Draft Environmental Impact Statement Coyote Springs Cogeneration Project Morrow County, Oregon

Bonneville
POWER ADMINISTRATION

DOE/DEIS-0201
January 1994

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

COYOTE SPRINGS COGENERATION PROJECT

DOE/EIS - 0201

**Bonneville Power Administration
U.S. Department of Energy**

January 1994

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Draft Environmental Impact Statement

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Responsible Agency: U. S. Department of Energy, Bonneville Power Administration (BPA)

Cooperating Agency: Federal Energy Regulatory Commission

Title of Proposed Action: Coyote Springs Cogeneration Project

State Involved: Oregon

Abstract: BPA is considering whether to transfer (wheel) electrical power from a proposed privately-owned, combustion-turbine electrical generation plant in Oregon. The plant would be fired by natural gas and would use combined-cycle technology to generate up to 440 average megawatts (aMW) of energy. The plant would be developed, owned, and operated by Portland General Electric Company (PGE). The project would be built in eastern Oregon, just east of the City of Boardman in Morrow County. The proposed plant would be built on a site within the Port of Morrow Industrial Park. The proposed use for the site is consistent with the County land use plan. Building the transmission line needed to interconnect the power plant to BPA's transmission system would require a variance from Morrow County. BPA would transfer power from the plant to its McNary-Slatt 500-kV transmission line. PGE would pay BPA for wheeling services.

Key environmental concerns identified in the scoping process and evaluated in the draft Environmental Impact Statement (DEIS) include these potential impacts: (1) *air quality impacts*, such as emissions and their contributions to the "greenhouse" effect; (2) *health and safety impacts*, such as effects of electric and magnetic fields, (3) *noise impacts*, (4) *farmland impacts*, (5) *water vapor impacts to transportation*, (6) *economic development and employment impacts*, (7) *visual impacts*, (8) *consistency with local comprehensive plans*, and (9) *water quality and supply impacts*, such as the amount of wastewater discharged, and the source and amount of water required to operate the plant. These and other issues are discussed in the DEIS.

The proposed project includes features designed to reduce environmental impacts. Based on studies completed for the DEIS, adverse environmental impacts associated with the proposed project were identified, and no evidence emerged to suggest that the proposed action is controversial.

BPA is mailing the DEIS to many agencies, groups, and individuals (see Section 8). BPA requests comments within a 45 day comment period, ending March 21, 1994.

To request copies of the EIS please contact: BPA's toll free document request line 1-800-622-4520 or:

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Summary

Bonneville Power Administration (BPA) is a Federal power marketing agency in the U. S. Department of Energy. BPA is considering whether to transmit (wheel) electrical power from a proposed privately-owned, gas-fired combustion turbine power generation plant in Morrow County, Oregon. The proposed power plant would have two combustion turbines that would generate 440 average megawatts (aMW) of energy when completed. The proposed plant would be built in phases. The first combustion turbine would be built as quickly as possible. Timing for the second combustion turbine is uncertain. As a Federal agency subject to the Nation Environmental Policy Act, BPA must complete a review of environmental impacts before it makes a decision on any action that may affect the environment. This Draft Environmental Impact Statement (DEIS) addresses the potential impacts from both combustion turbines, a proposed natural gas pipeline, and integrating transmission facilities.

Portland General Electric (PGE), an investor-owned utility, has asked BPA to transmit power for phase its proposed Coyote Springs Cogeneration Plant to PGE's customers in Portland, Oregon. PGE plans to build the cogeneration plant in eastern Oregon, just east of the City of Boardman. Cogeneration plants generate electricity in combination with a heat-producing process. The Coyote Springs Cogeneration Plant would burn natural gas to produce electricity and steam.

A 2.4 kilometer* (1.5 mile), 500-kilovolt (kV) transmission line would be built to interconnect the plant with a nearby BPA transmission line. Pacific Gas Transmission Company (PGT) would build a spur from a point on their existing pipeline northeast of Lone, Oregon, to the plant site. The proposed cogeneration plant, transmission line, and natural gas pipeline are parts of a single project.

S.1 Purpose and Need

BPA's transmission lines are used by both public and private electric utilities to transmit and market power. Under Federal law, if BPA has excess capacity on its transmission system, utilities or independent power producers can purchase capacity to carry power where it is needed.

BPA's Need - BPA must make a decision whether to provide wheeling services to PGE from PGE's proposed Coyote Springs Cogeneration Plant over BPA's McNary-Slatt 500-kV transmission line. BPA evaluated power loadings on the McNary-Slatt transmission line and determined that sufficient capacity is available on this line to wheel power from Phase I of the Coyote Springs Plant to the Portland, Oregon area.

* BPA uses metric measurements to comply with Public Law 100-418. See metric conversion chart on the inside of the back cover.

Wheeling power from PGE's proposed power plant would fulfill BPA's obligation under the Energy Policy Act of 1992 (Pub. Law 102-486, Sub. B., Sec. 722 (3) (i)). A decision to provide wheeling services would require amending or revising an existing transmission service agreement BPA has with PGE. PGE would pay BPA for the wheeling services.

PGE's Need - PGE's need for the proposed power plant is separate from BPA's. PGE needs to replace power lost when PGE's Trojan Nuclear Plant (Trojan) ceased operation. The Coyote Springs Plant would replace a significant portion of power lost from Trojan.

Purposes - Making a decision to provide wheeling services to PGE for the power produced at the proposed plant must accomplish the following purposes:

- Meet Federal, State, and local environmental requirements;
- Balance environmental impacts with economic costs;
- Assure consistency with BPA's statutory responsibilities; and
- Provide electrical system reliability that meets BPA's reliability criteria.

S.2 Proposed Action

BPA proposes to revise its general transmission agreement with PGE to establish Coyote Springs as a point of interconnection for wheeling services. To connect the proposed plant to BPA's main transmission grid, BPA would build a special structure, called a tap, next to its McNary-Slatt transmission line. BPA would also install microwave communication facilities to connect the plant with BPA's existing network, which operates the transmission system.

PGE proposes to build a 440 aMW cogeneration plant on a site within the Port of Morrow Industrial Park near the City of Boardman, Oregon. Associated facilities include an electrical substation, water storage tanks, cooling towers, workshop, warehouse and administrative offices. PGE also proposes to build a double-circuit 500-kV transmission loop line from the tap on BPA's transmission line to the proposed plant, a distance of about 2.4 km (1.5 miles).

PGT proposes to construct a 28.5-km (17.7-mile) pipeline from PGT's main natural gas transmission pipeline, which runs from near Stanfield to Malin, Oregon.

When the project is complete, power from the proposed plant would flow into BPA's system to one or more points of delivery in PGE's service area. PGE will pay BPA for this service.

S.3 No Action Alternative

Under the No Action alternative, BPA would not wheel the energy output from the proposed plant.

S.4 Affected Environment

The proposed Coyote Springs Plant would be in the Port of Morrow Industrial Park near the City of Boardman, in Morrow County. The proposed plant would be on an 8-hectare (20-acre) site in an unincorporated portion of Morrow County. The site is outside the City of Boardman, but within its urban growth boundary. Surrounding land uses are industrial.

The primary land use in the area near the proposed plant is related to gravel extraction and agriculture. This part of eastern Oregon is arid, and most crops require irrigation.

The proposed right-of-way for the transmission line is along existing utility corridors or lands zoned for industrial use.

Land Use

Land use of the proposed plant site is vacant. The surrounding land uses are industrial. The current land uses within the transmission line corridor include vacant lands, a public right-of-way, a concrete batch plant, a portion of the City of Boardman's sewage treatment facility, and an irrigated agricultural field.

Recreation Resources

Recreation opportunities near the proposed plant site include facilities for hunting, fishing, picnicking, swimming, sailboarding, boating, nature observation, and hiking. There are no recreation facilities and limited opportunities for recreation within the proposed right-of-way for the transmission line or at the cogeneration plant site.

Messner Pond, in the Port of Morrow near the proposed plant site, is occasionally fished for warm water species, primarily bass and walleye. Messner Pond is also used by Morrow County residents and passing tourists for birdwatching and wildlife viewing.

Because there are many existing recreation facilities nearby, no new recreation facilities or opportunities are planned because of the proposed plant or its workforce.

Natural Resources

Soils and Geology - The proposed plant site is on excessively drained loamy fine sand deposits near the Columbia River, underlain by rocks of the Columbia River Plateau Basalt Group and the Dalles Formation.

Water Resources - Three surface water systems occur within or adjacent to the plant site: the Columbia River; Messner Pond; and gravel mining ponds.

Groundwater in the area is almost fully allocated for municipal, industrial, domestic and irrigation uses with the Columbia Plateau. Use of groundwater has lowered the water level in some portions of the regional deep aquifer. Water quality in shallow alluvial wells is generally poor; water from these wells is generally used for irrigation.

The Port of Morrow uses the shallow alluvial aquifer and the deep basalt aquifer for water.

Wetlands - A wetland borders Messner Pond and is near the transmission line route.

Vegetation - Plants found at the proposed site are common in the Boardman-Umatilla, Oregon area and are characteristic of disturbed communities of the shrub-steppe vegetation zone in the Columbia Basin. Vegetation is primarily adapted to a dry environment and is not native.

Messner Pond is surrounded by emergent wetlands grading into forested wetlands.

No Federally-listed threatened or endangered plant species are known to occur within the project area. Three species of concern, Thompson's sandwort (*Arenaria franklinii* var. *thompsonii*), Lawrence's milkvetch (*Astragalus collinus* var. *laurentii*), and Columbia cress (*Rorippa columbiae*), may be found in the project area. These species are listed as "sensitive" by the Oregon Natural Heritage Data Base. A survey for these plants in 1993 found none on or near the plant site or transmission line route.

Fish and Wildlife - The proposed plant site is outside of any wilderness study, research, natural, wildlife, or other similarly designated area. However, many wildlife and fish species are found within the vicinity. Several designated wildlife refuges and other natural areas are nearby.

Wildlife use of the site is limited by poor quality habitat plus ongoing industrial activities and adjacent development. Some small mammals and birds may be found in the area. Small ponds also provide some limited aquatic habitat for waterfowl, shorebirds and amphibians.

No Federally-listed endangered or threatened species were recorded during a recent field survey, but three state sensitive species and one Federal candidate species were noted in the vicinity. Identified species are considered typical of regional fauna within existing habitats.

Wildlife use of the transmission line route is likely restricted to those species associated with industrial sites or disturbed shrub-steppe habitat.

Air Quality

Morrow County is designated by EPA as an unclassified/attainment area for regulated air pollutants. The Wallula area in Washington (northeast of the proposed facility) has been determined by EPA to be a moderate nonattainment area for particulate matter. Benton County, Washington, also north of the proposed plant, is being considered for classification as a moderate nonattainment area for particulate matter. Class I airsheds within 200 km (120 miles) of the proposed facility are the Mt. Hood Wilderness Area, the Eagle Cap Wilderness, the Strawberry Mountains Wilderness, and the Columbia Gorge Scenic Area.

Socioeconomic

Social and economic characteristics that identify the northern portion of Morrow and Umatilla counties include a sparsely settled rural area of eastern Oregon with an economy primarily based on agriculture. The area is served by a well-developed transportation system, including Interstate 84, the Union Pacific Railroad and the Columbia River.

Public Health and Safety

Noise - Noise levels were measured at six noise-sensitive locations. Existing noise levels within and adjacent to the Port of Morrow Industrial Park are quite high. At two noise recording sites, noise levels exceeded Oregon noise standards.

Electric and Magnetic Fields (EMF) - Electric wiring, household appliances, and electrical equipment produce electric and magnetic fields. The project area is vacant, but surrounded by existing industrial land uses. Existing agricultural processing plants, other development, and electric distribution lines produce electric and magnetic fields in the project area. Existing field strengths were not measured. Scientific evidence has not established a cause-and-effect relationship between electric or magnetic fields and adverse health effects, so specific health risks are unknown.

Visual Resources

The project area is located on low plateau land forms near the Blue Mountains and adjacent to the Columbia River. The project visual impact area is characterized by interspersed irrigated agricultural lands; natural areas consisting of lakes, ponds, reservoirs, wetlands and stands of Russian olive, willows, and cottonwoods; and commercial, residential and industrial

development found on surrounding Port of Morrow and City of Boardman lands. A gravel quarry, cranes, potato processing plants, wood chipping company, etc. developed at the Port have established a strong industrial character to the immediate area surrounding the site. The adjacent Columbia River (Lake Umatilla), Messner Pond, Coyote Springs Wildlife Refuge and the Umatilla Wildlife Refuge add a dominant natural character to the areas surrounding Port land on the north and east sides. The large Boardman Coal Plant and stack also add a strong industrial visual element in the area. There are over 25 locations in the visual impact area where activities with viewing sensitivity occur such as wildlife observation, hiking, golfing, sailboarding, picnicking, fishing, and hunting.

Cultural Resources

The project site is within the Southern Columbia Plateau culture area, which contains prehistoric sites dating from 11,000 to 200 years before present (B.P.). Lewis and Clark visited the area in 1805-06. Umatilla, the largest town in the area, was founded during the gold rush of 1860. As the mining boom slowed in the 1870s, agriculture became increasingly important. Today, agriculture is still a significant portion of the area's economy and culture.

S.5 Environmental Consequences

BPA analyzed potential environmental effects of the proposed Coyote Springs Plant, its related facilities, and the No Action alternative by living and non-living resource type (e.g., geology, water resources, etc.). The environmental analysis also considers Federal, state, and local regulations. Tables 5-1, 5-12 and 5-13 summarize major impacts that would be created by the plant, transmission line, and pipeline, and proposed mitigation.

Land Use Impacts

The proposed plant, transmission line, and other related facilities would be consistent with the industrial character of the surrounding area. Land uses would be converted from vacant, gravel extraction and agricultural lands to an industrial use. The land use change for the proposed plant would be consistent with existing land use plans and current zoning. The transmission line in the proposed corridor would require a variance from Morrow County.

Recreation Resource Impacts

Construction would create short-term noise impacts that could disturb recreation opportunities. No other recreation impacts are expected.

Natural Resource Impacts

Soils and Geology - Minimal impacts to soils are expected. Disturbed areas will be revegetated to avoid wind erosion.

Water Resources - No direct impacts to the Columbia River or the deep water habitat of Messner Pond are expected. Impacts are not expected to occur to forested wetlands adjacent to the pond. The impacts to the existing irrigation pond during plant construction would be direct and long term. The impact would be caused by filling part of the pond for the plant's foundation.

Wetlands -No impacts to wetland plant communities are expected from construction or operation of the plant or transmission line.

Fish and Wildlife - Filling the gravel pond at the plant site would eliminate low-quality fish habitat. No impacts on water quality or to fish habitat would occur in the Columbia River or Messner Pond from construction or operation of the proposed project.

About 8 ha (20 acres) of wildlife habitat of varying quality would be permanently lost from construction of buildings and other project facilities at the main plant site. Some direct mortality of wildlife could occur during project construction.

Wildlife use of Messner Pond and surrounding habitat could be disturbed temporarily during construction. Seasonal bald eagle use of Messner Pond could be inhibited during construction by disturbances created by construction activities. Visual disturbances during plant operation are not expected as eagles are likely to become acclimated to stationary buildings in the area.

No bald eagle habitat would be lost as a result of project implementation. Although four species of concern were documented to occur in the project area, only the bank swallow colony on the plant site would be impacted by the proposed plant. Electrocuting of raptors is unlikely due to the configuration proposed for the 500-kV transmission towers.

Air Quality Impacts

Air emissions from the proposed Coyote Springs Plant would fall below the significance levels of Oregon and Washington and will meet air quality standards. The plant is not expected to emit odors. The project will use natural gas to fire the combustion turbines. Natural gas is primarily methane, a greenhouse gas. Methane has a low carbon content, and natural gas combustion produces less carbon dioxide than coal and petroleum products. The project will also emit N_2O and NO_x , which are also greenhouse gases. These emissions will be controlled by best available control technology. The facility is not expected to significantly contribute to downwind acid rain. Photochemical pollutants (smog) are not expected to accumulate near the plant due to existing air, wind and sun radiation conditions in the area.

Socioeconomic Impacts

The proposed plant and related facilities should increase the assessed value of Morrow County by 20-40 percent, depending on whether PGE builds one combustion turbine or two. Operation of the cogeneration plant will provide full-time employment for 20-30 people. Overall, the proposed project should have a positive influence on the local economy over the expected life of the facility.

Public Health and Safety Impacts

Air Quality - No health impacts are anticipated from the low amounts of toxic air substances released by the plant.

EMF - Workers in the Coyote Springs Plant and occupants of buildings closer than 150 m (500 ft.) may be exposed to EMF. Scientific evidence relating to EMF has not yet established a cause-and-effect relationship between electric or magnetic fields and adverse health effects. BPA is unable to predict specific health risks, or specific potential levels of disease from exposure to EMF.

Noise - The proposed plant may create short-term noise increases of up to 10 dBA during certain atmospheric conditions. Transmission lines also create noise through a process called corona activity. No significant noise impacts are expected. Noise from the plant and the transmission line will meet Oregon noise standards.

Visual Resources

The project would have visual impacts varying from low to high on 13 sensitive viewer observation areas (25 total) found in the visual impact area. The only visual impact rated high would be to travelers on I-84 where over 9,450 travelers a day would be exposed to views of the project at less than 2.4 km (1.5 miles). Tall stacks, steam emissions and transmission towers are elements of the project that would be the most visible.

Cultural Resources

A site-specific survey for cultural resources was completed. The proposed plant would not be on or within any known historic, cultural, and/or archeological resources.

No Action Alternative Impacts

The No Action alternative would remove the potential impacts from the Coyote Springs Plant at the proposed site. Because PGE needs to find replacement power, PGE would likely build a similar plant at a different location or purchase power from independent power producers. The surplus capacity available on the transmission system could be used by other utilities or independent power producers.

S.6 Consultation, Permits and Review

Several Federal laws and administrative procedures must be met by the proposed action. Details of how the proposed action complies with these requirements is given in Section 6.

S.7 Cumulative Impacts

Cumulative impacts are created over time when minor individual actions combine with past, present, and future actions to cause significant actions. Within this context, several cumulative impacts are foreseeable.

Global Warming - The Coyote Springs Plant would release greenhouse gases. Greenhouse gases contribute to global warming.

The proposed Coyote Springs Plant, together with PGE's existing Boardman Coal Plant, and proposed cogeneration plants in Hermiston, Oregon would cumulatively emit a fairly large amount of greenhouse gas. The proposed plants would use natural gas as their primary fuel. Natural gas combustion produces less green house gas than coal or petroleum fuels.

Because cogeneration plants provide steam to nearby industries that would otherwise produce steam from fossil fuels, greenhouse gas emissions are partially offset by reductions in fossil fuel consumption by steam users.

One mitigating action that could offset CO₂ emissions is planting trees that use airborne CO₂ to grow. PGE has decided to not undertake CO₂ offset mitigation at this time.

Reduced Transmission Capacity - Integrating the Coyote Springs Cogeneration Plant over BPA's transmission system would diminish surplus capacity on BPA's McNary-Slatt 500-kV transmission line. If the Coyote Springs Plant and two other proposed plants are built, demands would exceed BPA's existing transmission system capabilities over this transmission line. Using projected completion dates for these units, BPA would need to install additional transmission capacity by the year 2000.

Groundwater - The Coyote Springs Plant, together with the other proposed power plants and industrial developments in the Columbia Basin, could impact groundwater resources. The cumulative impact of the proposed generation plants coupled with industrial developments that use process steam could cause future requests for groundwater rights to be restricted in favor of parties holding senior water rights.

Water used from the shallow aquifer in the Columbia Basin could affect recovery plans for threatened or endangered salmon. Shallow water aquifers are hydrologically connected to the Columbia River. The shallow water wells that serve the Port of Morrow and, in turn, the Coyote Springs Project, may face restrictions in future years.

Regional Energy Resource Needs - The Coyote Springs Plant, together with the combustion turbine generation projects proposed near Hermiston, if completed, would provide over 1300 aMW of energy. BPA's 1992 *Pacific Northwest Loads and Resources Study* projects a 3,425 MW deficit in 2003 based on the medium load forecast. These plants, in combination, would satisfy a significant portion of the Northwest's forecast energy needs.

Tax Revenue - Construction of the Coyote Springs Plant in Morrow County and two additional plants in Hermiston could offset tax reduction measures mandated by Oregon's Measure 5 for local governments. The State of Oregon could also benefit, in that the State, under Measure 5, has the responsibility of providing funding for the local school districts beyond the maximum of \$5/\$1000 of valuation that can be collected for tax year 1995/96 and beyond.

