m (0 and 4 ft) thick. On the geologic map of the area (Korosec, 1987), approximately 274 m (898 ft) of the route crosses an ancient landslide. However, aerial photographs indicate the pipeline line route crosses alluvium at the base of the landslide, and not the landslide itself. The photos also indicate the landslide has not been active recently. Approximately 0.6 km (0.4 mi) of the gas loop line route crosses Missoula flood deposits, which are highly erodible. The gas spur line lies mostly in fill and Quaternary alluvium.

The two main types of soil-related hazards to the gas pipeline are erodibility and soil shrink-swell action. Erodibility in soil surveys is estimated by use of an erodibility factor, which is calculated using soil properties of texture, organic matter content, structure, and permeability. Shrink-swell action occurs in soils that have certain clay minerals that can increase or decrease in volume, depending on water content.

Along the gas loop line, the predominant soils include the Hood, Chamana, and McGowan series. Hood soils have a high erodibility factor and a low shrink-swell potential. Chamana soils have a moderate erodibility factor and a low shrink-swell potential. McGowan soils are the most common soils along the gas loop line route, and have a low to moderate erodibility factor and a low shrink-swell potential. The gas spur line lies mostly in Cauley soils, which have a moderate to high erodibility factor and a low shrink-swell potential.

Proposed Bald Mountain Substation

The proposed Bald Mountain Substation is located on a high terrace above the White Salmon River in sandy silt, which is a highly erodible slackwater deposit from the late Pleistocene Lake Missoula floods (Korosec, 1987). Soils at the substation site are mapped as the Hood series.

Seismology

The project area is located within Seismic Zone 2B of the 1991 Uniform Building Code (UBC). The seismic hazard within this zone is usually characterized as moderate. However, because studies during the last ten years have identified the potential for great earthquakes on the Cascadia subduction zone in the Pacific Northwest, all of western Washington and Oregon, including the project site, will be placed in Seismic Zone 3 of the 1994 UBC. This zone is characterized as having moderate to high seismic risk.

Consequently, the seismic zone factor used to calculate design base shear would increase to 0.40. Appropriate force calculations and measures apply as stated in the UBC. These measures would assure a safety factor higher than 1.0 during such earthquakes. The factor of safety requirements would vary with the type of structure involved, the soil type, and structural features.

Mitigation

The primary potential impact of project construction would be a temporary increase in erosion and sedimentation. Erosion at the proposed cogeneration facility on the SDS Lumber Mill site is expected to be minimum because of its flat topography. A preliminary ESCP prepared as part of the NPDES permit addressed general issues of erosion and established erosion control guidelines for construction of the cogeneration facility. A final ESCP will be prepared prior to construction. An ESCP will be required by FERC for NWP to license the gas spur and loop lines. The gas loop line would be prone to erosion during construction because of steep slopes and erodible materials.

An ESCP will be prepared by BPA prior to construction of the Bald Mountain Substation. The sandy silt found at the substation site is highly erodible and particular attention will be paid to prevent erosion and runoff from reaching the White Salmon River.

The final ESCPs for all the project components will include site-specific implementation measures such as location of silt fences, bale barriers, waterbond, and other physical controls. Also, detailed information on revegetation should be provided such as seed mixes, application rates, topsoil stockpiling, and timing for reseeding and planting.

Unavoidable Impacts

Potential impacts from erosion, sedimentation, and localized increases in stream turbidity during construction are temporary. Because the gas loop line route is mostly gentle, and the only steep part is in bedrock, mass movements, if any, would probably be minor. The steep section is along the White Salmon bluffs just north of the Columbia River. Steep slopes below the bedrock cliffs may contain some loose talus material, which could be mobilized by construction disturbance. However, this would result only in minor rockfalls.

3.1.7 Air Quality

The Federal Clean Air Act requires the EPA to establish maximum concentrations of common air pollutants to protect the public health and welfare. EPA has established National Ambient Air Quality Standards (NAAQS) for the following criteria air pollutants: particulate matter less than 10 microns in diameter (PM_{10}), sulfur dioxide (SO_2), carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and lead. Ozone is not emitted by sources but is formed by sunlight interacting with nitrogen oxides (NO_x) and volatile organic compounds (VOCs). Therefore, to control ozone, air pollution sources must limit emissions of nitrogen oxides and VOCs. Ecology air quality regulations include standards for total suspended particulate (TSP) matter and 1-hour SO_2. At this time, Ecology has determined that the area surrounding the proposed project meets all of the applicable federal and state ambient air quality standards. Ecology administers a Federal program called Prevention of Significant Deterioration (PSD), which is designed to protect areas of national significance such as National Parks and Wilderness areas, from air pollution that might adversely impact resources such as soils, vegetation, and visibility. The area surrounding

the project (Columbia Gorge National Scenic Area) has been designated Class II, requiring moderate PSD protection. Several wilderness areas (Mt. Hood in Oregon, and Mt. Adams and Goat Rocks in Washington) have been designated Class I, requiring the highest level of protection from new sources of air pollution. Further, the Columbia Gorge is an area where visibility is an important resource. Because the emission rates for all criteria pollutants from the Klickitat Cogeneration Project are less than 91 metric tons (mt) (100 tn/yr), the project is not subject to regulation under these Federally mandated programs for PSD.

Background Sources and Air Quality

The most significant nearby source of air pollution is the SDS Lumber Company, a facility that will receive steam from the cogeneration project for process uses. Operations at the SDS Lumber Mill site include production of finished lumber and plywood; storage and handling of logs, finished lumber and wood chips; and generation of steam and power from a hogged fuel boiler. Estimated existing emissions from the SDS Lumber Mill are presented in Table 3.1.7-1 in units of metric tons per year (mt/yr) and U.S. standard tons per year (tn/yr). An estimate of the air quality from established monitors in the project vicinity is provided in Section A.16.1 of Appendix A.

Table 3.1.7-1. Estimated Existing Emissions From the SDS Lumber Mill[1/].

Pollutant	Hog Fuel Boiler	Plywood Plant	Stud Mill	Chipper	Veneer Dryer	Total All Sources
NO_x	26.9 (29.7)	-	-	-	-	26.9 (29.7)
SO_2	1.5 (1.7)	-	-	-	-	1.5 (1.7)
CO	38.1 (42.0)	-	-	-	-	38.1 (42.0)
TSP[2/]	91.3 (100.6)	24.5 (27.0)	17.0 (18.7)	0.27 (0.3)	-	133.1 (146.6)
VOC	24.7 (27.2)	-	-	-	10.1 (11.1)	34.7 (38.3)

1/ All values are in units of mt/yr (tn/yr), based on 25,400 kg/hr (56,000 lbs/hr) steam production.

2/ Total suspended particulates includes PM_{10}. Maximum particulate emissions (based on 30,390 kg/hr [67,000 lbs/hr] steam production) will be 103.6 mt/yr (114.2 tn/yr).

Source: Dames and Moore, 1994.

The project is located within 1.6 km (1 mi) of the Columbia River, which has been designated by Ecology as a sensitive air quality area (WAC 173-440). Also, the Columbia Gorge is an area where visibility of distant scenic objects and terrain is important to visitors and residents; therefore, any loss of visibility is of concern. Nitrogen monoxide (NO), in the presence of ozone, is converted to NO_2 (a yellowish-brown gas) and oxygen (this reaction is enhanced by the presence of VOCs), which consequently form more ozone and NO_2. If present in sufficient concentrations, NO_2 can impart a yellow or brown color to a plume which can degrade visibility. Also, TSPs from the project, if present in sufficient

quantities, can create a visible plume from the exhaust stack that may reduce visual range in the scenic area.

Mitigation

Emissions will be maintained at accepted standards through the use of the air pollution control systems shown in Table 3.1.7-2. Ecology has conducted a Best Available Control Technology (BACT) assessment for the project to determine the most effective technology to mitigate negative air quality impacts. With these controls, this project will comply with all state and Federal standards. Water injection and selective catalytic reduction (SCR) will be used to remove nitrogen oxides from the exhaust of the proposed combustion turbine. SCR uses ammonia to react with the nitrogen oxides to form harmless compounds (water and nitrogen). However, some ammonia would remain unreacted and constitutes a toxic air emission. The ammonia levels emitted by the SCR system will be within acceptable source impact levels (ASILs) of 10 ppm set by Ecology. Pollutant emissions are also being minimized by the use of natural gas as the primary fuel, low-sulfur fuel oil as the backup fuel, and proper combustion techniques.

Table 3.1.7-2. Proposed Air Pollution Control Systems.

Pollutant	Control Techniques
NO_x	Water injection and SCR.
CO	Proper combustion.
SO_2	Low-sulfur fuel for back-up fuel oil.
VOCs	Proper combustion.
PM_{10}	Proper combustion.

Source: Dames and Moore, 1994.

A visibility mitigation plan acceptable to Ecology has been prepared by the developer to ensure no net decrease in visibility in the Columbia Gorge area resulting from the proposed project. In the plan, the owner/operator of the existing hog fuel boiler (SDS Lumber) has agreed to reduce TSP emissions when the proposed cogeneration project is in operation. Emissions of TSPs will be reduced 36 percent, from 12.6 kg/hr (27.75 lbs/hr) to 8.0 kg/hr (17.75 lbs/hr). SDS Lumber intends to achieve the reduced emissions by one of the following means (Gonnella, 1994):

- Operate the boiler at lower and steadier fuel combustion and tuning existing controls for those lower rates.
- Install additional particulate control equipment such as an electrostatic precipitator, a baghouse, or a wet scrubber.
- Find an alternate economically acceptable means of disposal of its wood waste, and cease operation of the boiler.
- Find an alternate economically acceptable means of disposing of one or more elements of its wood waste, and operate the boiler at reduced firing rates to dispose of the remaining waste materials.

This reduction in particulate emissions will more than offset the 2.3 kg/hr (5 lbs/hr) of particulates expected from the proposed cogeneration facility, as well as the potential adverse affects on visibility in the Gorge that would be caused by increased NO_x emissions (Gonnella, 1994). This proposed mitigation plan will therefore provide a net benefit to the visibility in the Gorge when the existing and proposed systems are in operation. The net annual reduction in TSP emissions under the mitigation plan is shown in Table 3.1.7-3.

Table 3.1.7-3. Estimated Annual Reduction in Particulate (TSP) Emissions with Visibility Mitigation Plan

Case	Existing SDS Lumber Hog Fuel Boiler mt/yr (tn/yr)	Proposed Cogeneration Project mt/yr (tn/yr)	Total TSP Emissions mt/yr (tn/yr)
TSP without Mitigation Plan	110.2 (121.5)	16.0 (17.6)	126.2 (139.1)
TSP with mitigation plan	70.6 (77.8)[1/]	16.0 (17.6)	86.5 (95.4)
Net TSP reduction - both systems with mitigation plan	-39.6 (-43.7)	0	-39.6 (-43.7)
Net TSP reduction from existing conditions	-23.7 (-26.1)	N/A	-23.7 (-26.1)

Source: Ecology Order No. DE 94AQ-C183; Gonnella, 1994.
1/ Based on maximum operations (30,390 kg/hr [67,000 lbs/hr] steam production)

Enforcement of the proposed plan will be accomplished through Ecology Order No. DE 94AQ-C193. Under the terms of the Order, SDS Lumber will calculate an emissions factor for the hog fuel boiler based on pounds of particulate matter emitted per ton of wood waste burned. The amount of wood waste burned and the resulting emissions will be recorded by SDS Lumber for each month and reported annually to Ecology. If approved by Ecology, an alternate method of calculating emissions (such as one based on steam production rate) may be used by SDS Lumber.

As additional mitigation, KEP has volunteered to invest up to $200,000 to reduce visible emissions from the existing SDS plywood plant exhaust. The preferred method involves ducting exhaust gases from the plywood mill to the combustion air system of the existing SDS hog fuel boiler.

Unavoidable Impacts

The only source of emissions from the project is the exhaust stack of the gas turbine. Maximum emissions of criteria air pollutants that the project will be allowed to emit are shown in Table 3.1.7-4.

When present in sufficient quantities, the criteria air pollutants are known to cause a number of detrimental effects to ecosystems and to human health. Carbon monoxide displaces oxygen in hemoglobin, reducing the transport of oxygen in the blood stream. Elevated concentration of oxides of nitrogen and sulfur (NO_x and SO_x), particulate matter, and ozone result in greater airway resistance and decrease the ability of lungs to function properly. NO_x and O_3 also result in damage to vegetation and increase plants' susceptibility to pests and pathogens, in addition to causing damage to textiles, plastics, and

Table 3.1.7-4. Criteria Pollutant Emissions Expected from Project.

	8760 Hrs/Yr of Nat Gas		240 Hrs/Yr of Fuel Oil[a/]		Potential to Emit[b/]
Pollutant	PPMV[c/]	Mt/Yr (Tn/Yr)	PPMV[c/]	Mt/Yr (Tn/Yr)	Mt/Yr (Tn/Yr)
NO_x[d/]	9	63.6 (70.1)	15	2.5 (2.8)	64.4 (71.0)
CO	14	55.6 (61.3)	15	1.5 (1.7)	55.7 (61.4)
SO_2[e/]	1	10.7 (11.8)	10	2.3 (2.5)	12.6 (13.9)
PM_{10}[f/]	4	15.9 (17.5)	5	0.5 (0.6)	16.0 (17.6)
VOC	19.1	47.2 (52.6)	12	0.8 (0.9)	47.2 (52.0)

a/ Assumes a worst case of 10 days per year of fuel oil burning.
b/ Potential to emit for all pollutants based on natural gas usage of 8,520 hours/year with 240 hours/year of fuel oil, according to Ecology's preliminary determination (Ecology, 1994)
c/ Parts per million by volume (PPMV) corrected to 15 percent O_2.
d/ Assumes approximately combined NO_x control efficiency of 95.5 percent with water injection and SCR.
e/ Assumes 0.63 grams of sulfur per 2.8 standard cubic meter (SCM) (i.e., 2 grains of sulfur per 100 standard cubic feet [SCF]) of natural gas.
f/ Assumes that all particulate matter is emitted as PM_{10}.
Source: Dames and Moore, 1994.

rubber. NO_x is a precursor to acidic precipitation and results in a brownish coloration to the atmosphere.

The environment and human health are protected by enforcement of the Clean Air Act, and in particular, the NAAQS. New sources of air emissions are not allowed to result in ambient air quality concentrations that are greater than the NAAQS. The concentrations of criteria air pollutants from the cogeneration emissions will not exceed the NAAQS (Table A.16.1-4, Appendix A), thus protecting human health and the environment and therefore are not a significant impact.

Ecology has also established a set of ambient concentrations for a number of noncriteria pollutants which may cause either acute or chronic health effects. These air pollutants are controlled by establishing acceptable source impact levels (ASILs) for the maximum 24-hour concentrations, while chronic (carcinogenic) air pollutants are controlled with annual average concentrations. The quantities of listed toxic air pollutants expected to be emitted from the project including ammonia (listed in Table A.16.1-4 of Appendix A) will not exceed any ASIL, and are therefore not a significant impact. Ammonia emissions from the project will be limited to 7.4 Kg/hr (16.3 lbs/hr). Maximum project-related ammonia concentrations are predicted to be 12.5 $\mu g/m^3$, which is approximately 21 percent of the 24-hour ASIL, and therefore is not a significant impact.

Results from the Level 1 and Level 2 VISCREEN visibility analysis completed by the developer (Dames and Moore, 1994a) show no significant adverse impacts on visibility for the Mt. Adams, Goat Rocks, Mt. Jefferson, and the Mt. Hood Wilderness areas, and Mt. Rainier National Park.

The visibility mitigation plan proposed by the developer and SDS Lumber will provide a net benefit to the visibility in the Gorge when both the existing SDS Lumber hog fuel boiler and the proposed cogeneration facility are operating.

See Section A.16.1 for additional information on air quality.

3.1.8 Public Health and Safety

Construction activities that could potentially adversely impact public health and safety include:

- Use of hazardous and dangerous materials such as fuels and lubricating oils for construction equipment.
- Creation of open pits or trenches, and stacks of materials and debris on the construction and staging sites.
- Parked construction vehicles remaining on the site overnight.
- Noise from construction vehicles and activities such as blasting, pile-driving, and drilling.
- Air pollution and dust particles from operating equipment.
- Mud slides and earth sloughing at exposed slopes during rainfall events.
- Availability of emergency medical, police, rescue, and fire services to the construction sites.

Similarly, activities during operation include:

- Use and storage of hazardous and dangerous materials such as fuel, ammonia, and cleaning solvents (see Section A.16.3 of Appendix A for the list of chemicals expected to be stored at the cogeneration facility).
- Noise from operation of equipment.
- Air pollution.
- Electrical contact with transmission lines.
- Electric and magnetic fields (EMF).
- Availability of emergency medical, police, rescue, and fire services.

Electrical Contact with Transmission Lines

The most significant risk of injury from a transmission line is the danger of electrical contact. Electrical contact between an object on the ground and an energized conductor can occur even though the two do not actually touch. It is extremely important that a person not bring anything such as a TV antenna or an irrigation pipe too close to a power line. Also, to eliminate possible hazards, BPA prohibits homes, machinery buildings and most other structures within the ROW. BPA provides a free booklet that describes safety precautions for activities near transmission lines, *Living and Working Around High Voltage Power Lines*.

Power lines can also induce voltages into objects near the lines. This effect can lead to nuisance shocks if a voltage is induced on something like wire fencing which is on wood posts and, therefore, insulated from ground. Usually, however, this becomes a problem only with lines of voltages above 230 kV. Should problems develop with either high- or low-voltage lines, they can be corrected by simple grounding techniques.

Electric and Magnetic Fields (EMF)

Power lines, like all electrical devices and equipment, produce electric and magnetic fields (EMF). Current (movement of electrons in a wire) produces the magnetic field. Voltage (the force that drives the current) is the source of the electric field. The strength of these fields also depends on the design of the line and the distance from the line. Field strength decreases rapidly with this distance.

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01 kV/m. However, fields of 0.1 kV/m and higher can be found very close to electrical appliances. The average background magnetic field level measured in the center of rooms in 992 homes throughout the United States was 0.9 mG (Zafanella, 1993). In 15 percent of the homes, the magnetic field was greater than 2.1 mG. Fields very close to electrical appliances are much stronger than these levels, but appliance fields decrease in strength with distance very rapidly. When appliances and other electrical devices are operated, levels higher than this may be experienced. Typical electric and magnetic field strengths for some common electrical appliances are given in Table 3.1.8-1.

There are no Federal standards for magnetic fields. The state of Washington has considered establishing standards, but has concluded that the current evidence is insufficient to permit establishment of meaningful standards.

It is currently not possible to state with absolute scientific certainty what are safe or unsafe levels of exposure to EMF. There is ongoing controversy about whether or not exposure to EMF is a human health hazard. Today, most concern about potential adverse health effects is focused on exposure to magnetic fields. Some studies suggest that people who live or work near electrical equipment or power lines have an increased incidence of cancer or other illnesses, while other studies find no increased risks. BPA has published a document entitled *Electrical and Biological Effects of Transmission Lines: A Review* which discuss the worldwide research on EMF. Two other documents published by BPA that discuss the EMF issue are *What We Know and Don't Know About EMF* and *Electric Power Lines: Questions and Answers on Research into Health Effects*. These documents are available on request.

Electric fields dissipate when they encounter vegetation or structures; magnetic fields do not. Therefore, recent health concerns relating to EMF have mainly focused on magnetic fields. Because public concern is increasing over potential health effects of EMF, and because a clear course of action still cannot be determined from present scientific evidence, BPA has developed interim guidelines on EMF. These guidelines state that BPA will seek to keep EMF exposures as low as are reasonably achievable, considering social, economic and environmental factors. These guidelines also state that, where practical alternatives exist, public and employee exposure to EMF should not be increased by any BPA operation, practices, or action.

In general, an EMF exposure assessment is done by calculating magnetic field levels in locations where there are potential long-term exposures to people. This is usually done by assessing the number of homes, businesses, or schools near the proposed project and determining the change in magnetic field exposures that may be caused by the project.

To characterize changes in the magnetic field environment, BPA uses industry-accepted computer modeling techniques. For this project, estimated annual average magnetic fields were calculated with a computer program that uses existing electrical loading (current) data. To determine the anticipated magnetic field levels after the completion of the project, projected electrical loading data is used. Aside from electrical loading data, the transmission line design, is considered in calculating the magnetic field levels. An increase in public exposure is defined as a situation where field levels with the new project will increase and buildings exist nearby.

Table 3.1.8-1. Typical Electric and Magnetic Field Strengths 30.5 cm (1 ft) from Common Appliances.

Appliance	Electric Field (kV/m)	Magnetic Field[1/] (mG)
Coffee Maker	.030	1-1.5
Electric Range	.004	4-40
Hair Dryer	.040	0.1-70
Television	.030	0.4-20
Vacuum Cleaner	.016	20-200
Electric Blanket[2/]	.01-1.0	15-100

1/ By 1 to 1.5 m (3 to 5 ft), the magnetic field from appliances is usually decreased to less than 1 mG.
2/ Values are for distances from a blanket in normal use, not 30.5 cm (1 ft) away.
Source: Miller, 1974 and Gauger, 1985.

The proposed project includes the addition of about 49 MW of new generation from the SDS Lumber Mill site. Some of the new electrical load will be transmitted across the Columbia River to PP&L's Powerdale Substation. No houses or occupied structures were observed close enough to PP&L's 69-kV line that would experience a change in the EMF environment.

The rest of the new generation will be transmitted from SDS Lumber to the BPA/ Klickitat PUD Bingen substation and then to BPA's proposed Bald Mountain Substation.

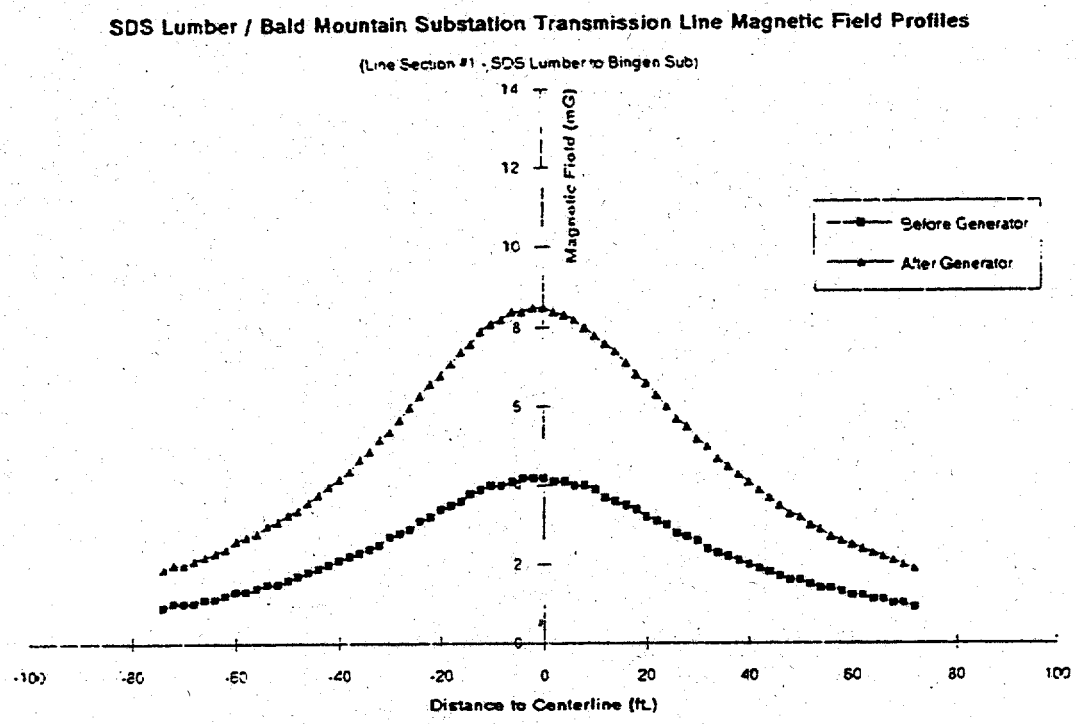
The existing transmission line changes design configuration and line height several times from the SDS Lumber Mill site to the proposed Bald Mountain Substation. Additionally, a portion of the line has distribution underbuild. For the purposes of the magnetic field analysis, three line sections were analyzed. Section 1 is the single woodpole line section in the city of Bingen. Section 2 is the single woodpole line section adjacent to Bingen Substation. Section 3 is the single woodpole section between Bingen Substation and the proposed Bald Mountain Substation. Any magnetic field contribution from distribution underbuild was not considered. Without knowledge of how the underbuild is loaded, it is difficult to determine its magnetic field contribution.

There are homes and businesses near the line from the SDS Lumber Mill site to the proposed substation. In the city of Bingen, there are homes and businesses very close to the center of the transmission line. Because operation of the existing transmission line will change from carrying distribution loading to carrying a generation resource, the magnetic field environment will likely increase to a number of homes and businesses near the transmission lines as a result of this project.

Figure 6 indicates the estimated annual magnetic field levels at various distances from the conductor. The magnetic field levels before generation are based on historical loading data. The levels after generation are based on projected annual average loading levels.