Temporary Housing Shortage - A shortage of temporary housing facilities in the area could result if all three cogeneration projects' peak construction periods occur concurrently. Construction of large-scale cogeneration plants, such as the proposed projects, normally take place over an 18-24 month period. At peak construction, the Coyote Springs Project would require about 200 workers on-site. At peak construction, the other proposed projects would require about 700 workers on-site.

Natural Gas Supply - The source of natural gas for the proposed cogeneration plant is from actively producing gas fields in Alberta and British Columbia, Canada. The number of natural gas wells that would be needed to supply PGE requirements was estimated by PGT. The average total yield of Canadian natural gas wells was divided into the total requirements of the Coyote Springs Plant (41 billion BTUs per day). Using this method, the output of 16 gas wells would be used each year by the Coyote Springs Plant (PGT, 1993). For perspective, 4,000 Canadian gas wells were drilled in 1991 and the total number of wells in Canada number in the 100's of thousands (PGT, 1992). Thus, the Coyote Springs Plant would use only a small amount of gas compared to that available in Canada. The world's proven reserves are expected to last about 58 years at the present consumption rate (*Inside Energy/with Federal Lands*, 1993).

1. Introduction

Congress gave Bonneville Power Administration (BPA) the responsibility to supply electrical power to its utility, industrial, and other customers in the Pacific Northwest. Congress also directed BPA to build and operate high-voltage **transmission lines**¹ to move electric power from hydroelectric dams, and **generation** plants fired by many types of fuel.

BPA owns and operates over 24,000 circuit kilometers (km²) (15,000 miles) of transmission lines in the Pacific Northwest. These transmission lines are used by both public and private electric utilities to transmit and market power throughout the region.

Portland General Electric (PGE), an investor-owned utility, has asked BPA to transmit power from its proposed Coyote Springs Cogeneration Plant to PGE's customers in Portland, Oregon. PGE plans to build the **cogeneration** plant in eastern Oregon, just east of the City of Boardman (see Figure 1-1). Cogeneration plants typically generate electricity in combination with a heat-producing process. The Coyote Springs Cogeneration Plant would use **natural gas** to produce electricity and steam.

**Figure 1-1
Project Location**

¹ Words in Boldface/italics are defined in Chapter 10, Glossary/Acronyms

² BPA uses metric measurements to comply with Public Law 100-418. See metric conversion chart on the inside of the back cover.

The Coyote Springs Project would have two **combined-cycle combustion turbines (CTs)** with a total electrical output of 440 **average megawatts (aMW)**. The plant would also supply steam to steam customers. A 500-**kilovolt (kV)** transmission line would be built to interconnect the plant with a nearby BPA transmission line. A natural gas pipeline spur would be built by Pacific Gas Transmission Company (PGT) from a point on their existing pipeline northeast of Lone, Oregon, to the plant site. The proposed cogeneration plant, transmission line, and natural gas pipeline are parts of a single project.

In July 1993, BPA published a Notice of Intent to prepare an **environmental impact statement (EIS)** on wheeling power generated from PGE's proposed Coyote Springs Cogeneration Plant through BPA's **transmission** system. The proposed plant would be built in phases. The first combustion turbine would be built as quickly as possible. Timing for the second combustion turbine is uncertain. This EIS addresses all potential impacts from both combustion turbines.

BPA has assumed the role of lead agency for the Federal EIS on the Coyote Springs Cogeneration Project. The **Federal Energy Regulatory Commission (FERC)** is a **cooperating agency**. FERC will prepare an EIS for PGT's Second Northwest Expansion Project, which proposes 140 km (90 miles) of new pipelines and compressor stations within Oregon. The pipeline to the Coyote Springs Plant will be evaluated separately by FERC in their EIS.

The State of Oregon Energy Facility Siting Council (EFSC) is currently evaluating PGE's *Application for a Site Certificate on the Coyote Springs Cogeneration Project*. Oregon's site evaluation process, like the **National Environmental Policy Act (NEPA)** process, provides opportunity for public participation. BPA is coordinating its NEPA process with the State of Oregon.

1.1 Public Involvement

The process to find out the concerns individuals, groups and agencies may have about a proposed project is called **scoping**. BPA's Notice of Intent included a 30-day scoping period, which ended August 6, 1993. During the scoping period, BPA accepted comments about issues to be addressed in this EIS.

BPA also held a public scoping meeting at Riverside High School in Boardman, Oregon on July 29, 1993. The public meeting was announced in the Notice of Intent, local newspaper ads, and in a notice sent to those on the project mailing list including Federal, State, and local governments; environmental organizations; landowners within 2 km (1.2 miles) of the site; and nearby **depository libraries**.

PGE prepared a fact sheet to help people understand key elements of the project.

Comments received during the scoping meeting and through written communications included these issues:

- Air quality impacts
- Noise impacts
- Water resources impacts
- Farmland impacts
- Water vapor impacts to transportation
- Economic development and employment impacts
- Electromagnetic field impacts to health and safety
- Visual impacts
- Consistency with local comprehensive plans

Issues identified during the scoping process are discussed in this draft EIS (DEIS).

BPA requests comments on the DEIS by March 21, 1994. A DEIS review meeting will be held in Boardman in late February 1994. The date, time and place of this meeting will be advertised in local newspapers and in a letter to those on the project mailing list. After the comment period, BPA will study the comments received and prepare responses to the comments. Comments and responses will be included in the final EIS.

BPA will use the FEIS to help decide whether to provide wheeling services to PGE. No action can be taken on the transmission part of this project until 30 days after the FEIS is made public. BPA will prepare a **Record of Decision** that explains BPA's decision on the project.

2. Purpose and Need for Action

BPA's transmission lines are used by both public and private electric utilities to transmit and market power. If BPA has excess **capacity** on its transmission system, utilities or independent power producers can purchase capacity to carry power where it is needed. Using BPA's transmission system to move power from one system to another system is called "**wheeling**." PGE has asked BPA to wheel power from PGE's proposed Coyote Springs Cogeneration Plant over BPA's 500-kV McNary-Slatt transmission line to the Portland, Oregon metropolitan area. The proposed Coyote Springs Cogeneration Plant site is close to this BPA transmission line.

2.1 Need for Action

BPA's Need - BPA needs to decide whether to provide wheeling services to PGE from the proposed Coyote Springs Cogeneration Plant over BPA's McNary-Slatt 500-kV transmission line. (Pub. Law 102-486, Sub. B., Sec. 722 (3) (i).) BPA evaluated power loadings on the McNary-Slatt transmission line and determined that sufficient capacity is available on this line to wheel power from the Coyote Springs Plant.

Wheeling power from PGE's proposed power plant would fulfill BPA's obligation under the Energy Policy Act of 1992 to provide wheeling services if excess capacity exists on BPA's transmission system. A decision to provide wheeling services would require amending an existing transmission agreement BPA has with PGE for such services. PGE would pay BPA for providing wheeling services.

PGE's Need - PGE's need for constructing the proposed project is separate from BPA's. PGE's need is to replace power lost when PGE's Trojan Nuclear Power Plant (Trojan) ceased operation. The Coyote Springs Cogeneration Project would replace a significant portion of power lost from Trojan. Trojan provided PGE with 481 aMW of energy.

On January 4, 1993 PGE announced it would permanently close Trojan on April 1, 1996. Trojan has not generated power since the closure was announced. Finding energy resources to replace the **energy** supplied by Trojan is an immediate need for PGE. This need was particularly apparent in the winter of 1992-93 when consumer demands for energy exceeded PGE resources.

The Coyote Springs Cogeneration Plant would replace 440 aMW of energy previously provided by Trojan. The facility would be constructed in two phases (220 aMW each). The first phase would be completed as quickly as possible to counter adverse economic impacts associ-

PGE's loads and resources forecast for 1993-2003 shows resource deficits increasing for each successive year. Resource deficits range from 104 MW in 1993-94 to 884 MW in 2003-04.

PGE's 1992 Integrated Resource Plan identified a Least Cost Plan to meet their customers' energy needs. PGE's preferred resource strategy proposed a wide range of new energy resources:

- 314 aMW of energy efficiency
- 100 aMW of renewable resources (wind and geothermal)
- 100 aMW from repowering the existing Beaver CT plant
- 260 aMW from various other resources, including cogeneration
- Replacing Trojan with resources that have operating, cost and environmental characteristics of gas-fired, combined-cycle CTs
- Building or acquiring 500 aMW of combined-cycle CT power by 1996

PGT's Need - The proposed Coyote Springs Natural Gas Pipeline Extension is needed to enable PGT to transport natural gas to PGE's proposed plant. The Coyote Springs extension would be supplied by PGT's mainline, which runs from Stanfield to Malin, Oregon.

FERC must review and approve all interstate pipelines. FERC requires that applications for review and approval of new pipeline projects contain "Resource Reports" containing environmental information. Resource reports allow FERC to quickly begin their NEPA review. FERC plans to prepare an EIS addressing not only the Coyote Springs Natural Gas Pipeline Extension but several other PGT pipeline expansion proposals collectively referred to as PGT's Second Northwest Expansion Project (SNEP). To avoid duplicate environmental coverage for the pipeline, FERC provided a summary of pipeline impacts which BPA includes in Section 5.1.3 and Table 5-12.

2.2 Purposes For Action

Making a decision to provide wheeling services to PGE for the power produced at the proposed Coyote Springs Plant must accomplish the following purposes:

- Meet Federal, State, and local environmental requirements;
- Balance environmental impacts with economic costs;
- Assure consistency with BPA's statutory responsibilities; and
- Provide electrical system reliability that meets BPA's reliability criteria.

2.3 Other Proposed Energy Resources in the Area

Two cogeneration projects are proposed near Hermiston, Oregon, 40 km (25 miles) east of Boardman.

U. S. Generating Company's Hermiston Generation Project - U. S. Generating Company proposes to build a combined-cycle cogeneration power plant with two combustion turbines fueled by natural gas. Expected output of the plant is 474 MW under annual average conditions at the site, assuming full **load**. U. S. Generating Company plans to connect the plant to BPA's existing transmission grid at McNary Substation.

Energy produced at the plant would be acquired by PacifiCorp (**d.b.a.** Pacific Power and Light -PP&L) for its customers in the Northwest. PP&L requested transmission wheeling services from BPA in August 1993. BPA is beginning system studies to define a plan for integrating the power produced. BPA studies show that existing BPA transmission lines have enough capacity to wheel the output of the proposed plant under most operating conditions. BPA is producing an EIS for this project.

Hermiston Power Project - J. R. Simplot Company, IDA-West Energy, and Trans Canada Pipelines Limited are proposing to build a 430 aMW combined-cycle CT cogeneration plant also near Hermiston, Oregon. The Hermiston Power Project was proposed in response to BPA's Resource Contingency Program. In this program, BPA solicited proposals for projects that BPA could option and purchase power from when needed.

Project sponsors were asked to propose projects that met certain requirements. Proposals were ranked and sponsors with potential projects to meet BPA's needs were selected to begin negotiations.

The Hermiston Power Project was selected for negotiations in BPA's Resource Contingency Program process. Negotiations and an EIS are underway.

3. Proposed Action and Alternatives

A number of actions, each an integral part of an overall action collectively called the Coyote Springs Cogeneration Project, are described below. More extensive descriptions for actions that have environmental consequences are provided later in this section.

3.1 Proposed Action

The BPA/PGE Transmission Agreement Would be Revised - BPA proposes to revise its general transmission agreement with PGE to establish Coyote Springs Plant as a point of interconnection for wheeling services. BPA and PGE currently have a transmission agreement through which PGE's power is delivered over BPA transmission lines. If BPA decides to wheel power from the plant, this agreement would be revised and reauthorized. The amended agreement would cover wheeling for power from the first combustion turbine at the plant. When PGE decides to complete the second combustion turbine, BPA will evaluate the transmission system, and provided sufficient capacity exists. The timing of the second combustion turbine is uncertain.

BPA's Transmission System Would be Modified - BPA proposes to modify its transmission system to connect Phase I of the new Coyote Springs Cogeneration Plant to BPA's main transmission grid. A transmission line tap and loop line is proposed to connect the plant with BPA's McNary-Slatt 500-kV transmission line. Microwave communication facilities to connect the plant with the existing network that operates BPA's transmission system would be installed at the plant.

PGE Would Build a 440 aMW Cogeneration Plant - PGE proposes to build a 440 aMW cogeneration plant on a site within the Port of Morrow (Port) Industrial Park near the City of Boardman, Oregon. The project would be built in phases. The first combustion turbine (220 aMW) would be built as quickly as possible. Timing for the second combustion turbine is uncertain. Associated facilities that would be installed at the plant site include an electrical substation, water storage tanks, cooling towers, workshop, warehouse and administrative offices.

PGE Would Design and Build a 500-kV Loop Line - PGE also proposes to build a **double-circuit** 500-kV transmission **loop** line from the **tap** point on BPA's transmission line to the Coyote Springs Plant, a distance of about 2.4 km (1.5 miles). Map 1 provides an overview of the area and transmission line route. An aerial photograph of the Coyote Springs Project area, Map 2, shows the proposed locations for these facilities. Upon energization of the Coyote Springs Plant, ownership of the loop line would be transferred to BPA. BPA would then own, operate and maintain the transmission line.

PGT Would Build a Gas Line to the Plant - PGT proposes to construct a 28.5 km (17.7 mile), 30 cm (12 inch) pipeline from PGT's main transmission line which runs from near Stanfield to Malin, Oregon. The proposed route for the gas pipeline is shown on Map 1. The purpose of the Coyote Springs Extension is to enable PGT to transport 41 billion **British thermal units (BTUs)** per day of natural gas to the proposed Coyote Springs Cogeneration Plant.

BPA Would Charge PGE for Transmission Wheeling Services - If the proposal is completed, power would flow from the Coyote Springs Plant into the BPA system and west to one or more points of delivery in PGE's service area. PGE would pay BPA for wheeling power from the Coyote Springs Plant to its load. If PGE pays for any portion of the cost of the new BPA-owned transmission facilities, BPA would reflect this contribution in the rate development process. Any cost associated with these facilities that is not paid by PGE would be recovered in the rates from transmission system network users.

3.1.1 How the Proposed Action was Defined

The Coyote Springs Cogeneration Project was conceived in 1990 by Power Link, a subsidiary of PGE. In 1991, PGE offered output from the project to BPA under the Competitive Resource Acquisition Pilot Program in response to BPA's Request for Proposals for 300 aMW of **firm energy**. BPA received resource proposals totalling 5,209 aMW of generation and 116 aMW of conservation. BPA did not select PGE's proposal.

In early 1993, PGE decided to proceed independently with the Coyote Springs Cogeneration Project to partially replace energy formerly provided by Trojan. An existing BPA transmission line corridor passes near the proposed plant site. PGE has requested transmission wheeling services for from BPA to deliver energy from Phase I of the proposed project to the Portland, Oregon area. BPA electrical system planners evaluated the transmission system and determined there is ample capacity to provide wheeling services for the first turbine.

Because BPA will not acquire energy from the project, this DEIS does not consider other generation resources, load shaping, fuel switching or conservation.

3.1.2 Location of the Proposed Project

The proposed project will be near the City of Boardman, Oregon in the northern half of Section 10, Township 4 North, Range 25 East of the Willamette Meridian in Morrow County, Oregon. The plant would be within the Port of Morrow Industrial Park, about 190 m (625 ft.) south of the Columbia River.

The cogeneration plant will be on an approximately 8-ha (20-acre) site within the Port of Morrow Industrial Park (see Maps 1 and 2). The site is bordered on the west by Ullman Boulevard, on the north by the Union Pacific Railroad, on the east by a Port water storage pond and on the south by a gravel road owned and maintained by the Port.

Coyote Springs Project

Project Area

- ▲ Existing BPA Substation
- ▲ Proposed Plant Site
- Existing BPA Transmission Line
- Gas Pipeline
- Proposed Pipeline Extension

Map 1

Coyote Springs Proj e

The proposed double-circuit 500-kV transmission loop line would exit the plant substation and run east about 91 m (300 ft.) north and parallel to Umatilla Electric Cooperative's transmission lines to an angle point within an existing concrete batch plant site. From this point the loop line would travel in a southeasterly direction to BPA's existing transmission corridor. The new transmission loop line interconnects with BPA's McNary-Slatt 500-kV transmission line immediately north of Interstate Highway 84 (I-84), just before the transmission corridor crosses the highway.

PGT's proposed pipeline route follows part of the eastern border of the Boardman Bombing Range (see Map 1). The pipeline crosses I-84 near the transmission line tap and generally follows the transmission loop line route to the Coyote Springs Plant.

3.1.3 The Coyote Springs Cogeneration Project

A detailed description of the Coyote Springs Cogeneration Project was provided by PGE in Exhibit B of PGE's *Application for Site Certificate*, submitted to Oregon's EFSC on September 16, 1993. A summary of the information follows:

Primary Plant Components

Descriptions of plant components as shown on the Coyote Springs Project Plot Plan, Figure 3-1, are provided below. Statistics on project components are summarized in Table 3-1.

Heat Recovery Steam Generator - The heat recovery steam generator's function is to combine the high pressure and intermediate pressure steam produced by the combustion process to generate additional electric power. One heat recovery steam generator will be provided for each gas turbine generator installed at the plant.

Combustion Turbine Generator - Two General Electric "Frame 7FA" gas turbine generators will be used. Each gas turbine generator will be installed with all auxiliary equipment, including the gas turbine itself, inlet filters, silencer compartment, hydrogen-cooled electrical generator, lube oil coolers, water injection skid, compressor water wash skid, acoustical enclosure, and complete control system.

Steam Turbine Generator - Two steam turbine generators will convert the waste heat recovered in the heat recovery steam generator into electricity. **Superheated** process steam will be extracted from each steam turbine generator for process needs. The process steam will be cooled as necessary to provide saturated steam to the industrial user.

Cooling Tower - A multi-cell cooling tower will reject steam cycle heat (by evaporation) from passing through the main condensers and provide cooling water for miscellaneous equipment coolers. The tower will be 18 m (60 ft.) wide, 91 m (300 ft.) long and 12 m (40 ft.) high.

Figure 3-1

Coyote Springs Cogeneration Plant Plot Plan

Legend

- ① Heat Recovery Steam Generator
- ② Combustion Turbine Generator
- ③ Steam Turbine Generator
- ④ Cooling Tower
- ⑤ Plant Substation
- ⑥ Transformers
- ⑦ Power Circuit Breaker
- ⑧ Substation Dead End Structure
- ⑨ Gas Metering Building
- ⑩ Auxiliary Equipment Building
- ⑪ Main Turbine Building
- ⑫ Administration/Control Building
- ⑬ Ammonia Storage Tanks
- ⑭ Storm Water Detention Basin
- ⑮ Demineralized Water Tank
- ⑯ Condensate Storage Tank
- ⑰ Fire Water Storage Tank

North
→
Not to Scale

Source: Ebasco Services Incorporated

Plant Components	Quantity	Size/Dimensions
Combustion Turbine Generator	2	Output: 184.4 MW each
Heat Recovery Steam Generator	2	64 m (210 ft.) exhaust stack
Steam Turbine Generator	2	Output: 79.3 MW each
Auxiliary Boiler	2	136,078 kg (300,000 lb.) of steam/hour 55 m (180 ft.)
Cooling Tower	2	L= 91 m (300 ft.) W=18 m (60 ft.) H= 22 m (72 ft.)
Auxiliary Equipment Building	1	2230 sq. m (24,000 sq. ft.). Height: 14 m (45 ft.)
Main Turbine Building	1	4459 sq. m (48,000 sq. ft.). Height: 24 m (80 ft.)
Administrative Control Building	1	Two story building. 465 sq. m (5000 sq. ft.) each side
Ammonia Storage Tank	2	45.4 cu. m (12,000 gal.) each.
Demineralized Water Tank	2	1514 cu. m (400,000 gal.) Height: 8.5 m (28 ft.)
Condensate Storage Tank	1	1703 cu. m (450,000 gal.) Height: 9.1 m (30 ft.)
Fire (Raw) Water Storage Tank	1	1136 cu. m (300,000 gal.) Height: 6 m (20 ft.)
Transmission Components		
Plant Substation and Control House	1	Fenced yard = 195 m x 107 m (640 ft. x 350 ft.)
500-kV Single-Phase Step-up Transformer	7	L=12 m (40 ft.) W= 10 m (30 ft.) H= 12 m (40 ft.)
500-kV Circuit Breaker	1 initially (2-4 final)	L= 12 m (40 ft.) W= 1.5 m (5 ft.) H= 12 m (40 ft.)
Substation Deadend Tower	2	L= 7.6 m (25 ft.) W= 24.4 m (80 ft.) H= 24.4 m (80 ft.)
Microwave Tower and Antenna	1	Height: 38 m (125 ft.)
500-kV Double-Circuit Transmission Loop Line	1	L=1.6 km (1- mile)
Transmission Line Tower	7	H=52 m (170 ft.)
Tap Structure	1	H=52 m (170 ft.)
Transmission Line Right-of-way	Easement	W= 45.7 m (150 ft.)
Clearing/Disturbance		930 sq. m (10,000 sq. ft.) at tower sites.