The magnetic field exposure field exposure levels are only indicators of how this proposed project may affect the magnetic field environment. They are not measures of risk

GRAPH NO. 1



GRAPH NO. 2

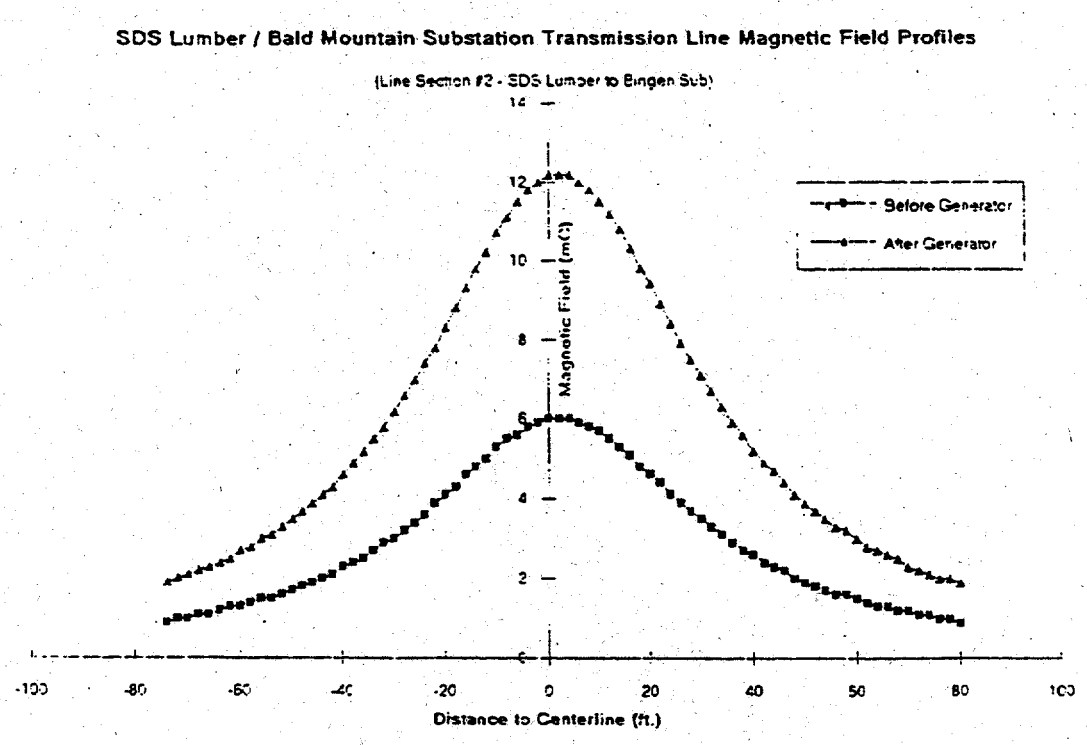


Figure 6. Magnetic Field Levels from Conductors

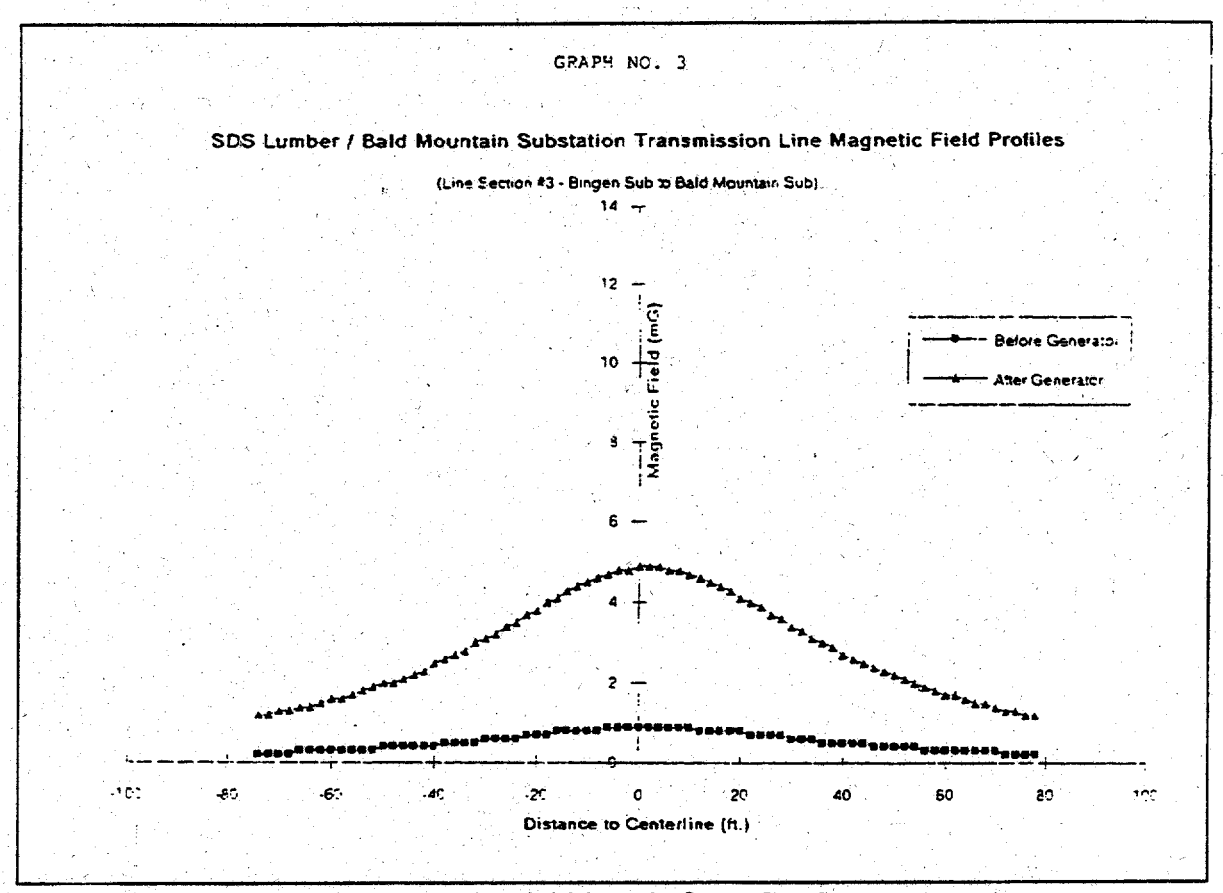


Figure 6. Magnetic Field Levels from Conductors (cont.)

or impact on health. Hundreds of studies on electric and magnetic fields have been conducted in the U.S. and other countries. Studies of laboratory animals generally show that these fields have no obvious harmful effects. However, a number of subtle effects of unknown biological significance have been reported in some laboratory studies (Frey, 1993).

Much attention at present is focused on several recent reports suggesting that workers in certain electrical occupations and people living close to power lines have an increased risk of leukemia and other cancers (Sagan, 1991; NRPB, 1992; ORAU Panel, 1992; Stone, 1992). Most scientific reviews, however, find that the overall evidence is too weak to establish a cause-and-effect relationship between electric or magnetic fields and cancer. As yet, no clear scientific consensus regarding whether or not there is a cause and effect relationship between exposure to EMF and adverse health effects has been obtained. A review of most of the studies relating to EMF and possible health effects are included in the BPA publications mentioned earlier in this section. These publications cover only a sampling of the studies that have been done relating to electric and magnetic fields.

Mitigation

A preliminary Hazardous Waste and Materials Plan (HWMP) was developed for the proposed cogeneration facility on the SDS Lumber Mill site (Dames and Moore, 1993b) identifying relevant issues and guidelines regarding storage and handling of hazardous waste materials. A final HWMP should be prepared prior to construction specifically detailing procedures for the site. A Spill Prevention, Containment, and Countermeasures Plan

(SPCC) was prepared for the gas spur and loop lines. However, more information should be provided regarding procedures for refueling and maintenance at staging areas. A HWMP will be developed by BPA prior to construction of the substation.

The developer will restrict from public access those portions of the project necessary to protect life, health, and property. Ammonia used in pollution control at the cogeneration facility will be handled in accordance with applicable regulations. The developer is required by Ecology to maintain control of noise produced during construction of the project components and from operation of the cogeneration facilities within regulated limits (WAC 173-60-040). The air quality permits required for the cogeneration facility (PSD or NOC) require the use of BACT to ensure minimum impact to public health and safety from airborne emissions. Skyline Hospital will provide emergency and ongoing medical care.

Unavoidable Impacts

There is the potential for minor and temporary risks to public health and safety associated with construction and operation of the proposed project. However, with suitable precautions as expected for the project, these potential impacts from the project are not considered to be significant.

3.1.9 Visual Quality

The general setting of the proposed project is the Columbia Gorge National Scenic Area. However, the visual quality of the project elements have been evaluated in light of their specific settings as described in the following paragraphs.

Project Components

SDS Lumber Mill Site

The visual quality of the SDS Lumber Mill site proposed for the cogeneration facilities is already significantly adversely affected by existing lumber mill buildings, stacks, yards, and log-storage areas, most of which have existed for more than 40 years. Development of the proposed cogeneration facilities on the mill site would blend in with the existing industrial character of the immediate area. No views from public vantage points near the project would be obstructed, and there would be minor alteration in the existing view of the site. Due to the industrial nature of the project area, the project itself would only be seen from limited viewpoints. It would be visible from portions of Interstate 84, on the Oregon side of the Columbia River. However, views from the roadway would not be significant as the project would blend with the existing facility.

Gas Spur Line

The existing visual quality of the western half of the proposed gas spur line route (portion not on lumber mill site) is considered disturbed, most of this portion of the route adjacent to SR 14. The spur line would pass close to a convenience store, a fruit packing plant and associated yards, and through stands of mixed deciduous forest and pasture. Construction of the spur line would involve clearing a ROW at least 18 m (60 ft) wide through the mixed deciduous vegetation on the south side of SR 14. This cleared ROW may be visible to motorists and pedestrians from SR 14, the Hood River Bridge, and boats near the north bank of the Columbia River.

Gas Loop Line

The proposed gas loop line route would be within the existing ROW of the NWP Hood River Lateral except for an approximately 244-m (800-ft) long section that would be located about 61 m (200 ft) east of the existing lateral. The existing visual quality of the proposed route is considered disturbed because of the presence of the existing maintained ROW and the urban and agricultural development that has occurred. The ROW passes through stands of mixed deciduous, conifer and oak woodlands, orchards, and pasture.

NWP currently maintains approximately a 9.1 m (30 ft) grassed operational ROW along the existing lateral. In some portions of the existing ROW that contain mixed conifer/deciduous forest, shrubs and small trees have become established within the ROW, providing a visual softening to the ROW edge.

The maximum construction ROW to be cleared for the new gas loop line will be 23 m (75 ft). The maintained operational ROW will be 18 m (60 ft). It is anticipated that the widened corridor would further disturb the existing visual quality of the proposed pipeline route, and could create a temporary visual "scar" on the White Salmon Bluffs portion of the route that will be visible from viewpoints on the Columbia River and the Hood River bridge.

Proposed Bald Mountain Substation

The existing visual quality of the proposed substation site is considered to be disturbed because of the presence of several overhead transmission lines traversing the area, and the gravel access/maintenance road (used mainly by PP&L) bordering the property. The proposed substation would likely be partially visible to motorists and pedestrians at points along SR 141 (see Figure 2), and to hunters, hikers, and others using the gravel access road to seek recreational activity or to view the existing Condit Hydroelectric Project, thereby further disturbing the existing visual quality of the area.

Mitigation

Potential adverse visual impacts resulting from the siting and operation of the project elements will be minimized in the following ways:

- On the SDS Lumber Mill site, the new steel structures will be coated with a non-reflective surface to reduce glare and blend in with the existing character of the mill.
- The gas spur and loop line ROW will be revegetated with native species, and the amount of clearing required for construction will be minimized.
- Special care will be taken to avoid stands of vegetation, plant larger saplings and mature shrubs as well as other native vegetation, and minimize construction ROW for the White Salmon Bluffs portion of the gas loop line.
- All vegetation and slash cleared for construction of the project elements will be removed by burning or hauling.

Unavoidable Impacts

Although development of the proposed project elements would potentially further disturb the existing visual quality of the project sites, if the mitigation actions listed above are used, the resulting potential adverse visual impacts would be mostly temporary, and are not considered significant.

3.1.10 Historical and Cultural Resources

No archaeological or historical sites eligible for, or listed in, the National Register of Historic Places were identified in the cultural resources surveys undertaken at the sites of the proposed project elements (Dames and Moore, 1993e; HRA, 1994; Ebasco, 1993).

Mitigation

If any archaeological or historic sites are discovered during construction, work in that area will be halted, and the State Historic Preservation Office (SHPO) consulted. Measures will then be identified and implemented as necessary to avoid or mitigate impacts to any sites discovered.

Unavoidable Impacts

There are no impacts to historical and cultural resources from the proposed project.

3.1.11 Recreation

The general area surrounding the proposed project, which includes a portion of the Columbia River Gorge National Scenic Area, provides a variety of active and passive recreation opportunities on both the Washington and Oregon sides of the Columbia River.

Unavoidable Impacts

There would be minor and temporary disturbances to potential recreational use of forested areas, orchards, pasture/agricultural lands, and the drive-in theater adjacent to the proposed gas loop line north of the city of White Salmon. Similar temporary and minor disturbance would occur to lands adjacent to the proposed substation.

The project will have no significant adverse impact on tourism in the area, particularly windsurfing tourism. Air and noise emissions will be within regulated standards, and the project will not involve structures in the Columbia River or use of shoreline that might interfere with windsurfing. Moreover, the project will not obstruct views from public vantage points.

3.1.12 Socioeconomics

The 1992 population of Klickitat County was 17,100, which is an increase of less than 500 since 1990. The populations of Bingen and White Salmon have remained fairly constant for that time period at 650 and 1,912, respectively (Office of Financial Management, 1993).

Klickitat County typically has a high unemployment rate, and continues to be designated a "distressed area" by the state. The state classifies a county as distressed if during the last three complete calendar years the unemployment rate was at least 20 percent above the statewide average. The current unemployment rate is 12.7 percent, compared to a state unemployment rate of 8.2 percent.

The primary impacts to the socioeconomic environment are expected to be a result of an increase in the labor force during project construction and operation and the increased tax base provided by project construction and operation. Construction of the cogeneration facility is expected to take 10 months, with an average of 56 workers on site per month, which includes a one-month peak of 100. Construction of the pipelines and meter station would take approximately three months, with a maximum of 65 workers. It is anticipated the majority of construction workers would be hired from the local work force. Additional

workers would be available from the Vancouver metropolitan area and other cities and towns within a 1.5-hour commuting distance. Existing motels in the area would accommodate any overnight accommodations required by any construction workers unable to commute. Operation and maintenance of the cogeneration facilities would require up to eight additional full-time employees, amounting to approximately a $300,000 increase in direct payroll.

The proposed Bald Mountain Substation would be constructed by BPA employees. BPA estimates that it would take 10 to 15 employees approximately 18 months to construct it. While BPA would not pay any taxes, and would use its own employees, workers would most likely spend money in the area, thereby creating a minor and temporary—but beneficial—impact to the local economy.

The largest economic impact during construction is expected to be the increased sales tax revenue generated by the local purchase of construction materials. Other forms of tax revenue would be generated from project operation annually. These include increases in property, business and occupation, and brokered natural gas taxes.

Table 3.1.12-1 presents estimates of the tax revenues expected from construction and operation of the proposed project, based on 1993 tax rates, compared to fiscal year 1992 revenues.

Unavoidable Impacts

Construction and operation of the proposed facility would provide benefits to the socioeconomic environment; no negative impacts are expected to occur.

3.1.13 Noise

Noise Regulations

Allowable noise levels are regulated by Ecology, and are specified in WAC 173-60. Allowable noise levels are specified as "A-weighted decibels," or dBA. For noise produced by industrial facilities, the allowable noise contributions from specific sources at residential and commercial areas are as follows:

	Daytime	Nighttime
Residential Receiver	60 dBA	50 dBA
Commercial Receiver	65 dBA	65 dBA

These limits do not limit total noise but only that from individual industrial facilities. Traffic noise from highways, railroads and aircraft is regulated at the Federal level with noise emission standards for new vehicles.

Temporary, daytime construction activities are exempted from the off-site noise limits. In addition, existing industrial facilities that have consistently operated at night in the past are not required to retrofit their equipment to meet the above limits.

Existing Noise Levels

Existing daytime and nighttime noise levels at the commercial and residential areas adjacent to the SDS Lumber Mill property were measured in September, 1993 (Dames and Moore, 1993c). Fifteen-minute average readings were taken at five locations, at five different times of the day and night. The residual or background level (L_{90}) and the energy average of all the noise present (L_{eq}) were determined for each 15-minute period. L_{90} is

Table 3.1.12-1. Estimated Taxes Anticipated from the Proposed Project Compared to Fiscal Year (FY) 1992 Taxes.

	During Construction		Operation (Annual)			
	Sales Tax		Property Tax		Other Taxes (business & occupation, natural gas)	
Jurisdiction	From Project	FY 1992 (Approximate)	From Project	FY 1992 (Approximate)	From Project	FY 1992 (approximate)
City of Bingen	$ 136,300	40,300	$135,000	135,300		
City of White Salmon	3,050	55,800	10,300	122,420		
Klickitat County	6,200	300,000	670,000	1,158,300		
Washington State	1,900,000	3,551,205,500	--	--	$360,200	1,229,860,000
Total	$2,045,550	3,551,601,600	$815,300	1,416,020	$360,200	1,229,864,000

the noise level exceeded during ninety percent of the measurement period and it excludes noise from transient event such as intermittent traffic and aircraft while retaining the continuous noises from industry and distant freeway traffic. This is the measure most likely to be affected by new noise from the cogeneration facility. The L_{eq}, also called the equivalent noise level, is a measure of all the noise present during the monitoring period, including that from transient events.

Existing L_{90} levels at the two residential sites where readings were taken ranged from about 49 dBA during the day to 50 dBA during the night. The L_{eq} levels ranged from 68 dBA during the day to 60 dBA at night. The SDS Lumber operations were primarily responsible for the L_{90} levels, whereas traffic was largely responsible for the higher L_{eq} levels. The L_{90} levels were at or below the nighttime Ecology limit of 50 dBA for residential receptors.

Higher noise levels were measured in the commercial areas which had more traffic. The L_{90} levels ranged from 57 dBA during the day to 52 dBA at night. The L_{eq} levels were 69 dBA during the day and 77 dBA during the night. The L_{90} levels are within the Ecology limits for commercial areas. Although the L_{eq} levels are above the Ecology limits, the limits are not applicable to traffic noise.

Noise Generated by Proposed Project

Construction Noise

Construction of the new gas spur and loop lines, the proposed Bald Mountain Substation, and the cogeneration facility itself will be limited to daylight hours, and is expected to be completed within one year. These temporary, daytime construction activities are exempted from the allowable residential noise limits. The noise levels produced by the construction activities will vary widely, depending on the specific equipment being operated at the time. EPA has published approximate noise levels that are expected to be caused by typical, well-maintained construction equipment (EPA, 1971). Table 3.1.13-1 lists the estimated noise levels that would be caused by construction activities.

Table 3.1.13-1. Estimated Noise Levels During Typical Construction Activities.

Construction Activity	Estimated Noise Level at 15.2-m (50-foot) distance	Estimated Noise Level at 152-m (500-foot) Distance
Ground Clearing	84 dBA	64 dBA
Excavation	89 dBA	69 dBA
Foundation Construction	78 dBA	58 dBA
Pile Driving	87 dBA	67 dBA
Building Erection	85 dBA	65 dBA
Building Finishing	89 dBA	69 dBA

Operational Noise

Noise levels resulting from operation of the cogeneration facility were modeled using the NOISECALC computer model (Driscoll, 1985). Noise emission data from the proposed equipment was determined by measurement of levels from a similar plant which contained standard noise control features that are typical of cogeneration facilities (Kessler, 1994).

Expected sound levels were determined at representative residential and commercial receiver locations near the facility. The model accounted for attenuation due to design mitigation measures, shielding provided by existing buildings (the plywood mill), attenuation of sound by divergence, and absorption of the atmosphere. The model was run with and without background (L_{90}) sound levels.

Initial levels predicted, based on measured levels from the similar plant, were above the nighttime residential noise limits by 4 to 5 dBA at the nearest residential receptors to the northeast. The predicted level at the residence on the south side of Steuben Street, between Maple and Cherry Streets, was 53.9 dBA. The predicted level at the residence on Humbolt Street adjacent to the Gorge Museum was 54.4. Consequently, additional noise control was required to bring these levels within the Ecology limits.

The nearest residential receptors to the north and northwest, isolated apartments above or behind commercial businesses along Steuben Street, will receive significant shielding from the plywood mill building and likely will not notice any change in the noise environment. Predicted levels ranged from 46.7 dBA to 49.1 dBA between Alder and Oak Streets on Steuben.

Thus, in all cases, the modeled noise levels for the proposed cogeneration equipment are within the allowable Ecology limits. The predicted levels are slightly below the existing measured background (L_{90}) levels and the additive effect will be an increase of less than 3 dBA at any location. This small increase is not significant and will go largely unnoticed.

Noise associated with operation of the substation will be maintained within state noise limits.

Mitigation

The developer has committed to design the facility to achieve an overall noise level that is below allowable Washington State noise levels for the nearest residential and commercial receivers. The noise levels from the cogeneration facility will be maintained at levels below the Ecology limits by the following:

- Gas turbine will be enclosed in an acoustical enclosure.
- Efficient mufflers and silencers will be installed on the turbine air inlets.
- Noise insulation material will be installed on exposed surfaces of the HRSG.
- Structures will be placed using existing buildings at the SDS Lumber Mill site as noise barriers.
- Generator components will be enclosed within acoustical enclosures.
- Silencers will be installed on ventilation and exhaust fans.
- Silencers will be installed on steam blowdown vents and pressure relief valves.

If these measures do not achieve the desired noise levels, the developer will either construct a noise barrier wall or employ other methods to block turbine and generator noise to the northeast.

Unavoidable Impacts

Noise from the project will meet applicable Washington State noise standards (WAC 173-60). State noise standards serve to mitigate noise to non-significant levels. Also, the project will add only a slight increase (less than 3 dBA) to existing noise levels in the

vicinity of the lumber mill. Therefore, only minor adverse noise impacts are expected from the project.

3.1.14 Solid Waste and Hazardous Waste Management

Project Components

SDS Lumber Mill Site

Most of the solid waste generated by this project would be generated during construction of the cogeneration facilities on the lumber mill site. This would include scrap wood, scrap metal, and trash generated by work crews. Hazardous materials used during the construction phase would be materials required by heavy equipment: diesel, gasoline, oil, solvents, and lubricants.

The completed facility would include 120 hours of storage of No. 2 fuel oil in a tank 12.2 m (40 ft) high, by 12.2 m (40 ft) in diameter, with a capacity of 1,552,318 liters (410,200 gal). The oil tank would be an above-ground structure and be surrounded by a berm designed to meet spill containment regulations as outlined in 40 CFR 112. Fuel oil would be transported to the cogeneration facility site by tanker trucks. It is estimated that completely filling the on-site storage tank would require 15 to 20 truck deliveries per day for a three-day period. Currently, between 75 and 100 truck deliveries/pickups per day occur at the lumber mill, so the additional short-duration truck traffic would not constitute a significant impact. Approximately 30,283 liters (8,000 gal) of ammonia would also be delivered by truck and stored at the facility and handled in accordance with the final hazardous waste material plan (HWMP), to be developed for the site. The ammonia would be used with a catalyst for flue base (NO_x) control through selective catalytic reduction methods. The proposed facility would use two types of catalyst frameworks. One type is a ceramic substrate with titanium and vanadium oxides deposited in the substrate. The other type is a honeycomb formed entirely of oxide material. With the substrate type of system, the catalyst can be sent back to the vendor who strips off the oxide and disposes of it in accordance with state and Federal regulations and reconditions the catalyst. If this recycling process is chosen, reprocessing would occur off the lumber mill site.

Gas Spur and Loop Lines

Hazardous materials associated with the construction of the gas pipelines would consist of vehicle maintenance products (fuel and lubricating oils). Some solid waste will be generated during construction of the pipelines.

Proposed Bald Mountain Substation

Solid waste consisting of scrap wood, metal, and trash would be generated during the construction of the substation. Hazardous materials used during the construction phase include diesel, gasoline, oil, solvents, and lubricants. In addition, dielectric oil is used in the transformers. This oil would not contain polychlorinated biphenyls (PCBs).

Mitigation

SDS Cogeneration Facilities and Proposed Bald Mountain Substation

All waste materials (e.g., vehicle maintenance wastes, solvents, paints, concrete form, and curing solution waste) generated during construction activities will be stored in separate clearly labeled containers for proper disposal. Materials that are recyclable are planned for

recycling, thus minimizing the amount of waste generated. A preliminary HWMP has been developed for the proposed cogeneration facility (Dames and Moore, 1993b). The plan outlines issues regarding the storage of hazardous waste and materials at the site. A final HWMP will be prepared prior to construction specifically detailing procedures for the site. A preliminary ESCP and Initial Site Restoration Plan has also been developed for the SDS Lumber facility (Dames and Moore, 1993a). A final plan should be developed prior to construction.