	Other Characteristics
	Fuel: Natural Gas. Air Emission Controls=Dry-low NOx technology.
	Ammonia injection system and selective catalytic reduction systems to reduce NOx emissions.
	Fuel: Natural Gas. Also produces steam for industrial users.
Exhaust stack	Fuel: Natural Gas. Produces steam when plant is shut down.
Height: 40 ft.	Mechanical draft towers, two-speed fans force air through the towers, high-efficiency drift eliminators provided. Blowdown system to remove buildup of dissolved solids. Uses 8.9 cu. m (2,331 gal.) of water/minute. Blowdown 9.5 cu. m (666 gal.) per minute.
	Will house the water treatment and auxiliary boilers.
	Will house the combustion turbines and steam turbine generators.
Height: 9 m (30 ft.)	Will house the control room, administration offices, electrical room, maintenance shop and a small warehouse.
	Delivered by truck to the site. Used in NOx emission control system.
	Metal tank on concrete foundation. Storage of demineralized water for use in the steam cycle.
	Metal tank on concrete foundation. Storage of water condensed and returned from steam users.
	Metal tank on concrete foundation. On-site storage of well water.
	Outdoor, gravel surfaced, security fenced yard. Termination site for loop line. Step up transformers, power circuit breakers and sectionalizing switches located in the plant substation. The substation control house will house microwave radios, control devices, and metering equipment.
Height: 30 ft.	The step-up transformers will boost the voltage from that of the generators to 500-kV. Each transformer contains 45.4 cu. m (12,000 gal.) of cooling oil.
Height: 23 ft.	Gas insulated circuit breakers automatically interrupt the flow of electrical current. Circuit breakers are necessary to switch transmission lines open or closed for maintenance or outage conditions.
Height: 7 m (114 ft.)	Towers within the confines of the substation where incoming and outgoing transmission lines end.
	Steel structure to elevate microwave antenna to provide line of sight path to BPA's McNary Microwave Station.
	Interconnects with BPA's McNary-Stat 500-kV line and delivers power from the plant to BPA's transmission system.
	Each transmission tower will carry two circuits (one on each side of the tower). Overhead ground wires will be attached to the top of the tower for lightning protection.
	Will look similar to the loop line towers.
	PG&E will acquire the right-of-way and deed it to BPA upon completion of the line.
	Only tower sites would be cleared of vegetation.

Table 3-1
Statistics For Major Project Components

Plant Substation - A PGE substation will be built at the plant site. Substation equipment is described later on pages 3-8 and 3-9.

Auxiliary Transformers - Power for internal plant operation will be obtained through three auxiliary **transformers**. Two of the auxiliary transformers each have the capability of supplying the station internal load under normal operating conditions. The third auxiliary transformer will have the capability of supplying power to the facility under shutdown conditions, and will provide power from a separate utility, Umatilla Electric Cooperative.

Gas Metering Building - The Gas Metering Building will register how much natural gas is used to fuel the plant. The peak fuel use for the proposed facility is expected to be 1,800 million BTUs per hour for each steam turbine or 18,000 **therms** (1 therm = 100,000 BTUs or 95 cubic ft. of gas).

Auxiliary Equipment Building - The Auxiliary Equipment Building will house water treatment equipment, auxiliary boilers, and associated system equipment. Two auxiliary boilers will provide backup to the facility to allow uninterrupted steam to the industrial park.

Main Turbine Building - The Main Turbine Building will house the two gas turbine generators, the two steam turbine generators, and the turbine auxiliary system equipment. The building will be approximately 24 m (80 ft.) high and contain approximately 4,460 sq. m (48,000 sq. ft.).

Administrative/Control Building - The Administrative/Control Building will house the plant control room, administrative offices, electrical room, maintenance shop and warehouse functions. The two-story building will be approximately 930 sq. m (10,000 sq. ft.).

Ammonia Storage Tanks - Two storage tanks will store 64 m³ (17,000 gal.) of ammonia at the facility. This amount of ammonia would provide about 40 days of continuous plant operation. The facility will use about 1.5 m³ (410 gal.) of ammonia per day.

Stormwater Detention Basin - A stormwater detention basin will be constructed in the northeastern corner of the site. Stormwater from building roof drains and outdoor plant areas will be discharged to the Port's process water agricultural recycling system after first passing through the stormwater retention basin. The basin will have a surface area of about 1,860 sq. m (20,000 sq. ft.) and will have an impervious liner to prevent leaching into the **groundwater**.

Demineralized Water Tank - Demineralized water will be used at the facility for makeup to the steam cycle. Two 1,500 m³ (400,000 gal.) demineralized water tanks will be on-site.

Condensate Storage Tank - Condensate produced from steam will be stored in a single 1,700 m³ (450,000 gal.) storage tank on the site. Approximately 50 percent of the process steam export is expected to be returned as condensate to the facility for reuse in the steam cycle.

Fire Protection Water Storage Tank - The proposed fire water system is a pumped system. Its primary source is the Port's 7,600 m³ (2 million gal.) fresh water storage tank, about 400 m (1/4 mile) south of the proposed site. The Port's fire water system can be interconnected with the City of Boardman's domestic and fire water system, which has as its source the water tower in the City of Boardman, about 3.2 km (2 miles) away.

Coyote Springs Substation

A substation contains several different kinds of equipment arranged to carry out electrical functions, to minimize safety risk, and to accommodate operation and maintenance. The discussion below describes the equipment that would be installed at Coyote Springs Substation. Figure 3-1 shows the location of the equipment.

Power Circuit Breakers - Breakers automatically interrupt power flow on a transmission line at the time of a fault. Several kinds of breakers have been used in substations. The breakers planned for the proposed substation, called gas breakers, are insulated by special nonconducting gas (sulfur hexafluoride). Small amounts of hydraulic fluids are used to open and close the electrical contacts within gas insulated breakers. The hydraulic fluid is the only toxic or hazardous material that will be used.

Transformers - Transformers change voltage. Electricity from the steam turbine generator and the gas turbine generators will be transformed to 500-kV for delivery over BPA's transmission system. Three single phase transformers will be needed for each combustion turbine. An additional single phase unit will serve as a spare transformer. The transformers each contain 45 m³ (12,000 gal.) of cooling oil. An oil containment liner would be installed to collect and retain oil within the substation should an oil spill occur. Only newly purchased electrical equipment certified as PCB-free would be installed.

Switches - Switches are devices used to mechanically disconnect or isolate equipment. Switches are normally on both sides of circuit breakers.

Bus Tubing, Bus Pedestals - Power moves within a substation and between breakers and other equipment on ridged aluminum pipes called bus tubing. Bus tubing is elevated by supports called bus pedestals. Buswork within the plant substation would transport the entire plant's power output to an overhead 500-kV line. Buswork within the substation will transport the entire plant's power output to an overhead 500-kV transmission line. This transmission line will tap into the existing McNary-Slatt 500-kV transmission line, at a point about 2.4 km (1.5 miles) southeast of the proposed site.

Substation Dead Ends - Dead ends are towers within the confines of the substation where incoming and outgoing transmission lines end. Dead ends are typically the tallest structures in a substation.

Substation Fence - This chain-link fence with razor wire bayonets on top provides security and safety. Space to maneuver construction and maintenance vehicles is provided between the fence and electrical equipment.

Substation Rock Surfacing - A 8-cm (3-inch) layer of rock selected for its insulating properties is placed on the ground within the substation to protect operation and maintenance personnel from electrical danger in the event of substation electrical failures.

Control House - Electric/electronic controls and monitoring equipment for the power system are housed in a building within the substation. Control houses are heated and air conditioned to provide a constant environment for equipment.

Communication Facilities - BPA has an existing microwave communication network that delivers signals to operate substation equipment from control centers and other remote locations, and to report revenue metering. This network also provides voice communication from dispatchers to substation operators and maintenance personnel. Microwave communications require an unobstructed "line of sight" between antennas. A tower 38 m (125 ft.) high would be constructed at the substation for an antenna aimed toward BPA's existing Roosevelt radio station. New communication equipment will be provided at both McNary and Coyote Spring substations.

Cogeneration Process and Output

The proposed plant would burn natural gas and produce electrical energy and useful heat captured as steam. Steam from the facility could be used by food processors within the Port of Morrow Industrial Park. Lamb Weston and Oregon Potato currently process potatoes using steam from in-house gas-fired boilers. PGE anticipates that when the Coyote Springs Plant becomes operational, existing boilers at the potato processors will be shut down. However, the owners of the processing plants may retain the boilers as backup units. Each unit of the Coyote Springs Plant will be able to produce up to 113 tonnes (250,000 pounds) of steam per hour.

Water and Sewer Systems

Water - The fresh water requirements of the proposed plant may be supplied from one new and/or one or two existing wells. One existing well belongs to the Port of Morrow; the other belongs to City of Boardman. The existing Port of Morrow well available to supply water to the proposed plant has the capability of furnishing 7.6 m³ (2,000 gal.) per minute. A new well the Port intends to develop will have the capability of supplying 10.2 m³ (2,700 gal.)

per minute. These two wells should provide sufficient water for the project. If additional water is needed, the Port has reached an agreement with the City of Boardman for the City to supply up to an additional 7.6 m³ (2,000 gal.) per minute (PGE, 1993). The City's well has the capability of withdrawing approximately 22.8 m³ (6,000 gal.) per minute and is currently using about a fourth of that capacity.

The maximum amount of water that is required for the operation of the facility is 16.5 m³ (4,350 gal.) per minute. Actual operation of the proposed plant, however, is purported to require considerably less water. On an annual average basis, the proposed project is expected to require approximately 9.5 m³ (2,500 gal.) per minute (PGE, 1993). Figure 3.2 illustrates the average annual flow that will be required to operate the facility. Figure 3-2 reveals that of the anticipated 9.5 m³ (2,500 gal.) per minute: (1) 6.3 m³ (1,660 gal.) per minute will be evaporated into the atmosphere; (2) 2.6 m³ (690 gal.) per minute will be discharged into the Port of Morrow's industrial wastewater system; and (3) although not shown, 22.7 L (6 gal.) per minute will be routed into the Port's sanitary sewer system, and will then flow into the City of Boardman's sewage treatment facility.

Of the aforementioned 6.3 m³ (1,660 gal.) per minute that is evaporated into the atmosphere from the proposed plant, approximately 4 L (1 gal.) per minute will fall back to the earth as so-called "**drift**." Drift is considered that part of the condensate that condenses on a surface, be it a blade of grass, the exterior of a building or an asphalt roadway.

Well Water Use - Water from the Port's existing and proposed shallow **aquifer** wells will provide makeup water to the cooling water basin and the condenser water system because pure water is not needed. Well water from the **alluvial** aquifer will also be used for miscellaneous nonpotable uses such as equipment maintenance and washdown, and fire suppression.

Demineralized Water - A demineralized water system will be used to replace water used in the steam cycle. Deep wells in the Port's water system will provide raw water for the demineralized water system and potable water for the plant. Minerals within the raw water will be removed, and demineralized water will be stored in two large tanks. Demineralized water will then be pumped from the storage tanks to various services within the plant.

Wastewater - Normally, 2.6 m³ (690 gal.) per minute of **wastewater** will be produced by the plant. Wastewater will be from one or more of the following sources: (1) neutralized demineralized backwash water; (2) neutralized condensate polisher backwash water, and/or (3) cooling tower **blowdown**. Wastewater will be discharged into the Port's industrial wastewater system for dilution and farmland application.

Plant Operation and Air Pollution Control Equipment

The combustion turbines are each expected to operate an average of 7,760 hours per year, but have the capacity to operate up to 8,760 hours per year. Auxiliary boilers are ex-

Coyote Springs Cogeneration Site Water Balance (Annual Average Flow)

Source: PGE, 1993

Figure 3-2

pected to operate for six weeks each spring while the turbines are shut down for maintenance (during the Columbia River fish flush operation). Auxiliary boiler operation is expected to total 2,000 hours but could be as high as 8,760 hours if a major turbine failure occurs.

The proposed facility will use **best available control technology** to minimize pollutants emitted in significant quantities. Specific controls proposed for use at the Coyote Springs Plant are discussed below.

Oxides of Nitrogen (NO_x) - NO_x are formed by two different mechanisms during fossil fuel combustion: when nitrogen normally present in the atmosphere combines with free oxygen in the presence of heat (nitrogen fixation); and when nitrogen in the fuel stock is oxidized during combustion. Natural gas contains insignificant amounts of nitrogen, so most NO_x emitted will be from free nitrogen fixation. The majority of NO_x emitted from combustion processes is nitrous oxide (NO); the rate of conversion to NO₂ depends on the oxidizing potential of the atmosphere.

NO_x emissions will be controlled both in the turbine exhaust and in the stack. NO_x emissions from the turbines will be minimized by combining natural gas with air before combustion, thereby inhibiting a discrete flame front and reducing flame temperature. This technique is called dry low NO_x technology. Dry low NO_x technology will bring the NO_x emissions down to 25 **ppm**. The NO_x remaining in the flue gas will be reduced to nitrogen (N₂) and water by ammonia injection at the heat recovery steam generating units through a process called selective catalytic reduction. Selective catalytic reduction can be operated at varying degrees of NO_x destruction. The more NO_x removed, the more ammonia released to the atmosphere (ammonia slippage). The proposed facility intends to operate at 64 percent NO_x removal efficiency with an ammonia slippage of between 10 -20 ppm (24.4 pounds/hour from each turbine). Operating at this level will bring NO_x emissions down to 9 ppm.

NO_x emissions from the auxiliary boilers will be controlled through the use of low NO_x burners and flue gas recirculation. Low NO_x burners have multiple combustion zones that either suppress the excess air in the primary combustion zone or control flame temperature. Flue gas recirculation reduces both the peak flame temperature and the oxygen concentration in the combustion air; both reduce NO_x formation. Together these two control technologies will reduce NO_x emissions to 40 ppm.

Carbon Monoxide (CO) - CO emissions from the turbines and from the auxiliary boilers will be minimized by the use of optimal operating conditions. These controls will reduce CO emissions to 15 ppm.

Sulfur Dioxide (SO₂) - The sulfur concentration in natural gas is very low (0.3-0.19 grains per 100 standard cubic feet) (California Energy Commission, 1992 and PGE, 1993). Therefore, SO₂ emissions from natural gas combustion will be negligible (10 tons/year). Good combustion controls will be used to limit SO₂ emissions.

Carbon Dioxide (CO₂) - Current control technologies for natural gas-fired combustion turbines are ineffectual. Natural gas combustion produces less CO₂ than other fossil fuels.

Particulate Matter - Particulate matter is generated by several mechanisms: (1) incomplete combustion; (2) nitrate (NO₃-) and sulfate (SO₃-) formation from SO₂ and NO_x; and (3) by the formation of ammonia salts during selective catalytic reduction of NO_x. Most **particulates** emitted from the facility will be generated from the selective catalytic reduction process. Particulate emissions from the turbines and from the auxiliary boilers will be controlled by using clean fuel (natural gas) and good combustion controls. Traditional particulate control technologies such as bag houses and scrubbers cause air pressure to drop too much for turbine operation. Projected emissions from the facility are expected to amount to 78 tons/year.

Air Toxics - Air toxics come from impurities in the fuel, injection water, intake air and from incomplete combustion. To discourage air toxic emissions, demineralized injection water and prefiltered intake air will be used. In addition, the facility will burn natural gas (a low ash fuel), which will encourage complete combustion. Good combustion controls will also be used to limit air toxic emissions.

Continuous Emission Monitoring - In addition to the pollution controls mentioned above, the two heat recovery steam generating unit stacks will each be equipped with continuous emission monitoring systems. These systems will record NO_x, CO and O₂ levels in stack emissions and provide historical evidence that emissions meet permit requirements (PGE, 1993).

Solid Waste and Toxic or Hazardous Materials

Estimated quantities of solid waste material expected to be produced during plant operation are listed in Table 3-2. Some solid waste material is classified as **hazardous** and would need careful handling and disposal to protect public health and safety. Section 5 describes these materials and special handling plans for them.

Table 3-2
Coyote Springs Cogeneration Plant - Description of Solid Waste Materials

Waste Stream	Classification	Amount	Frequency	On-Site Treatment	Storage	Off-Site Treatment/ Disposal
Used Lead Acid Batteries	Hazardous	2-cells	Once Per Year	None	90-days	Recycle to Battery Vendors
Spent SCR Catalyst Material	Hazardous	170-230 cu. m (6,000-8,000 cu. ft.)	Once Every 3-5 Years	None	None	Ship to Hazardous Waste Disposal Facility
Oily Rags, Oil Absorbent Material	Hazardous	<1 cu. m (20 cu. ft.)	Once Per Month	None	90-days	Ship to Hazardous Waste Disposal Facility
Spent Cation Demineralizer Resins	Nonhazardous	48 cu. m (1,700 cu. ft.)	Once Every 8-10 Years	None	None	Recycle to Resin Vendors
Spent Anion Demineralizer Resins	Nonhazardous	45 cu. m (1,600 cu. ft.)	Once Every 4-5 Years	None	None	Recycle to Resin Vendors
Office Waste Materials (Trash and Garbage)	Nonhazardous	>9 kg/day (>20 lb./day)	Daily	None	None	Ship to Sanitary Landfill

The cogeneration plant would use and store several toxic substances. Table 3-3 lists the materials that will be used at the Coyote Springs Plant. These substances are discussed in Section 5.

Table 3-3
Coyote Springs Cogeneration Plant - Toxic Fluids, Chemicals and Gases

Material Type	Purpose	Volume	Storage	Delivery
Fuels				
Natural Gas	Principal fuel	27.4 Trillion BTUs/YR.	None	Pipeline
Chemicals				
Sulfuric Acid	Water Treatment	129 cubic meters (34,000 Gallons)	Steel Tank	Truck
Sodium Hydroxide	Water Treatment	38 cubic meters (10,000 Gallons)	Steel Tank	Truck
Coord. Phosphate/pH Control	Boiler Water Treatment	30 cubic meters (8,000 Gallons)	Steel Tank	Truck
Neutralizing Amine	Corrosion Control-Boilers	.75 cubic meters (200 Gallons)	Tank	Truck
Oxygen Scavenger	Corrosion Control-Boilers	1.5 cubic meters (400 Gallons)	Tank	Truck
Anhydrous Ammonia	Air Pollution Control	2 - 32 cubic meters (8,500 Gallons)	Pressurized Tank	Truck
Sodium Hypochlorite Bleach	Cooling Water Treatment	11.4 cubic meters (3,000 Gallons)	Tank	Truck
Corrosion/Scale Inhibitor	Cooling Water Treatment	26.5 cubic meters (7,000 Gallons)	Tank	Truck
Gases				
Gaseous Hydrogen	Generator Coolant	2.8-7.4 cubic meters (100-260 Cubic feet)	Pressurized Bottles	Truck
Carbon Dioxide	Generator Purging	NA	Steel Cylinders	Truck
Lubricants/Coolants				
Lubricating Oil	Turbine Lubrication	208 liters (55-Gallon Drums)	Metal Drums	Truck
Hydraulic Fluid	Equipment Operation	208 liters (55-Gallon Drums)	Metal Drums	Truck
Insulating Oil	Electrical Equipment	208 liters (55-Gallon Drums)	Metal Drums	Truck
Misc. Lubricants	Equipment Operation	208 liters (55-Gallon Drums)	Metal Drums	Truck
Cleaning/Degreasing Agents	Equipment Cleaning	208 liters (55-Gallon Drums)	Metal Drums	Truck

3.1.4 Transmission Integration Facilities

Proposed Electrical Plan - Plan 5

Power from the Coyote Springs Cogeneration Plant would be integrated into BPA's transmission grid by tapping the existing 500-kV transmission line between McNary Dam and Slatt Substation. A new double-circuit 500-kV loop line would be built from the tap point to the Coyote Springs Substation, located at the plant. Switches and power **circuit breakers** would be installed in the Coyote Springs Substation. Microwave communication facilities to accommodate system operation would also be installed.