An SPCC plan will be required for the cogeneration facility and the Bald Mountain Substation. The SPCC plans will include all the information as specified in WAC 073-303-340. The SPCC plan for the Bald Mountain Substation will ensure that a containment system will be installed to intercept any oil leakage. Due to the storage of number 2 fuel oil, an Oil Spill Prevention (OSP) plan will likely be necessary, as outlined in 40 CFR 112. The current regulations regarding OSP plans are in proposed form and are expected to be finalized within the next 6 months. Copies of the OSP and SPCC plans are to be filed with their respective agencies and with local emergency planning committees. The presence of ammonia and fuel oil above the threshold planning quantity (TPQ) as specified by 40 CFR 302 (the SARA Right-to-Know act) requires that a Tier 2 report be filed with the state, the local emergency planning committee, and the local fire department. Any additional chemicals stored at the proposed facility above the TPQs will be reported. Because ammonia is on the 313 chemical list, a "form R" will be filed on an annual basis.

Gas Spur and Loop Lines

A preliminary Erosion Control, Revegetation and Maintenance Plan and an SPCC plan have been developed for the spur and loop lines (NWP 1994). In the SPCC plan, it mentions that refueling or maintenance would not take place within 31 m (100 ft) of any bodies of water or within 61 m (200 ft) of any groundwater wells. A final SPCC plan (to be kept at the site) will be prepared prior to construction. This plan will include the procedures to be followed for refueling and maintenance at the staging areas, and the response plan for any potential spills and other information as indicated in WAC 173-303-350 and -360.

Unavoidable Impacts

Impacts from solid wastes created during construction will be temporary and impacts from use of controlled hazardous wastes during construction and operation of the proposed project will be minimal or mitigated, and are therefore, not considered to be significant.

3.1.15 Checklist of Environmental Consultation, Review, and Permit Requirements

A summary of environmental consultation, review, and permit requirements applicable to the Klickitat Cogeneration Project is presented in Table 3.1.15-1.

3.2 NO ACTION ALTERNATIVE

Under the No Action alternative, BPA would not purchase 49.5 aMW of firm power generated by the Klickitat Cogeneration Project. Although the No Action alternative would not have any immediate impacts on the environment, it would not meet BPA's underlying need for additional electrical energy.

Table 3.1.15-1. Checklist of Environmental Consultation, Review, and Permit Requirements.

Requirement	Applicability	Remarks
National Environmental Policy Act	Yes	EA evaluates significance of impacts.
Endangered Species Act	Yes	Rare plant surveys to assess potential impacts on Federal candidate plant species. Biological assessment for Federal species.
Fish and Wildlife Conservation	Yes	Mitigation measures required to protect streams crossed by gas transmission lines.
Heritage Conservation	Yes	Consultation in progress.
Land Use Plan Consistency	Yes	Consultation in progress with local jurisdiction.
Coastal Zone Management	No	No determination of Compliance required.
Floodplain Management	Yes	Portions of the gas spur line are located within 100-year floodplain of Columbia River. Consultation in progress.
Farmlands	No	No significant farmlands involved.
Recreation Resources	Yes	No impact on recreation.
Global Warming	Yes	Greenhouse gas emissions controlled by permit regulations.
Permit for Structures in Navigable Waters (Rivers and Harbors Act)	Yes	Project is located adjacent to navigable waters. A Section 10 permit needed for modifications to outfall diffuser.
Washington State Hydraulic Approval	Yes	Several stream crossings are unavoidable. Application filed in May 1994.
Permit for Discharges into Waters or Wetlands of the U.S. (Clean Water Act)	Yes	New NPDES permit required. Section 401 Water Quality Certification Required. Section 404 Discharge Permit may be required.
Public Lands Permit	No	No Federal lands involved.
Energy Conservation at Federal Facilities	No	No Federal facilities involved.
Pollution Control at Federal Facilities	No	No Federal facilities involved.
Clean Air Act	Yes	Notice of Construction (NOC) required.
Solid and Hazardous Waste	Yes	Permit required to keep waste out of water.
Hazardous Waste	Yes	SARA Title 3 Threshold Planning Quality.
Hazardous Waste	Yes	Oil Spill Prevention Plan and SPCC Plan.
Noise	Yes	Noise will be attenuated to state regulations.
Safe Drinking Water	No	No impacts on drinking water.
Pesticides/Herbicides	No	No pesticide use known. Some herbicide use.
Toxic Substances	No	No PCBs.
Asbestos	No	No asbestos.
CERCLA	No	No known existing hazardous wastes.
Radon	No	Radon hazards not applicable.

3.3 OTHER ACTIONS

See Section 2.3 and referenced materials.

4.0 PERSONS AND AGENCIES CONSULTED

The following representatives from county, state, and Federal agencies were contacted for input and information regarding the proposed Klickitat Cogeneration Project.

Columbia River Gorge Commission - Alan Bell

Federal Emergency Management Agency - Larry Vasage, Marcy Melvin

Klickitat County Planning Department - Francine Havecroft, Curt Dreyer

Northwest Pipeline Company - Jan Camp

Northwest Power Planning Council - Robert Lohn

State of Washington Department of Ecology - Darleen Frye, Thom Lufkin

State of Washington Department of Natural Resources, Washington Natural Heritage Program - Sandy Norwood

State of Washington Department of Wildlife - Lee Van Tussenbrook

State of Washington Office of Archaeology and Historic Preservation - Sarah Steel, Robert Whitlam

State of Washington Parks and Recreation Commission, Scenic Rivers Program - Steve Starlund

U.S. Army Corps of Engineers - Ken McGowen

United States Department of Commerce, National Marine Fisheries Service - Merrit Tuttle, Dan Avery

United States Fish and Wildlife Service - David Frederick, Michelle Eames

United States Soil Conservation Service - Mike Blakely

5.0 REFERENCES

Ahlbom, A., M. Feychting, M. Koskenvuo, J.H. Olsen, E. Pukkala, G. Schulgen, and P. Verkasalo. 1993. Electromagnetic Fields and Childhood Cancer. Lancet 343:1295-1296.

Ahlbom, A. et al. 1987. Biological Effects of Power Line Fields. New York State Powerlines Project Scientific Advisory Panel Final Report. New York State Department of Health, Power Lines Project. Albany, New York.

Blakeley, M. 1993. Unpublished data on Klickitat County soils. Soil Conservation Service. White Salmon, Washington.

Camp, J. 1993. Northwest Pipeline Corporation, Battle Ground, Washington. Personal communication with Domoni Glass, Ebasco Environmental, Bellevue, Washington. 16 September 1993.

Coleman, M. et al. 1985. Leukemia and Electromagnetic Fields: A Case-Control Study. Pages 122-125, In, International Conference on Electric and magnetic Fields in Medicine and Biology. Institution of Electrical Engineers. London and New York.

Coleman, M. and V. Beral. 1988. A Review of Epidemiological Studies of the Health Effects of Living Near or Working with Electricity Generation and Transmission Equipment. International Journal of Epidemiology.

Dames and Moore. 1977. Foundation Investigation, Proposed Boiler-turbine installation, Bingen, Washington, 6p.

Dames and Moore. 1993a. Erosion Control, Revegetation, and Maintenance Plan. Seattle, Washington.

Dames and Moore. 1993b. Hazardous Waste and Materials Plan. Seattle, Washington.

Dames and Moore. 1993c. Noise Analysis of Proposed Klickitat Energy Partners Cogeneration Facility. October 15, 1993.

Dames and Moore. 1993d. Cultural Resources Assessment of the Proposed Klickitat Energy Partners Cogeneration Facility and Northwest Pipeline's Proposed Spur and Loop Line. Seattle, Washington.

Dames and Moore. 1994. Notice of Construction Permit Application; Klickitat Energy Project for Klickitat Energy Partners. Portland, Oregon. February 1994.

Driscoll, D.A. 1985. NOISECALC: A Computer Model for Sound Propagation Calculations. Noise Control Engineering Journal, Nov/Dec.

Ebasco. 1993. Historic Properties Inventory of the Bald Mountain Substation, Klickitat County, Washington. Bellevue, Washington.

EMF Health and Safety Digest, "Denmark: No EMF Regulations," Vol. 11, No. 6, June 1993, pp. 4-5.

EPA (Environmental Protection Agency). 1971. Noise from Construction Equipment and Operations, Building Equipment and Home Appliances. NTID300.1, December, 1971.

EPA (Environmental Protection Agency). 1980. EPA Region 10 Noise Program: Noise Guidelines for EISs. November 24, 1980.

Federal Emergency Management Agency. 1981. Flood Insurance Rate Map, for Klickitat County, community panel number 530099-0375b.

Federal Emergency Management Agency. 1984. Flood Insurance Rate Map for Town of Bingen, Washington.

Federal Emergency Management Agency. 1985. Flood Insurance Rate Map for White Salmon, Washington.

Feychting, M. and A. Ahlbom. 1993. Magnetic Fields and Cancer in Children Residing Near Swedish High-Voltage Power Lines. American Journal of Epidemiology 138:467-481.

Feychting, M. and A. Ahlbom. 1992. Magnetic Fields and Cancer in People Residing Near Swedish High Voltage Power Lines. IMM-rapport 6/92. Institute of Environmental Medicine, Karolinska Institute, Stockholm, Sweden.

Fish Passage Center. 1993. Fish Passage Center Annual Report 1992. Fish Passage Center, Portland, Oregon.

Franklin, J.F. and C.T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. Forest Service Gen. Tech. Report PNW-8, U.S. Department of Agriculture. (Reprinted with bibliography supplement, Oregon State University, Corvallis, 1988.)

Frederick. 1994. U.S. Fish and Wildlife Service. Letter to Jennifer Rude, Wildlife Biologist, Enserch Environmental, Bellevue, Washington

Frey, A.H. 1993. Electromagnetic Field Interactions with Biological Systems. Federation of American Societies for Experimental Biology Journal 7:272-281.

Fulton, J.P., S. Cobb, L. Preble, L. Leone, and E. Forman. 1980. Electrical Wiring Configuration and Childhood Leukemia in Rhode Island. American Journal of Epidemiology.

Gauger, J.R. 1985. Household Applicance Magnetic Field Survey. IEEE Transactions on Power Apparatus and Systems PAS (104(9):2436-2444.

Gonnella. 1994. Facsimile Letter Regarding Visibility from Sam Sanchez to Mike Gonnella of IPEC. 23 May 1994.

Hefeneider, S.H., S.L. McCoy, A.C. Freed, J. Lee, B.E. Ogden, and A.S. Hall. 1994. Sheep Exposed to Whole Body EMF Show a Reduction of In Vitro Production of the Immunoregulatory Cytokine Interleukin-1. Paper to be presented at the 16th Annual Meeting of the Bioelectromagnetics, June 12-17, 1994. Copenhagen, Denmark.

HRA. 1994. Results of a Phase I Cultural Resources Study of the Northwest Pipeline Corporation Hood River Pipeline Expansion Project. Historical Research Associates Inc. Seattle, Washington.

International Standards Organization (ISO), 1992. Attenuation of Sound During Propagation Outdoors: Part 2 - A General Method of Calculation. ISO/DIS 9613-2, 1992.

Juutilainen, J., P. Mailainen, S. Soarikoski, E. Laara, and S. Suonio. 1993. Early Pregnancy Loss and Exposure to 50-Hz Magnetic Fields. Bioelectromagnetics 14:229-236.

KEP (Klickstat Energy Partners). 1994. Comment Letter on Draft Klicktat Cogeneration Project Environmental Assessment to Dames and Moore. May 1994.

Kessler, F. 1994. Letter report "Klickitat Power Plant, Bingen, Washington - Sound Emission Study." FMK Technology, Inc., Bound Brook, New Jersey.

Korosec, M.A. 1987. Geologic Map of the Hood River Quadrangle, Washington; Washington State Division of Geological and Mineral Resources Open-file Report 87-6.

Lee, J.M., Jr., et al. 1993. Melatonin Secretion and Puberty in Female Lambs Exposed to Environmental Electric and Magnetic Fields. Biology of Reproduction 49:857-864.

Lin, R.S. and P.Y.-Lu. 1989. An epidemiologic study of childhood cancer in relation to residential exposure to electromagnetic fields. Abstract A-40. In: The Annual Review of Research on Biological Effects of 50 and 60 Hz Electric and Magnetic Fields. U.S. Department of Energy. Washington D.C.

Lindgren, R. 1993. Report From the National Electrical Safety Board to the Government - November 1993. Vottenfall Transmission AB, Gothenburg, Sweden.

London, S.J., D.C. Thomas, J.D. Bowman, E. Sobel, T. Cheng, and J.M. Peters. 1991. Exposure to Residential Electric and Magnetic Fields and Risk of Childhood Leukemia. American Journal of Epidemiology 134(9):923-937.

McDowall, M.E. 1986. Mortality of Persons Resident in the Vicinity of Electricity Transmission Facilities. British Journal of Cancer 53:271-279.

Milham, S. 1982. Mortality From Leukemia in Workers Exposed to Electrical and Magnetic Fields. (Letter to the editor). New England Journal of Medicine 307(4):249.

Miller, D.A. 1974. Electrical and Magnetic Fields Produced by Commercial Power Systems. pp. 62-70. In: Biological and Clinical Effects of Low-Frequency Magnetic and Electric Fields. J.G. Llaurado et al. (editors). Charles C. Thomas. Springfield, Illinois.

Myers, A. et al. 1985. Overhead Power Lines and Childhood Cancer. Pages 126-130, in International Conference on Electric and Magnetic Fields in Medicine and Biology. The Institution of Electrical Engineers. London and New York.

NRPB (National Radiation Protection Board). 1992. Electromagnetic Fields and the Risk of Cancer. Volume 3, No. 1. Chilton, England.

NPC (Northwest Pipeline Corporation). 1994. Environmental Report for the Hood River Pipeline Loop and Extension. Battleground, Washington.

Norwood, Sandy. 1993. Washington Department of Natural Resources. Letter to Ron Tressler, Wildlife Biologist, Ebasco Environmental, Bellevue, Washington.

Oak Ridge Associated Universities (ORAU) Panel. 1992. Health Effects of Low-frequency Electric and Magnetic Fields. ORAU 92/F8. Prepared for the Committee on Interagency Radiation Research and Policy Coordination. U.S. Government Printing Office. GPO#029-000-00442-9.

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981. Raptor Research Report No. 4. Raptor Research Foundation, Inc.

Olsen, J.H., A. Nielsen, and G. Schulgen. 1993. Residence Near High Voltage Facilities and the Risk of Cancer in Children. British Medical Journal 307:891-895.

Olsen, J.H., A. Nielsen, G. Schulgen, A. Bautz, and V.B. Larsen. 1992. Residence Near High-Voltage Facilities and the Risk of Cancer in Children. English Translation of Background Paper in Danish. Cancer Registry of the Danish Cancer Control Agency. Copenhagen, Denmark.

Revised Assessment of Magnetic Fields and Health Hazards. 1993. Swedish National Board for Electrical Safety. Stockholm, Sweden.

Sagan, L.A. 1991. Epidemiological and Laboratory Studies of Power Frequency Electric and Magnetic Fields. Journal of the American Medical Associations, 268:625-629.

Savitz, D.A., and E.E. Calle. 1987. Leukemia and Occupational Exposure to Electromagnetic Fields: A Review of Epidemiologic Surveys. Journal of Occupational Medicine. 29:47-51.

Savitz, D.A., et. al. 1988. Case-Control Study of Childhood Cancer and Exposure to 60-Hz Magnetic Fields. American Journal of Epidemiology 128(1):21-38.

Science Advisory Board. 1992. Potential Carcinogenicity of Electric and Magnetic Fields. EPA-SAB-RAC-092-013. U.S. Environmental Protection Agency. Washington, D.C.

Severson, R.K. et al. 1988. Acute Nonlymphocytic Leukemia and Residential Exposure to Power Frequency Magnetic Fields. American Journal of Epidemiology 128(1):10-20.

Stone, R. 1992. Polarized Debate: EMF's and Cancer. Science 258: 1724-1725.

Taubes, G., 1993. EMF - Cancer Links: Yes, No, and Maybe. Science 262:649.

Tomenius, L. 1986. 50-Hz Electromagnetic Environment and the Incidence of Childhood Tumors in Stockholm County, Bioelectromagentics 7:191-207.

U.S. Department of Energy, Bonneville Power Administration, Lee et al. 1993.

U.S. Department of Energy, Bonneville Power Administration. February 1993 (Revised). Electrical and Biological Effects of Transmission Lines. - A Review.

U.S. Department of Energy, Bonneville Power Administration. November 1993. Questions and Answers on Research into Health Effects.

Washington Natural Heritage Program. 1994. Endangered, Threatened, and Sensitive Vascular Plants of Washington. Department of Natural Resources, Olympia, Washington.

Washington Department of Fisheries and Oregon Department of Fish and Wildlife. 1992. Status Report Columbia River Fish Runs and Fisheries 1938-91.

Wertheimer, N. and E. Leeper. 1979. Electrical Wiring Configurations and Childhood Cancer. American Journal of Epidemiology 19:273-284.

Wertheimer, N. and E. Leeper. 1982. Adult Cancer Related to Electrical Wires Near the Home. International Journal of Epidemiology 11(4):345-355.

Wertheimer, N. and E. Leeper. 1989. Fetal Loss Associated with Two Seasonal Sources of Electromagnetic Field Exposure. American Journal of Epidemiology 129:220-224.

Zaffanella, L.E. (Principal investigator). 1993. Survey of Residential Magnetic field Sources (2 vols.). TR-102759/Research Project 3335-02. Prepared for Electric Power Research Institute. Palo Alto, CA.

APPENDIX A

Environmental Consultation, Review, and Permit Requirements

APPENDIX A - ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS

A.1 NATIONAL ENVIRONMENTAL POLICY ACT

This Environmental Assessment (EA) has been prepared pursuant to regulations implementing the National Environmental Policy Act (42 USC 4321 et seq.), which requires Federal agencies to assess the impacts their actions might have on the environment. BPA will use the information in the EA to determine whether the proposed action would have a significant impact on the environment. If the impacts are determined to be significant, an environmental impact statement (EIS) will be prepared. If the impacts are determined to be not significant, BPA will issue a Finding of No Significant Impact (FONSI).

A.2 THREATENED AND ENDANGERED SPECIES

BPA has consulted with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended, 16 U.S.C.A. 1531 et seq., Public Law 97-304.

There is currently one Federally listed threatened plant species in Washington [Nelson's checker-mallow (*Sidalcea nelsoniana*), Cowlitz County]; however, this species is unlikely to occur in habitats found in the project area. The swamp sandwort (*Arenaria paludicola*) is listed as a Federally endangered plant species in Washington, but is thought to be extirpated from Washington (WNHP, 1994). However, numerous species found in Washington are candidates for listing under the ESA, and potential impacts to these species must be considered in the environmental analysis for Federally sponsored or permitted projects, as required by the ESA.

The Washington Department of Natural Resources' (WDNR) Natural Heritage Program was consulted in an effort to coordinate with the State of Washington Natural Heritage Plan, which identifies Federal and state-listed threatened, endangered, and sensitive plant species and their habitats. A search of the Washington Natural Heritage Program database for records of state-listed rare plants or high-quality native plant communities in the project area or project vicinity was conducted as a result of this inquiry. This search resulted in a listing of 25 sightings of state-listed endangered, threatened, and sensitive plant species—two of which are candidates for Federal listing—and one sighting of a high-quality native plant community (Norwood, 1993).

All portions of the project were surveyed for sensitive plants during May and August 1993 and May 1994, by a qualified rare plant botanist from Enserch Environmental (formerly Ebasco Environmental). No sensitive plant species were located during these surveys.

A.2.1 Species with Federal Status Potentially Occurring in the Project Area

Merrit Tuttle of the NMFS, Portland Office, was consulted regarding Federally listed endangered and threatened species under their jurisdiction (letter dated 10 May 1993). The NMFS indicated that the endangered Snake River sockeye salmon (*Oncorhynchus nerka*), and Threatened Snake River spring/summer (*Oncorhynchus tshawytscha*) and fall chinook (*Oncorhynchus tshawytscha*) are present in the proposed action area. Also this area is part of the proposed Critical Habitat for these species (Federal Register, Vol. 55, No. 232, 2 December 1992).

The USFWS Olympia office was consulted regarding Federally listed and proposed threatened and endangered species potentially occurring in the vicinity of the project area. The USFWS reported the threatened bald eagle (*Haliaeetus leucocephalus*) and endangered peregrine

falcon (*Falco peregrinus*) as the only listed species potentially occurring in the project area (letter from David C. Frederick, USFWS, 5 May 1993).

A biological assessment (BA) for the bald eagle and peregrine falcon has been completed and addresses potential environmental effects to these species (see Appendix B).

In addition, the northern goshawk (*Accipiter gentilis*), black tern (*Chlidonias niger*), Northwestern pond turtle (*Clemmys marmorata marmorata*), spotted frog (*Rana pretiosa*), and Larch Mountain salamander (*Plethodon larselli*) are candidate species (proposed for Federal listing) identified by USFWS and WDW as potentially occurring in the project area (letters from David C. Frederick, USFWS, 5 April 1993 and Timothy Young, WDW, 12 April 1993). These species are addressed below.

Bald Eagle

The bald eagle potentially winters in the study area from 31 October to 31 March. Bald eagles winter in large concentrations in Washington with over 2,000 wintering birds reported during some years (Taylor 1988, 1989). In southern Washington, most bald eagle use occurs along the Columbia River where the birds congregate in large numbers to take advantage of spawned out salmon (*Oncorhynchus* sp.) carcasses and abundant waterfowl and seabird concentrations (Watson et al., 1991).

Wintering eagles in the Pacific Northwest perch on a variety of tree species. Proximity to a food source is probably the most important factor influencing perch selection by bald eagles (Steenhof et al., 1980). Most perches selected by bald eagles provide a good view of the surrounding area and eagles tend to use the highest perch sites available (Stalmaster, 1976; Servheen, 1975).

Historically, bald eagles winter in the vicinity of the project area, however there are no nest sites documented near the project area (personal communication, D. Anderson, WDW, 22 March 1993) and no bald eagle observations were made during the two site visits conducted during June 1993. Food sources potentially available for eagles wintering near the project area include anadromous fish, waterfowl, and shorebirds that use the mudflats and wetlands along the shores of the Columbia River. Wintering bald eagles have been documented in the vicinity of the project area, specifically near the Condit powerhouse and Northwestern Lake (PacifiCorp Electric Operations, 1991). However, no loss of suitable perching, roosting, or foraging habitat would result from project construction, and operation of the project would not significantly change the degree of human disturbance and noise levels in the project vicinity. More importantly, no construction activity will occur during the eagle wintering period (31 October to 31 March).

Peregrine Falcon

USFWS data files indicate that the peregrine falcon potentially occurs in the study area (PacifiCorp Electric Operations, 1991). The peregrine falcon has experienced widespread population declines since the 1940s, which have been largely attributed to reductions in breeding habitat and contamination from chlorinated hydrocarbon pesticides (Pacific Coast American Peregrine Falcon Recovery Team, 1982). In recent years, however, there has been a gradual increase in the number of sightings and reoccupation of historical eyries reported for northern California, southern Oregon, and Washington. The Columbia River Basin has been designated as a peregrine falcon management area (Pacific Coast American Peregrine Falcon Recovery Team, 1982).

Peregrine falcons generally nest on steep cliffs greater than 46 m (150 ft) tall that are close to water. Characteristics of most nesting territories in the Pacific Northwest include large cliffs with some vertical sections that have a good view of the surrounding landscape and proximity to water (Pacific Coast American Peregrine Falcon Recovery Team, 1982). Peregrine falcons will travel up to 27 km (17 mi) to hunt, usually foraging near marshes, lakes, and river bottoms, although croplands and meadows are sometimes used as well (Porter and White, 1973). Peregrines feed almost exclusively on avian prey captured while in flight. Marshes and riparian areas are particularly important feeding areas for peregrines because they attract and concentrate prey (Craig, 1986).

Suitable nesting habitat does not occur within the project area, and no peregrine falcons were observed during two June 1993 site visits. Furthermore, no active peregrine eyries are documented in the vicinity by WDW (personal communication, D. Anderson, WDW, 22 March 1993). However, a release site for captive-bred peregrine falcons is located in the Little White Salmon drainage near Dog Mountain, approximately 15 km (9 mi) from the project area (PacifiCorp Electric Operations, 1991). Peregrines have been sighted in the Little White Salmon drainage and throughout the Gorge in Klickitat and Skamania counties (PacifiCorp Electric Operations, 1991), and the project area is within foraging range of the peregrine release site near Dog Mountain. No habitats that support high densities of prey where peregrine falcons typically forage would be affected. Finally, all construction activity will occur in the summer, which is outside of the peregrine migrating period. Therefore, the project is not likely to affect the peregrine falcon.