Initially, only one circuit breaker would be installed at Coyote Springs. When the second phase generation units are built, additional protection facilities will be installed. The cost of Plan 5 is \$11 million (with transmission line costs).

Proposed facilities in Plan 5 are described in greater detail below. Statistics for substation and transmission facilities are also provided in Table 3-1.

Coyote Springs Substation

PGE proposes to design and build the Coyote Springs Substation at the southern edge of the plant site. The substation will be built in two stages corresponding to development of the two generators. BPA and PGE engineers will coordinate closely during substation design. Substation design will meet BPA standards. (See Section 3.1.3.)

Double-Circuit 500-kV Transmission Loop Line

The double-circuit 500-kV transmission line will exit the plant substation and run east about 40 m (130 ft.), parallel to and north of existing Umatilla Electric Cooperative's 115-kV and 12.47-kV transmission lines to a point within an existing concrete batch plant. From this point the transmission line would turn and continue southeast to BPA's McNary-Slatt 500-kV transmission line. The double-circuit line would connect with the existing line at a point immediately north of I-84. The route of this line and tentative transmission **tower** sites are shown on Map 2.

A typical **lattice steel** 500-kV double-circuit transmission line tower is shown in Figure 3-3. One line composed of three **conductor** groups, called phases, is on each side of the towers. Each phase will have three steel reinforced aluminum conductor cables. Overhead ground wires would be strung between the tops of the towers to reduce damage from lightning strikes.

BPA Transmission Line Tap

The existing 500-kV transmission line between BPA's McNary Dam Power House and BPA's Slatt Substation would be interconnected with the new double-circuit loop line built by PGE. A dead-end tower would be built within the existing line to break the line into two segments. Each line segment would cross over two 230-kV lines and be attached to opposite sides of the new double-circuit line. The locations of the tap and tap line towers are shown on Map 2.

Figure 3-3
Transmission Line Tower Design

3.1.5 PGT Natural Gas Extension Pipeline

PGT proposes to construct a 28 km (17.7 mile), 30 cm (12 inch) pipeline from PGT's main transmission line (see Map 1). The Coyote Springs Extension would transport 41 billion BTUs of natural gas daily to the Coyote Springs Plant.

PGT would also construct a meter station and a **fibre optic cable** with the pipeline. Because the proposed pipeline route would parallel existing roads for most of its distance and because of intersecting county roads, no new **access roads** are proposed. Local utilities would provide power and telephone service to the meter station; no new supply lines would be needed.

FERC must issue a permit for the proposed pipeline project. For more information, see PGT's *Coyote Springs Extension Resource Report*.

3.1.6 Electrical Plans Considered but Dropped

Five different electrical plans were considered for integrating power from Coyote Springs Plant into BPA's transmission grid (see Figure 3-4). Each plan included tapping BPA's McNary-Slatt 500-kV transmission line, and building a new 500-kV transmission line from the tap to the Coyote Springs Plant. The plans differ in degree of protection against transmission line-caused plant shut downs and initial cost. The proposed plan is Plan 5. Plans 1-4 each have undesirable aspects, such as costs or environmental impacts, which caused them to be dropped from consideration. These plans are described below.

Plan 1 - Facilities added include: (1) a 500-kV double-circuit tap to BPA's McNary-Slatt 500-kV line; (2) a new substation containing three 500-kV circuit breakers and communication facilities; (3) a single-circuit 500-kV transmission line from the substation to the Coyote Springs Plant Substation.

Plan 1 provides the greatest operational flexibility and maximum protection against transmission line outages that would cause the Coyote Springs Plant to shut down. Plan 1 would have the highest cost at \$13.4 million excluding transmission line costs.

Plan 2 - Plan 2 differs from Plan 1 in one facility; only one circuit breaker is provided at the substation. This plan does not protect against transmission-caused shut downs of the Coyote Springs Plant. Costs for Plan 2 are \$9.7 million excluding transmission line costs.

Plan 3 - Plan 3 does not require a new substation. A tap to BPA's 500-kV McNary-Slatt line is required. A single-circuit 500-kV line would be built from the tap to the Coyote Springs Plant Substation. Existing circuit breakers at BPA's McNary and Slatt Substations, and

Figure 3-4
Electrical Plans Considered

a new 500-kV breaker at the Coyote Springs Substation would form what is called a three terminal line. These breakers would de-energize the line if the line is disturbed by lightning strikes or other natural events, or during line maintenance.

This plan minimizes the cost of transmission facilities. Costs for Plan 3 are \$5 million (excluding transmission line costs). This plan does not protect against transmission-caused shut downs of the Coyote Springs Plant.

Plan 4 - Plan 4 is similar to Plan 3, but adds line sectionalizing switches at the tap point. The switches provide the ability to take a portion of the McNary-Slatt line out of service for maintenance and still allow the Coyote Springs Plant to operate. The plant and line would need to be de-energized before these switches could be operated, requiring a plant shut down. As in Plans 2 and 3, no protection is provided for transmission line disturbances that could cause the Coyote Springs Plant to shut down.

I-84 is close to the tap/switch site. Switch installations for 500-kV lines look similar to a substation and would be visible from I-84.

3.2 No Action Alternative

The No Action alternative would remove the potential impacts from the Coyote Springs Plant and related transmission facilities at the proposed site. Because PGE needs to find replacement power, PGE would build a similar plant at a different location or purchase power from independent power producers.

If the Coyote Springs Plant is not built, the surplus capacity on BPA's transmission lines would likely be available for other power plants. Future upgrades of the transmission system to increase capacity through the area may be able to be deferred longer.

4. Affected Environment

This section describes the environment that would be affected by construction and operation of the proposed Coyote Springs Cogeneration Project and related facilities. The description provides the baseline for comparing the No Action alternative to the proposed action. Environmental consequences are discussed in Section 5.

4.1 Coyote Springs Cogeneration Plant and Transmission Loop Line

4.1.1 Land Use and Community Character

The area's land use has been influenced by several important characteristics: (1) geography, including latitude, elevation, and relative position with respect to the Cascade Mountain Range; (2) meteorology, including annual rainfall, seasonal and diurnal temperatures, relative humidity, length of the growing season and prevailing winds; (3) geology, including soils and availability of subterranean water; (4) location relative to major transportation routes, primarily the Columbia River and I-84, one of the principal east-west highway corridors in the western United States; (5) proximity to the City of Boardman and other population centers both within and outside the State of Oregon, including markets overseas; and (6) an available labor supply in Morrow and Umatilla counties.

The proposed project is outside the City of Boardman, but within the City's urban growth boundary (UGB) (see Map 3). Title to the 8-ha (20-acre) site for the proposed plant is held by the Port of Morrow. This site is a small portion of approximately 2,800 ha (7,000 acres) under the Port's control in the area. The major portion of the Port's holdings is also shown on Map 3. Title to the proposed 2.4 km (1.5-mile) transmission line corridor is also held by the Port. The Port has agreed to lease the power plant site to PGE and issue PGE an easement for the 500-kV transmission line.

The proposed plant site is about 400 m (1/4 mile) east of the City of Boardman. The City of Boardman is about 70 km (45 miles) west of the City of Pendleton, approximately the same distance from the Tri-Cities area of southeastern Washington, and about 225 km (140 miles) east of the Portland, Oregon metropolitan area. The Tri-Cities area is the nearest large population center to the City of Boardman. The combined population of the incorporated areas of Pasco, Kennewick and Richland is over 100,000 (Lowe, 1993). The City of Spokane in northeastern Washington, with a 1992 population of approximately 180,000, is about the same distance from the City of Boardman as is the City of Portland.

Existing Land Use

The current land use of the proposed power plant site is vacant. The parcel was once operated as a gravel quarry, but the quarry has since been filled (see Section 4.1.2 for more information). Land uses adjacent to the proposed site include the Union Pacific Railroad on the north, Messner Pond and an irrigation pond on the east, a vacant parcel on the south, and Ullman Boulevard on the west. Land near the proposed plant site is also used for potato and onion processing plants, two mobile homes, potato storage barns, the City of Boardman's sewage lagoons, a quarry for mining *riprap*, and BPA's Boardman Substation.

The proposed transmission line route would cross vacant land and land used for a public right-of-way (Columbia Avenue), a concrete batch plant that may soon close, a portion of the City of Boardman's sewage treatment facilities, and an irrigated agricultural field (see Map 4). Land in the area is also used for a number of Federal facilities such as the Boardman Bombing Range, the Umatilla Ordinance Depot, and the Umatilla National Wildlife Refuge (see Map 5).

Planning and Zoning

The proposed plant site is in the unincorporated area of Morrow County, but within the City of Boardman's UGB. Because the Port controls a significant amount of land within the City's UGB, the Port was included with the City and Morrow County when they developed an agreement to promote consistency in planning and development efforts between governmental and quasi-governmental entities. The agreement states that Morrow County shall retain responsibility for land use decisions and actions affecting lands within the City of Boardman's UGB. Most of the proposed transmission line will be on land within the City's UGB, but approximately 400 m (500 yards) would be outside the UGB.

The proposed plant site is on land zoned Port Industrial (PI). The proposed transmission line would be on land zoned PI and General Industrial (MG) (see Map 6).

Transportation

The transportation network in the local area includes most modes of travel including: (1) highway travel on I-84, just south of the proposed site; (2) passenger and freight rail service on the Union Pacific Railroad corridor, immediately north of the proposed site; (3) barge transportation on the Columbia River, just north of the Union Pacific Railroad corridor; (4) air service at the Boardman flight strip, about 8 km (5 miles) west-southwest of the City of Boardman; (5) public and private (Port) roads in the immediate vicinity of the proposed project; and (6) trails in the Umatilla National Wildlife Refuge used for hiking and horseback riding.

Currently, two passenger trains and 24 freight trains use the Union Pacific Railroad corridor adjacent to the proposed project site each day (Hill, 1993). This rail corridor is a portion of Union Pacific's main line, which travels to Omaha, Nebraska, and points east. Average daily

Coyote Springs Project

Major Land Jurisdictions Within Vicinity of Project Site

- Proposed Plant Site
- Noise Measurement Sites
- Proposed Pipeline Extension
- BPA Transmission Line
- City Limits
- Urban Growth Boundary
- Wildlife Refuge
- Port of Morrow

KILOMETERS

0 1 2

MILES

0 1 2

Map 3

Coyote Springs Project

Land Use/Land Cover

Map 4

Coyote Springs Project

Major Land Jurisdictions
Within 40 Km (25 Miles)
of Project Site

- BLM
- State of Oregon
- Bankhead Jones LU Lands
- Native American Lands
- National Wildlife Refuge
- Irrigon Wildlife Area-ODFW
- Proposed Pipeline Extension
- Existing BPA Substation
- Proposed Plant Site

Map 5

Coyote Springs Project

Zoning Designations for
Project Site and Vicinity

- PI Port Industrial
- MG General Industrial
- RSC Rural Service Center
- SF40 Farm Residential
> 2 Acres
- FR2 Small Farm 40 Acres
- EFU Exclusive Farm Use
- Proposed Pipeline
Extension
- Proposed 500kV
Transmission Line

Map 6

traffic on I-84, just south of the proposed site, was 9,450 vehicles as of 1991, the most recent information available (Alexander, 1993). Average daily traffic on Columbia Avenue near the proposed project was 3,100 vehicles in 1989, the most recent information available, and 1,800 vehicles traveled on Ullman Boulevard during the same year (Morrow County, 1993).

Recreation Resources

Existing and potential recreational resources within an 8-km (5-mile) impact area are shown on Map 7 and described below.

A wide range of recreational opportunities are available within 8 km (5 miles) of the plant site, including facilities for hunting, fishing, picnicking, swimming, boating (including launching facilities), nature observation, and hiking. Camping and picnicking are permitted at Boardman Marina Park, which is operated by the Boardman Parks and Recreation District. Boat ramp access to the Columbia River is available at Boardman Marina Park and the Umatilla National Wildlife Refuge. Swimming and other beach activities including sailboarding are popular at Boardman Marina Park and at beach areas along the Columbia River.

There are no recreational facilities and limited opportunities for recreation within the proposed right-of-way for the transmission line and at the proposed plant site.

The Columbia River is fished for sturgeon, salmon, steelhead, and warm water species such as bass and walleye.

Umatilla National Wildlife Refuge is 9,250 ha (22,860 acres) along the Columbia River north and northeast of the proposed main plant site. The refuge is also popular for fishing. McCormack Slough, ponds and water impoundments on the refuge are open to fishing February 1 through September 30.

The refuge has trails for hiking, horseback riding, and waterfowl viewing. About 186 ha (460 acres) of refuge land are farmed to provide food and cover for wildlife. Horseback riding is popular along the Columbia River within this refuge. Camping and overnight parking are not permitted in the refuge.

The Port of Morrow and Boardman Regulated Hunt Areas (RHA) are within the impact area and provide opportunities for upland game bird, waterfowl, and big game hunting during authorized seasons. The RHA Area includes the Willow Creek Wildlife Area, Sixmile Canyon Potholes Area, Threemile Canyon, Taggares Farms, and adjacent land south of I-84. Port of Morrow RHA, North Unit, includes the Coyote Springs Wildlife Area and the area north of I-84 to the Umatilla National Wildlife Refuge. Hunting is permitted on about 70 percent of the refuge. The McCormack Unit of the refuge sells waterfowl permits to hunt waterfowl, with upland game permits also available.

A 9-hole golf course is located at the west end of Wilson Road, southwest of Boardman. Riverside High School in Boardman has athletic accommodations for tennis, basketball, baseball and other sports, and a running track. Additional baseball diamonds are at Boardman Marina Park, Boardman City Park and Sam Boardman Elementary School on West Wilson Road. Sam Boardman Elementary School and Boardman City Park have playgrounds. A privately owned indoor riding arena is south of Boardman.

Messner Pond, in the Port of Morrow adjacent to the proposed plant site, is occasionally fished for warm water species, primarily bass and walleye. There are no designated trails along the east side of Messner Pond. Messner Pond is also used by Morrow County residents and tourists for birdwatching and wildlife viewing. Hunting is permitted at Messner Pond only by permit from the Port of Morrow. According to the Oregon Department of Fish and Wildlife, Messner Pond is discussed in several Oregon birding guides.

Other Nearby Recreational Facilities

Many recreation facilities outside the impact area but within the vicinity are used by Morrow County residents. In addition to the boat ramp facilities discussed above, boat access to the Columbia River is also available at Irrigon Marina Park and Quesnel Park (Threemile Canyon). Hat Rock State Park, 13 km (8 miles) east of Umatilla, is a 297-ha (735-acre) park on the banks of the Columbia River. Picnicking, hiking trails, and fish viewing areas are available at Hat Rock State Park. McNary Dam, and Cold Springs Recreation Area also have boat facilities.

The Cold Springs National Wildlife Refuge is a 1260-ha (3,100-acre) refuge, 11 km (7 miles) east of Hermiston around Cold Springs Reservoir. The refuge has a trail system for hiking and wildlife viewing. Sport hunting is permitted on 506 ha (1,250 acres) of the refuge, and the reservoir is fished for warm water species. A boat ramp is available at South Point, and parking and rest rooms are also available.

Fishing is popular in the Umatilla River, with steelhead the primary game fish. An asphalt ramp enters the river at Nugent Park. Parking and rest room facilities are available.

Future Recreation Opportunities

Morrow County, the Port of Morrow, and the City of Boardman do not have plans to develop any new recreation facilities or opportunities. Existing recreational facilities will be more than adequate to meet the needs of an increased population caused by construction and operation of the proposed plant according to Deane Seeger, Planning Director of Morrow County.

The Morrow County Comprehensive Plan (1986) has 20 Recreation Policies, with the first policy stating that the county wants to "... encourage the development of public meeting places and indoor recreational facilities for all age groups, with special attention to young adults." The county encourages combining certain recreation facilities and activities with the school district to

Coyote Springs Project

Recreation Sites

- ① McCormack Slough
 - ② McCormack Regulated Hunting Area
 - ③ Port of Morrow RHA North Unit
 - ④ Port of Morrow Beach
 - ⑤ Riverside H.S. Playing Field
 - ⑥ Boardman Marina Park
 - ⑦ Boardman City Park
 - ⑧ Umatilla National Wildlife Refuge
 - ⑨ Boardman RHA
 - ⑩ Oregon Contact Station and Restrooms
 - ⑪ Boardman Golf Course
 - ⑫ Port of Morrow South Unit
- ▲ Proposed Plant Site
 --- Proposed Pipeline Extension

reduce public costs. At this time, there are no plans to build any new facilities associated with schools. However, Morrow County encourages continued and expanded use of schools for community activities, including using playing fields on school grounds.

A recreation plan for Messner Pond was developed but never implemented. The stated goal of the plan was to provide additional recreational opportunities and to aesthetically enhance the industrial zone locale, while maintaining the wildlife values of the area. This included plans for carp management, trail building, and the addition of a picnicking area on the northeast side of the pond.

4.1.2 Natural Resources

Regional Geology

The proposed plant site is within a 129-km (80-mile) wide unit of plain and low plateau topography called the Walla Walla Section of the Columbia River Plateau Physiographic Province. The plain is underlain by rocks of the Columbia River Basalt Group and the Dalles Formation. These bedrock units are covered by glaciofluvial deposits and loess. The Columbia River Basalt Group is mostly flood basalts extruded during the late Tertiary between 17 to 6 million years before present (B.P.). They are collectively up to 3.7 km (12,000 ft.) deep. The beds were later deformed into many structural features including folds, faults and basins. Major structural features include the Blue Mountain Anticline southeast of the site, the Rattlesnake Hills Anticline and Wallula-Walla Walla Fault System to the northeast, and the Dalles-Umatilla Syncline to the southwest. (PGE, 1993.)

Local Geology

The proposed plant site is underlain by river deposited sands, gravels, and cobbles, extending approximately 17-18 m (55-60 ft.) deep. The river deposits are underlain by the Columbia River Basalt Group. The Columbia River shoreline is approximately 190 m (625 ft.) north of the proposed generation plant. The proposed plant site and transmission line corridor are within the *historic* Columbia River floodplain. However, dams on the Columbia River now regulate its flows, so the proposed locations for the plant and transmission line are not now considered in the Columbia River's 100-year floodplain.

Seismic Hazard

Ground Shaking - The proposed plant site lies within the Columbia River Plateau Seismotectonic Province. Two fault zones/faults within 100 km (62.5 miles) of the site, the Walla Walla Fault Zone and the Toppenish Ridge Fault, are possible seismic generation sources (Ebasco Infrastructure, 1993). The estimated maximum magnitude of the Walla Walla Fault Zone, which is approximately 80 km (50 miles) from the proposed site, ranges between 6.5 and 6.7 on the Richter scale. The Toppenish Ridge Fault, which is approximately 136 km (85 miles) from the proposed site, is considered capable of generating an earthquake of 7.3 in magnitude.

Other possible sources of seismic activity are earthquakes in adjacent Seismotectonic Provinces, subduction earthquakes or intraplate earthquakes.

No active faults (faults with surface displacement within the last 11,000 years) have been identified within the proposed plant, substation or transmission line alignment.

Estimated Earthquake Potential - Ebasco conducted a study for PGE to determine possible seismic sources and their associated earthquake potential. The potential is based on the combination of the estimated maximum magnitude of the event and its distance from the proposed facility site. Of the sites, including discrete known fault zones, seismotectonic provinces and the postulated subduction zone at the interface between the Pacific Plate and the North American Plate, the largest expected earthquake potential was estimated at MM VII intensity. MM VII intensity roughly equates to a magnitude of 5.5 +/- .5 on the Richter scale and .13 g to .16 g (peak horizontal acceleration).^{*} This estimated magnitude is one of the controlling factors in the design of the facility.

Local Soil Conditions

Two soil phases exist within the study area, Burbank loamy fine sand and Quincy loamy fine sand. Both soil types are excessively drained. Runoff is slow, and water erosion hazard is slight. Soil blowing hazard is high. Protection from soil blowing is critical.

The soil at the plant site is Burbank loamy fine sand. The site has been extensively mined for gravel and then was overlain with 2-4 m (8-13 ft.) of fill dredged from the Columbia River. The fill is intermingled sands, gravels, and cobbles. Natural soils below the fill are dense cobbles and dense sands. (See Exhibit G-3 in Volume 1 of PGE, 1993.)

Soils along the transmission route are Burbank loamy sands at the plant site, then change to Quincy loamy fine sand along the proposed route of the tapline to the existing BPA line. Test holes have been drilled along the proposed electrical transmission line alignment. Soils are naturally deposited dense sands, gravels and cobbles.