Northern Goshawk

WDFW data files indicate that the northern goshawk, a Category 2 Federal candidate species and state-proposed candidate species, potentially occurs in the vicinity on the project (letter from Timothy Young, WDW, 2 April 1993). No observations of the northern goshawk were made during field surveys. Suitable forest habitats do not exist within the project area; therefore, the project is not likely to affect the northern goshawk.

Black Tern

USFWS data files indicate that the black tern, a Category 2 Federal candidate species and a state-proposed monitor species, potentially occurs in the vicinity of the project area (letter from David C. Frederick, USFWS, 5 May 1993). Suitable habitat for the tern includes lakes and fresh marshes. Coastal waters are also used during migration. The black tern appears, however, to require large emergent wetlands (> 5 ha [12.3 ac]) (Brown and Dinsmore, 1986). Wetlands of this size do not occur in the project area. Therefore, the project is not likely to affect the black tern.

Northwestern Pond Turtle

USFWS data files indicate the Northwestern pond turtle, a Category 2 Federal candidate species and a state-listed threatened species, may occur in the vicinity of the project area (letter from David C. Frederick, State Supervisor, USFWS, 5 May 1993). Pond turtles require ponds or slow-moving portions of rivers with emergent wetland vegetation and basking sites. There have been no recent observations of pond turtles in the vicinity of the project area and no observations of the turtles were made during the field surveys. The ponds and the Columbia River in the project area do not provide suitable habitat for pond turtles primarily because of the relatively small size of the ponds (<.1 ha [0.3 ac]) and absence of appropriate basking sites.

Therefore, it is unlikely that pond turtles occur in the project area or that the project would affect the Northwestern pond turtle.

Spotted Frog

USFWS data files indicate the spotted frog, a Category 2 Federal candidate species and a state candidate species, may occur in the vicinity of the project area (letter from David C. Frederick, USFWS, 5 May 1993). The spotted frog is an aquatic frog native to Washington and is nearly always found in or near perennial water bodies such as springs, ponds, lakes, or slow-moving streams. It is often associated with emergent, non-woody vegetation (Leonard et al., 1993). Several intermittent streams within the ROW cross the proposed route of the gas loop line with portions of these streams associated with narrow bands of emergent wetland vegetation. These streams and any associated vegetation and wildlife habitat would be temporarily impacted by construction of the gas loop line and would temporarily displace any species inhabiting the area. However, no permanent loss of habitat is expected. Therefore, the project is not likely to affect the spotted frog.

Larch Mountain Salamander

WDFW data files indicate the Larch Mountain salamander, a Category 2 Federal candidate species and a state candidate species, may occur in the vicinity of the project area (letter from Timothy Young, WDW, 12 April 1993). WDW confirmed two observations of Larch Mountain salamanders in 1984 in the vicinity of the project area (letter from Timothy Young, GIS Manager, WDW, Olympia, Washington, 12 April 1993). No observations of the salamanders were made during field surveys. The gas loop line ROW includes areas of coniferous forest and rock talus; however, these areas are dry and mostly devoid of the mosses that retain moisture required by the salamanders. It is unlikely that the salamander occurs within the project area; therefore, the project is not likely to affect the Larch Mountain salamander.

A.2.2 Species with State Status Potentially Occurring in the Project Area

A total of six species with state status were identified, either by WDFW or during field surveys, as occurring or potentially occurring in the vicinity of the project area. These species are discussed in the following paragraphs.

California Mountain Kingsnake

WDFW data files indicate that the California mountain kingsnake (*Lampropeltis zonata*), a state candidate species, potentially occurs in the project area (letter from Timothy Young, WDW, 12 April 1993). This species is frequently found under rotten logs and stones near sunlit stretches of rocky streams and on rocky outcrops in oak-grasslands. In 1985, WDW confirmed two observations of California mountain kingsnakes in the vicinity of the project area. No observations of the snake were made during field surveys. Suitable habitat for the California mountain kingsnake does not occur in areas where construction would take place. Therefore, the project is not likely to affect the species.

Ringneck Snake

WDFW data files indicate that the ringneck snake (*Diadophis punctatus*), a state-proposed monitor species, potentially occurs in the project area (letter from Timothy Young, WDW, 12 April 1993). Suitable habitat for this species includes rocky outcrops, logs, and loose bark of dead trees in oak-grasslands. Although the snake was not observed during field surveys,

WDFW confirms an observation of the ringneck snake in 1985 on the rocky outcrop/cliffs west of the project area. However, similar suitable habitat does not exist in areas where construction would take place. Therefore, the project is not likely to affect the ringneck snake.

White Salmon Pocket Gopher

WDFW data files indicate the White Salmon pocket gopher (*Thomomys talpoides limosus*), a state-proposed monitor species, potentially occurs in the project area (letter from Timothy Young, WDW, 12 April 1993). Suitable habitat for this species includes open grassy and brushy areas often found in the oak-grasslands. Because pocket gophers spend most of their time in burrows and are seldom seen above ground, this species cannot be detected with survey methods used for more conspicuous wildlife. No indications of gopher activity were observed during field surveys in any portion of the project area. Although oak-grasslands are a common habitat type in the region of the project area, this habitat type is not found within the currently defined project area. The proposed Bald Mountain Substation would be constructed in an area of upland shrubs that may be suitable as pocket gopher habitat. Construction of the substation would displace any species inhabiting the 0.4-ha (1-ac) site; however, the operation of the project is not likely to affect the White Salmon pocket gopher.

Southern Alligator Lizard

WDFW data files indicate that the southern alligator lizard (*Gerrhonotus multicarinatus*), a state-proposed monitor species, potentially occurs in the project area (letter from Timothy Young, WDW, 12 April 1993). The lizard can be found in grasslands, open woods, and moist areas—wherever cover is plentiful—but primarily oak woodlands of foothills. Two male southern alligator lizards were confirmed by WDW in 1985 in the vicinity of cliffs west of the project area. No observations of the species were made during field surveys. Suitable habitat for the southern alligator lizard does occur in the project area and it is possible the species occurs there. However, the amount of habitat loss from project developments and disturbance from the project would be minimal. Therefore, the project is not likely to affect the southern alligator lizard.

Osprey

WDFW data files indicate the osprey (*Pandion haliaetus*), a state-proposed monitor species, potentially occurs in the project area (letter from Timothy Young, WDW, 12 April 1993). Osprey forage almost exclusively on fish and typically nest in trees or on poles near fresh or salt water. One osprey was observed flying over the proposed location of the Bald Mountain Substation during one field survey in June 1993. Foraging habitat for the osprey is likely limited to the Columbia River and Northwestern Lake. Although no osprey nests were observed during the field survey or documented by WDW, suitable nesting habitat is found throughout the vicinity of the project area. No loss of suitable nesting sites or modifications to foraging areas would result from the proposed project. Therefore, the project is not likely to affect the osprey.

Great Blue Heron

The great blue heron (*Ardea herodias*), a state-proposed monitor species (letter from Timothy Young, WDW, 12 April 1993), was observed perching on logs in the SDS mill log-holding ponds. Suitable habitats for the great blue heron include wetlands, shorelines, and tideflats. Trees are preferred heron sites, with spruce trees commonly used along the Pacific

Coast (Bayer, 1978) and black cottonwood trees used along the Willamette River in Oregon (English, 1978). However, the type of tree used for nesting is not as important as its height and distance from human activity (Miller, 1943). One great blue heron was observed on the log-holding pond at the SDS mill site during one field survey. Other than the small wetlands along the proposed gas line, the mill site provides the only suitable foraging habitat within the project area. Nearby, however, the Columbia River shorelines provides extensive habitat for the great blue heron. Although suitable nesting habitat exists in the project area, the amount of human disturbance decreases the possibility for nest sites to occur. No loss of shoreline habitat, loss of potential nesting habitat, or changes in the log-holding pond are expected to result from the project. Therefore, the project is not likely to affect the great blue heron.

A.2.3 Federally Listed Snake River Salmon

All listed salmon stocks are present in the region during migration as the freshwater rearing and spawning of these stocks occurs in the Snake River Basin. Spring/summer chinook juveniles would be in the Bonneville pool primarily during the months of April to June, while adults pass this area March to July. Fall chinook juveniles pass this area primarily from June through August, and adults from August to November. Sockeye salmon migrate through the region as juveniles and adults during April to July and June through August, respectively (U.S ACOE, 1991, Ceballos et al., 1991, Fish Passage Center, 1993). All of the juveniles of these stocks are greater than 6.0 cm (2.4 in) during migration through this area. Typical size of juvenile spring/summer chinook that pass McNary dam are in excess of 10 cm (4.0 in). For fall chinook all would be greater than 6.0 cm (2.4 in). Sockeye salmon would also be greater than 10 cm (4.0 in).

The actions taken by the project will not affect listed endangered or threatened salmon stocks. The existing water intake structure and proposed modifications meet the NMFS screening criteria for velocity and mesh opening for fingerling and larger fish (24.4 cm/s [0.8 fps], and screen opening less than 6.4 mm [0.25 inch]). Impacts to these listed stocks from water withdrawal based on these screen criteria should not occur when these fish pass this area as fingerling and larger fish. Increases in water temperature will affect a very small area of the river, only a few feet from the diffuser. Relocating the diffuser to deeper water will ensure no effect on migrating salmonids. As part of NPDES permit approval, Ecology will require modification to the chlorine discharge concentration to meet state guidelines and prevent adverse impacts to fisheries resources (personal communication, Chuck Wallin, Ecology, 20 May, 1994).

A.3 FISH AND WILDLIFE CONSERVATION

The project would include temporary modifications to water bodies. The gas spur line would cross one perennial stream (Jewett Creek) near the mouth. The crossing will be above an existing culvert that has at least 1.8 m (6 ft) of fill over it. Therefore, the pipeline installation here will not disrupt the stream bottom or riparian area. The gas loop line would cross Jewett Creek tributaries in five places. All but one of these crossings are of intermittent streams and all are less than 0.9 m (3 ft) wide. Jewett Creek contains steelhead and cutthroat trout (personal communication, Lee Van Tussenbrook, WDW, 27 July, 1993). A State Hydraulic Project Approval has been applied for that will specify restrictions such as method and timing of stream crossing, to protect aquatic resources. The developer has submitted a document stating their goal of reducing sediment runoff from construction and committing to file an erosion control plan prior to construction (Dames and Moore, 1993). The Northwest Pipeline Corporation, as part of their application to FERC for a Federal permit to construct the pipeline,

has committed to following both the FERC "Erosion Control, Revegetation, and Maintenance Plan" and "Wetland and Waterbody Construction and Mitigation Procedures" (developed by FERC in 1992). These two documents indicate strict procedures for construction of the gas pipelines to ensure minimal environmental impacts.

The existing screening facility for increased water intake has been established as adequate to protect all juvenile salmon and trout likely to be in the region (letters from John Easterbrook of WDFW to Dames and Moore dated: 3 February, 2 March, and 19 April 1994). An additional pump and intake screen, housed in the same facility, will be installed to meet the WDFW guidelines to protect fry (KEP, 1994).

Because the project would discharge up to 1.1 cms ([38.7 cfs], 95.5 mld [25.0 mgd]), of waste water into the Columbia River, a new NPDES permit will be required (see Section A.13). The permit was applied for on 29 July 1993. Modifications to the existing outfall and diffuser will ensure that thermal discharge from the project meets such state standards and NMFS conditions. This work will require a U.S. Army Corps of Engineers (ACOE) Section 10 permit. The permit has not yet been applied for. Chlorine concentration proposed will require lowering to meet Ecology requirements to obtain an NPDES permit (personal communication, Chuck Wallin, Ecology, 20 May 1994). With required modifications to the chlorine discharge concentration, its effects should not be significant to aquatic resources in the Columbia River.

Washington State Hydraulic Project Approval permit issued by WDFW will be required for the construction of the gas spur line and loop line stream crossings of Jewett Creek and its tributaries. Application is being made by NWP for pipeline installation. A Washington State Shoreline Permit has been applied for to construct the gas spur line.

An application to modify the existing Water Rights Permit was made to Ecology 27 May 1993 by the developer for an additional water withdrawal of 0.6355 cms (22.44 cfs) (total is 1.10 cms [38.7 cfs]) from the Columbia River. The status of the granting of this application is unclear at this time because of the current moratorium on granting of additional water rights from the Columbia River (WAC 173-563-015), which will be in effect until at least 30 June 1994. There are exceptions to this moratorium that may apply to this project. The exemption criterion the project must meet is that the water use is nonconsumptive. This means that the water diverted from the river is immediately returned back to the river in the same quantity as first diverted while meeting water quality standards for the source, including temperature. The project will return all but (0.00056 cms [0.02 cfs]) to the Columbia River. The developer has indicated that if the slight loss of water (0.00056 cms [0.02 cfs]) creates an impediment to obtaining a Water Rights permit, they would add the lost water from on-site wells. But at this time, the status of whether the project qualifies under the exemptions has not been determined (personal communication, Chuck Wallin, Ecology, 23 May 1994).

State of Washington Law (WAC 77.16) requires water intakes be designed and constructed to protect fish resources. The current design meets state guidelines for salmon and trout protection (Letters from John Easterbrook of WDFW to Dames and Moore dated: 3 February, 2 March, and 19 April 1994).

Any stream crossing and any in-river construction would require a Temporary Modification of Water Quality Criteria approval from Ecology. This permit application would be submitted prior to any construction. To date, no application has been made.

A.4 HERITAGE CONSERVATION

No National Register of Historic Places sites are on record from the project site area. The developer has committed to stopping work and consulting with the SHPO should evidence be discovered during construction of any archaeologically significant sites.

A.5 STATE, AREA-WIDE, AND LOCAL PLAN AND PROGRAM CONSISTENCY

The developer and/or BPA have contacted the U.S. Forest Service (USFS), Ecology, WDFW, Washington Department of Parks (WDP), WDNR, NWPPC, the Columbia River Gorge Scenic Area Commission, Klickitat County, and the cities of Bingen and White Salmon to ensure consistency with state, areawide, and local plans and programs.

With the exception of the Bald Mountain Substation and northern two-thirds of the gas loop line, all other elements are within the "Urban Management Area" of the Columbia River Gorge National Scenic Area (Scenic Area), and are therefore exempt from regulations. The northern two-thirds of the gas loop line is located completely outside of the Scenic Area in an area zoned rural residential, extensive agriculture, and forest resource lands. The Bald Mountain Substation is located within the "General Management Area" of the Scenic Area, and therefore a land use application to the Gorge Commission would be required. The White Salmon River is considered to be a "Candidate Scenic River" by the Washington State Parks and Recreation Commission's 1988 Washington State Scenic River Assessment (personal communication, Steve Starlund, WDP, 17 January 1994). The city of Bingen is acting as the lead agency in the review process for the project. An environmental checklist was submitted by the developer on 19 April 1994 to the city who circulated it for agency comment. The close of comment period was 13 May 1994. The city has held public hearings on the project on 24 May, 7 June, and 14 June 1994. At the close of their review process, the city found a Mitigated Decision of Non Significance (MDNS) for the project. The city will require building, zoning, and shoreline substantial development permits for the construction of the gas spur line and the cogeneration facility.

Klickitat County is acting as the lead agency for the gas pipeline portion of the project.

A.6 COASTAL ZONE MANAGEMENT CONSISTENCY

Not applicable.

A.7 FLOODPLAIN MANAGEMENT

Both the city of Bingen and the Klickitat County Federal Emergency Management Act (FEMA) maps were examined, and significant discrepancy was noted between the two maps regarding the proximity of the cogeneration facilities and gas spur line to the 100-year flood line. Both maps, however, showed significant portions of the cogeneration facilities and gas spur line to be within the 100-year flood line. Because of the discrepancies between the two FEMA maps and uncertainty of the available information, BPA commissioned a qualified surveyor under subcontract to Enserch Environmental (formerly Ebasco Environmental) to survey the 100-year flood elevation on the SDS Lumber Mill site.

The survey results indicate that none of the proposed cogeneration facility structures on the lumber mill site are in the 100-year floodplain. The floodplain elevation is 27 m (89.0 ft) at river mile 171, which is adjacent to the proposed facilities. This elevation was obtained from the Army Corps of Engineers in their original study of flooding along the Columbia River. Furthermore, most of the gas spur line on the lumber mill site would lie above the 100-year floodplain. However, three locations totaling 177 m (580 ft) are within the floodplain. Consultation is underway regarding these sites. Because the pipeline would be buried, no net

change in floodplain topography would occur. Several alternate routes for the gas spur line were examined, but all of them had greater archaeological, traffic, and/or wetland impacts, and were not as cost effective. Therefore, BPA has determined that no practical alternative exists for siting the pipeline, and no significant floodplain impacts are expected. Furthermore, there is no vegetation present where the pipeline would cross the floodplain. Therefore, no impacts to riparian vegetation would occur in this area.

A.8 WETLAND PROTECTION

In accordance with requirements for permits under Section 404 of the Clean Water Act and project approvals under the Washington State Hydraulic Code, NWP prepared a report describing delineations and results of wetland functional assessments and potential impact analyses for wetlands occurring along the proposed gas spur and loop line (Enserch Environmental, 1994). Approximately 0.27 ha (0.59 ac) of wetland vegetation would be temporarily disturbed during construction. Approximately 0.04 ha (0.1 ac) would be permanently converted to scrub-shrub and/or emergent wetland habitat. An evaluation of these impacts will be undertaken by appropriate agencies as part of permit application review process.

A.9 FARMLAND PROTECTION

Development of the proposed project elements would convert approximately 1.1 ha (2.6 ac) of pastureland and orchard land into gas pipeline ROW and electrical substation site. None of the land taken is considered to be prime or unique agricultural land by the Soil Conservation Service.

A.10 RECREATION RESOURCES

Not applicable.

A.11 GLOBAL WARMING

Certain types of air pollutants are producing long-term and perhaps irreversible changes to the global atmosphere. Several of these greenhouse gases would be emitted by the proposed project including oxides of nitrogen (NO_x), carbon dioxide (CO_2), and carbon monoxide (CO). NO_x emissions will be controlled by Best Available Control Technology (BACT) and CO emissions will be controlled by maintaining optimal combustion. There are no current plans to control CO_2 emissions. CO_2 is an inevitable by-product of efficient hydrocarbon combustion. The gas turbine is expected to produce approximately 117,026 mt (129,000 tn) per year of CO_2. The project is designed to achieve exceptional efficiencies with lower CO_2 emissions than other commercially available fossil fuel technologies. CO_2 emissions are currently not regulated by any ambient concentration or emission standard. Emissions from the SDS Lumber hogged fuel boiler are expected to be reduced, thereby reducing the total CO_2 emissions of the two facilities combined.

A.12 PERMITS FOR STRUCTURES IN NAVIGABLE WATERS

Modifications to the existing outfall and diffuser in the Columbia River planned by the developer to mitigate potential thermal plume effects on migrating salmonids will require an Army Corps of Engineers (ACOE) Section 10 permit under the River and Harbors Act. The developer has requested confirmation from ACOE that the installation of a second intake pump and fish screen does not require a permit on the basis that installation of this equipment does not constitute work in navigable waters of the United States as defined in the Act. Should these

installations be considered to be work in navigable waters of the United States by the Army Corps of Engineers, the developer has requested of the Army Corps of Engineers that the work be covered by Nationwide Permit 7 for discharge structures with associated intake structures.

A.13 PERMIT FOR DISCHARGES INTO THE WATERS OF THE UNITED STATES

The construction and operation of this project would discharge fill material into waters of the United States. This action requires a Clean Water Act Section 404 permit from the U.S. Army Corps of Engineers. Information regarding permitting requirements for discharging cooling water, wastewater, and stormwater is provided in Section 16.2 of this appendix.

A.14 PERMITS FOR ROW ON PUBLIC LANDS

No state or Federal lands are required for the project.

A.15 ENERGY CONSERVATION AT FEDERAL FACILITIES

Not applicable.

A.16 POLLUTION CONTROL

A.16.1 Clean Air Act

Emission Estimation

All new sources of air pollution in the state of Washington are required to undergo preconstruction design review by an air pollution control agency to assure that all regulations will be complied with. The regulations specify the types of air pollution control systems that must be installed, the maximum allowable concentrations of air pollutants that may be emitted, and the acceptable environmental effects. Large sources (those that emit more than 100 tons per year of air pollutants) are subject to more stringent review under Federal regulations. The Klickitat Cogeneration Project will emit less than 100 tons of any pollutant and will only be subject to the rules of the Ecology that are effective state-wide.

Table A.16.1-1 contains the estimated emissions rates of criteria air pollutants for the proposed CT/HRSG installation. The estimates were provided by the GT/HRSG manufacturer and assumes 8,520 hours per year of natural gas firing and a maximum of 240 hours per year of No. 2 fuel oil firing. Table A.16.1-2 provides an estimate of the emission rates for toxic air pollutants expected from the project.

Air Pollution Control

Ecology requires that new sources evaluate all available and applicable pollution control technologies and install the Best Available Control Technologies (BACT) from this evaluation. Dames and Moore completed a control technology evaluations based on EPA's "top-down" guidance for determining BACT (Dames & Moore 1994). The final decision of BACT will be made by Ecology during the permit approval process.

Proposed technologies for NO_x control for the project include selective catalytic reduction (SCR) and water injection. SCR is a post-combustion control technology and is currently the most stringent NO_x emission control technology available for gas turbines. However, the use of SCR involves injection of ammonia into the system. The system will require ammonia storage and handling equipment.

The project proposes to use distillate oil as an emergency backup fuel. The maximum number of hours per year of distillate oil firing is 240 hours. During distillate oil firing, the

Table A.16.1-1. Estimated Annual Criteria Pollutant Emissions Expected from the Project.

	8760 Hrs/Yr of Nat Gas		240 Hrs/Yr of Fuel Oil[a/]		Potential to Emit[b/]
Pollutant	PPMV[c/]	Mt/Yr (Tn/Yr)	PPMV[c/]	Mt/Yr (Tn/Yr)	Mt/Yr (Tn/Yr)
NO_x[d/]	9	63.6 (70.1)	15	2.5 (2.8)	64.4 (71.0)
CO	14	55.6 (61.3)	15	1.5 (1.7)	55.7 (61.4)
SO_2[e/]	1	10.7(11.8)	10	2.3 (2.5)	12.6 (13.9)
PM_{10}[f/]	4	15.9 (17.5)	5	0.5 (0.6)	16.0 (17.6)
VOC	19.1	46.4 (51.1)	12	0.8 (0.9)	47.2 (52.0)

a/ Assumes a worst case of 10 days per year of fuel oil burning.
b/ Potential to emit for all pollutants based on natural gas usage of 8,520 hours/year with 240 hours/year of fuel oil, according to Ecology's preliminary determination (Ecology, 1994)
c/ Parts per million by volume (PPMV) corrected to 15 percent O_2.
d/ Assumes approximately combined NO_x control efficiency of 95.5 percent with water injection and SCR.
e/ Assumes 0.63 grams of sulfur per 2.8 standard cubic meter (SCM) (i.e., 2 grains of sulfur per 100 standard cubic feet [SCF]) of natural gas.
f/ Assumes that all particulate matter is emitted as PM_{10}.
Source: Dames and Moore 1994.

project will utilize water injection technology to reduce NO_x emissions from the system prior to SCR.

CO emission from the system are primarily due to incomplete combustion. By using water injection for NO_x control, CO emissions will tend to increase. However, because water injection is only proposed for a maximum of 240 hours per year, this increase will not be significant. The SCR control will have little effect on CO emissions. Because the impact due to CO emissions is not significant, the only CO control technique necessary will be to maintain proper combustion conditions in the system. This will maintain CO emission below levels of concern.

SO_2 emissions from natural gas firing are considered quite low and no control will be necessary. SO_2 emissions during distillate oil firing will be reduced to lower levels by burning oil that has a low sulfur content. Approximately 23 percent of the SO_2 emissions will be the result of fuel oil firing.

Impacts of volatile organic compounds (VOCs) from the project are also below significant impact levels. Proper design of the proposed turbine and proper combustion techniques will keep these emissions low.

Particulate matter control technologies were evaluated for feasibility. The results indicated that because particulate matter emissions from the system will be below levels of concern, all technologies evaluated were not cost effective. Control techniques such as proper combustion, maintenance, installation of an inlet air filter, and limiting distillate oil use is normally BACT for particulate matter emissions.