Water Resources

General - Aquatic systems protected under the Federal Clean Water Act (CWA) in general are rivers, stream, lakes, estuaries and special aquatic sites. Sections 402 and 404 of the CWA describe certain conditions that must be met if pollutants (including sediment) or fill are discharged into areas designated as Waters of the United States. In Oregon, the Division of State Lands (DSL) and the U.S. Army Corps of Engineers (Corps) regulate the discharge of fill (ORS. 196.800-.990) into these waters. Waters of the State include most wetlands and other aquatic habitats. Delineation criteria used by the Corps and the Oregon DSL to determine the extent of jurisdictional wetlands are published in *Corps of Engineers Wetlands Delineation Manual, Tech.*

^{*}Note: BPA estimates a MM VII intensity to be approximately 6.0 on the Richter Scale and equivalent to approximately .24 g (peak ground acceleration).

Report Y-87-1. Criteria are based on the presence of positive indicators for three parameters: (1) wetland hydrology; (2) wetland vegetation; and (3) hydric (requiring moisture) soils.

Surface Water - Three surface water systems occur within or adjacent to the plant site: the Columbia River; Messner Pond; and gravel mining ponds (see Map 4).

The Columbia River, adjacent to the project site, is the major water body in the area. Water levels in the river are artificially maintained by John Day and McNary dams.

Messner Pond, a former embayment of the Columbia River, is about 12 ha (30 acres) and is within 181 m (600 ft.) of the plant site property line. Although water in the pond is restricted by the Union Pacific Railroad right-of-way, two culverts connect the pond to the river. Surface drainage from the southeast also recharges water in Messner Pond.

The pond within the construction site of the main plant is one of many gravel mining ponds in the vicinity shown as open-water habitats on the National Wetland Inventory sheet (NWI, Boardman, OR, 1981). The pond is an aquatic feature about 3 ha (7.5 acres). Because the pond is created by an active mining operation, it is not regulated by either the Corps or the Oregon DSL (OAR 141-85-010.20.(c.)(F.)). No other aquatic systems occur along the transmission line corridor.

Groundwater - Because surface water in the Columbia Plateau is almost fully allocated, groundwater is heavily used. The regional aquifer system, formed in sedimentary material interbedded within basalt flows, is the major source of deep groundwater for municipal, industrial, domestic and irrigation uses within the Columbia Plateau. Use of deep groundwater has lowered levels as much as 30 m (100 ft.) in some portions of the aquifer. Water quality in shallow alluvial wells is generally poor and water from these wells is used for irrigation. Water levels in the shallow alluvial aquifer have been raised by the discharge of irrigation water into these porous, sandy soils. Permanent features like wetlands, ponds and perennial streams have been established on this historically dry land. Many ponds and wetlands near the plant site are created and recharged by surface/irrigation water.

The Port obtains water from two aquifer systems: a shallow alluvial aquifer; and a deeper basalt aquifer. The Port has eight permits for water rights from three basalt aquifer wells and eight alluvial aquifer wells. The Port also has a permit to use water from the Columbia River. (PGE, 1993.)

Air Quality

The proposed plant site is in relatively flat terrain near Lake Umatilla (the Columbia River). Terrain to the south of the site slopes gently upward, with the nearest abrupt terrain change about 19 km (12 miles) to the south. The State of Washington is across the river to the north. In Washington, a series of moderately sloped ridges line the Columbia River.

Joint frequency distributions of wind direction and wind speed, commonly known as wind roses, are presented in Figures 4-1 and 4-2. These figures illustrate that the wind at the site is predominately from the west and southwest quadrants and that there is a strong easterly flow in the winter months as high pressure moves west from eastern Oregon and Washington. Winds often blow from the west and southwest as marine air moves through the Columbia River Gorge. The wind roses also show that calm wind conditions are more common in the fall and winter than during spring and summer. Data presented in these wind roses is dated (1976 and 1935-38, respectively). However, direction and speed frequencies are not expected to change appreciably from year to year.

Morrow County is designated by the **Environmental Protection Agency (EPA)** as an unclassified/**attainment area** for **criteria pollutants**, which means insufficient ambient air data is available to determine whether **ambient air** exceeds **National Ambient Air Quality Standards (NAAQS)**. EPA has determined that the Wallula area in Washington State is a moderate **nonattainment** region for particulate matter (**PM-10**). EPA is considering expanding this nonattainment region to include larger portions of Benton and Franklin counties. Benton and Walla Walla counties are directly north of the proposed facility, across the Columbia River.

EPA has also designated all areas in the U.S.--except National Parks--as **Class II areas**, allowing limited industrial growth. Thus the proposed facility is consistent with EPA airshed designations.

There has been one ambient air monitoring study in the Boardman area. In the mid-1980s, PGE monitored ambient air for an Air Contaminant Discharge Permit for its Boardman Power Plant. This study monitored two of the three pollutants identified as triggering New Source Review/Prevention of Significant Deterioration (NSR/PSD) requirements for the Coyote Springs Plant. Study results reflect the influence of PGE's Boardman Power Plant.

The study measured annual average total suspended particulate (TSP) in the range of 20 - 30 $\mu\text{g}/\text{m}^3$. All annually averaged TSP measurements were less than 50 $\mu\text{g}/\text{m}^3$, the annual geometric mean NAAQS for TSP/PM-10. However, the study recorded several exceedances of the 24-hour TSP/PM-10 NAAQS of 150 $\mu\text{g}/\text{m}^3$. These exceedances were associated with strong winds that create windblown dust, a condition common to eastern Oregon and Washington.

Figure 4-1
Wind Direction and Speed in the Boardman Area (1976)

The study also monitored SO_2 . Measurements indicated that the three-hour sulfur dioxide average was 424 ug/m^3 , the 24-hour average 112 ug/m^3 , and the annual average 1 ug/m^3 . These levels are below the national primary standards of 80 ug/m^3 (annual mean) and 365 ug/m^3 (24-hour maximum). The national secondary ambient air standard, $1,300 \text{ ug/m}^3$ (3-hour average), also was not exceeded. The Boardman study also monitored nitrogen oxides in the form of nitrogen dioxide (NO_2). The annual NO_2 ambient concentration was 30 ug/m^3 , compared to the NAAQS of 100 ug/m^3 (annual average).

Figure 4-2
Wind Direction and Speed Boardman Area (1935-38)

The only pollutant triggering major NSR/PSD review requirements not monitored during the Boardman Power Plant study was (CO). Background CO levels in the Boardman area are expected to be low because this region is not highly industrialized and does not have heavy automobile traffic. Ambient concentrations of other pollutants of concern such as **volatile organic compounds (VOC)**, sulfuric acid and beryllium are also expected to be low in this region.

Class I Areas and National Scenic Areas - The proposed facility is required to go through the New Source/Prevention of Significant Deterioration permitting process (NSR/PSD). Typically, under PSD requirements, impacts of criteria pollutants emitted from proposed facilities are only evaluated for the nearest Federal **Class I area**. However, the Oregon NSR/PSD process strongly encourages impact assessment of all Class I areas within 200 km (120 miles) of proposed projects. Three Class I areas are within 200 km of the proposed facility and were evaluated for

possible impacts: Mt. Hood Wilderness Area, Eagle Cap Wilderness Area and Strawberry Mountains Wilderness Area. The Columbia Gorge Scenic Area was also included in the evaluation. (See Section 5.1.1. for impact discussion.)

Vegetation

Plant Associations - Plant associations at the site are common in the Boardman-Umatilla area and are characteristic of disturbed communities of the shrub-steppe vegetation zone in the Columbia Basin physiographic province. Vegetation is primarily adapted to a dry environment (xeric) and non-native. Forested areas surrounding ponds are dominated by Russian olive (*Elaeagnus angustifolia*), and common cocklebur (*Xanthium strumarium*), grading into tumbleweed (*Salsola kali*), tumbled mustard (*Sisymbrium officinale*), common yarrow (*Achillea millefolium*), cheatgrass (*Bromus tectorum*), intermediate wheatgrass (*Agropyron intermedium?*), and tarweed (*Amsinckia lycopoides*). In less disturbed areas the composition changes slightly to include antelope brush (*Purshia tridentata*), and sagebrush (*Artemesia tridentata*). This vegetation occurs along the Port of Morrow access road in the proposed transmission line corridor.

Messner Pond is a lake (lacustrine) system surrounded by swamp (**palustrine**) **emergent wetlands** grading into forested wetlands. Emergent wetlands are dominated by hardstem bulrush (*Scirpus acutus*), broad-leaf cattail (*Typha latifolia*), and ovate spikerush (*Eleocharis ovata*) grading into forested wetland dominated by Russian olive (*Elaeagnus angustifolia*). These forested wetlands next to Messner Pond are about 30 m (100 ft.) to the north of Ullman Boulevard. They also form a thin unit between Messner Pond and the irrigation/gravel mining pond.

Vegetation near the irrigation/gravel mining pond is sparse, covering only about 20 percent of the surface. The dominant vegetation, cheatgrass (*Bromus tectorum*), and tumbleweed (*Salsola kali*), is representative of disturbed xeric plant communities. No hydrophytic or aquatic vegetation was observed. (See Exhibit R, PGE, 1993.)

Federally Protected Plants - No Federally listed **threatened** or **endangered** plant species are known to occur within the project area. Within the State of Oregon, none of the plant species currently listed under the Endangered Species Act (ESA) are found near the project vicinity. Three Federal candidate species: Thompson's sandwort (*Arenaria franklinii* var. *thompsonii*), Lawrence's milkvetch (*Astragalus collinus* var. *laurentii*), and Columbia cress (*Rorippa columbiae*), possibly occurring within the project area, were not present during a plant survey conducted in July 1993.

State Protected Plants - Thompson's sandwort, Lawrence's milkvetch, and Columbia cress also constitute Oregon state species of concern, and as noted, these were not found on or near the proposed plant site. These candidate species are also listed by the Oregon Natural Heritage Data Base. A fourth plant, Robinson's onion, became a state candidate species in 1980 but was subsequently dropped from consideration and may be extinct in Oregon.

Fish and Wildlife

The proposed plant site is outside of any wilderness study, research, natural, wildlife, or other similarly designated area. However, many wildlife and fish species are found within the project vicinity. Several designated wildlife refuges and other natural areas are nearby.

Most of the proposed 2.4 km (1.5 mile) transmission line route is vegetated. An 0.8 km (0.5 mile) portion of the transmission line is shrub-grassland and cultivated fields entirely within the Port of Morrow Industrial Park. Both habitats provide little wildlife habitat. Wildlife use of this area is likely to favor those species associated with industrial sites (e.g., house sparrow [*Passer domesticus*], small mammals, and gulls), agricultural fields (e.g., California quail [*Callipepla californica*], and ring-necked pheasant [*Phasianus colchicus*]), or disturbed shrub-steppe (e.g., coyote [*Canis latrans*] and western meadowlark [*Sturnella neglecta*]).

Several fish species are present in Messner Pond including smallmouth bass, crappie, and rough fish such as carp, northern squawfish and peamouth. A wetland community exists next to the pond, but wildlife use of the site is somewhat limited by poor quality habitat plus ongoing industrial activities and adjacent development. Some small mammals (e.g., mice and voles) and birds (e.g., gulls, sparrows, doves) may be found in this area. Small ponds also provide some limited aquatic **habitat** for waterfowl and shorebirds.

Federally Listed Animals - The U.S. Fish and Wildlife Service (FWS) reported two Federally listed species known or suspected to seasonally occur near the project area: the bald eagle (**threatened**) and peregrine falcon (**endangered**).

There are no bald eagle nest sites within or adjacent to the impact zone of the facility. No portions of the facility area have been designated as critical habitat for the bald eagle. Approximately 20-100 bald eagles winter along the Columbia River and within the Umatilla National Wildlife Refuge. There are two Oregon Natural Heritage Program (ONHP) occurrence records within the facility area: approximately 16 km (10 miles) southeast of the facility site on Carty Reservoir; and 4.8 km (3 miles) northeast of the facility site on the Umatilla National Wildlife Refuge.

The peregrine falcon is almost exclusively a cliff-nesting species, primarily in locations near water. Occurrence within the project vicinity would be expected only during migration. The U.S. Fish and Wildlife Service, Olympia Field Office, listed this species as potentially occurring (but rare) in the project area in both summer and fall within the Umatilla National Wildlife Refuge. There are no Oregon Natural Heritage Program occurrence records within the project area. No peregrine falcons have been reported around Messner Pond, although an occasional bird may utilize the area.

No Federally listed threatened or endangered animal species were recorded during four wildlife surveys (May and June 1993). One Federal candidate species, a long-billed curlew (*Numenius americanus*) was recorded northeast of Messner Pond in grassland-shrub habitat during the surveys.

Listed fish species noted by the National Marine Fishery Service (NMFS) include Snake River spring/summer Chinook salmon (threatened), Snake River fall Chinook salmon (threatened), and Snake River sockeye salmon (endangered). Although the project does not directly affect these species, the Columbia River in the project vicinity serves as a migratory corridor.

Additional information on Federally listed threatened and endangered species is included in Chapter 5 and within Appendices A and C.

State Special Status Animals - Regulatory protection at the state level is based on citations within OAR 635-100-040. Three Oregon state sensitive species (American white pelican [*Pelecanus erythrorhynchos*], bank swallow [*Riparia riparia*], and Franklin's gull [*Larus pipixcan*]) were recorded during wildlife surveys conducted in May and June 1993. All three of the state sensitive species were observed at Messner Pond during the late spring and early summer surveys noted. Other species known or suspected to occur during other seasons of the year include the bald eagle (threatened), peregrine falcon (endangered), Barrow's goldeneye (protected), and bufflehead (protected), as noted in Appendix A.

Several special status species were identified as occurring infrequently in the project area (yellow-billed cuckoo, pygmy rabbit, tri-colored blackbird, upland sandpiper) or using habitat that would not be altered by the project (bufflehead, American white pelican, bull trout, Barrow's goldeneye, dusky Canada goose).

4.1.3 Socioeconomics and Public Services

This section of the environmental document describes the social and economic characteristics of the local area, and the essential local government services available to area residents.

Social Characteristics

Population - The population of Morrow County as of July 1, 1992 was 8,100 (Portland State University, 1993). The county is about 5,500 sq. km (2,000 sq. mi.) with a population density of nearly 1.4 persons per sq. km (4 persons per sq. mi.). Only eight of Oregon's 35 other counties are less densely populated than Morrow County. All are in eastern Oregon.

The five incorporated communities in Morrow County and their populations (as of July 1, 1992) are the City of Boardman (1,480), the City of Heppner, county seat (1,420), the City of Irrigon (830), the City of Lexington (290) and the City of Lone (240). As of July 1992, about 52 percent of the county's residents lived in these five communities, a slight reduction from the 1980 Census, when 55 percent of the county's residents lived in these five communities. The county's population is becoming increasingly rural.

As of July 1992, Umatilla County, the county immediately east of Morrow County, had a population of 61,000. The county is about 5,100 sq. km (3,200 sq. mi.), for a population density of 12 persons per sq. km (19 persons per sq. mi.). The principal urban communities in Umatilla

County are the City of Pendleton (15,400), the City of Hermiston (10,150), the City of Milton-Freewater (5,630), the City of Umatilla (3,090), the City of Stanfield (1,580) and the City of Pilot Rock (1,500). Approximately 66 percent of Umatilla County's population lived in 12 incorporated communities in 1992, approximately the same proportion of the county's residents 12 years earlier (65 percent).

The closest urban area with a population over 25,000 is Kennewick and Richland, Washington with 1993 populations of 45,000 and 34,000, respectively. These communities are about 70 km (45 miles) northeast of the City of Boardman. The closest urbanized area in Oregon with a population over 25,000 is the City of Gresham, with a 1992 population of 72,000. The City of Gresham is 225 km (140 miles) west of the City of Boardman, on the east side of the Portland, Oregon metropolitan area, which has a population over 1,300,000.

The populations of Morrow and Umatilla counties have increased by only 4 percent since 1981, while Oregon's population has increased 13 percent over the same period. The main reason for the slow growth experienced by both counties has been the amount of population lost through migration. During the decade of the 1980s, Morrow County lost 650 persons, while Umatilla County experienced a loss 4,800 persons, approximately 8 percent of their respective populations. (Portland State University, 1992.) Migration cancelled out most growth from natural increase (births over deaths). The migration was likely related to the relatively high unemployment rate in the area, and lack of opportunities experienced by the resident population, particularly the area's youth.

Employment - The combined labor force of both Morrow and Umatilla counties as of July 1, 1992 was 33,860 with an unemployment rate of 9.5 percent. The employed population amounted to 30,630. (Oregon Employment Division, 1993). With a combined population of 69,100 persons in the two counties, the labor force participation rate was just under 50 percent.

During the late 1970s, employment in Morrow and Umatilla counties expanded rapidly. The growth in employment then slowed considerably before actually declining in the 1980s. Employment in the two counties peaked in 1981, at the start of the 1981-83 recession, with 31,490 jobs. The labor force, however, continued to climb in the mid-1980s, peaking in 1986 with 34,900 people. The unemployment rate in the two counties reached 12.1 percent in 1986. Although the unemployment rate has subsided significantly over the past few years, it remains high (8-10 percent). The Oregon Employment Division expects the unemployment rate to remain high in the 1990s. (Oregon Employment Division, 1993.)

The agricultural sector is the largest sector of employment in Umatilla and Morrow counties. Including the agricultural portion of nondurable goods manufacturing, food processing and direct agricultural employment, the agricultural sector employed 7,200 people in 1991, nearly 25 percent of total employment. Three sectors follow the agricultural sector in people employed within the two counties: government (approximately 5,600), and retail and services (approximately 2,500 each). Government employment is relatively high compared to other rural counties in the area, due to the Umatilla Army Depot, the Navy Bombing Range, the Umatilla National Forest, the Eastern Oregon Correctional Institution and the Eastern Oregon Psychiatric Center.

Housing - The 1990 Census shows that 3,410 housing units existed in Morrow County in 1990, with 82 percent (2,805 units) occupied when the Census was taken on April 1, 1990. The median value of occupied housing units in the county was \$43,500 (in 1990 dollars). Of these occupied housing units, 68 percent (1,905 units) were owner-occupied, and 32 percent (895) were rental properties. Excluding multi-family dwellings, mobile homes and homes on more than 4 ha (10 acres), approximately 60 percent (525 units) of the owner-occupied housing units had an existing mortgage. The median mortgage payment was \$536, which was 17.8 percent of 1989 household income. Of those 32 percent of occupied households that were rented, the median gross rent amounted to \$332, which was 23.7 percent of 1989 household income. The vacancy rate for non-rental units was 1.7 percent, while the vacancy rate for rental property, was 10.6 percent. (State of Oregon, 1990.)

Umatilla County's 1990 housing stock was 24,335 total units, with 90 percent (22,020 units) occupied. The Census shows that Umatilla County had more rental properties than Morrow County, both in absolute numbers and as a percentage of the whole. Only 62 percent (13,650 units) of Umatilla County's housing stock was owner-occupied, while the remainder, 38 percent (8,375 units), was occupied by renters. The median value of all occupied housing units was \$47,800 (in 1990 dollars). Excluding multi-family dwellings, mobile homes and homes on more than 4 ha (10 acres), about 61 percent (5490 units) of the owner-occupied housing units had an existing mortgage. The median mortgage payment was \$552, which was 19.2 percent of 1989 household income. Of those 38 percent of occupied households rented, the median gross rent amounted to \$313, which was 19 percent of 1989 household income. The vacancy rate for homes that were not for rent was 2.1 percent, while the vacancy rate for rental properties was 8.6 percent.

Statewide on Census Day, April 1, 1990, 63 percent of the occupied housing units were owner-occupied, with a median value of \$66,600. The median mortgage payment was \$650, which was 20.4 percent of monthly gross household income in 1989. The vacancy rate for non-rental properties was 1.4 percent. The median rent payment was \$344 for rental properties, with a vacancy rate of 5.3 percent. A 5 percent vacancy rate is considered a normal vacancy rate for residential rental properties. The vacancy rates experienced by both Morrow and Umatilla counties (10.6 percent and 8.6 percent, respectively) are considered relatively high.

The temporary housing stock in the area consists of those single family houses and apartment units identified above that are in the rental market, in addition to motel units. Mobile home parks, in some instances, have mobile home units "that are available for rent, but normally provide only physical space and utility "hook ups" for those with their own accommodations. This is also true for RV parks.