Table A.16.1-2. Estimated Toxic Air Emissions and Impacts.[a/]

Pollutant	Emission Factor[b/ c/]	Total Emissions (g/s)	Mt/Yr (Tn/Yr)	Max Annual Concentration ($\mu g/m^3$)	Annual ASIL ($\mu g/m^3$)	Max 24-hr Concentration ($\mu g/m^3$)	24-hr ASIL ($\mu g/m^3$)
Acrolein (oil fired)	1.06E-03 (8.90E-03)	3.60E-04	3.11E-04 (3.43E-04)	---	---	1.40E-03	8.0000E-01
1,3-butadiene (oil fired)	3.34E-04 (2.80E-03)	1.13E-04	9.76E-05 (1.08E-04)	---	---	4.41E-04	7.3300E+01
Chlorobenzene (oil fired)	4.78E-05 (4.00E-04)	1.62E-05	1.40E-05 (1.54E-05)	---	---	6.30E-05	1.1655E+03
Cadmium (oil fired)	2.63E-04 (2.20E-03)	8.89E-05	7.65E-05 (8.47E-05)	8.66E-05	5.6000E-04	---	---
(gas fired)	1.17E-06 (2.73E-06)	1.75E-04	5.52E-03 (6.08E-03)	2.67E-04			
Hexavalent Chromium (oil fired)	2.98E-05 (2.50E-04)	1.01E-05	8.73E-06 (9.62E-06)	9.84E-06	8.3000E-05	---	---
Toluene (oil fired)	6.21E-03 (5.20E-02)	2.10E-03	1.81E-03 (2.00E-03)	---	---	8.19E-03	1.2488E+03
(gas fired)	3.27E-04 (7.61E-04)	4.87E-02	1.54E+00 (1.69E+00)			2.98E-01	
Xylenes (oil fired)	4.32E-03 (3.62E-02)	1.46E-03	1.26E-03 (1.39E-03)	---	---	5.70E-03	1.4486E+03
(gas fired)	8.99E-04 (2.09E-03)	1.34E-01	4.23E+00 (4.66E+00)			8.18E-01	
Hydrogen Chloride (oil fired)	4.36E-02 (3.65E-01)	1.48E-02	1.28E-02 (1.41E-02)	---	---	5.75E-02	2.3300E+01
Arsenic (oil fired)	1.55E-04 (1.30E-03)	5.25E-05	4.54E-05 (5.00E-05)	5.12E-05	2.3000E-04	---	---
Naphthalene (oil fired)	1.66E-03 (1.39E-02)	5.62E-04	4.86E-04 (5.35E-04)	---	---	2.19E-03	1.6650E+02
(gas fired)	2.03E-06 (4.72E-06)	3.02E-04	9.52E-03 (1.05E-02)			1.85E-03	

Table A.16.1-2. Estimated Toxic Air Emissions and Impacts.[a/]

Pollutant	Emission Factor[b/ c/]	Total Emissions (g/s)	Mt/Yr (Tn/Yr)	Max Annual Concentration ($\mu g/m^3$)	Annual ASIL ($\mu g/m^3$)	Max 24-hr Concentration ($\mu g/m^3$)	24-hr ASIL ($\mu g/m^3$)
Beryllium (oil fired)	1.55E-04 (1.30E-03)	5.25E-05	4.54E-05 (5.00E-05)	5.12E-05	4.2000E-04	---	---
(gas fired)	1.39E-07 (3.24E-07)	2.07E-05	6.53E-04 (7.20E-04)	3.17E-05			
Copper (oil fired)	8.83E-04 (7.40E-03)	2.99E-04	2.58E-04 (2.85E-04)	---	---	1.16E-03	7.0000E-01
(gas fired)	6.71E-05 (1.56E-04)	9.97E-03	3.14E-01 (3.47E-01)			6.10E-02	
Manganese (oil fired)	3.70E-04 (3.10E-03)	1.25E-04	1.08E-04 (1.19E-04)	---	---	4.88E-04	3.3000E+00
(gas fired)	5.46E-05 (1.27E-04)	8.11E-03	2.56E-01 (2.82E-01)			4.96E-02	
Mercury (oil fired)	3.58E-05 (3.00E-04)	1.21E-05	1.05E-05 (1.15E-05)	---	---	4.72E-05	3.0000E-02
(gas fired)	4.90E-06 (1.14E-05)	7.30E-04	2.30E-02 (2.54E-02)			4.47E-03	
Nickel (oil fired)	8.48E-04 (7.10E-03)	2.87E-04	2.48E-04 (2.73E-04)	---	---	1.12E-03	3.3000E+00
(gas fired)	6.62E-05 (1.54E-04)	9.87E-03	3.11E-01 (3.43E-01)			6.04E-02	
Selenium (oil fired)	9.55E-05 (8.00E-04)	3.23E-05	2.79E-05 (3.08E-05)	--	--	1.26E-04	7.0000E-01
Zinc (oil fired)	4.72E-03 (3.95E-02)	1.60E-03	1.38E-03 (1.52E-03)	---	---	6.22E-03	3.0000E-02
Acetaldehyde (gas fired)	1.84E-06 (4.29E-06)	2.75E-04	8.67E-03 (9.56E-03)	4.20E-04	4.50E-01	--	--
Ammonia (gas fired)	--	2.05E+00	6.46E+01 (7.13E+01)	--	--	1.25E+01	5.99E+01
Benzene (gas fired)	2.07E-06 (4.81E-06)	1.21E-03	3.82E-02 (4.21E-02)	1.85E-03	1.20E-03	--	--
Chromium (gas fired)	1.68E-06 (3.90E-06)	2.50E-04	7.88E-03 (8.69E-03)	--	--	1.53E-03	1.70E+00

Table A.16.1-2. Estimated Toxic Air Emissions and Impacts.[a/]

Pollutant	Emission Factor[b/ c/]	Total Emissions (g/s)	Mt/Yr (Tn/Yr)	Max Annual Concentration ($\mu g/m^3$)	Annual ASIL ($\mu g/m^3$)	Max 24-hr Concentration ($\mu g/m^3$)	24-hr ASIL ($\mu g/m^3$)
Formaldehyde (gas fired)	6.92E-05 (1.61E-04)	1.03E-02	3.25E-01 (3.58E-01)	1.58E-02	7.70E-02	--	--
Phenol (gas fired)	1.33E-05 (3.09E-05)	1.98E-03	6.24E-02 (6.88E-02)	--	--	1.21E-02	6.33E+01

a/ Source: Dames and Moore, 1994, based on screening level dispersion model.

b/ Kg/1000 liter (lb/1000 gal) for oil emissions, or kg/million KJoules (lb/million BTU) for natural gas emissions.

c/ Emission factors are expressed in scientific notation, which is a method of writing or displaying numbers in terms of a decimal number between 1 and 10 multiplied by a power of 10. The scientific notation of 10,492, for example, is 1.0492×10^4.

Background Air Quality

The predominant wind direction in Bingen is from the east or west along the Columbia River. Air pollutants emitted in the more industrialized areas to the east and west of Bingen will be transported into the area after being heavily diluted. The air quality of Bingen has not been measured. However, an indication of Bingen air quality may be obtained by examining all air quality measurements in the greater Bingen region, including locations such as Kennewick and Walla Walla, Washington to the east; and Longview, Washington and Portland, Oregon to the west. When measurements from these areas are averaged, the results are less than the air quality standards (Table A.16.1-3).

Ambient Impact

Air pollution control agencies require a computer modeling simulation of proposed projects to determine the likely ambient concentrations from new sources. Computer modeling of the dispersion of the air pollutants emitted from the facility has been performed on preliminary emissions data and the expected ambient concentrations conform to all regulatory requirements for both criteria and toxic air pollutants. This means that the facility will not adversely impact either public health or public welfare (damage property or natural resources). Table A.16.1-4 presents the predicted ambient concentrations and compares them to the appropriate ambient standards. Ecology will determine the necessary air pollution control systems from information regarding the potential emissions from the project and the resulting air quality concentrations. It can be expected that the project impacts will be no more than those estimated here and provided in Table A.16.1-4.

Dispersion of air pollutants is dependant upon the meteorology, local terrain, and source specific stack parameters and emission rates. Because nearby terrain extends well above the proposed cogeneration facilities stack, the use of two different EPA-approved plume dispersion models is required. The RTDM (Rough Terrain Dispersion Model) and the ISCST2 (Industrial Source Complex Short Term) models were used to predict ambient concentrations. Due to a lack of meteorology data in the Columbia Gorge area, screening meteorology was used as inputs. The screening meteorology data set is a set of wind speeds and stability classes that are evaluated to determine which worst case meteorological conditions result in maximum ground level concentrations.

Air Toxics

New sources of air toxics are regulated by Ecology through the NOC application and approval process. New sources must show that emission of toxic air pollutant will not cause ambient concentrations above Washington State standards, or Acceptable Source Impact Levels (ASILs). Additionally, new sources of toxic air pollutant must apply BACT for controlling these emissions.

Emissions of toxic air pollutants were estimated using EPA-approved emission factors with the exception of ammonia, which was provided by the SCR manufacturer. Emission rates were modeled using the modeling methodology described above. Emission rates estimations and results form the modeling efforts are shown in Table A.16.1-2. The Washington State ASILs are divided into two classes. Class A are carcinogenic pollutants and new sources must comply with a annual average ambient standard. Class B pollutant are non-carcinogenic and emissions must result in concentrations less than the 24-hour ASIL. Table A.16.1-2 indicates that all toxic air pollutants expected from the new installation will comply with ASIL standards.

Table A.16.1-3. Background Ambient Air Quality.

Pollutant	Averaging Period	Station	Avg. Value 1987-1991	Ambient Air Quality Standard
PM_{10} (μg/cubic m)	Annual	Pendelton, Oregon	39	50
		13575 Spangler Rd, Portland	17	
		Central Fire Station, Portland	31	
		SE Lafayette, Portland	26	
		Roosevelt High, Portland	25	
		Transcon Terminal, Portland	40	
		Kennewick, WA Columbia Ctr.	35	
		Walla Walla Co., Wallula	51	
		Walla Walla, WA Fire Station	37	
		Vancouver, WA Port	23	
		Vancouver, WA Moose Lodge	25	
		Vancouver, WA Elem. School	37	
		Longview, Oregon City Shops	30	
	Average		**32**	
PM_{10} (μg/cubic m)	24-hour	Pendelton, Oregon	134	150
		13575 Spangler Rd, Portland	17	
		Central Fire Station, Portland	98	
		SE Lafayette, Portland	130	
		Walla Walla Co., Wallula	113	
		Walla Walla, WA Fire Station	107	
		Roosevelt High, Portland	186	
		Transcon Terminal, Portland	114	
		Vancouver, WA Port	55	
		Vancouver Moose Lodge	78	
		Vancouver Elementary School	42	
		Longview, Oregon City Shops	85	
	Average		**97**	
CO (ppm)	1-hour	Hollywood, Portland	9	35
		Vancouver, Atlas and Cox	15	
		4th & Alder, Portland	6	
		SE Lafayette, Portland	13	
		Postal Bldg., Portland	11	
		82nd Division, Portland	15	
	Average		**11**	
	8-hour	Hollywood, Portland	7	9
		4th & Alder, Portland	8	
		SE Lafayette, Portland	7	
		Postal Bldg., Portland	8	
		82nd Division, Portland	9	
		Vancouver, Atlas and Cox	10	
	Average		**8**	
NO_x (ppm)	Annual	SE Lafayette, Portland	0.019	0.05
	Average		**0.019**	

Table A.16.1-3. Background Ambient Air Quality.

Pollutant	Averaging Period	Station	Avg. Value 1987-1991	Ambient Air Quality Standard
SO_2 (ppm)	1-hour	Camas, Armory Bldg.	0.091	0.40
	Average		**0.091**	
	3-hour	Standard Oil, Portland	0.054	0.5
		Camas, Armory Bldg.	0.080	
	Average		**0.067**	
	24-hour	Camas, Armory Bldg.	0.031	0.10
		Standard Oil, Portland	0.024	
	Average		**0.028**	
	Annual	Standard Oil, Portland	0.031	0.02
		Camas, Armory Bldg.	0.007	
	Average		**0.019**	

Source: Annual reports of the Washington Department of Ecology and the Oregon Department of Environmental Quality.

Table A.16.1-4: Air Quality Modeling.

Pollutant	Nat Gas Max Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Fuel Oil Max Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	NAAQS or WA Standard ($\mu g/m^3$)
CO (8-hr)	18.9	9,158	12.4	9,158	10,000
CO (1-hr)	27.0	12,592	17.7	12,592	40,000
NO_2 (annual)	3.08	35.8	--	35.8	100
SO_2 (annual)	0.52	50.0	--	50.0	80.0
SO_2 (24-hr)	2.08	73.7	10.1	73.7	365
SO_2 (3-hr)	4.68	179.3	22.8	173	1,300
SO_2 (1-hr)	5.20	239.5	25.3	240.0	1,048
PM_{10} (24-hr)	3.08	97.0	2.45	97.0	150
PM_{10} (annual)	0.77	32.0	--	32.0	50.0

Source: Dames and Moore 1994.

Other Permits

A Burning Permit would be required from WDNR if slash removed from the ROW and substation clearing and is burned rather than through a disposal permit.

A.16.2 Clean Water Act

A Section 401 Water Quality Certification from Ecology will be required for the project. In addition, a Short Term Exception to Water Quality Standards will be needed from the state for short term effects of construction at stream crossings for the gas spur line and loop line. These permits have not been applied for at this time, but would be needed prior to construction. The Section 401 Certification would not be approved until the NPDES permit is also approved by the state.

An NPDES Permit application was sent to Ecology on 29 July 1993. The quantity of flow would increase from the current maximum of 0.462 cms ([16.3 cfs], 40 mld [10 mgd]) to future maximum of 1.1 cms ([38.7 cfs], 95 mld [25 mgd]). The state will require modifications to the applicant's proposed chlorine concentration (personal communication, Chuck Wallin, Ecology, 20 May 1994) before issuing the NPDES permit, which is mandated prior to obtaining the Water Quality Certificate from Ecology. The current mixing zone allowed for chronic chemical concentrations is 91 m (300 ft) plus the depth of intake (i.e., 98 m [320 ft] at this location). In the case of chronic chlorine concentrations, the allowable level is 11 $\mu g/l$, 98 m (320 ft) from the diffuser, while acute concentrations must not be exceeded at 0.1 of the full mixing zone. The chlorine concentration currently proposed by the developer is considered acute, and therefore, concentrations must be less than 19 $\mu g/l$ within 9.1 m (30 ft) of the diffuser. The NPDES permit will have these restrictions on the chlorine concentrations discharge from the project (personal communication, Chuck Wallin, Ecology, 6 June 1994). To meet these

restrictions, the developer will need to either reduce the proposed chlorine discharge, modify the diffuser, or demonstrate they can stay within these limits with the current diffuser.

See Section A.13 for discussion of Section 404 permit requirements for this project.

A.16.3 Solid and Hazardous Waste

The construction activities related to the cogeneration facility would not generate any new hazardous wastes. Oils and greases collected from normal equipment operation and maintenance would be disposed of in accordance with applicable regulations. Spent catalyst used in SCR would be collected by the vendor for handling and disposal. Solid waste would be recycled if possible or disposed of in a solid waste landfill. No hazardous waste is expected to be generated. Aqueous ammonia would be transported to the cogeneration site via trucks and stored and handled in compliance with applicable regulations (i.e., SARA Title III, Sections 302, 312).

Hazardous and dangerous materials expected to be stored at the cogeneration facility site are listed in Table A.16.3-1. Boiler chemicals are typical of those that are anticipated to be used at the facility. Specific chemicals used will depend upon the treatment program recommended by the project's water treatment consultant prior to commissioning.

An SPPC plan will be produced and filed with Ecology, on site, and with the Klickitat Department of Ecology Management. An Oil Spill Prevention plan will be required by EPA. In addition, any chemicals stored above the threshold reporting quantities will be reported according to the SARA Title 3 regulations.

A.16.4 Safe Drinking Water

The proposed facility is not known to be located over any designate Sole Source Aquifers (EPA, 1990 as cited in Science Applications International Corp., and Advanced Sciences Inc., 1992).

The Columbia River in this reach is designated Class A suitable for domestic, agricultural, industrial, fish migration, spawning and rearing, wildlife habitat, and recreation. The increased discharge and changes in chemical constituents are unlikely to have influence on the suitably of the Columbia River in this region to meet these needs because the high dilution flow [typically greater than 2,266 cms (80,000 cfs)] in this region of the river relative to a discharge from the project of 1.1 cms ([38.7 cfs], 95 mld [25 mgd]).

A.16.5 Noise

No permits are required regarding noise generated during construction or operation of the proposed project. The main source of ongoing noise from the project will be the cogeneration facility located on the SDS Lumber Mill site. The facility is considered to be an industrial noise source in an area zoned industrial/manufacturing. There are commercial and residential receptors located within 305 m (1,000 feet) of the facility. Allowable noise levels in these areas are regulated by Ecology, as specified in WAC 173-60.

The city of Bingen has adopted Washington State noise standards and will act as the regulatory authority with regard to noise generated from the proposed project.

A.16.6 Pesticides

The developer has indicated that pesticides and herbicides have not been used previously on the proposed cogeneration facility site, and would not be used in the future. BPA will conduct a site audit at the substation site prior to construction to determine past use of pesticides and herbicides, and to prescribe appropriate measures.

Table A.16.3-1. Hazardous and Dangerous Chemicals Expected to be Stored at the Cogeneration Facility

Trade Name	System	Reported Hazardous Ingredients	Amount to be stored (liters/gal)
Polyquest 684	Boiler water treatment	None[1/]	416/110
Dearborn 604	Boiler water treatment	None[1/]	416/110
Steamate 2001	Boiler - return line treatment	Diethylaminoethanol <15% Morpholine <15% Dimethylpropanolamine <20% Amino methyl propanol <10%	416/110
Ecogard 2033	Boiler - return line treatment	Morpholine	416/110
Neutrox 53	Boiler water treatment	Hydroquinone <3% Diethylhydroxylamine <30%	416/110
Deartreat 1052	Boiler resin cleaner	None[1/]	416/110
Dearcide 735	Boiler - oxidizing biocide	1-Br-3-Cl-5,5-Dimethylhydantoin 60% 1,3-dichloro-5,5 Dimethylhydantoin 27.4% 1,3-dichloro-5-ethyl-5-methylhydantoin 10.6% Inert 2.0%	416/110
Firemate 8	Boiler firebox	Copper carbonate <2% Magnesium oxide <60% Aluminum oxide <50%	416/110
Mineral Spirits	Parts washing sink	Petroleum Naptha	190/50
#2 Fuel Oil	Turbine facility		1,552,771/ 410,200
Aqueous Ammonia	SCA		30,300/8,000
Mineral Oil	Bald Mountain Substation transformer	Mineral Oil	30,300/8,000

1/ MSDSs for these chemicals "Does not contain hazardous constituents under 29 CFR 1910.1200, d(3) & (4)."

NWP is currently using a product called Garlon 4 on the existing gas transmission line ROW to control vegetation growth. The product kills brush, but not grass. It is sprayed using a backpack sprayer, targeting mainly plants that could interfere with the pipe, such as alder and vine maple, leaving smaller plants alone. At the White Salmon meter station, which is gravelled, NWP currently uses Crobar2, which sterilizes the soil and minimizes vegetative growth.

A.16.7 Toxic Substances Control Act (TSCA)

The developer has indicated that PCBs (polychlorinated biphenyls) are currently being used in existing electrical equipment (Dames and Moore, 1993b). However, there is no evidence of leaks or mishandling of PCBs at the SDS Lumber Mill site. Further discussion with the developer is required to determine potential continued use of PCBs.

A.16.8 Asbestos

The developer has indicated that materials containing asbestos have not been used in the past on the project site, and would not be used in the future.

A.16.9 Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)

The developer has indicated that there is no existing or pending liability for leaking of hazardous waste at any of the four sites within the project area.

A.16.10 Radon

The project is not affected by regulations concerning radon.

A.17 Summary of Permits and Approvals for the Klickitat Cogeneration Project

Permit/Approval	Status
Section 401 Water Quality Certification	Section 404 application not yet submitted to U.S. Army Corps of Engineers; thus, Section 401 Certification review by Ecology not yet requested.
Section 404 Discharge Permit	Application not yet submitted to U.S. Army Corps of Engineers. Wetland analyses/delineations completed for all project elements. Field delineations and reporting completed at end of February 1994.
Section 10 Navigable Waters Permit	Application not yet submitted to U.S. Army Corps of Engineers.
NPDES Permit	Applied for on 29 July 1993 from Ecology, discharge flow may be increased.
State Water Right Permit	Applied for on 27 May 1993 from Ecology. Request for increased water may be made.
Permit for Short-Term Exception to Water Quality Standards	Will need to be obtained from Ecology 180 days prior to construction.
Washington State Hydraulic Project Approval	Application has been submitted to WDFW.
Industrial Stormwater Permit	Application not yet filed with Ecology.
Disposal Permit	Will be required if land disposal is chosen over burning of slash.
Burning Permit	Will be required from WDNR if burning of slash is the chosen disposal method.
Notice of Construction/Order of Approval	Application submitted 4 February 1994 to Ecology.
Building Permit	Application made to city of Bingen 28 February 1994.
Shoreline Management Substantial Development Permit	Application made to city of Bingen 22 April 1994.
Forest Practices Application and Conversion Statement	Will need to be processed through WDNR prior to forest vegetation removal.

A.18 REFERENCES

Bayer, R.D. 1978. Aspects of an Oregon Estuarine Great Blue Heron Population. Wading Birds. National Audubon Society Resource Report 7:99-103.

Brown, M. and J.J. Dinsmore. 1986. Implications of Marsh Size and Isolation for Marsh Management. Journal of Wildlife Management 50:392-397.

Craig, G. 1986. The Peregrine Falcon. In: Audubon wildlife report 1986. R.L. DiSilvestro (ed.). National Audubon Society, New York. pp. 807-826.

Dames and Moore. 1993a. Phase 1 Site Assessment for the SDS Lumber Mill Cogeneration Facility. Seattle, Washington.

Dames and Moore. 1993c. Erosion Control, Revegetation, and Maintenance Plan. Seattle, Washington.

Dames and Moore. 1994. Notice of Construction Permit Application; Klickitat Energy Project for Klickitat Energy Partners. Portland, Oregon. February 1994.

Ebasco Environmental. 1991. Biological Assessment for the Little White Salmon River Bridge Replacement, Skamania County, Washington. Prepared for Washington Department of Transportation, Environmental Section. 10 pp.

English, S.M. 1978. Distribution and ecology of great blue heron colonies on the Willamette River, Oregon. Wading birds. Natl. Audubon Soc. Res. Rep. 7:235-244.

Fielder, P.C. and R.G. Starkey. 1986. Bald eagle perch-sites in eastern Washington. Northwest Science. 60:186-190.

Fish Passage Center. 1993. Fish Passage Center Annual Report 1992. Fish Passage Center, Portland , Oregon.

KEP (Klickstat Energy Partners). 1994. Comment Letter on Draft Klicktat Cogeneration Project Environmental Assessment to Dames and Moore. May 1994.

Leonard, W.P., H.A. Brown, L.L.C. Jones, K.R. McAllister, and R.M. Storm. 1993. Amphibians of Washington and Oregon. Seattle Audubon Society Trialside Series. Mantec Production Corp., Hong Kong. pp. 130-133.

Miller, R.F. 1943. The great blue herons: the breeding birds of the Philadelphia region (Part II). Cassinia 33:1-23.

Norwood, Sandy. 1993. Washington Department of Natural Resources. Letter to Ron Tressler, Wildlife Biologist, Ebasco Environmental, Bellevue, Washington.

Pacific Coast American Peregrine Falcon Recovery Team. 1982. Pacific coast recovery plan for the American peregrine falcon (*Falco peregrinus anatum*). 86 pp.

PacifiCorp Electric Operations. 1991. Application for New License for Major Project - Existing Dam. Condit Hydroelectric Project FERC Project No. 2342. Vol. XI, Appendix 3.2-1.

Palmer, R.S. 1988. Northern goshawk. In: Handbook of North American birds (4): 355-378. R.S. Palmer ed. Yale Univ. Press, New Haven and London.

Porter, R.D. and C.M. White. 1973. The Peregrine Falcon in Utah, Emphasizing Ecology and Competition with the Prairie Falcon. Brigham Young University Science Bull., Biol. Ser. 18:1-74.

Science Applications International Corporation and Advanced Science Incorporated. 1992. SDS Lumber Cogeneration Project Topical Outline. July 13, 1992. Bonneville Power Administration, Portland Oregon. 26 pages.

Servheen, C.W. 1975. Ecology of wintering bald eagles on the Skagit River, Washington. M.S. Thesis. Univ. Washington, Seattle. 96 pp.

Stalmaster, M.V. 1976. Winter ecology and effects of human activity on bald eagles in the

Nooksack River Valley, Washington. M.S. Thesis. West. Washington State College, Bellingham, WA. 100 pp.

Stalmaster, M.V. and J.R. Newman. 1979. Perch-site Preference of Wintering Bald Eagles in Northwest Washington. Journal of Wildlife Management. 43:221-224.

Steenhof, K., S.S. Berlinger, and L.H. Fredrickson. 1980. Habitat Use by Wintering Bald Eagles in South Dakota. Journal of Wildlife Management. 44(4): 798-805.

Storer, R.W. 1966. Sexual dimorphism and food habits in three North American accipiters. Auk 83:423-436.

Taylor, R.H. 1988. Washington State mid-winter bald eagle survey results for 1988. Washington Department of Wildlife, Olympia, WA.

Taylor, R.H. 1989. Washington State mid-winter bald eagle survey results for 1989. Washington Department of Wildlife, Olympia, WA.

USFS (U.S. Forest Service). 1990. Draft environmental impact statement for the Lower White Salmon River management plan. Pacific Northwest Region, Portland, Oregon.

Washington Department of Fisheries and Oregon Department of Fish and Wildlife. 1992. Status report Columbia River fish runs and fisheries 1938-91.

WNHP (Washington Natural Heritage Program). 1994. Endangered, Threatened, and Sensitive Vascular Plants of Washington. Department of Natural Resources, Olympia.

Watson, J.W., M.G. Garrett, and R.G. Anthony. 1991. Foraging Ecology of Bald Eagles in the Columbia River Estuary. Journal of Wildlife Management 55:492-499.

APPENDIX B
BIOLOGICAL ASSESSMENT

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1.0 INTRODUCTION

Bonneville Power Administration (BPA) proposes to acquire 49.5 average megawatts (aMW) of firm power from the Klickitat Cogeneration Project. Power for the proposed project would be derived through a combination of an existing cogeneration system fired by wood waste and a new gas-fired turbine and heat recovery steam generator (HRSG) system. The project also includes gas and electric interconnection facilities.

Two Federally listed species are known to occur in the vicinity of the project. The bald eagle (*Haliaeetus leucocephalus*), a threatened species, winters in the vicinity of the project area between October 31 and March 31; and the peregrine falcon (*Falco peregrinus*), an endangered species, migrates through the project area in the spring and fall. This Biological Assessment addresses the environmental effects of the project components on the bald eagle and peregrine falcon and has been prepared in compliance with Section 7 of the Endangered Species Act of 1973, National Environmental Policy Act of 1969, and subsequent regulations issued by the Council on Environmental Quality (40 CFR 1500).

2.0 LOCATION AND DESCRIPTION OF THE PROJECT

The project area lies within a Pacific Northwest vegetation transition zone found only in the Columbia River Gorge and is within the Columbia Gorge National Scenic Area (Figure 1). Vegetation in this zone is a mixture of plant species characteristic of the western hemlock zone of the Cascade Mountains (a wetter climate) and the Ponderosa pine zone of the eastern Cascade Mountains (a dryer climate) (Franklin and Dyrness, 1973). Typical understory vegetation in undisturbed areas includes shrub species such as salal (*Gaultheria shalon*), Oregon holly-grape (*Mahonia aquifolium*), snowberry (*Symphoricarpos albus*), and herbaceous vegetation including sword fern (*Polystichum munitum*), desert parsley (*Lomatium* spp.), and sweet-cicely (*Osmorhiza chilensis*). The proposed project components and construction schedule are described in the following sections.

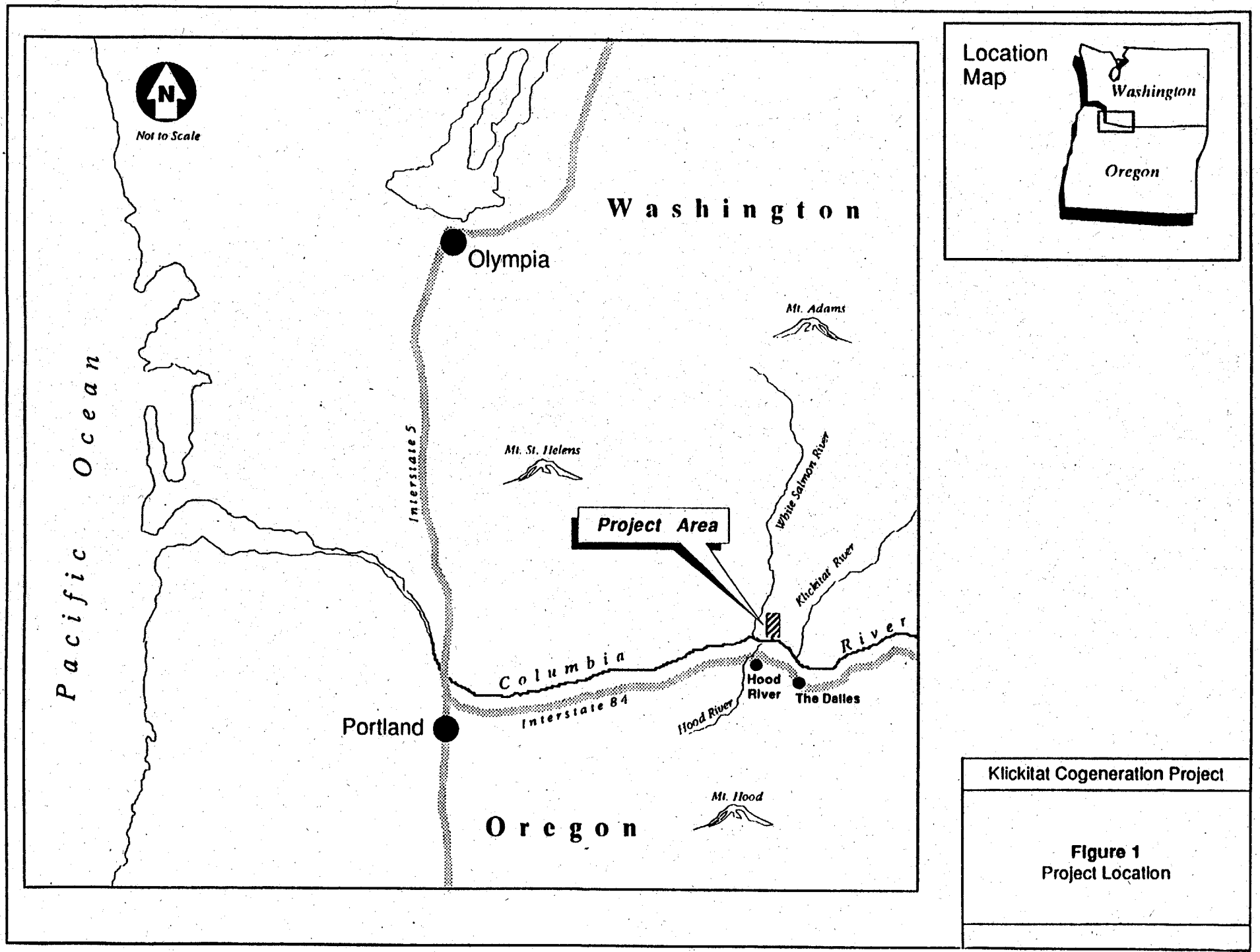
2.1 PROPOSED COGENERATION FACILITY

The proposed cogeneration facility would occupy about 1.6 hectares (ha) (4 acres [ac]) on the SDS Lumber Mill site in Bingen, Washington (Township 3N, Range 11E, Section 30). The 43.5-MW gas-fired turbine generator coupled to an HRSG would be located adjacent and to the east of the existing boiler and turbine facility at the mill (Figure 2). In addition to the turbine generator, a 24.4-meter (m) (80-foot [ft]) emissions stack, two storage tanks (12.2 m [40 ft] in diameter and 12.2 m [40 ft] in height), and a new gas metering station would be constructed on the mill site.

Construction of the cogeneration facility on the SDS Lumber Mill site would begin in the fall of 1994, with a project startup date anticipated for the fall of 1995.

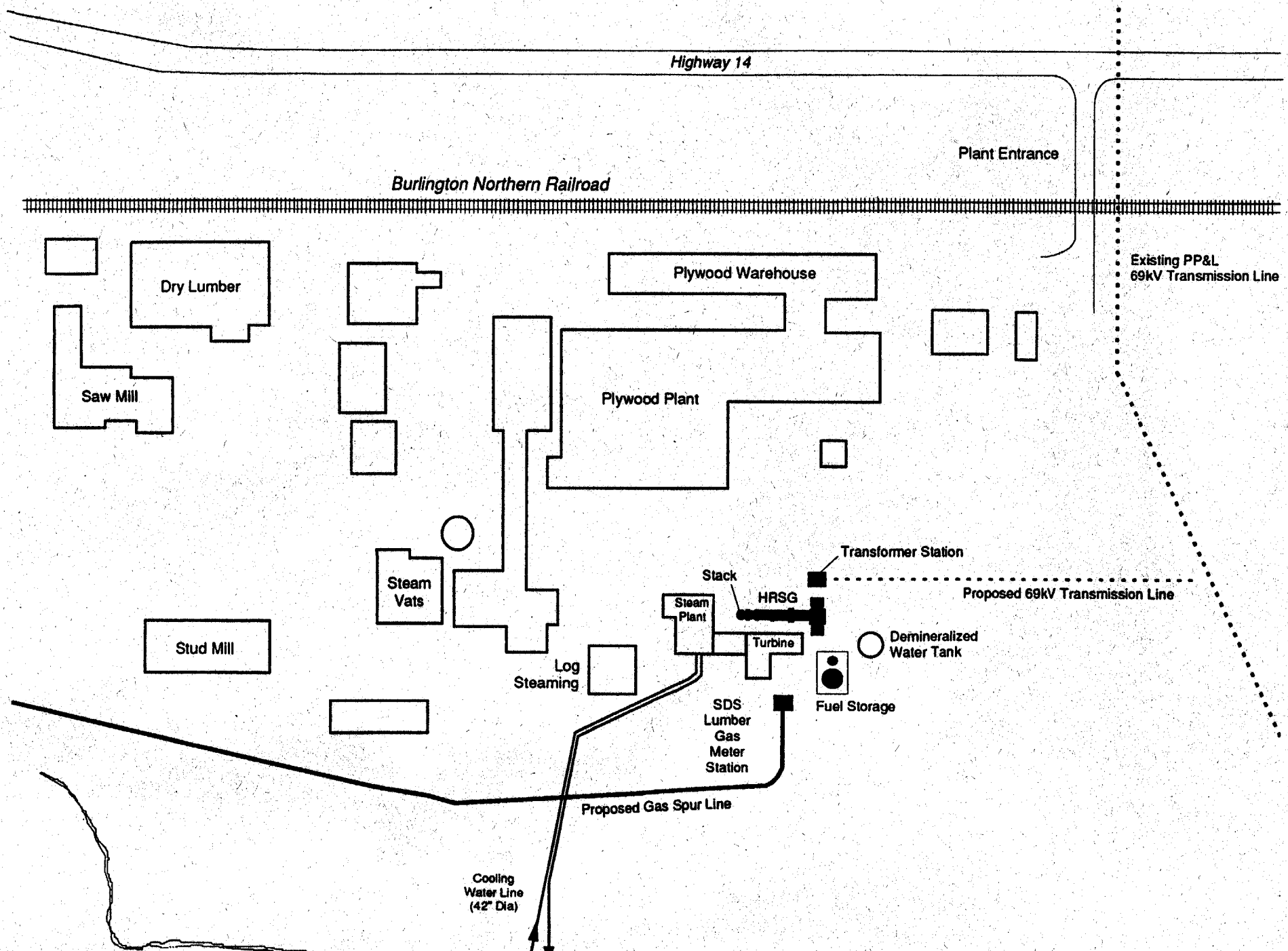
2.2 GAS TRANSMISSION

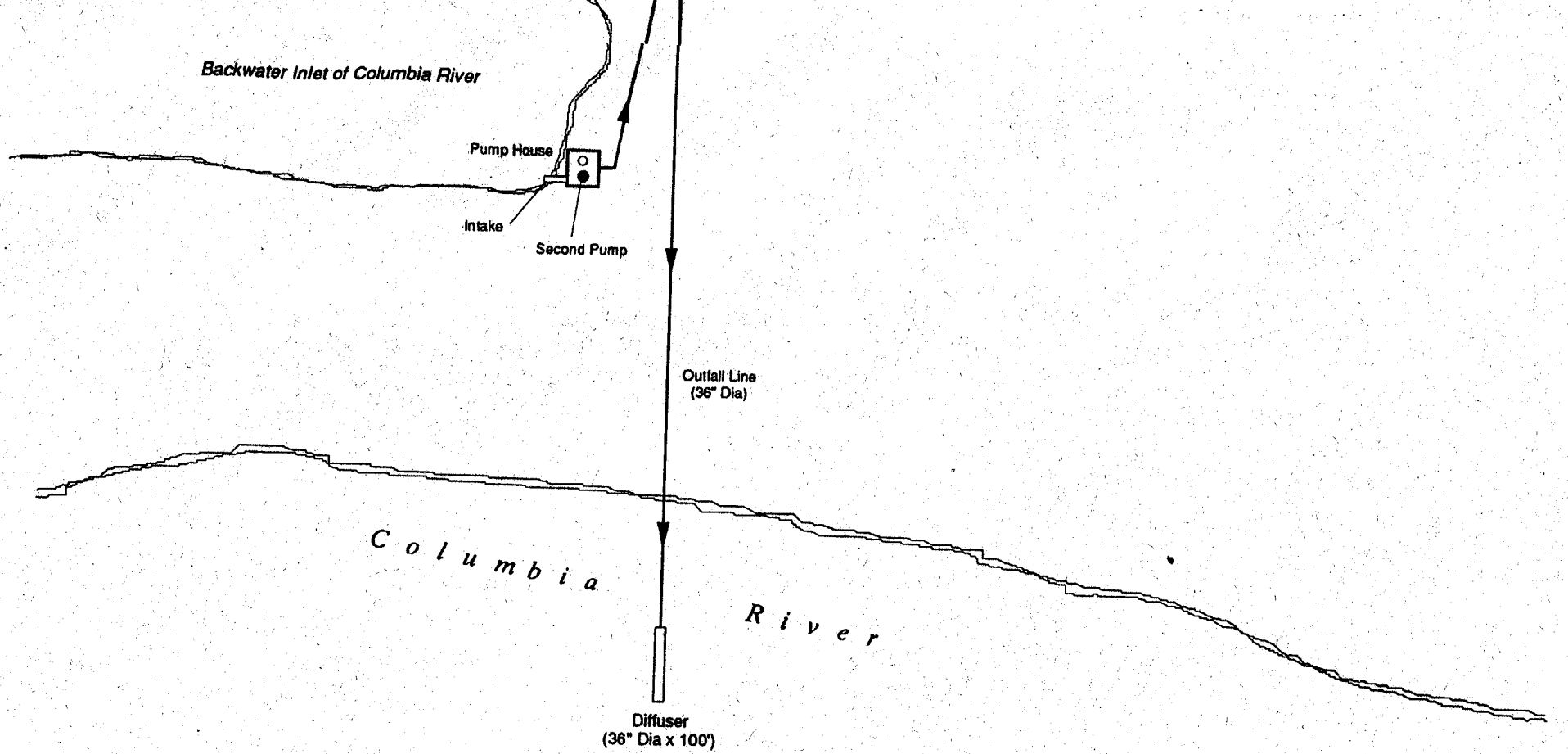
The Hood River gas transmission line, proposed for development by Northwest Pipeline (NWP), is comprised of two parts (Figure 3). A new 6.8-kilometer-long (km) (4.2-mile-long [mi]) 20.3-centimeter (cm) (8-inch [in.])-diameter steel gas pipeline would be constructed parallel to the existing Hood River lateral line, which is owned and maintained



Klickitat Cogeneration Project

Figure 1
Project Location


Highway 14
Plant Entrance
Burlington Northern Railroad
Existing PP&L
69kV Transmission Line
Dry Lumber
Saw Mill
Plywood Warehouse
Plywood Plant
Steam
Vats
Stud Mill
Log
Steaming
Transformer Station
Stack
HRSG
Steam
Plant
Turbine
Proposed 69kV Transmission Line
Demineralized
Water Tank
Fuel Storage
SDS
Lumber
Gas
Meter
Station
Proposed Gas Spur Line
Cooling
Water Line
(42" Dia)



Legend

- Existing Structure
- Proposed Structure
- Shoreline

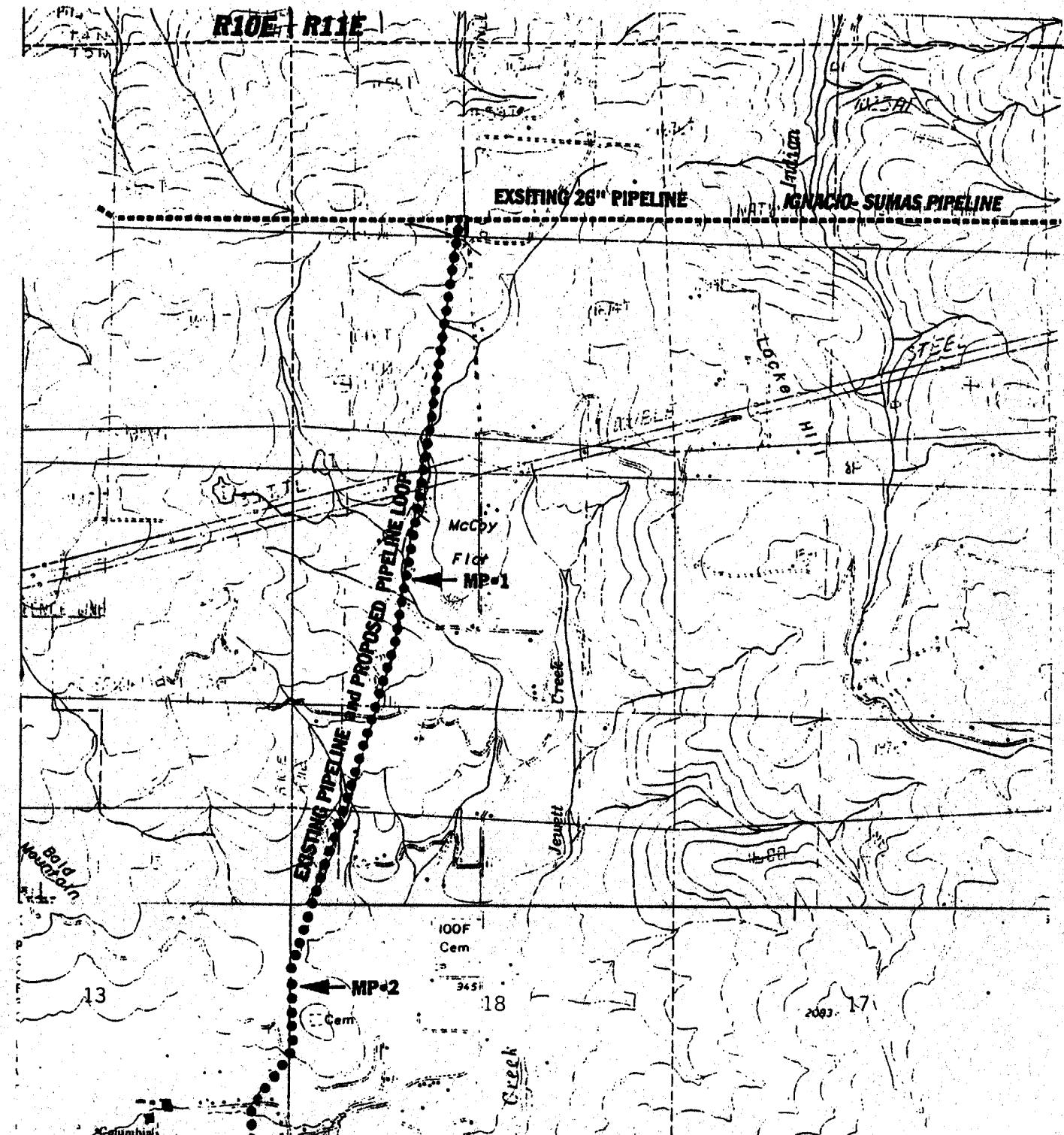
N

0 450'

Scale in Feet
(Approximate)

Klickitat Cogeneration Project

Figure 2
Cogeneration Facility


R10E
R11E
T4N
T3N
EXSITING 26" PIPELINE
IGNACIO- SUMAS PIPELINE
EXISTING PIPELINE and PROPOSED PIPELINE LOOP
McCoy
Flat
MP-1
MP-2
Bald Mountain
Jewett
Creek
Locke
Hill
100F
Cem
Cem
13
18
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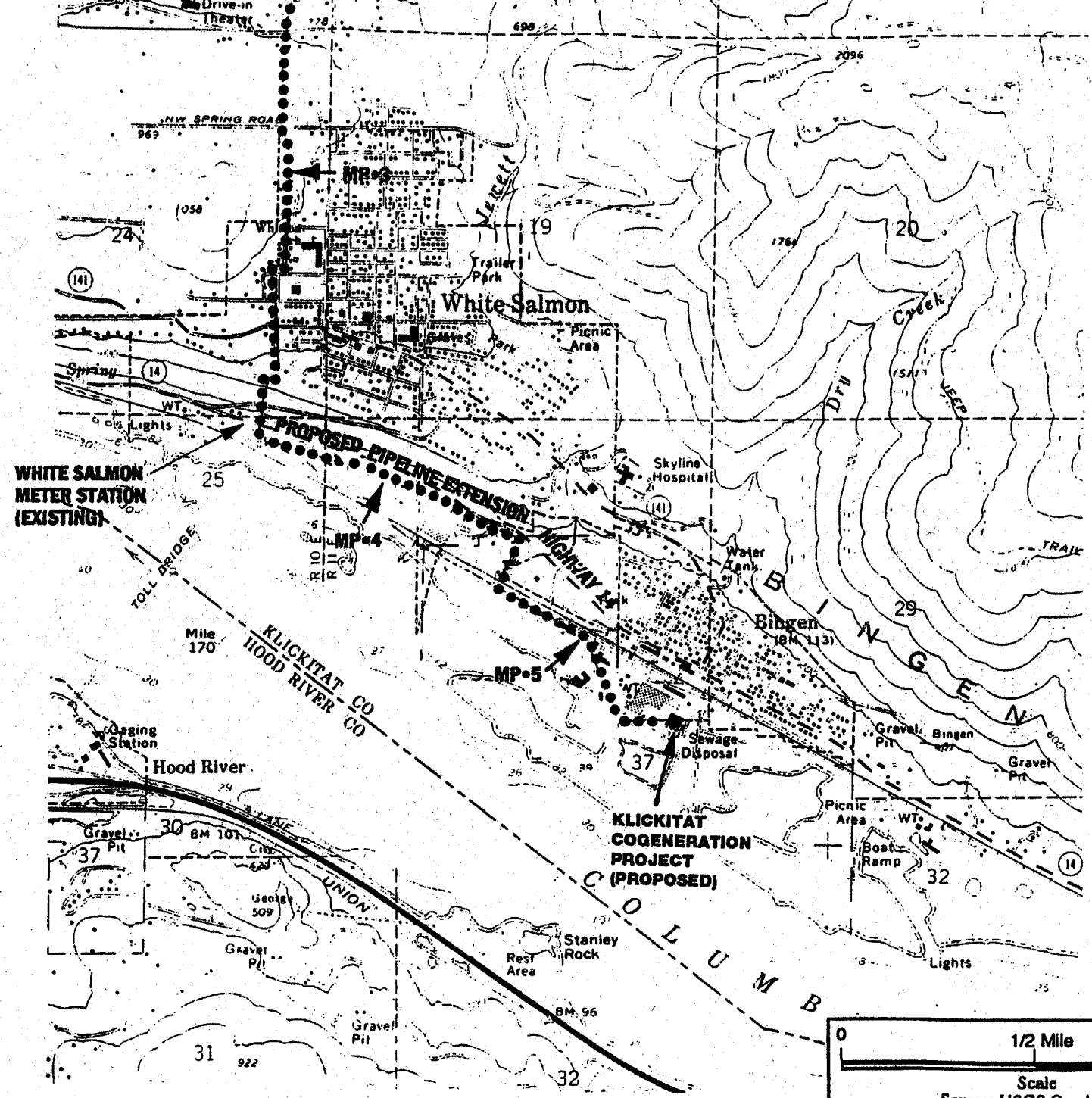

Klickitat Cogeneration Project

Figure 3
Gas Transmission Lines

by NWP, from the White Salmon metering station to the Ignacio-to-Sumas gas pipeline. The existing right-of-way (ROW) is 9.1 m (30 ft) wide and would be expanded to 22.9 m (75 ft) wide to accommodate the additional gas line. This northern one-third of the gas loop line is located in Township 3N, Range 10E, Sections 13, 24, and 25 and Township 3N, Range 11E, Sections 6, 7, and 18. Most of this section of the proposed gas loop line traverses an unincorporated area of Klickitat County dominated by gentle slopes that are covered with trees, pastures, and an orchard. The southern two-thirds of the gas loop line passes through the western end of the city of White Salmon and then descends down a steep slope to the White Salmon metering station adjacent to State Route (SR) 14.

The second segment of the gas pipeline (approximately 2.1 km [1.3 mi] long, 20.3 cm [8 in.] in diameter), known as the gas spur line, would run approximately parallel to SR 14, starting at the White Salmon metering station and then turn south into the SDS Lumber Mill site terminating at the turbine generator. The gas spur line is located in Township 3N, Range 10E, Section 25 and Township 3N, Range 11E, Section 30. The gas spur line would run through light industrial, large-lot residential and strip commercial areas.

Construction of the gas pipelines would be scheduled for the fall of 1994 with most of the intensive operations being performed between June 15 and September 30, 1995. Construction activities will normally be confined to the 22.9-m (75-ft) and 19.8-m (65-ft) construction ROWs for the gas loop line from the White Salmon metering station to the Ignacio-to-Sumas line and the gas spur line from the White Salmon metering station to the cogeneration facility, respectively. However, at road and railroad crossings, staging areas of approximately 61 m x 61 m (200 ft x 200 ft) will be needed on the working side of the crossing and 30.5 m x 30.5 m (100 ft x 100 ft) on the non-working side. These staging areas will be used for safe and efficient construction. The precise size and location of these working areas will be determined after detailed engineering analysis.