Within the Boardman/Hermiston /Umatilla area there are 11 motels that have an inventory of 490 units (See Table 4-1); 20 mobile home/RV parks in the Umatilla, Hermiston, Pendleton, Pilot Rock and Milton Freewater area that supply 132 spaces, seven of these mobile home/RV parks are located near Hermiston alone; and 36 apartment complexes that are located in the Boardman, Hermiston, Umatilla, Irrigon, Pendleton and Milton-Freewater area.

Economic Characteristics

The economy of Morrow and Umatilla counties is primarily based on agriculture, with government employment being an important contributor. Counting direct agricultural employment, food processing, and nondurable goods wholesale employment, the agricultural sector within Morrow and Umatilla counties employed 7,155 persons in 1991. (Oregon Employment Division, 1993.) This amount of employment does not include the portions of transportation, and other sectors directly involved in agricultural activities. Government employment is also high for the region. Federal government employment is 16 percent of government employment, State government employment makes up 24 percent, and local government employment is 60 percent of government employment, most for education.

Table 4-1
Motel Accommodations in the Project Area

COMMUNITY	NUMBER OF MOTELS	NUMBER OF MOTEL ROOMS
Boardman	3	111
Hermiston	4	193
Umatilla	4	181
Total	11	485

Source: Hermiston Chamber of Commerce, July 1993

Median Family Income - Median family income is a measure of income at the midpoint of all household incomes, for a particular defined area. Usually larger communities have a more diversified economy because a larger population base can support businesses and services not found in smaller communities. These larger communities are likely to have a higher labor force participation rate, and a higher median family income, than smaller, more rural communities. In 1989 (the most recent information available), Morrow County's median family income was \$23,970. This was 88 percent of the State median family income (\$27,250) during the same year. (U. S. Department of Commerce, 1990.)

Per Capita Income - Per capita income is an estimate of total personal income divided by the area's total population. It includes wages, rents, interest, dividends, and all other "money" income. The per capita income is used as a rough measure of how well one area is doing compared to another. Overall, Morrow County's per capita income has been declining considerably since 1978, as compared with the per capita income for the State as a whole. In the 13-year period from 1978 to 1991, the County's per capita income has increased only 15 percent while the State's per capita income has more that doubled (Oregon Employment Department, 1993).

While Umatilla County's per capita income is slightly below that of Morrow County (\$15,102 vs. \$14,805 for 1991), Umatilla County's per capita income has shown a stronger growth through the 1980s than Morrow County's. Umatilla County increased its per capita income 63 percent through the decade, while Morrow County's per capita income increased by only 18 percent.

Table 4-2
PER CAPITA INCOME FOR MORROW COUNTY AND THE STATE OF OREGON
(in \$ millions)

YEAR	MORROW COUNTY	STATE OF OREGON	COUNTY AS A % OF STATE
1978	\$13,100	\$8,250	159%
1979	\$13,350	\$9,150	146%
1980	\$12,790	\$9,870	130%
1981	\$11,200	\$10,480	107%
1982	\$9,390	\$10,650	88%
1983	\$10,780	\$11,380	95%
1984	\$12,700	\$12,300	103%
1985	\$12,350	\$12,930	95%
1986	\$12,200	\$13,540	90%
1987	\$12,490	\$14,180	88%
1988	\$14,370	\$15,020	96%
1989	\$15,640	\$16,190	97%
1990	\$17,340	\$17,040	102%
1991	\$15,100	\$17,500	86%

Source: Bureau of Economic Analysis, U.S. Bureau of Commerce

Table 4-3
ASSESSED VALUE OF MORROW COUNTY AND THE STATE OF OREGON
(in \$ millions)

YEAR	MORROW COUNTY	STATE OF OREGON	COUNTY AS A % OF STATE
1970-71	89	18,800	0.47%
1971-72	89	20,261	0.44%
1972-73	92	22,113	0.42%
1973-74	101	24,899	0.41%
1974-75	127	28,402	0.45%
1975-76	193	32,175	0.60%
1976-77	236	35,547	0.66%
1977-78	285	40,704	0.70%
1978-79	328	46,646	0.70%
1979-80	472	59,025	0.80%
1980-81	527	73,402	0.72%
1981-82	664	82,427	0.81%
1982-83	688	86,429	0.80%
1983-84	769	85,365	0.90%
1984-85	806	85,400	0.94%
1985-86	814	83,035	0.98%
1986-87	879	82,944	1.06%
1987-88	848	83,111	1.02%
1988-89	769	84,258	0.91%
1989-90	832	88,076	0.94%
1990-91	804	95,850	0.84%
1991-92	728	112,135	0.65%
1992-93	725	123,756	0.59%

Source: Bureau of Economic Analysis, U.S. Bureau of Commerce

According to the Oregon Employment Development Department, Morrow and Umatilla counties have been below the State average in per capita income over the years. During the late 1970s and early 1980s, however, Morrow County was considerably above the State average, as shown in Table 4-2, due to the construction of the Boardman coal-fired plant underway at that time, and also because potato and onion processing plants were being built. Large scale corporate farms in the area and extensive use of center-pivot irrigation systems have expanded the agricultural sector of the local economy in recent years. These new sources of raw materials have attracted the food processing industry to the area. (Electric Power Research Institute, 1982.)

Assessed Value of Morrow County - Morrow County's assessed value of all real taxable property has increased nine-fold since the early 1970s, increasing in value from \$89 million in 1972-73 to \$725 million in 1992-93 (see Table 4-3). Table 4-3 also reveals that the County's share of assessed value of taxable property against that of the assessed value of private taxable property statewide increased during the period of 1972-73 to 1985-86. From 1985-86 on, however, the County's share of private taxable property (as compared to Oregon's), has been declining, and has actually fallen in absolute dollars from \$879 million in 1986-87 to \$725 million in 1992-93. While Morrow County has realized this 18 percent decline in assessed value over the past six years, the State has realized nearly a 50 percent increase during this same period, increasing from \$83 billion to \$124 billion.

The apparent aberration in Table 4-3 showing a sharp rise in the county's share of assessed value in the 1970s and early 1980s, compared to Oregon as a whole, was related to construction of the Boardman coal-fired plant in the late 1970s, and also the addition of large potato and onion processing plants built in the county in the early 1980s. Since that time, however, as Table 4-3 reveals, property development in the County has not kept pace with Oregon as a whole.

Essential Government Services

Law Enforcement - Law enforcement services in the project area are provided by the Morrow County Sheriff's Office, which provides law enforcement services primarily to the unincorporated portion of Morrow County. The county, however, also maintains mutual aid agreements with the State of Oregon, larger incorporated cities within Morrow County, such as Boardman and Heppner, and neighboring counties. Primary responsibilities of the Morrow County Sheriff's Office is to conduct criminal investigations and to provide security. Providing traffic control is considered a secondary responsibility of all uniformed officers within the County Sheriff's Office.

The Sheriff's Office consists of seven sworn officers: the sheriff, an undersheriff, a detective and four deputy sheriffs. Response times depend on time of day, and location and availability of personnel. Response times for emergency services would normally be within 10 minutes and no more than 45-60 minutes on a worst-case basis (Morrow County Sheriff's Office, August 1993).

Fire Protection - Fire protection services in the project area are provided by the City of Boardman Fire Department and the Boardman Rural Fire District. These two fire departments include the same individuals who work out of the same fire station. The two separate departments exist for budgetary purposes only (Boardman Fire Department, August 1993).

The Boardman Rural Fire District encompasses approximately 160 sq. km (100 sq. mi.) and provides fire protection to the City of Boardman and to rural areas around the City of Boardman. At the present time firefighters consist of the Fire Chief and 18 volunteer firefighters. The Chief's position is a paid position, and as such, the Chief is an employee of the City of Boardman.

The Boardman Rural Fire District's primary responsibility is to provide fire protection services to the City of Boardman and the rural areas around the City of Boardman. The District has a 7.6 m³ (2,000 gal.) water tender, a 12.5 m³ (3,300 gal.) water tender with a 3.8 m³ (1,000 gal.) per minute pump, a rescue unit, a 3.8 m³ (1,000 gal.) water tender, and a personnel carrier. The City of Boardman maintains 3.8 m³ (1,000 gal.) and 5.8 m³ (1,500 gal.) water tenders (City of Boardman, April 1993).

The Boardman Rural Fire District also maintains mutual aid agreements with the City of Irrigon and the Umatilla Army Depot, each able to respond to a fire at the Port of Morrow within 15 minutes after receiving a call for support. In addition, the fire district can request help, if needed, from the fire brigade at the Boardman coal-fired plant, 16 km (10 miles) southwest of Boardman. The fire brigade has 47 members, each qualified to fight industrial structure fires. Additional help is also available from other fire districts in the county. These fire districts include Heppner, Lone, and Lexiton Fire Districts.

Water Service - The City of Boardman's municipal water supply is provided by a Ranney water collection system, one of two such systems currently being used in the State of Oregon (City of Boardman, July 1993). The water system draws both induced Columbia River water and groundwater from the shallow aquifer at the rate of 22.8 m³ (6,000 gal.) per minute. According to the City's Public Works Director, this volume of water is sufficient to serve a community of 6,000 people. In addition to the existing well site, the City of Boardman has identified two additional sites that could be used to install additional Ranney units should that ever become necessary to increase the water volume to 60.6 m³ (16,000 gal.) per minute, sufficient to serve a community of 16,000 people.

Sewage Treatment Facilities - The City of Boardman's sewage treatment facility has sufficient capacity for 4,000 residents. The current population of Boardman is approximately 1,500 (Portland State University, 1992). The existing sewage treatment facility should be adequate for some years to come.

Education/Schools - The Morrow County School District's boundaries are the same as the county's boundaries. As a result, all schools in the county are contained within a single county-wide school district, including those schools within the cities of Boardman and Irrigon. The

school district operates four schools: two elementary schools, one junior high school, and one high school. Of these four schools, Riverside High School and Sam Boardman Elementary School in Boardman, and the A.C. Houghton Elementary School in Irrigon, are at capacity. The fourth, Columbia Junior High School in Irrigon, is nearing capacity. The school district hopes to pass a bond issue soon to provide for additional classroom space within these four schools. The school district needs to expand its facilities even if the Coyote Springs Plant is not constructed. (Morrow County School Superintendent, August 1993).

Library Services - Library services are provided to the local area by the Oregon Trail Library District, which maintains a library in the City of Boardman and in the City of Heppner. The library district, formed in early 1991, encompasses the northern portion of the county, about half of Morrow County. The library district serves a population of about 4,000 persons. (Oregon Trail Library, August 1993). Irrigon and Ione, and the remaining rural areas of Morrow County have elected not to join the library district.

Health Care - Health care services for the City of Boardman and the northern Morrow County area are provided by the Boardman Health Care Center in the City of Boardman. The health center is staffed by a physician's assistant and a nurse. Ambulance service is provided by Boardman Ambulance Service, also in the City of Boardman. The ambulance service has two ambulance units and is staffed by eight trained emergency technicians.

Morrow County residents are also served by the Good Shepherd Community Hospital and the Hermiston Community Health Clinic in the City of Hermiston.

Solid Waste Disposal - One sanitary landfill exists in Morrow County and two are currently used in Umatilla County. The sanitary landfill in Morrow County is the Finely Butte Waste Disposal Area. This landfill is about 18 km (11 miles) south of the City of Boardman, off Bombing Range Road. The landfill is approximately 200 ha (500 acres) and is projected to provide service for the City of Boardman, Morrow County, and current customers for 50 years at the present rate of use. If needed, additional land is available adjacent to the facility for expansion. The landfill accepts municipal solid waste only. The facility is not equipped to receive any toxic, hazardous or liquid wastes. Discussions of other waste issues are covered in other sections of this DEIS.

4.1.4 Public Health and Safety

Power plants and transmission facilities provide electricity for heating, lighting and other services essential for public health and safety. These same facilities can potentially harm humans. Contact with transmission lines can injure birds, people and aircraft. Power plants can impact air and water, and generate noise at levels potentially injurious to public health. Also, certain amounts of toxic and hazardous substances are used which pose a risk of emergency releases (spills) and thereby health and safety risks. Expanded discussions for these health and safety issues are provided below.

Air Impacts to Public Health and Safety - Air pollutants from stationary sources such as the Coyote Springs Cogeneration Plant are closely regulated under the Clean Air Act. The EPA and Oregon's Department of Environmental Quality (DEQ) have established acceptable emission rates for a wide range of air pollutants and have established ambient air quality standards based on public health and safety. Section 5 reports the air pollutants generated by the Coyote Springs Plant and how these compare with regulatory standards. The Coyote Springs Plant will be equipped with continuous air monitoring equipment to assure that actual emissions do not exceed authorized levels.

Toxic and Hazardous Materials - A review and data search (level 1) of the cogeneration plant site and lands along the transmission line route was done to determine if toxic or hazardous materials users, and/or generators might have used or accidentally contaminated the proposed site. No hazardous material sites, hazardous material generators or transporters, or records of hazardous chemicals or accidental spills were identified.

Toxic and solid waste material expected to be generated during plant operation are listed in Tables 3-2 and 3-3. Some solid waste material is classified as hazardous and would need careful handling and disposal to protect public health and safety. Section 5 describes these materials and special handling plans for them.

Electric and Magnetic Fields - Power lines, like electrical wiring and household appliances, produce **electric fields and magnetic fields (EMF)**. Current (movement of electrons in wire) produces the magnetic field. Voltage (the force that drives the current) is the source of the electric field. The strength of these fields depends on the design of the line and distance from the line. Field strength decreases rapidly with distance. Electric and magnetic alternating-current (AC) fields induce currents in conducting objects, including people and animals. These currents, even from the largest power lines, are too weak to be felt. However, some scientists believe these currents might be potentially harmful and that long-term exposure should be minimized. Hundreds of studies on electric and magnetic fields have been conducted in the U.S. and other countries. However, today most concern about potential adverse health effects is focused on exposure to magnetic fields.

Electric and magnetic fields are found throughout a home. In homes the **electric field** strength from wiring and appliances is typically less than 0.01 kilovolts per meter (kV/m). However, fields of 0.1 kV/m and higher can be found *very close* to electrical appliances. Typical electric and magnetic field strengths for some common electrical appliances are listed in Table 4-4.

Table 4-4
Typical Electric and Magnetic Field Strengths from Common Appliances
At 0.3 Meter (1 Foot)

Appliance	Electric Field (kV/m)	Magnetic Field * (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 **	.01-1.0	15-100
kV/m = kilovolts per meter mG = milligauss * By 1 to 1.5 meters (3-5 feet), the magnetic field from appliances is usually decreased to less than 1 mG. ** Values are for distance from a blanket in normal use, not 1 foot away. Source for appliance data: Miller 1974, Gauger 1985		

Average **magnetic** field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 milligauss (mG). *Very close* to appliances carrying high current, fields of tens of hundreds of milligauss are present. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. So, power lines can be a major source of magnetic field exposure throughout a home located close to the line. Typical electric and magnetic field strengths for some BPA transmission lines are shown in Table 4-5.

**Table 4-5
Typical Electric and Magnetic Field Strengths
From BPA Overhead Transmission Lines**

Transmission Lines	Electric Field (kV/m)	Magnetic Field * (mG)	
		Maximum *	Average **
115- kV			
Maximum on Right-of-way	1.0	63	30
Edge of Right-of-way	0.5	14	7
60 m (200 ft.) from center	0.01	1	0.4
230- kV			
Maximum on Right-of-way	2.0	118	58
Edge of Right-of-way	1.5	40	20
60 m (200 ft.) from center	0.05	4	2
500- kV			
Maximum on Right-of-way	7.0	183	87
Edge of Right-of-way	3.0	62	30
60 m (200 ft.) from center	0.3	7	3
kV/m = kilovolts per meter mG = milligauss * Under annual peak load conditions (occurs less than 1 percent of the time) ** Under annual average loading conditions Note: Above information obtained from a BPA study to characterize nearly 400 transmission lines in Pacific Northwest.			

Because public concern is increasing over potential health effects of electric and magnetic fields and because a clear course of action has not been determined from present scientific evidence, BPA has developed interim guidelines. These guidelines state that BPA should not increase public exposure to electric and magnetic fields where practical alternatives exist. It is BPA's practice to consider potential electric and magnetic field exposure increases in the design and location of new transmission facilities. Increases in long-term, involuntary exposures to these fields are avoided if practical alternatives exist. A description of EMF impacts is provided in Section 5.

4.1.5 Noise

Noise is commonly defined as unwanted sound that disrupts normal human activities or diminishes the quality of the human environment. Transient noise sources, such as passing aircraft or motor vehicles, are usually of short duration and excluded from regulation. Stationary sources such as the proposed plant emit more long-term noise. Ambient noise is all noise generated in the vicinity of a chosen site by typical noise sources such as traffic, wind, neighboring industries, and aircraft. The total ambient noise level is a typical mix of distant and nearby sources.

Noise is measured as a sound pressure level exerted on the microphone of a sound meter. Sound is measured in **decibels (dBA)**. Because the human ear is more sensitive to higher frequency (or higher pitched) sound, levels are adjusted by the sound meter and are reported as A-weighted decibels (dBA).

Local, state and Federal regulations and guidelines protect residents and workers from excessive noise. The Federal Noise Control Act of 1972 gave states the responsibility for noise control. Executive Order 12088 requires Federal agencies such as BPA to comply with state and local noise control regulations.

Noise regulations focus primarily on noise impacts on noise sensitive properties (such as residences). Oregon's nighttime noise standard is 50 dBA. Oregon's daytime noise standard (55 dBA) has been equated with interrupting speech, which in some instances could impact public safety.

Noise measurements were made at the proposed plant site and at surrounding property where noise impacts are likely to occur (see Map 3). Ambient noise measurements vary. Activities that contribute to the ambient noise include existing industrial activities, traffic on I-84, and aircraft. Ambient noise levels and potential noise impacts from the project are reported in Section 5. Noise impacts to wildlife are in Section 5.

4.1.6 Visual and Aesthetic Resources

The visual resource change introduced by the Coyote Springs Project is related to the (1) visual characteristics of the proposed facility, (2) existing visual character of the area and the degree to which the project would contrast, or be incompatible with that character, and (3) viewers exposed to this change and the degree of their exposure and sensitivity to visual change. The following discussion summarizes the visual resources and viewers potentially impacted, and the project's visual characteristics. Plant emission impacts on visibility are discussed in Section 5 (page 5-20).

The 48-km (30-mile) visual impact zone used in the analysis is defined by Oregon Siting Regulations. The visual impact area extends through parts of Morrow, Umatilla, and Gilliam counties.

Visual Characteristics of the Proposed Facility - The plant will be on the east side of Ullman Boulevard, just south of the Union Pacific Railroad corridor, within the Port of Morrow Industrial Park. The plant site is rectangular measuring about 244 m by 355 m (800 ft. by 1,100 ft.) (See Figure 3-1 and Map 2). The utility corridor is south of the property. A 3 ha (7.5 acre) irrigation pond is just outside and east of the plant site. Messner Pond is adjacent to the irrigation pond.

The facility will have three main buildings: a main turbine generator building, an auxiliary equipment building, and an administration control building. In addition, there are major structures or equipment proposed that add significantly to the visual character of the project. Table 4-6 describes the visual characteristics of proposed buildings and structures.

Figures 4-3, 4-5, and 4-7 illustrate views of the plant site from I-84. Figures 4-4, 4-6, and 4-8 are simulations of the proposed facilities as they might appear from the same view points on I-84. The views from I-84 will be the most prominent public views of the site. The simulations were prepared for PGE's site application. They do not show the 500-kV transmission line. A simulation of the proposed transmission line is in Figure 5-2.

Outdoor lighting will be controlled by a photocell. The general lighting design for the exterior of the facility will minimize any obtrusive physical features. Exterior lighting will generally point inward toward the plant rather than outward toward approaching people or passersby. Perimeter lights along the fence will simply display that a fence exists. Aircraft warning lights will be installed on the two 64 m (210 ft.) tall heat recovery boiler stacks, if required by the Federal Aviation Administration (FAA).