All streams that the pipeline would cross, with the exception of Jewett Creek, are intermittent streams and dry washes that have surface water only during heavy precipitation. Crossing the pipeline over these streams would be accomplished by using conventional dry land pipeline construction methods. Streams to be crossed using these methods will be identified in consultation with resource management agencies. Jewett Creek, a perennial stream, intersects the proposed pipeline route at a 15.2-m (50-ft) culvert. A trench will be dug underneath this culvert and then the pipeline will be placed into the trench. Construction across all streams will be conducted between June 15 and September 30.

2.3 ELECTRICAL TRANSMISSION

The proposed Bald Mountain Substation would occupy approximately 0.2 ha (0.6 ac) in a 2.4-ha (6-ac) parcel of land to be acquired from Pacific Power & Light (PP&L) (Figure 4). This site, within existing BPA and PP&L transmission ROWs, is pastureland and is owned and maintained by PP&L. The proposed substation would be located approximately 305 m (1,000 ft) north of the existing Condit Hydroelectric Project's powerhouse and about 8 km (5 mi) north of the SDS Lumber Mill in Township 3N, Range 10E, Section 10. In addition to the construction of the Bald Mountain Substation, placement of new wood pole supports and new 69-kilovolt (kV) conductor lines would be required for re-routing the existing PP&L 69-kV line through the Bald Mountain Substation.

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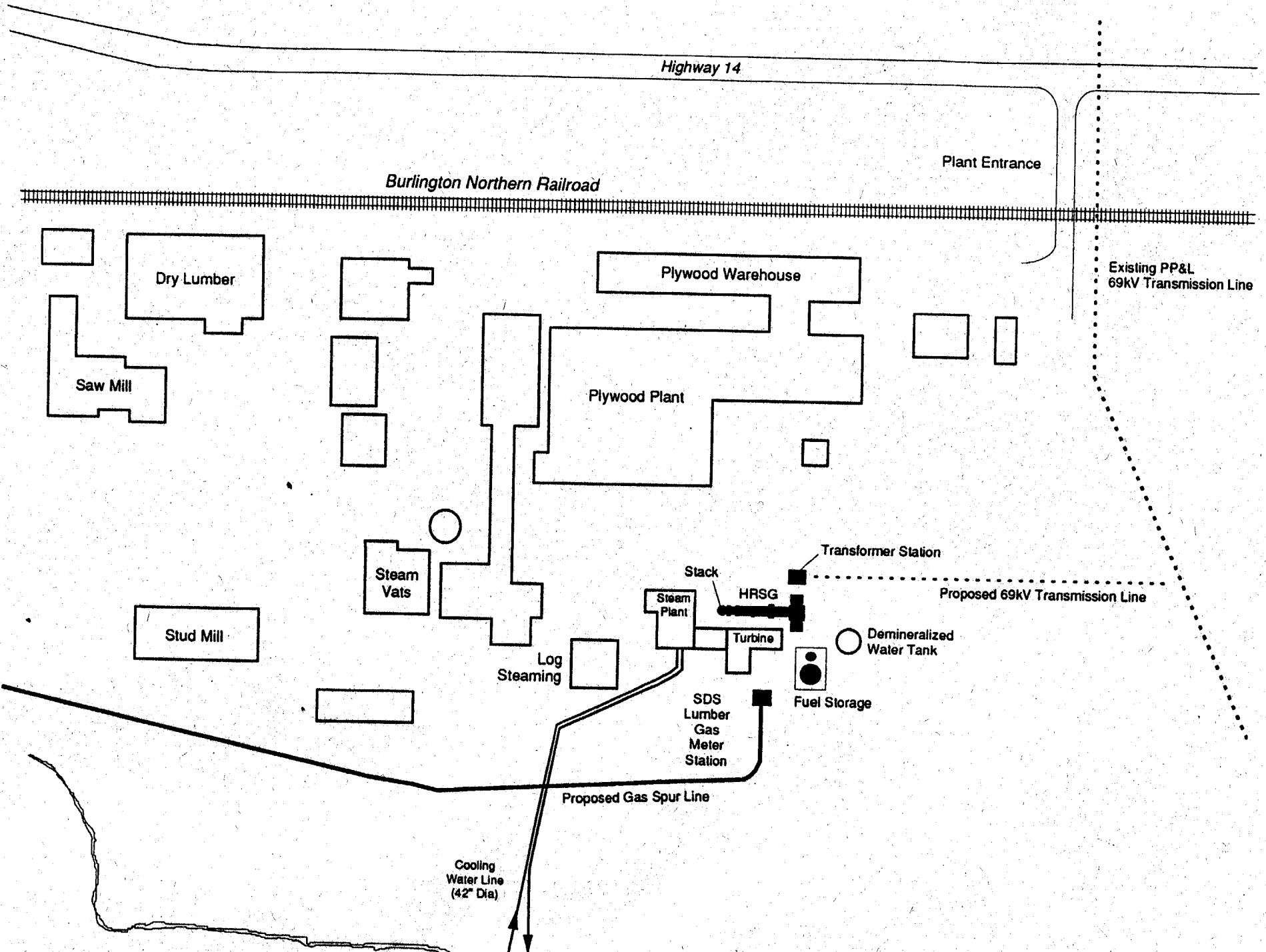
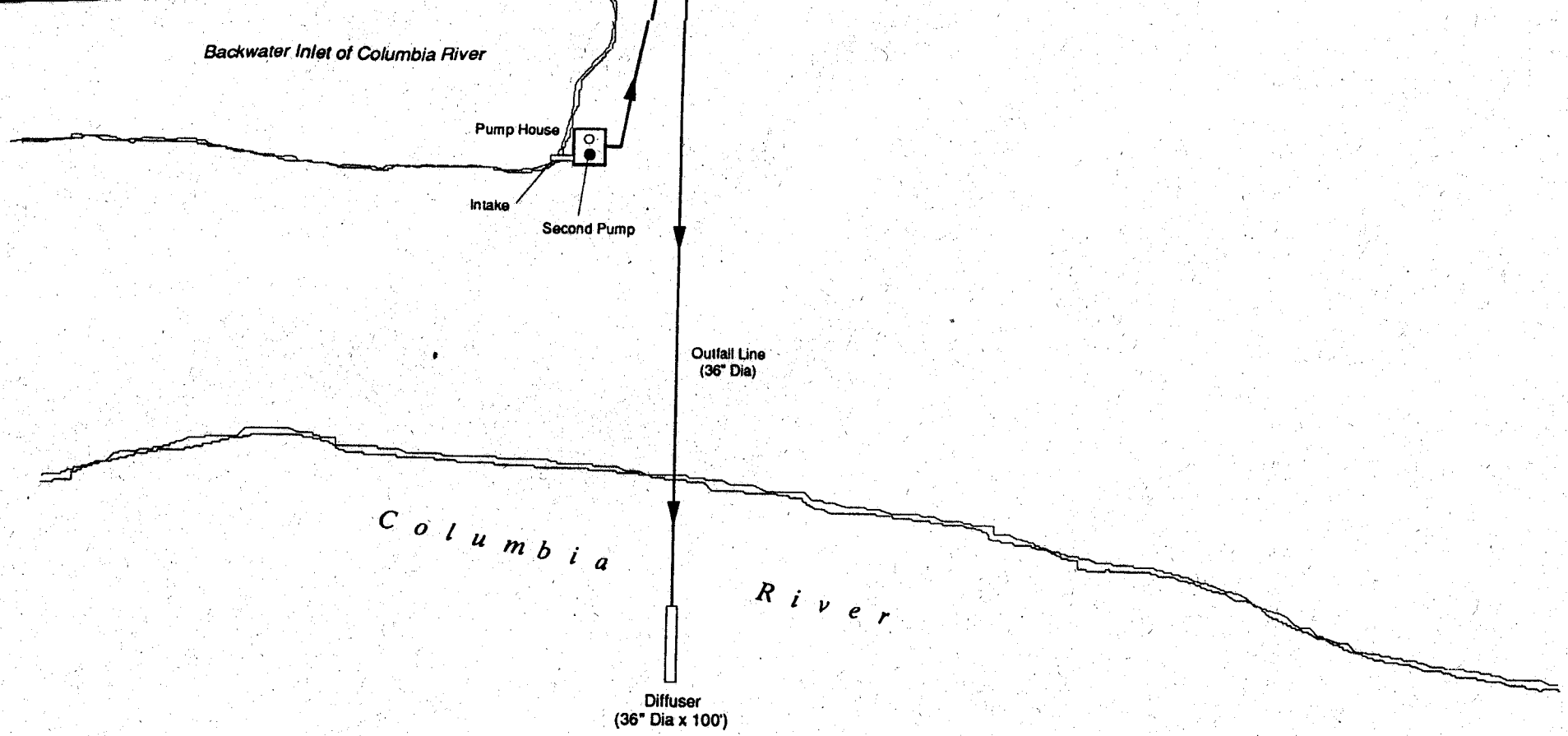

Highway 14
Plant Entrance
Burlington Northern Railroad
Existing PP&L
69kV Transmission Line
Dry Lumber
Saw Mill
Plywood Warehouse
Plywood Plant
Steam
Vats
Stud Mill
Log
Steaming
Transformer Station
Stack
HRSG
Steam
Plant
Turbine
Proposed 69kV Transmission Line
Demineralized
Water Tank
Fuel Storage
SDS
Lumber
Gas
Meter
Station
Proposed Gas Spur Line
Cooling
Water Line
(42" Dia)



Legend

- Existing Structure
- Proposed Structure
- Shoreline

N

0 450'

Scale in Feet
(Approximate)

Figure 3
Cogeneration Facility
Components

Klickitat Cogeneration Project

Construction of the Bald Mountain Substation would begin in the spring of 1995; completion of the facility will take approximately 4 months. Dimensions of the substation will be approximately 61 m x 38 m (200 ft x 125 ft). None of the structural components of the substation will exceed 16.2 m (53 ft) high. Structures will consist of switches, a switch stand, a transformer, and 69-kV racks. The substation will be enclosed with a barbed, 2.1-m (7-ft) chain-link fence.

Construction of six 24-m (80-ft) and five 26-m (85-ft) new wood poles and removal of existing 26-m (85-ft) wood poles would be required to tie the Bald Mountain Substation into the existing PP&L transmission lines. In addition, approximately 244 m (800 ft) of 69-kV conductor would be removed and replaced with approximately 610 m (2,000 ft) of new 69-kV conductor to accommodate re-routing.

3.0 METHODS

To prepare this biological assessment and determine the potential use of the project area by wintering bald eagles and migrating peregrine falcons, the following methods were used: (1) consultation with state and Federal agency biologists; (2) review of other biological assessment and wildlife studies conducted in the vicinity of the study area; and (3) two site visits, June 17 and 20, 1993.

4.0 RESULTS AND DISCUSSION

The U.S. Fish and Wildlife Service (USFWS) and the Washington Department of Wildlife (WDW) confirm the occurrence of bald eagles and peregrine falcons during spring and fall in the vicinity of the project area (letters from David C. Fredrick, State Supervisor, USFWS, Olympia, Washington, May 5, 1993 and Timothy Young, GIS Manager, WDW, Olympia, Washington, April 12, 1993).

4.1 BALD EAGLES

The bald eagle, a species classified as threatened in the state of Washington by the USFWS and WDW, potentially winters in the study area from October 31 to March 31. Bald eagles winter in large concentrations in Washington with over 2,000 wintering birds reported during some years (Taylor 1988, 1989). In southern Washington, most bald eagle use occurs along the Columbia River where the birds congregate in large numbers to forage on spawned out salmon (*Oncorhynchus* sp.) carcasses and abundant waterfowl and seabird concentrations (Watson et al., 1991). There are, however, no known nest sites occurring in the project vicinity (personal communication, D. Anderson, Wildlife Biologist, WDW, March 22, 1993) and no eagles were observed during two site visits conducted in June 1993.

4.1.1 Habitat Characteristics of Wintering Bald Eagles

Wintering eagles in the Pacific Northwest most commonly perch on tall snags, Ponderosa pine, and cottonwoods (Stalmaster and Newman, 1979; Fielder and Starkey, 1986); proximity to a food source is probably the most important factor influencing perch selection

by bald eagles (Steenhof et al., 1980). Most perches selected by bald eagles provide a good view of the surrounding area and eagles tend to use the highest perch sites available (Stalmaster, 1976; Servheen, 1975).

During the daytime, bald eagles usually perch close to a food source if possible. It has been observed that bald eagles will roost overnight in old-growth stands as far as 15 km (9.3 mi) from a food source in the Klamath Basin, even though closer stands of juniper and young Ponderosa pine were available (Keister and Anthony, 1983). Forest stand structure (i.e., uneven-aged and at least a remnant of the old-growth component) is an important habitat component for selection of communal night roosts (Anthony et al., 1982). In addition, communal night roosts sites in western Washington provide protection from chilling weather because they are sheltered by landforms and the coniferous foliage insulates eagles from wind and rain (Stalmaster, 1976; Hansen, 1977).

4.1.2 Use of Project Area by Wintering Bald Eagles

Historically, bald eagles winter in the vicinity of the project area. Eight bald eagle observations were documented during the winter of 1990 near the Condit powerhouse, approximately 305 m (1,000 ft) southwest of the proposed Bald Mountain Substation, and Northwestern Lake, approximately 4.8 km (3 mi) west of the northern end of the gas loop line (PacifiCorp Electric Operations, 1991). However, there are no communal winter roost sites documented near the project area (personal communication, D. Anderson, WDW, March 22, 1993). Food sources potentially available for eagles wintering near the project area include anadromous fish, waterfowl, and shorebirds that use the mudflats and wetlands along the shores of the Columbia River. Jewett Creek and one of its small tributaries in the project area support resident cutthroat and steelhead.

Suitable perching/roosting habitat for bald eagles is limited within the actual project area. The forest type adjacent to the gas loop line is primarily even-aged conifer/deciduous stands and lacks large trees for perching or roosting. Although there are large trees along the Columbia River shoreline in the project area, the highly disturbed nature of the area precludes it from being valuable perching habitat.

4.2 PEREGRINE FALCONS

The USFWS data files indicate that the peregrine falcon, a Federally listed endangered species, potentially occurs in the study area (letter from David C. Fredrick, State Supervisor, USFWS, Olympia, Washington, May 5, 1993). The peregrine falcon has experienced widespread population declines since World War II that have been largely attributed to reductions in breeding habitat and contamination from chlorinated hydrocarbon pesticides (Pacific Coast American Peregrine Falcon Recovery Team, 1982). In recent years, however, there has been a gradual increase in the number of sightings and reoccupation of historical nesting sites reported for northern California, southern Oregon, and Washington. The Columbia River Basin, including the project area, has been designated as a peregrine falcon management area (Pacific Coast American Peregrine Falcon Recovery Team, 1982).

4.2.1 Habitat Characteristics of Peregrine Falcons

Peregrine falcons frequently nest on steep cliffs greater than 46 m (150 ft) tall that are close to water. Characteristics of most nesting territories in the Pacific Northwest include large cliffs with some vertical sections that have a good view of the surrounding landscape and proximity to water (Pacific Coast American Peregrine Falcon Recovery Team, 1982). Peregrine falcons will travel up to 27 km (17 mi) to hunt and will frequently forage near marshes, lakes, and river bottoms; although croplands and meadows are sometimes used also (Porter and White, 1973). Peregrine falcons feed almost exclusively on avian prey captured while in flight. Marshes and riparian areas are particularly important feeding areas for peregrine falcons since they attract and concentrate prey (Craig, 1986). The Washington coast contains important wintering areas that may be critical to the maintenance of region-wide populations of peregrine falcons. Areas most commonly used in the state include intertidal mud flats and estuaries of the Skagit Flats (northern Puget Sound), Grays Harbor (central Washington coast), and Willapa Bay (southern Washington coast) (Pacific Coast American Peregrine Falcon Recovery Team, 1982).

4.2.2 Use of Project Area by Peregrine Falcons

Suitable nesting habitat for peregrine falcons does not occur in the project area (personal communication, D. Anderson, Wildlife Biologist, WDFW, March 22, 1993) and no peregrine falcons were observed during two June 1993 site visits. However, a release site for captive-bred peregrine falcons is located in the Little White Salmon drainage near Dog Mountain, approximately 15 km (9 mi) from the project area (PacifiCorp Electric Operations, 1991). Peregrine falcons have also been sighted in the Little White Salmon drainage and throughout the Columbia River Gorge in Klickitat and Skamania counties (Ebasco Environmental, 1991; PacifiCorp Electric Operations, 1991). The project area is within foraging range of the peregrine falcon release site near Dog Mountain. The Columbia River shoreline and its associated riparian habitats also provide a large area for foraging opportunities. A number of small wetlands are located along the Burlington Northern Railroad tracks that could potentially serve as forage sites for peregrine falcons.

5.0 PROJECT EFFECTS

5.1 BALD EAGLES

Potential effects to bald eagles include: (1) removal of perch trees; (2) alteration of bald eagle food sources; (3) disturbance of perching eagles due to noise; and (4) disturbance of winter roost sites.

Placement of the gas loop line will require expansion of the existing ROW and, consequently, the removal of approximately 2.2 ha (5.5 ac) of forested habitat. This habitat includes ponderosa pine and bigleaf maple, which can potentially used as perch sites, but does not constitute a preferred forest stand for perching or roosting bald eagles because of the smaller, even-aged character of the stands. In addition, these stands are more than 2.4 km (1.5 mi) from the Columbia River, which is the nearest forage area. The gas spur line is routed through a highly disturbed area and no loss of suitable perch trees are expected in clearing of this ROW. Therefore, there will not be any impact to bald eagle perching habitat.

The only creeks crossed that support anadromous fish are Jewett Creek and one of its small tributaries, both of which are small and lack open gravel bars for eagle foraging. Jewett Creek and its tributary support cutthroat and steelhead but no salmon species that eagles might forage on. Additionally, all of the intermittent streams and dry washes will be crossed using methods that do not cause increased siltation downstream of the crossing sites. Therefore, there would be no effect on bald eagle foraging opportunities.

Construction of the pipelines is proposed to occur during the summer of 1995, with the majority of it to be completed between June 15 and September 30. The timing and anticipated length of the construction activities is such that the more intensive operations would be completed before wintering bald eagles would typically occupy the project area vicinity. Operation of the completed project would not increase the noise or human activity level already present in the heavy industrial/residential area and would not cause any reduction of prey.

Construction of the Bald Mountain Substation is also proposed to occur during the summer on 1995. Although only 305 m (1,000 ft) from the Condit powerhouse where wintering bald eagle observations were recorded in 1990 (PacifiCorp Electric Operations, 1991), construction of the substation would not disturb any wintering bald eagles in the vicinity as construction will have been completed prior to the wintering period.

Approximately 30 m (100 ft) of new transmission line will run from the new substation to the existing tower. Transmission lines of this length are not likely to pose a threat to raptors in the area. However, any transmission lines and towers will be constructed within the guidelines set forth by the Raptor Research Foundation for raptor protection on powerlines (Olendorff et al., 1981).

Construction of the cogeneration facility will be confined to the highly disturbed SDS Lumber Mill site. Therefore, no potential perching or roosting habitat would be destroyed and any additional disturbance created from construction or operation will not impact bald eagles. The proposed project is not likely to adversely affect the bald eagle.

5.2 PEREGRINE FALCONS

Potential effects to peregrine falcons include disturbance from pipeline construction and alteration of potential food sources.

The proposed project will not affect peregrine falcon nesting sites as none occur in the vicinity of the project area. Potential disturbances expected during construction of the project components includes noise from large equipment operation, site excavation, ROW clearing, and increased human presence.

However, such disturbances would be confined to the summer construction period and should not create any additional disturbance to spring and fall peregrine falcon migrants. Since noise and activity levels will be similar to current levels in the vicinity of the project, the operation of the project will not affect waterfowl or shorebird abundance along the Columbia River or other areas where peregrine falcons may forage. Therefore, the proposed project is not likely to adversely affect the peregrine falcon.

6.0 REFERENCES

Anthony, R.G., R.L. Knight, G.T. Allen, B.R. McCelland, and J.I. Hodges. 1982. Habitat Use by Nesting and Roosting Bald Eagles in the Pacific Northwest. Trans. North American Wildlife Natural Resource Conference 47:332-342.

Craig, G. 1986. The Peregrine Falcon. In: Audubon wildlife report 1986. R.L. DiSilvestro (ed.). National Audubon Society, New York. pp. 807-826.

Ebasco Environmental. 1991. Biological Assessment for the Little White Salmon River Bridge Replacement, Skamania County, Washington. Prepared for Washington Department of Transportation, Environmental Section. 10 pp.

Fielder, P.C. and R.G. Starkey. 1986. Bald Eagle Perch Sites in Eastern Washington. Northwest Science. 60:186-190.

Franklin, J.F. and C.T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. Forest Service General Technical Report PNW-8, U.S. Department of Agriculture. (Reprinted with bibliography supplement, Oregon State University, Corvallis, 1988).

Hansen, A.J. 1977. Population Dynamics and Night Roost Requirements of Bald Eagles Wintering in the Nooksack River Valley, Washington. Problem Ser., Huxley Coll, Environmental Studies Bellingham, WA. 31 pp.

Keister, G.P. and R.G. Anthony. 1983. Characteristics of Bald Eagle Communal Roosts in the Klamath Basin, Oregon and California. Journal Wildlife Management. 47:1072-1079.

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981. Raptor Research Report No. 4. Raptor Research Foundation, Inc.

PacifiCorp Electric Operations. 1991. Application for New License for Major Project - Existing Dam. Condit Hydroelectric Project FERC Project No. 2342. Vol. XI, Appendix 3.2-1.

Pacific Coast American Peregrine Falcon Recovery Team. 1982. Pacific Coast Recovery Plan for the American Peregrine Falcon (*Falco peregrinus anatum*). 86 pp.

Porter, R.D., and C.M. White. 1973. The Peregrine Falcon in Utah, Emphasizing Ecology and Competition with the Prairie Falcon. Brigham Young University Science Bull., Biol. Ser. 18:1-74.

Servheen, C.W. 1975. Ecology of Wintering Bald Eagles on the Skagit River, Washington. M.S. Thesis. Univ. Washington, Seattle. 96 pp.

Stalmaster, M.V. 1976. Winter Ecology and Effects of Human Activity on Bald Eagles in the Nooksack River Valley, Washington. M.S. Thesis. Western Washington State College, Bellingham, WA. 100 pp.

Stalmaster, M.V. and J.R. Newman. 1979. Perch Site Preference of Wintering Bald Eagles in Northwest Washington. Journal Wildlife Management 43:221-224.

Steenhof, K., S.S. Berlinger, and L.H. Fredrickson. 1980. Habitat Use by Wintering Bald Eagles in South Dakota. Journal of Wildlife Management. 44(4): 798-805.

Taylor, R.H. 1988. Washington State Mid-Winter Bald Eagle Survey Results for 1988. Washington Department of Wildlife, Olympia WA.

Taylor, R.H. 1989. Washington State Mid-Winter Bald Eagle Survey Results for 1989. Washington Department of Wildlife, Olympia WA.

Watson, J.W., M.G. Garrett, and R.G. Anthony. 1991. Foraging Ecology of Bald Eagles in the Columbia River Estuary. Journal of Wildlife Management 55:492-499.

APPENDIX C
AGENCY CORRESPONDENCE

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3704 Griffin Lane SE, Suite 102
Olympia, Washington 98501-2192
(206) 753-9440 FAX: (206) 753-9008

April 14, 1993

Ronald W. Tressler
Ebasco Environmental
10900 N.E. 8th Street
Bellevue, Washington 98004-4405

FWS Reference: 1-3-93-SP-475

Dear Mr. Tressler:

This is in response to your letter dated March 18, 1993 and received in this office on March 19. Enclosed is a list of listed threatened and endangered species, and candidate species (Attachment A), that may be present within the area of the proposed co-generator plant in Bingen, in Klickitat County, Washington. The list fulfills the requirements of the Fish and Wildlife Service (Service) under Section 7(c) of the Endangered Species Act of 1973, as amended (Act). We have also enclosed a copy of the requirements for Federal Highway Administration (FHWA) compliance under the Act (Attachment B).

Should the biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, the FHWA should request Section 7 consultation through this office. If the biological assessment determines that the proposed action is "not likely to adversely affect" a listed species, the FHWA should request Service concurrence with that determination through the informal consultation process. Even if the biological assessment shows a "no effect" situation, we would appreciate receiving a copy for our information.

Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. However, protection provided to candidate species now may preclude possible listing in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the FHWA may wish to request technical assistance from this office.

In addition, please be advised that federal and state regulations may require permits in areas where wetlands are identified. You should contact the Seattle District of the U.S. Army Corps of Engineers for federal permit requirements and the Washington State Department of Ecology for state permit requirements.

Your interest in endangered species is appreciated. If you have additional questions regarding your responsibilities under the Act, please contact Jim Michaels or Kimberly Flotlin of this office at the letterhead phone/address.