Table 4-6
Visually Important Structures Located on the Plant Site

Visually Important Structures	Structure Type	Size/Height
Main Turbine Building	One story steel structure with metal panel exterior walls.	4460 sq. m (48,000 sq. ft.) plan area, 24 m (80 ft.) high.
Auxiliary Equipment Building	One story steel structure with metal panel exterior walls and boiler exhaust stack.	2230 sq. m (24,000 sq. ft.) plan area, 14 m (45 ft.) high.
Administration/Control Building	Two story steel structure with metal panel exterior walls.	465 sq. m (5000 sq. ft.) plan area, 9 m (30 ft.) high.
Heat Recovery Steam Generators	Steel structures on concrete foundation.	24 m (80 ft.) high, Exhaust Stack 64 m (210 ft.) high.
Cooling Towers	Wood frame on concrete basin/foundation	Length=91 m (300 ft.) Width=18 m (60 ft.) Height=12 m (40 ft.)
Demineralized Water Tanks	Metal tanks on concrete foundations.	8.5 m (28 ft.) high
Raw Water Tanks	Metal tanks on concrete foundations.	6 m (20 ft.) high

Visual Resources - The visual characteristics of the area were examined using USGS topographic maps, field reconnaissance and a review of visual and aesthetic resource portions of the project site application prepared by PGE. Included in the review are areas designated "significant or important" in the comprehensive plans of the counties potentially impacted as well as "protected areas" defined by Oregon EFSC.

The project would be on a low plateau that slopes gently downward from the foothills of the Blue Mountains to the Columbia River. The area has been categorized as part of the Walla Walla Section of the Columbia Plateau physiographic province or the Columbia Basin Province (Franklin and Dyrness, 1986). Topography in this part of the province is very gently undulating covered by shrub-steppe vegetation (Franklin and Dyrness, 1986). Present land use of the region

is dry-land grain farming on the uplands and hay farming in areas such as stream valleys, where irrigation is possible. Irrigation development has occurred on large tracts of land adjacent to the Columbia River. There is some cattle and sheep grazing, although not as extensive as in the past.

It is possible to see long distances in this region because of the relatively flat terrain. Map 8 illustrates the area visible (viewshed) from this project. The viewshed map was constructed using BPA's geographic information system. Areas that can see project structures (30 meters and above) are shaded. Sweeping views along the Columbia River and across the uplands to the south of the river are visible. However, views are disrupted by stands of Russian olive, cottonwood and poplar trees. Motorists on I-84 in Oregon and State Highway 14 in Washington can see the Boardman Coal Plant 6-9 km (10-15 miles) away. Depending on the relief and vegetation adjacent to I-84, it is sometimes possible to see buildings and the stack and plume from the Boardman Coal Plant. Another predominant feature of the landscape while driving along I-84 is the extensive network of transmission towers and lines in BPA's transmission line corridor.

Such sweeping views are impossible closer to the City of Boardman because of local topography, vegetation and trees. At the Boardman interchange on I-84 there are commercial developments. Residential development has occurred on both sides of I-84. Contiguous with the commercial and residential developments in Boardman are the industrial developments in the Port of Morrow (see Figure 4-3). The visually dominant industrial developments are the Boardman Chip Company plant and potato processors, Lamb Weston and Oregon Potato Company, immediately east of the proposed plant site. The potato processing plants are visible from I-84, and from local roads and residences. Visible plumes are emitted from these facilities.

Within the impact area is the U. S. Navy's 130 sq. km (50 sq. mi.) Boardman Bombing Range. The range contains relict grassland communities. Part of the range is used for bombing practice, part is leased for grazing, and part is managed as a Natural Research Area by The Nature Conservancy.

Morrow County - There are no areas designated as "significant" or "important" in the Morrow County Comprehensive Plan (1986). Page 120 of the Plan states:

Morrow County contains a variety of landscapes, many of which may be considered to be scenic. The County has not, however, designated any sites or areas as being particularly high in scenic-resource value.

The road between Ukiah and Heppner is a scenic byway. However, this road is outside the 48-km (30-mile) impact area. (Morrow County, 1993.)

Umatilla County - Although not specifically identified in the Umatilla County Comprehensive Plan, there are several sites and vistas classified in the Comprehensive Plan Technical Report as "justifying limits to conflicting land uses" and, therefore, constitute key observation points. These sites and vistas include Hat Rock State Park, the Columbia River, and Cold Springs Reservoir.

In addition to these sites, the following resources in the impact area have scenic value:

1. **Umatilla County Scenic-Historic Road.** This road, which is a collection of county roads, city streets, and state highways, follows the general course of early wagon roads between Umatilla and the Blue Mountains. The road is about 35 km (22 miles) east of the plant site.
2. **McNary Lock and Dam.** This structure on the Columbia River is at the western edge of Umatilla, approximately 32 km (20 miles) northeast of the plant site. (PGE, 1993.)

Gilliam County - There are no scenic or aesthetic resources identified in northeastern Gilliam County.

Viewer Exposure - Principal observation areas from which viewers could be exposed to visual impact are identified on Table 4-7. The locations of these areas are shown on Map 8. These areas were selected because of their designation as protected areas or designation in county or other land use plans as public recreation sites. Many of these visual observation areas are recreational sites where the visual experience is important.

Coyote Springs Cogeneration Plant - Morrow County, Oregon

**Figure 4-3
View Looking
Northeast from I-84**

Coyote Springs Cogeneration Plant - Morrow County, Oregon

Figure 4-4
View Looking
Northeast from I-84
(With Simulation)

Figure 4-5
Distant View Looking
Northeast from I-84 -

Coyote Springs Cogeneration Plant - Morrow County, Oregon

Figure 4-6
Distant View Looking
Northeast from I-84
(With Simulation)

Coyote Springs Cogeneration Plant - Morrow County, Oregon

Coyote Springs Cogeneration Plant - Morrow County, Oregon

Figure 4-7
Distant View Looking
Northwest from I-84

Coyote Springs Cogeneration Plant - Morrow County, Oregon

**Figure 4-8
Distant View Looking
Northwest from I-84
(With Simulation)**

Table 4-7
Visual Observation Areas Near the Proposed Project

Viewer Observation Areas	Activity	Designation in Land Use Plan
Boardman Marina Park	Swimming, Sailboarding, Camping & Picnicking	Designated
Boardman Research Natural Area	Viewing, Research	Protected Area
Boardman Sailboard Beach	Sailboarding	Not Designated
Cold Springs Reservoir	Boating	Designated
Cold Springs National Wildlife Refuge	Hiking, Wildlife Viewing, Hunting & Boating	Protected Area
Horn Butte BLM ACEC	Wildlife Viewing & Hiking	BLM Designated and Protected Area
Coyote Springs State Wildlife Area	Wildlife Viewing & Hunting	Not Designated but Protected Area
Hat Rock State Park	Picnicking, Hiking, Fish Viewing	Designated and Protected Area
I-84 Rest Stops (east/west bound)	Picnicking, Resting	Not Designated
Irrigon Marina Park	Boat Launching, Boating	Not Designated
Irrigon State Wildlife Area	Wildlife Viewing & Hunting	Not Designated or Protected
Lake Wallula	Boating	Designated
Lake Umatilla	Boating	Designated
Lindsay Grassland	Viewing	Designated
McNary Lock and Dam	Viewing	Designated
Messner Pond	Fishing, Boating, Wildlife Viewing	Not Designated
Oregon Trail BLM ACEC (Bucks Corner)	Viewing, Hiking & Historic Values	BLM Designated and Protected Area
Power City Wildlife Area	Viewing & Hunting	Not Designated or Protected
Riverside High School	Tennis, Baseball, Softball, Football, Track & Jogging	Not Designated
Motorists on I-84	Destination Travel	Not Designated
Umatilla County Scenic-Historic Road	Scenic Travel & Viewing	Designated
Umatilla National Wildlife Refuge	Hiking, Horseback Riding, Hunting, Boating & Wildlife Viewing	Protected Area
Willow Creek Corps of Engineers Boat Ramp/Recreation Area	Boating, Fishing, Camping	Designated
Willow Creek State Wildlife Area	Wildlife Viewing	Protected Area
Wilson's Willow Run Golf Course	Golfing	Not Designated

Coyote Springs Project

Visual Assessment

Viewer Observation Locations

- 1 Boardman Marina Park
- 2 Boardman Research Natural Area
- 3 Boardman Sailboard Beach
- 4 Coyote Springs Wildlife Area
- 5 I-84 Rest Stop
- 6 Lake Umatilla
- 7 Messner Pond
- 8 Riverside High School
- 9 Travelers on I-84
- 10 Umatilla National Wildlife Refuge
- 11 Wilson's Willow Run Golf Course
- 12 Cold Springs Reservoir and National Wildlife Refuge
- 13 Horn Butte Area of Critical Environmental Concern (BLM)
- 14 Hatrock State Park
- 15 Irrigon Marine Park
- 16 Irrigon State Wildlife Area
- 17 Lake Wallula
- 18 Lindsay Grasslands
- 19 McNary Lock and Dam
- 20 Oregon Trail Area of Critical Environmental Concern (BLM)
- 21 Power City Wildlife Area
- 22 Umatilla County Scenic-Historic Road
- 23 Willow Creek State Wildlife Area
- 24 Willow Creek Corps of Engineers Boat Ramp-Recreation Area

Viewshed

Visible terrain from point 30 Meters Above Facility*

Project Proposal

- Proposed Plant Site
- Proposed Pipeline Extension
- Existing BPA Transmission Line

Map 8

4.1.7 Cultural Resources

Historic, cultural, and archeological resources near the project site that might be affected by proposed project facilities were evaluated by the Museum of Natural History, Eugene, Oregon under contract to PGE. Findings are reported in Exhibit T of PGE's *Application for Site Certificate*. PGT's Resource Report for FERC reports on cultural resources along the natural gas pipeline. A summary of these studies follows.

Cultural Resources Background - The project lies within the Southern Columbia Plateau culture area, which contains prehistoric sites dating from 11,000 to 200 years B.P. The earliest prehistoric period dates from 11,000 to 3,500 B.P. and is distinguished from later periods by the absence of permanent pit house dwellings. The later prehistoric period, dating from 3,500 to 200 B.P., is characterized by semi-subterranean houses and an increased reliance on fish.

Most cultural resource work in the Columbia Plateau is related to hydroelectric power projects in the Columbia River Basin. Important sites in the project vicinity include Five Mile Rapids, Wildcat Canyon, and Umatilla Rapids. The Five Mile Rapids site contains evidence of over 10,000 years of human occupation. At the time of historic contact, it was the greatest trading center and fishing area in the Northwest.

Wildcat Canyon contains a cultural sequence of comparable length, with the earliest human occupation dating to 9,000 years B.P. The most intense occupation at Wildcat Canyon was between 2,500 and 1,000 B.P. The artifact inventory from this period includes a variety of tools relating to food processing and gathering, as well as tools for making wood, leather, and textile items.

When the Lewis and Clark Expedition passed by the Umatilla Rapids site in 1805, they noted it was a village with "a great number of lodges." This important site at the confluence of the Columbia and Umatilla rivers was occupied before 7,000 B.P., with occupation extending into historic times. The remains of over 30 prehistoric houses have been excavated at the site, and over 230 burials were identified in a cemetery area.

At the time of historic contact, the project area was inhabited by Umatilla Indians. Although no single ethnography exists on the Umatilla, living patterns of these people can be reconstructed through information found in journals of trappers and early explorers. Lewis and Clark noted 34 villages between the Snake River and the Columbia River channel. The most important resource to the Umatilla was the fish species of the Columbia River.

The first commercial enterprises in the area were fur-trading companies established in the early 1810s. Umatilla, the largest town in the area, was founded during the gold rush of 1860. Umatilla served as a supply center for the region during the mining boom. As the mining-based economy slowed in the 1870s, agriculture became increasingly important and was fueled by

completion of the Central Pacific Railroad. Wheat and livestock were a focus in the area's early agricultural period. As irrigation projects were completed in the early 1900s, large tracts of land were devoted to growing peaches and melons. Today, agriculture still is a significant portion of the area's economy.

Review of Existing Information - Information on existing historic, archeological, and cultural resources in the vicinity of the proposed project was obtained through consultation with the **State of Oregon Historic Preservation Office (SHPO)** and a review of available literature. Known historic, archeological, and cultural resources in the vicinity include the following resources.

Oregon National Historic Trail - The Oregon Trail route is within 24 km (15 miles) of the main plant site. Much of the Oregon Trail has been obliterated by cultivation and other land development activities, but the trail is evident near Immigrant Road, 24 km (15 miles) south of the plant site. The SHPO and National Park Service have expressed concern over protection and preservation of remaining trail sections.

Carty Reservoir Prehistoric Sites - Two prehistoric sites were found during 1973-75 in the area now occupied by Carty Reservoir near the Boardman Coal-Fired Plant. Site 35 MW 15, the "Fourmile Canyon Site," and Site 35 MW 18, the "Canyon Four Site," were both extensive stone working/tool making sites dating from the period 6,000 to 9,000 B.P. Three other less extensive sites containing lithic flakes and fragments were also found in the area (Sites 35 MW 16, 35 MW 17, and 35 MW 19).

West Extension Irrigation Canal - The West Extension Irrigation Canal is within about 2.4 km (1.5 miles) of the main cogeneration plant site. The canal was built in 1913 and is still used. It is considered a historic engineered structure by the U.S. Bureau of Reclamation.

Lewis and Clark Historical Marker - A historical marker along Highway 730 in Irrigon represents a stopover made by the Lewis and Clark Expedition on October 19, 1805.

Columbia River South Shoreline Lithic Scatters - Elongated areas containing scattered lithic flakes and fragments are along the south shoreline of the Columbia River in the project's vicinity. These include areas just upstream and downstream of the inlet to Messner Pond about 0.8 km (0.5 mile) from the plant (Sites MW 12 and MW 13).

Other Nearby *Isolates* in the Vicinity - Several other small isolated and detached sites (isolates) containing prehistoric remnants have been identified in the vicinity (PGE, 1993). These include two areas about 2.4 km (1.5 miles) northeast of the main plant site (MW 47 and MW 48), two areas between Boardman and Irrigon (MW 45 and MW 46), and one area 3.2 km (2 miles) east of Irrigon (MW 12).

Other Previous Surveys in the Vicinity - Several other archeological surveys have been conducted in the vicinity. Most produced no significant or substantive historic or archeological evidence. These include:

PGT Pipeline Surveys - Extensive surveys were done along the existing PGT pipeline route in 1990. No prehistoric sites or isolates were found during these surveys. No historic sites or isolates were found, with the exception of the Oregon Trail, which crosses the existing PGT pipeline just northwest of Ione.

Northwest Pipeline Surveys - Extensive surveys were conducted during 1990-91 along the proposed route for the Northwest Pipeline Expansion Project, including the segment recently constructed near Umatilla. Four historical sites along the pipeline corridor were trash scatters determined not to be significant. In addition, historic irrigation systems were determined to be eligible for the National Register of Historic Places. Treatment plans were developed and implemented to protect the historical significance of the 12 canal crossings during construction of the natural gas pipeline. No prehistoric sites or isolates were found during these surveys.

Port of Morrow Interchange Surveys - An on-site archeological reconnaissance survey was done by the Oregon Department of Transportation (ODOT) in a limited area surrounding the Port of Morrow/Interstate 84 interchange just south of the proposed plant site. No prehistoric or historic sites, or isolates were found during this survey.

Boardman Bombing Range Survey - An on-site archeological reconnaissance survey was conducted in a limited area on the Boardman Bombing Range near the Boardman coal-fired plant. Only one prehistoric isolate was found during this survey.

On-Site Surveys - On-site surveys to assess the possible presence of historical, archeological, and cultural resources have been done.

Surveys were done during April and May 1993 by teams of qualified archaeologists as recommended by SHPO. The surveys were conducted by a team of four archaeologists walking in unison at 30 m (100 ft.) intervals. The surveys initially checked for presence of surface materials. Subsurface testing was not recommended by the archaeologists based on the surface reconnaissance. PGE submitted survey results to SHPO and EFSC. If surveys and subsurface testing reveal any resources of historical, cultural, or archeological significance, treatment plans will be developed and implemented to appropriately protect, recover, or avoid such resources. The survey team included Dana Schneder, a cultural resource technician from the Confederated Tribes of the Umatilla.

National Park Service - The National Park Service was contacted about any concerns relevant to their interest within the impact area. The National Park Service's primary concern was the Oregon Trail. The proposed gas pipeline and its impact will be reported in an EIS issued by the FERC in early 1994. The pipeline would cross the Oregon Trail in a location that has not been evaluated to determine its National Register eligibility.

4.1.8 Protected Areas

In Oregon, siting energy facilities is regulated by EFSC. One aspect of this regulation is to prohibit energy facilities from being sited within special land use areas called Protected Resources. Oregon Administrative Rules, Chapter 345, Division 22, Rule 040 (1) lists Protected Resources. In addition, design, construction and operation of a facility near these areas cannot significantly impact these areas. The proposed facility is near the Protected Resources discussed below and shown on Map 9.

The Umatilla National Wildlife Refuge is approximately 3.5 km (2.2 miles) northeast of the proposed plant site. The refuge occupies a 32-km (20-mile) portion of the mid-Columbia River and adjacent uplands, totaling 9250 ha (22,900 acres). About half of the acreage is made up of the flowing Columbia River. The refuge is an important wildlife and recreational area. A wide variety of habitats enable the refuge to support a wide diversity of wildlife, including bald eagle, peregrine falcon, long-billed curlew, white pelican, osprey, and burrowing owl. Frequently seen mammals are coyote, badger, mule deer, beaver, and river otter. The Columbia River and its backwaters serve as migration, feeding, spawning, and rearing areas for a variety of fish.

The Coyote Springs Wildlife Area is 65 ha (160 acres) located in Morrow County north of I-84 near the junction of I-84 with U. S. Highway 730, approximately 3.2 km (2 miles) from the proposed plant site. It is a waterfowl hunting and nesting area.

Other protected areas within a 32-km (20-mile) radius of the proposed facility are: two State fish hatcheries between Irrigon and Umatilla; Hat Rock State Park; Willow Creek, Irrigon, and Power City Wildlife Areas; Boardman Research Natural Area; Lindsay Grassland; and two BLM areas of Critical Concern (part of the Oregon National Historic Trail and Horn Butte).

4.2 Coyote Springs Natural Gas Pipeline Extension

PGT's Coyote Springs Extension Pipeline passes through areas with largely the same characteristics as the Coyote Springs Cogeneration Project. The preferred route of the pipeline is shown on the resource maps.

A complete discussion of the affected environment along the pipeline will be provided in a draft EIS for the pipeline that FERC plans to release in early 1994. To avoid unnecessary duplication the reader is referred to PGT's Resource Reports. A list of PGT's resource reports is provided in Section 9.

Coyote Springs Project

Protected Areas

- ① COLD SPRINGS NATIONAL WILDLIFE REFUGE
- ② UMATILLA NATIONAL WILDLIFE REFUGE
- ③ IRRIGON STATE FISH HATCHERY
- ④ UMATILLA STATE FISH HATCHERY
- ⑤ HAT ROCK STATE PARK
- ⑥ POWER CITY WILDLIFE AREA
- ⑦ COYOTE SPRINGS WILDLIFE AREA
- ⑧ WILLOW CREEK WILDLIFE AREA
- ⑨ IRRIGON WILDLIFE AREA
- ⑩ LINDSEY GRASSLAND PRESERVE
- ⑪ BOARDMAN NATURAL AREA
- ⑫ HERMISTON AGRICULTURAL RESEARCH & EXTENSION CENTER
- ⑬ OREGON NATIONAL HISTORIC TRAIL
- ⑭ HORN BUTTE

Federal Threatened and Endangered Species

- BOLD EAGLE

State Sensitive Species

- ★ HILLSIDE MILVETCH
- ▲ THOMPSON'S SANDWORT
- ◆ ROBINSON'S ONION
- ▼ COLUMBIA CRESS
- LONG-BILLED CURLEW
- † FERRUGINOUS HAWK

- ▲ PROPOSED TURBINE SITE
- PROPOSED PIPELINE EXTENSION

KILOMETERS

0 1 2 3 4 5

MILES

0 1 2 3 4 5

Map 9

5. Environmental Consequences

This section describes the impacts of the proposed action and alternatives to the proposed action on the environment. Most impacts are from the proposed cogeneration plant.

Impacts are organized by proposed action, that is, impacts to resources from the cogeneration plant are first, followed by impacts from the transmission line and the natural gas line. Impact matrices are provided at the beginning of these impact discussions and provide an overview of predicted impacts. Impact narratives follow the matrices and provide more detailed explanations of predicted environmental consequences.

Environmental Impact Definitions - Analysts evaluated the proposed action and alternatives to determine if these actions would cause significant adverse change to present environmental conditions. A significant adverse change to present environmental conditions would satisfy one or all of these outcomes:

1. Create an effect that cannot be mitigated.
2. Significantly reduce the quantity or quality of a regionally or nationally significant resource.
3. Pose a clear risk to human health or safety.
4. Affect the long-term productivity of the affected environment.
5. Irreversibly or irretrievably damage the environment.
6. Consume significant quantities of non-renewable natural resources.