Sincerely,

David C. Frederick
State Supervisor

wp/kr
Enclosures
SE/FHWA/1-3-93-SP-475/Klickitat
c: WDW, Region 5 (Nongame)
WNHP, Olympia

ATTACHMENT B

FEDERAL AGENCIL RESPONSIBILITIES UNDER SECTION 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2. Consultation with FWS when a federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and

3. Conference with FWS when a federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which is/are likely to be affected by a construction project. The process is initiated by a federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National Marine Fisheries Service, state conservation department, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. Upon completion, the report should be forwarded to our Endangered Species Division, 3704 Griffin Lane SE, Suite 102, Olympia, WA 98501-2192.

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* "Construction project" means any major federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes federal action such as permits, grants, licenses, or other forms of federal authorization or approval which may result in construction.

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES WHICH MAY OCCUR WITHIN THE VICINITY OF THE PROPOSED COGENERATION PLANT IN BINGEN, KLICKITAT COUNTY, WASHINGTON. (T3N R10E S11/14/23-25; T3N R11E S19/29/30/32/33/37)

1-3-93-SP-475

LISTED

X Bald eagle *(Haliaeetus leucocephalus)* - wintering bald eagles may occur in the vicinity of the project from about October 31 through March 31.

X Peregrine falcon *(Falco peregrinus)* - spring and fall migrant falcons may occur in the vicinity of the project.

Major concerns that should be addressed in your biological assessment of the project impacts to listed species are:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks and foraging areas in all areas influenced by the project.

3. Impacts from project construction (i.e., habitat loss, increased noise levels, increased human activity) which may result in disturbance to listed species and/or their avoidance of the project area.

PROPOSED

None.

CANDIDATE

X Black tern *(Chlidonias niger)* - may occur in the vicinity of the project.

Bull trout *(Salvelinus confluentus)* - may occur in the vicinity of the project.

California floater (mussel) *(Anodonta californiensis* (Lea, 1852)) - may occur in the vicinity of the project.

Columbia pebblesnail *(Fluminicola (=Lithoglyphus) columbianus* (Hemphill in Pilsbry, 1899)) [great Columbia River spire snail] - may occur in the vicinity of the project.

X Northwestern pond turtle *(Clemmys marmorata marmorata)* - may occur in the vicinity of the project.

X Spotted frog *(Rana pretiosa)* - may occur in the vicinity of the project.

CHRON

United States Department of the Interior

TAKE PRIDE IN AMERICA

FISH AND WILDLIFE SERVICE
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3704 Griffin Lane SE, Suite 102
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(206) 753-9440 FAX: (206) 753-9008

April 14, 1993

Ronald W. Tressler
Ebasco Environmental
10900 N.E. 8th Street
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FWS Reference: 1-3-93-SP-475

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Should the biological assessment determine that a listed species is likely to be affected (adversely or beneficially) by the project, the FHWA should request Section 7 consultation through this office. If the biological assessment determines that the proposed action is "not likely to adversely affect" a listed species, the FHWA should request Service concurrence with that determination through the informal consultation process. Even if the biological assessment shows a "no effect" situation, we would appreciate receiving a copy for our information.

Candidate species are included simply as advance notice to federal agencies of species which may be proposed and listed in the future. However, protection provided to candidate species now may preclude possible listing in the future. If early evaluation of your project indicates that it is likely to adversely impact a candidate species, the FHWA may wish to request technical assistance from this office.

In addition, please be advised that federal and state regulations may require permits in areas where wetlands are identified. You should contact the Seattle District of the U.S. Army Corps of Engineers for federal permit requirements and the Washington State Department of Ecology for state permit requirements.

Your interest in endangered species is appreciated. If you have additional questions regarding your responsibilities under the Act, please contact Jim Michaels or Kimberly Flotlin of this office at the letterhead phone/address.

Sincerely,

David C. Frederick
State Supervisor

wp/kr
Enclosures
SE/FHWA/1-3-93-SP-475/Klickitat
c: WDW, Region 5 (Nongame)
WNHP, Olympia

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND CANDIDATE SPECIES WHICH MAY OCCUR WITHIN THE VICINITY OF THE PROPOSED COGENERATION PLANT IN BINGEN, KLICKITAT COUNTY, WASHINGTON. (T3N R10E S11/14/23-25; T3N R11E S19/29/30/32/33/37)

1-3-93-SP-475

LISTED

X Bald eagle *(Haliaeetus leucocephalus)* - wintering bald eagles may occur in the vicinity of the project from about October 31 through March 31.

X Peregrine falcon *(Falco peregrinus)* - spring and fall migrant falcons may occur in the vicinity of the project.

Major concerns that should be addressed in your biological assessment of the project impacts to listed species are:

1. Level of use of the project area by listed species.

2. Effect of the project on listed species' primary food stocks and foraging areas in all areas influenced by the project.

3. Impacts from project construction (i.e., habitat loss, increased noise levels, increased human activity) which may result in disturbance to listed species and/or their avoidance of the project area.

PROPOSED

None.

CANDIDATE

X Black tern *(Chlidonias niger)* - may occur in the vicinity of the project.

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X Spotted frog *(Rana pretiosa)* - may occur in the vicinity of the project.

ATTACHMENT B

FEDERAL AGENCIL RESPONSIBILITIES UNDER SECTION 7(a) AND 7(c) OF THE ENDANGERED SPECIES ACT OF 1973, AS AMENDED

SECTION 7(a) - Consultation/Conference

Requires:

1. Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2. Consultation with FWS when a federal action may affect a listed endangered or threatened species to ensure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after it has determined if its action may affect (adversely or beneficially) a listed species; and

3. Conference with FWS when a federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or an adverse modification of proposed critical habitat.

SECTION 7(c) - Biological Assessment for Construction Projects *

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify any proposed and/or listed species which is/are likely to be affected by a construction project. The process is initiated by a federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, please verify the accuracy of the list with our Service. No irreversible commitment of resources is to be made during the BA process which would result in violation of the requirements under Section 7(a) of the Act. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an onsite inspection of the area to be affected by the proposal, which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within the FWS, National Marine Fisheries Service, state conservation department, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures; and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. Upon completion, the report should be forwarded to our Endangered Species Division, 3704 Griffin Lane SE, Suite 102, Olympia, WA 98501-2192.

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* "Construction project" means any major federal action which significantly affects the quality of the human environment (requiring an EIS), designed primarily to result in the building or erection of human-made structures such as dams, buildings, roads, pipelines, channels, and the like. This includes federal action such as permits, grants, licenses, or other forms of federal authorization or approval which may result in construction.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
3704 Griffin Lane SE, Suite 102
Olympia, Washington 98501-2192
(206) 753-9440 FAX: (206) 753-9008

August 11, 1994

Rob Diffely
Environmental Specialist
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208-3621

FWS Reference: 1-3-94-I-667
X-Reference: 1-3-93-SP-475

Dear Mr. Diffely:

This letter is in response to your request for concurrence dated May 19, 1994, and received in this office on May 23, regarding the Klickitat Cogeneration Project, in Klickitat County, Washington. The Bonneville Power Administration proposes to acquire 49.5 average megawatts (aMW) of firm power from the Klickitat Cogeneration Project, through an existing wood-waste fired cogeneration system, and a new gas-fired turbine and heat recovery steam generator (HRSG) system. The project also includes the construction of a gas transmission line and facilities, and electrical transmission lines and substation. Leslie Propp of my staff discussed the project with you several times by telephone between July 19 through 27, 1994.

As noted in the biological assessment (BA), construction activities will occur outside the October 31 through March 31 period when bald eagles may use the project area. Although a total of about 5.5 acres of forested habitat will be removed as a result of clearing for the gas loopline, few potential eagle perch trees exist along the ROW, and the nearest foraging areas (the Columbia River and Jewett Creek) are not within the immediate vicinity of most of the ROW. Pipeline construction across Jewett Creek, which supports cutthroat and steelhead (eagle prey species), would use methods that do not cause increased siltation downstream of the crossing site (as will all creek crossings). Operation of the completed Bald Mountain Substation and the gas pipeline is not expected to disturb wintering bald eagles or migrant peregrine falcons, since the noise and level of human activity in these areas is already high. Approximately .6 acres of wetlands will be impacted through pipeline construction. Peregrine falcon and bald eagle prey (waterfowl and shorebird species) could be negatively affected through disturbance of their wetland habitat.

As stated in the BA, all transmission lines will be constructed according to the guidelines established by the Raptor Research Foundation in order to minimize the threat of electrocution to raptors.

After consideration of the information provided in the BA, the Fish and Wildlife Service (Service) concurs with the Bonneville Power Administration's (BPA) "not likely to adversely affect" determination on bald eagles and peregrine falcons. This concurrence is contingent upon timing restrictions for wintering bald eagles (avoid construction between October 31 through March 31), and construction of transmission lines according to the Raptor Research Foundation guidelines. In addition, we recommend the following additional measures:

(1) Retain large trees and snags throughout the project area that may be used by perching bald eagles; and

(2) Limit construction that impacts wetland habitat to July and August to avoid the period of heavy use by migrating and breeding waterfowl and shorebirds.

This concludes informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended. This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation, if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation, and/or if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Leslie Propp or Jim Michaels at the letterhead phone/address.

Sincerely,

David C. Frederick
State Supervisor

LP/ac
SE/BPA/1-3-94-I-667/Klickitat

c: WDFW, Region 5

APPENDIX D
MITIGATION ACTION PLAN

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1.0 INTRODUCTION

This Mitigation Action Plan (MAP) addresses mitigation measures considered essential to render "Not Significant" the potential environmental impacts from entering into a competitive acquisition contract with Klickitat Energy Partners (KEP) for the development of the Klickitat Cogeneration Project. The proposed project involves constructing a cogeneration facility, an associated gas loop line and extension, and an electric substation in the vicinity of White Salmon and Bingen, Klickitat County, Washington. A complete description of the proposed project is provided in Section 2.2 of the Environmental Assessment (EA), to which this MAP is appended.

This MAP is consistent with the U.S. Department of Energy (DOE) "Implementing Procedures and Guidelines Revocation, Final Rule and Notice; Federal Register, April 24, 1992, from volume 10 CFR, to be codified at Section 1021.331," and DOE Order 5440.ID, Section 23. Bonneville Power Administration (BPA) wants to ensure compliance with all regulations and mitigation measures recommended by or developed in concert with appropriate government agencies regarding this project.

2.0 BACKGROUND

The potential environmental impacts and mitigation measures addressed in this MAP have been identified during the time that the proposed project passed through National Environmental Policy Act (NEPA) review, and BPA competitiveness acquisition program application review procedures. During the course of these proceedings, documents were developed (in addition to the EA to which this MAP is appended) to satisfy terms and conditions of the various approval processes, and adequately address the potential impacts and mitigation measures for the proposed project. A listing of these documents is presented in Section 5.0 of this MAP. Although each of these documents addressed one or more of the potential environmental impacts and associated mitigation measures, no one document addressed them all. This MAP summarizes and correlates potential impacts and prescribed mitigation from all of these documents.

3.0 METHODOLOGY

This MAP was prepared by reviewing the attached EA and the documents listed in Section 5.0, and through consultation with appropriate agencies. These activities resulted in identification of the following:

(a) Specific environmental features that would be affected by the proposed project;

(b) Potential impacts associated with each environmental feature identified in (a);

(c) Particular mitigation action(s) required to render "Not Significant" each impact identified in (b);

(d) The party or parties responsible for implementing each prescribed mitigation action identified in (c);

(e) The project phase during which each mitigation action identified in (c) is to take place; and

(f) Those government agencies that should be consulted to ensure compliance with applicable regulations.

4.0 RESULTS AND IMPLEMENTATION

Information derived from review of the attached EA and the documents listed in Section 5.0 is summarized in Table 1, attached. Table 1 also references particular documents listed in Section 5.0 providing specific discussion of affected environmental features, impacts, and prescribed mitigation measures.

The prescribed mitigation actions summarized in Table 1 will be carried out prior to, during, and following construction by KEP for the cogeneration portion of the project, Northwest Pipeline Corporation (NWP) for the gas pipeline portion, and BPA for the substation portion. In this section, plans for implementing the prescribed mitigation

actions during preconstruction, construction, and postconstruction/operational phases of the project are discussed.

4.1 PRE-CONSTRUCTION PHASE

NWP has prepared a Stormwater Pollution Prevention Plan (SWPPP) that includes a revegetation plan to restore vegetation disturbed during construction of the gas pipeline. The SWPPP also addresses treatment and handling of hazardous materials (e.g., fuels, oils, lubricants) during construction. A spill prevention, control, and countermeasures plan (SPCC) has also been prepared.

BPA will develop an Erosion and Sediment Control Plan (ESCP) for the Bald Mountain Substation in consultation with the Soil Conservation Service. The ESCP will minimize erosion of the site by requiring installation of appropriate measures, such as silt fences, berms, and sediment traps.

4.2 CONSTRUCTION PHASE

The majority of mitigation actions identified in Table 1 will be implemented during the construction phase. The major goals of the mitigation actions are as follows:

(a) Avoid or otherwise mitigate impacts to sensitive plants, if present,

(b) Avoid, minimize, and compensate for impacts to wetland vegetation,

(c) Prevent sediment from entering streams and wetlands,

(d) Prevent pipeline construction from negatively impacting fish in the tributary to Jewett Creek,

(e) If discovered, preserve historical and cultural resources on the project site.

4.3 POST-CONSTRUCTION/OPERATIONS PHASE

To the extent they have not done so already, KEP and NWP will engage the necessary contractors/consultants to implement the SWPPP, its revegetation plan, and the mitigation plans, which have been or will be developed in consultation with appropriate

agencies. Such agencies will include the Soil Conservation Service, the United States Fish and Wildlife Service, the Washington Department of Wildlife, the Washington Department of Ecology, and the U.S. Army Corps of Engineers. The major goals of the mitigation actions are as follows:

(a) Limit criteria pollutants: NOx, CO, SO2, VOCs, PM10 from the cogeneration facility, to within permitted standards

(b) Prevent additional adverse impacts on visibility beyond the impacts caused by existing sources,

(c) Limit noise generated by the turbine air inlets, exhaust stack, and steam condensers to acceptable criteria,

(d) Minimize visual and habitat impacts of the widened pipeline right-of-way, NWP will comply with the monitoring and reporting of FERC's Erosion and Revegetation procedures until full restoration of the Right-of-Way has been completed,

(e) Prevent fish from entering the water intake structure and being affected by the outfall structure.

4.4 MONITORING/REPORTING

Prior to commercial operation of the project, KEP will provide a monthly report to BPA on the progress made on mitigation actions listed in Table 1, until all actions have been successfully implemented. NWP will provide to BPA a copy of all cover letters regarding correspondence with FERC concerning mitigation actions.

NWP will comply with the monitoring and reporting of FERC's erosion control and revegetation procedures until full restoration of the ROW has been completed.

5.0 REFERENCE DOCUMENTS

Dames and Moore. 1993a. Erosion Control, Revegetation, and Maintenance Plan. Seattle, Washington.

Dames and Moore. 1993b. Hazardous Waste and Materials Plan. Seattle, Washington.

Dames and Moore. 1993c. Noise Analysis of Proposed Klickitat Energy Partners Cogeneration Facility.

Dames and Moore. 1994. Notice of Construction Permit Application, Klickitat Energy Project for Klickitat Energy Partners. Portland, Oregon.

Enserch Environmental (formerly Ebasco Environmental). 1994a. Wetland Inventory and Delineation Report for the Hood River Pipeline Loop and Extension. Bellevue, Washington.

Enserch Environmental. 1994b. Environmental Report Hood River Pipeline Loop and Extension, prepared for Northwest Pipeline Corporation. Bellevue, Washington.

Enserch Environmental. 1994c. Storm Water Pollution Prevention Plan for the Hood River Pipeline Loop and Extension. Bellevue, Washington.

Norwood, Sandy. 1993. Washington Department of Natural Resources. Letter to Ron Tressler, Wildlife Biologist, Ebasco Environmental, Bellevue, Washington.

Olendorff, R.R., A.D. Miller, and R.N. Lehman. 1981. Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1981. Raptor Research Report No. 4. Raptor Research Foundation, Inc.

State of Washington Environmental Noise Regulations. Washington Administrative Code (WAC-173-60).

6.0 ENDORSEMENT

Klickitat Energy Partners, Northwest Pipeline Corporation, and Bonneville Power Administration intend to implement this MAP by undertaking the prescribed mitigation actions during the appropriate project phase. Their joint endorsement of and intention to implement this MAP is provided by signature block below.

Klickitat Energy Partners, Inc.	Date
Northwest Pipeline Corporation	Date
Bonneville Power Administration	Date

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Upland Vegetation	Cogeneration Facility	N/A	N/A			
	Gas Transmission Line	Disturbance and clearing during construction	NWP will minimize removal of vegetation. NWP will revegetate with native species, in accordance with an agency-approved revegetation plan. NWP will follow the FERC Erosion Control, Revegetation and Maintenance Plan.	Pre-construction, construction, and post-construction	WDFW USFWS SCS WDNR	Stormwater Pollution Prevention Plan (SWPPP); FERC License; Environmental Report
	Substation	Disturbance and clearing during construction	BPA will avoid unnecessary removal of vegetation. BPA will prepare an ESCP. BPA will revegetate as necessary.	Pre-construction, construction, and post-construction.		
Wetland Vegetation	Cogeneration facility	N/A	N/A			

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Wetland Vegetation (continued)	Gas transmission line	Disturbance of wetlands; potential loss of wetlands or wetland functions	NWP will minimize the wetland area affected by construction. - Disturbance of forested wetlands will be minimized by removing only those stumps and roots directly over the trench. - Wetland vegetation will be cut at ground level to minimize root damage. - All wetland topsoils will be stockpiled and replaced after trench backfilling. - Erosion and sediment control measures will be used around all wetlands. - All wetlands will be reseeded with an agency-approved seed mix of native species. - Locations of all wetlands will be posted prior to construction to ensure that mitigation measures are implmented.	Construction	WDFW ACOE DOE	Wetland Report, SWPPP, Environmental Report
	Substation	N/A	N/A			

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Water Quality; Fisheries Resources	Cogeneration Facility	Intake/return of Columbia River water	KEP will ensure the following: - No in-river construction will be conducted; - Existing and new fish screens will be kept in compliance with WDFW standards; - Temperature, chlorine, and other chemical parameters in the effluent stay within WDOE limits.	Construction, operations	BPA NMFS WDFW WDOE	NPDES permit
			KEP will extend the existing outfall line and diffuser into deeper water of the Columbia River to avoid thermal impact to migrating salmonids. Construction will take place between December and March.	Constuction, operations	BPA NMFS	
		Increase in turbidity in the Columbia River due to erosion	KEP will develop and follow an Erosion and Sediment Control Plan (ESCP).	Construction	SCS WDOE	

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Water Quality; Fisheries Resources (continued)	Gas transmission line	Increased turbidity and sediment in streams	NWP will ensure that activities during and after construction include the following: - Installation of erosion/ sediment control measures at the base of each streambank crossed by the pipeline; - Prompt reseeding/ planting of disturbed areas after construction; - Installation of permanent erosion control measures on pipeline right-of-way; - Adherence to the requirements of the SWPPP and ESCP; - Monitoring and maintenance of erosion control measures. - Timing of construction in streams will be limited to June 15 through September 30; - Any streams flowing at time of construction will be crossed using flume or dam and pump methods; and - Streambanks will be restored to original contours, reseeded/ replanted, and covered with jute matting.	Construction and post-construction	SCS WDFW	SWPPP; Hydraulic Project Application(s); Environmental Report

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Fisheries Resources (continued)	Substation	Increased turbidity and sediment in streams due to erosion	BPA will prepare an Erosion and Sediment Control Plan (ESCP); measures in the ESCP will minimize erosion of the substation site.	Pre-construction, construction, post-construction	SCS	
Wildlife	Cogeneration facility	N/A	N/A			
	Gas transmission line	Death, injury, or disturbance of wildlife during construction	NWP will restrict construction to time intervals that are least disturbing to wildlife. No heavy construction will take place between October 31 and March 31.	Construction	WDFW USFWS	revegetation plan in (SWPPP)
		Loss of habitat; disturbance of habitat	NWP will ensure that: - there is minimal impact on the riparian zone; - the amount of forest disturbed or removed is kept at a minimum; - adequate erosion control methods are used; - disturbed areas will be revegetated with native species.	Construction, post-construction		
	Substation	Disturbance of wildlife during construction	BPA will restrict construction to time intervals that are least disturbing to wildlife. No heavy construction will take place between October 31 and March 31.	Construction	WDFW USFWS	

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Wildlife (continued)		Electrocution of raptors	All powerlines will be constructed in accordance with guidelines of the Raptor Research Foundation	Post-construction	WDFW USFWS	
Air Quality	Cogeneration facility	Decreased air quality due to emissions	KEP will use BACT to limits emission of criteria and non-criteria pollutants (including ammonia to 10 ppm).	Pre-construction, construction, operation	WDOE	BACT assessment; Notice of Construction; NEPA review; SEPA review
			KEP will use selective catalytic reduction (SCR) to remove nitrogen oxides.	Operations		
			KEP will use fuels and good combustion techniques to minimize pollutant emissions.	Operations		
		Decreased Visibility in the Columbia River Gorge	KEP and Ecology will implement a visibility mitigation plan to reduce total suspended particulate levels from the existing SDS Lumber Mill to ensure no net decrease of visibility in the Columbia River Gorge Scenic Area.	Operations		
			KEP has volunteered to invest up to $200,000 to reduce visible emissions from the existing SDS plywood plant exhaust. The preferred method involves ducting exhaust gases from the plywood mill to the combustion air system of the existing SDS hog fuel boiler.	Operations		

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Air Quality (Continued)	Gas transmission line	Dust during construction	NWP will lightly water cleared areas should dust become a problem.	Construction	SCS	SWPPP; Environmental Report
	Substation	Dust during construction	BPA will lightly water cleared areas should dust become a problem.	Construction	SCS	ESCP
Public Health and Safety	Cogeneration facility	Hazards associated with materials such as fuel, ammonia, and clearing solvents	KEP will create a Health and Safety program to be used during and after construction.	Preconstruction, construction, operations	LIB	
	Gas transmission line	N/A	N/A			
	Substation	Hazards associated with materials, such as fuel, and cleaning solvents	BPA will develop an oil containment system and use a Hazardous Waste and Materials Plan (HWMP); the plan will ensure safe treatment, storage, and use of hazardous materials.	Construction, operations		
Noise	Cogeneration facility	Increased noise levels during operation	KEP will design the facility to mitigate noise to Washington State requirements of WAC 173-60 by using mufflers, silencers, noise insulation material, noise barriers, and enclosures.	Operations	City of Bingen, BPA	Washington State Regulations
	Gas transmission line	Increased noise levels during construction	NWP will ensure that construction noise will be maintained within Washington State Noise Limits (WAC 173-60).	Construction	WDOE	Washington State Regulations

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Noise (continued)	Substation	Increased noise levels during construction	BPA will ensure that construction noise will be maintained within Washington State noise limits (WAC 173-60).	Construction	WDOE	Washington State Regulations
Visual Quality	Cogeneration facility	Decreased visual quality in the Bingen area	KEP will ensure that: - Non-reflective coating will be used on all new steel structures; - Construction debris will be removed	Construction, operations	WDFW USFS	
	Gas transmission line	Decreased visual quality in the Bingen area	NWP will ensure that: - Revegetation will be done with native species; - Clearing will be minimized; - On the right of way on the White Salmon Bluffs vegetation will be retained as much as possible; larger saplings will be used to replace vegetation on cleared areas; - Construction debris will be disposed of in accordance with Federal, state and local regulations.	Construction, post-construction	WDFW USFS	Environmental Report
	Substation	N/A	N/A			

Table 1. Mitigation Action Plan Summary.

Affected Environmental Feature	Project Component	Potential Impact to be Mitigated	Mitigation Action and Party Responsible	Project Phase	Agency Consultation*	Reference Documents
Historical/ Cultural Resources	Cogeneration facility	N/A	N/A			
	Gas transmission line	Disturbance of archaeological or historical sites during construction	NWP will ensure that if any archaeological or historical sites are discovered during construction, work will cease in the area, the Washington State Historic Preservation Officer notified, and suitable mitigation actions taken.	Construction	OAHP	Environmental Assessment.
	Substation	Disturbance of archaeological or historical sites during construction	BPA will ensure that if any archaeological or historical sites are discovered during construction, work will cease in the area, the Washington State Historic Preservation Officer notified, and suitable mitigation actions taken.	Construction	OAHP	Environmental Assessment.

* List of Acronyms

ACOE	U.S. Army Corps of Engineers
BPA	Bonneville Power Administration
KEP	Klickitat Energy Partners
LIB	Washington Labor and Industries Board
NMFS	National Marine Fisheries Service
NWP	Northwest Pipeline Corporation
OAHP	Office of Archaeological and Historical Preservation
SCS	Soil Conservation Service
USFS	Unites States Forest Service
USFWS	United States Fish and Wildlife Service
WDFW	Washington Department of Fisheries and Wildlife
WDNR	Washington Department of Natural Resources
WDOE	Washington State Department of Ecology