Analysts considered short-term and long-term impacts. Impacts that do not meet the definitions above, or that can be mitigated, are not considered significant.

5.1 Impacts of the Proposed Action

5.1.1 Coyote Springs Cogeneration Plant Impacts

Impacts predicted to occur from the cogeneration plant are summarized in Table 5-1. Narrative descriptions of predicted impacts are provided below.

Land Use Impacts - Cogeneration Plant

Construction of the proposed power plant would alter the land use at the proposed site from vacant to an industrial use. The proposed project has been sited in an industrial park and is appropriately zoned for the proposed use. Power-generating facilities are permitted uses in the Port Industrial Zone, under the Morrow County Zoning Ordinance, MC-C-2 Section 3.073 (1)(L). A land use compatibility statement for the proposed use was approved by the County of Morrow

and the City of Boardman in September 1991. Furthermore, the proposed project would be surrounded by other industrially zoned parcels. No land use conflicts or incompatibilities with existing or future industrial land uses are anticipated.

Transportation Impacts - Cogeneration Plant

Possible train derailments adjacent to the proposed project site are unlikely to impact any of the proposed facilities (Egan, 1993). With a permanent work force of 20-30 full-time employees, the proposed project would generate approximately 40-60 vehicle trips per day in the local area. Construction vehicles and equipment used in the construction of the proposed project could damage existing roads in the local area.

Mitigation - Road improvements necessary to provide access to the proposed facility could be financed and constructed by PGE in accordance with the Morrow County Street Classification policies and the County's Transportation Policy #10. Prior to any construction activities taking place, PGE could place sufficient funds in escrow to return any roads damaged during construction to their preconstruction condition.

Recreational Impacts - Cogeneration Plant

Recreational facilities and opportunities in Morrow County would not change as a result of this project (PGE, 1993).

Construction noise could cause short-term impacts; noise could increase to 68 dBA L_{max} for 4 hours (PGE, 1993). Temporary disturbance of recreational opportunities at Messner Pond may occur during plant construction due to increased noise levels. Plans to develop recreational trails and/or other facilities would not be impacted by developing the power plant near the west side of Messner Pond. No disturbance of recreational opportunities at Messner Pond during facility operation is expected, so no mitigation is needed.

Primary recreational facilities and opportunities within the 8-km (5-mile) impact area are at the Umatilla National Wildlife Refuge, Boardman Marina Park, Coyote Springs Wildlife Area, and Riverside High School. These facilities would not be impacted by the proposed plant.

The visual impact discussion describes visual impacts to recreational areas and activities.

Natural Resource Impacts - Cogeneration Plant

Soils and Geology

Soils - Minimal impacts to soils are expected from plant construction other than construction related impacts such as fugitive dust leaving the site, and erosion caused by soil disturbances during construction. Determination of soil impacts are based on soil characteristics, topography,

Impact Table - Coyote

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
WATER				
Resulting from Construction Activities				
Messner Pond	Unlikely	None	NPDES requirements	DEQ 1200 C
Columbia River	Unlikely	None	NPDES requirements	DEQ 1200 C
Unnamed Irrigation Pond	Certain	Moderate	NPDES requirements	DEQ 1200 C
Resulting from Facility Operation				
Shallow aquifer water quality	Unlikely	Slight	None	Water Rights Permit
Degradation of water quality	Unlikely	Slight	City of Boardman's sewage treatment facility	None
Deep aquifer lowering of water table	Possible	Slight	None	Water Resources Permit
Spills of fuel or other hazardous materials	Unlikely	Major	NPDES requirements	None
Fisheries impacts	None	None	NPDES requirements	DEQ 1200 C
Wetlands/Messner Pond	Unlikely	Slight	NPDES requirements	DEQ 1200 C
Boardman sewer facilities	Likely	Unknown	None	None
VEGETATION				
Habitat disturbance	None	None	Recontouring and revegetation	None
Sensitive plant species	None	None	None	None
WILDLIFE				
Fauna				
Mortality of individuals	Unlikely	Unlikely	None	None
Temporary displacement	Unlikely	Unlikely	Place fence around swallow nests and plant trees on west shore of Messner Pond.	None
Stress in crucial life cycle times	Unlikely	Unlikely	None	None
Wildlife Habitat				
Wildlife habitat impact shrub-steppe	Minimal	Unlikely	None	None
FISH				
Mortality/displacement	Unlikely	None	None	None
SPECIAL STATUS SPECIES				
None found in project area	None	None	None	None

ngs Cogeneration Plant

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
THREATENED AND ENDANGERED SPECIES (Federally Listed)				
Plants				
None found in project area	None	None	None	None
Wildlife				
Peregrine falcon	Unlikely	None	None	None
Bald eagle	Unlikely	None	None	None
Fish				
Salmon River fall chinook salmon	Unlikely	None	None	None
Salmon River spring/summer chinook salmon	Unlikely	None	None	None
Salmon River sockeye salmon	Unlikely	None	None	None
GEOLOGIC HAZARDS				
Seismic Hazards (Possibilities that ground shaking, fault offset, soil liquefaction, or seismically induced waves and flooding could affect the integrity of the facility.)	Possible	Local area	Construct facilities according to the Uniform Building Code, and the appropriate importance factor for essential and hazardous facilities.	Building Permit
SOIL				
Wind erosion due to removal of vegetation	Slight	Localized short-term	NPDES Requirements	DEQ 1200 C
Water erosion due to removal of vegetation.	Slight	Localized short-term	NPDES Requirements	DEQ 1200 C and Plot Plan Review Permit
LAND USE				
Land use will change from vacant to industrial.	Certain	Localized	None	None
Plant will generate approximately 50 vehicle trips each day.	Likely	Localized	Project proponent could fund necessary road improvements.	None
Construction vehicles may damage local roads	Unlikely	Project Area	Project proponent could fund any repairs necessary to repair roads to preconstruction condition.	None
CULTURAL RESOURCES				
Historic, cultural and archeological resources	Unlikely	None	Site-specific survey	None
SOCIOECONOMIC				
Significant increase in the assessed value of Morrow County	Likely	County-wide	Positive impact	None
Construction and operation of proposed project will increase employment in local area	Likely	Local area	Positive impact	None

Table 5-1
Impact Table - Coyote Springs Cogeneration Plant

Impact Table - Coy

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
SOCIOECONOMICS Cont.				
Construction of proposed project will increase demand for temporary housing	Likely	Local area	None	None
Incremental increase in demand for law enforcement and fire protection services.	Likely	Plant/local area	Increased property tax revenue should more than compensate for increased demand	None
Increase in school district enrollment	Likely	County-wide	Increased property tax revenue should more than compensate for increased costs	None
Increased demand for library services.	Likely	Slight-local area	Increased property tax revenue should more than compensate for any increased demand.	None
RECREATION				
Nearby recreation sites	Unlikely	None	None	None
VISUAL AND AESTHETIC RESOURCES				
Nearby residences, Washington Highway 14, I-84, Columbia River, portions of the Umatilla Wildlife Refuge, and the Coyote Springs State Wildlife Refuge.	Likely	Moderate	(1) Paint buildings and exhaust stacks in neutral shades to minimize visual impacts. (2) Minimize the amount of exterior lighting at night. (3) Use native material landscaping.	None
Other key observation points	Unlikely	Slight	(1) Paint buildings and exhaust stacks in neutral shades to minimize visual impacts. (2) Minimize the amount of exterior lighting at night. (3) Use native material landscaping.	None
PROTECTED RESOURCES				
Oregon DOE designated protected resources	Unlikely	Slight	None	None
PUBLIC HEALTH AND SAFETY				
Toxic and hazardous waste	Minimal	Localized area	Requirements of SPCC Plan pursuant to the Clean Water Act	None
Electric fields	Likely	None	Standard safety precautions	None
Magnetic fields	Likely	Unknown	None	None
NOISE				
Construction noise	Likely	Significant, localized/short-term	None	None
Operation noise (increase above background)	Likely	Insignificant, localized/long-term	None	None

Table 5-1 (continued)
Impact Table - Coyote Springs Cogeneration Plant

Springs Cogeneration Plant

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
OTHER ENVIRONMENTAL ISSUES				
Global warming	Likely	Slight	Control emissions by best available control technology. Natural gas used as fuel.	None
Acid rain	Likely	Slight	NOx emission minimized with selective catalytic combustion.	None
AIR QUALITY				
Particulates released during construction	Likely	High-localized	Wet soil as needed.	None
Mist from cooling tower	Likely	Localized-slight	None	None
Criteria Pollutants				
NOx	Likely	Moderate	Analyze impacts to soils, vegetation and visibility, demonstrate non-impact to Class 1 areas. Use "best available control technology."	Prevention of Significant Deterioration (PSD), and DEQ Air Contaminant Discharge Permit
CO	Likely	Moderate	See above	Prevention of Significant Deterioration (PSD), and DEQ Air Contaminant Discharge Permit
SO2	Likely	Slight	Use of natural gas	DEQ Air Contaminant Discharge Permit
TSP/PM-10 (Particulate Matter)	Likely	Slight	See above	DEQ Air Contaminant Discharge Permit
Air Toxins				
Iron, arsenic, barium, silica (cooling towers)	Unlikely	None	None	None
Ammonia (Boilers and turbines)	Likely	Slight	Selective catalytic reduction system adjusted to minimize ammonia release.	DEQ Air Contaminant Discharge Permit
Formaldehyde (Boilers and turbines)	Likely	Slight	Good combustion controls	DEQ Air Contaminant Discharge Permit
Odor	Unlikely	None	None	None
Photo-Chemical pollutants	Minimal	Slight	None	None

vegetation, and erosion elements including water and wind. The proposed project site is mostly flat, dry, and sparsely vegetated. Water erosion would be minimal because soils are permeable. Topsoil and vegetation must be replaced to avoid wind erosion. Measures would be used to prevent fugitive dust from leaving the site during construction. Such measures include watering and would be performed by PGE and/or their contractors, when needed.

Seismic Hazards - Earthquake damage to structures is based on the magnitude of the event, distance from the earthquake epicenter, type and depth of soils, degree of saturation of underlying soils, and type of construction and materials used in the structure.

The proposed project site is east of the Cascade Mountain Range in Oregon and within seismic Zone 2B, according to the 1991 Edition of the UBC. Construction must be based on the seismic zone factor Z of 0.2 (.2g-Acceleration/gravity) or greater in this area. Structures designed to pass this code are considered appropriate for occupant safety for a seismic event with a 475-year return period. However, facilities may be inoperable or unsafe. The minimum code is adjusted depending on the type of facility and soil conditions at the site.

To ensure essential facilities are operable and hazardous facilities (containing or supporting toxic or explosive substances) would not endanger the public, the seismic zone factor is multiplied by an importance factor of 1.25. The seismic zone factor for construction of this type of facility in this zone is .25 (for a seismic event with a 950-year return period).

Soil type at the plant site may raise the seismic zone factor and require an appropriate change in building construction. Soil liquefaction is a phenomenon in which loose, submerged, cohesionless soils lose strength during cyclic loading in strong earthquake ground shaking. Clay soils and an increase in the density of cohesionless soils minimizes this effect. A Standard Penetration Test (SPT) was conducted to determine the density of the soils at the plant site. (PGE, 1993.)

Seismic Risk - The Coyote Springs Project location is within seismic zone 2B. The facility would be designed to meet seismic requirements of the 1991 UBC.

Ground Shaking - All non-critical buildings and structures would be designed and constructed in accordance with the latest UBC requirements with an importance factor of 1.00. All critical project structures would be designed and constructed with an 1.25 importance factor.

Fault Offset Hazard - The likelihood of surface rupture or fault offset in the project area is very remote, due to the lack of identifiable active faults in the area.

Soil Liquefaction - Loose layers of fill in upper materials at the site would be compacted to minimize the potential for soil liquefaction. The potential for liquefaction in underlying dense and very dense soils is slight.

Seismically Induced Waves and Flooding - During strong earthquakes, strong waves such as tsunamis or seiches can be generated in large bodies of water. These waves can cause substantial damage to shoreline facilities. Seiches occur in large inland bodies of water such as lakes or wide rivers.

The site is about 190 m (625 ft.) south of the Columbia River. Columbia River water levels are controlled by a system of dams to a minimum pool level of elevation 78.3 m (257 ft.) and a maximum pool level of 81.7 m (268 ft.). The plant site elevation is 86.7 m (285 ft.), which is well above the maximum pool level. An existing earth embankment for the railroad is between the river and the main plant site. The chance of seismically-induced wave damage such as a seiche, and damage from flooding is remote.

Stability - Plant operations would not impact site stability. Heavy equipment would be operated on properly designed spread footing and mat foundations. Water storage tanks would be supported on grade and on ring footing foundations. All foundations would be on compacted fill placed over the DDC-densified fill during construction. Chemical storage tanks would be surrounded by confinement barriers to contain potential spills or leakage. Barriers would be either a reinforced concrete slab with surrounding perimeter walls or a perimeter earth berm with a waterproof membrane.

Fish and Wildlife Impacts - Cogeneration Plant

Fisheries - Potential impacts to fish and wildlife during construction and operation of the proposed project were evaluated based on the likelihood that the project would cause direct mortality of individuals, temporary or permanent loss or alteration of habitat, or disturbances that may cause wildlife to avoid areas of suitable habitat.

Filling the gravel pond at the plant site would likely eliminate fish and low-quality fish habitat. The number and kind of fish impacted is not known, but would not be significant based on the poor quality of fish habitat and the limited recreational fishing that occurs there.

No impacts on water quality or fish habitat would occur in the Columbia River or Messner Pond from construction or operation of the proposed project. During operation, all wastewater from the plant would be discharged to the Port's industrial wastewater system. Wastewater with oil contaminants would be treated prior to discharge to the City of Boardman sewage treatment facility.

Wildlife - About 8 ha (20 acres) of wildlife habitat of varying quality would be permanently lost from construction of buildings and other project facilities at the main plant site. Some direct mortality of wildlife could occur during project construction. This is particularly true for less mobile species such as reptiles and small mammals, burrowing species (e.g., ground squirrels), and ground-nesting birds (e.g., lark sparrow, western meadowlark) in areas where vegetation clearing and construction equipment traffic would occur. The impact of this loss of wildlife is considered insignificant due to the low quality of habitat that currently exists there. Proposed landscaping around the site following construction would provide new, although low-quality, wildlife habitat.

During construction and operation of the cogeneration plant, wildlife use of Messner Pond could be inhibited by increased human activity. This is particularly true for species most sensitive to visual and auditory disturbances (e.g., mule deer, some raptors). However, a well-developed riparian fringe dominated by Russian olive trees surrounds much of Messner Pond, and would provide some buffering of visual and auditory disturbances from the main plant site. In addition, wildlife use of the pond and surrounding habitat currently exists with daily visual and auditory disturbances from trains, trucks, and a rock-crushing plant. These existing sources of noise and visual disturbance are closer to the pond than construction activities at the plant site would be.

PGE conducted a detailed study of cooling tower impacts to Messner Pond. Operation of the cooling tower may deposit dissolved chemicals contained within drift water droplets into Messner Pond and on surrounding vegetation. The chemicals of greatest concern, heavy metals, would either be nondetectable or only present in trace amounts. The majority of dissolved chemicals in drift water occur commonly in nature (salts). The operation of the cooling tower is not expected to result in adverse effects to Messner Pond water quality and surrounding vegetation, and any change in chemical composition within the pond would be below levels considered toxic.

Mitigation - PGE, in conjunction with ODFW, would develop a fish, wildlife, and vegetation monitoring plan. This plan would be submitted to Oregon Department of Energy (ODOE) for review and approval before construction begins.

To provide a visual and sound buffer, PGE proposes to plant trees along the west shore of Messner Pond. The plantings would extend from the railroad embankment to the gravel pond.

If other concerned agencies or subsequent studies indicate there would be adverse impacts on fish, wildlife, or their respective habitats, PGE would develop and implement (in conjunction with ODFW) a **mitigation** plan and other measures as may be deemed necessary to offset anticipated impacts.

Threatened and Endangered Species Impacts - Cogeneration Plant

Federally Listed Animals - Impacts to listed threatened or endangered animal species were evaluated by Beak Consultants. A copy of their Biological Assessment is enclosed as Appendix C. The bald eagle, the peregrine falcon, and three salmonoids are the only listed species known or suspected to occur in the project area. Specialists evaluated impacts using the following general criteria: potential of the project to cause direct mortality of individuals, alter suitable habitat either temporarily or permanently, or cause a disturbance (visual or auditory) that results in avoidance of suitable habitat. The Biological Assessment concludes: "the proposed action may effect, (Sic) but is not likely to adversely effect (Sic) individuals or populations of the bald eagle or its habitat. It is also concluded that the proposed action will not effect (Sic) individuals or populations of the peregrine falcon, Snake River spring/summer chinook salmon, Snake River

fall chinook salmon, and Snake River sockeye salmon or their habitat. These conclusions are based on strict adherence to the conservation measures described herein..."

Conservation measures defined to reduce impact on listed species are described in Appendix C, and PGE has agreed to adhere to these measures. Possible actions include: erection of perch guards to protect raptors from electrocution; provide information to construction workers on minimizing disturbance; planting of trees along the shore of Messner Pond; construction of a sediment retention pond to protect water quality; monitoring wildlife impacts during construction, and if necessary, consulting with the U.S. Fish and Wildlife Service and/or the National Marine Fisheries Service if unanticipated impacts occur.

BPA has reviewed the Biological Assessment and concurs with the opinion that the Coyote Springs Cogeneration Project is not likely to affect Federally listed threatened and endangered species, and has forwarded the Biological Assessment to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service seeking their review and concurrence with the above findings. Their determination would be reported in the Final EIS.

State Special Status Species Impacts - Special status species identified within the project area were described in Chapter 4. Although four species of concern (American white pelican, Franklin's gull, bank swallow, and long-billed curlew) were documented to occur in the project area, only the bank swallow colony on the plant site would potentially be impacted by the proposed project.

Based on field surveys, bank swallow populations in the area appear abundant. On the railroad embankment just north of the project site, 3-4 dozen nest holes were observed. It is estimated that 12 pairs are actively using these nests. PGE proposes to build a fence to restrict pedestrian and equipment intrusion near the bank swallow colony. The fence would be a three-strand wire fence about 1.5 m (5 ft.) high and would extend about 76 m (250 ft.). The fence would be about 7.6 m (25 ft.) south of and parallel to the bank swallow colony site. The fence would have a sign that identifies the area as sensitive bird habitat. The fence would be built during the winter, prior to the first arrival of any bank swallows (April 1). Based upon these measures project construction is not expected to negatively impacting the bank swallow colony.

PGE also intends to develop, in conjunction with the Oregon Department of Fish and Wildlife, a monitoring plan for vegetation, fish and wildlife. Potential measures may include seasonal restrictions on construction within a species-specific radius of a nest site (e.g., Swainson's hawk, long-billed curlew) or colony location (e.g., Washington ground squirrel); routing of the transmission line to avoid impacts; and placement of nest platforms on transmission towers for raptors (e.g., Swainson's hawk, ferruginous hawk).

Federally Listed Plants -There are no known or suspected Federally listed threatened or endangered plant species within the project area. A survey for threatened and endangered plants, conducted during spring 1993, identified no special status plant species (see Appendix A).

State Special Status Plants - Potential impacts on special status plant species were evaluated relative to OAR 603-73-090. A survey for threatened and endangered plants, conducted during spring 1993, identified no special status plant species within the impact zone (see Appendix A).

Water Impacts - Cogeneration Plant

Construction of the proposed project could also cause erosion from stormwater or wind. Ground disturbing activities during construction of the proposed project could lead to erosion of unprotected soil, which could cause siltation of adjoining waterways. A **stormwater pollution prevention plan (SWPP Plan)** would be prepared by PGE prior to any soil disturbing activities.

Surface Water - No direct impact to the Columbia River is expected from construction. Plant operation may reduce the volume of water in the alluvial aquifer and might reduce the volume of water recharging the river. Because the gradient is from the southeast to the northwest, the river is not expected to recharge the alluvial aquifer being used by the City of Boardman.

No direct impact to Messner Pond is expected by construction. A slight impact is expected from salt precipitation from cooling tower emissions.

Wastewater effluent from the facility would be discharged to the Port's industrial wastewater system. Effluent from the industrial wastewater system is used for crop irrigation (see Exhibit O, PGE, 1993). No adverse impact to protected areas is expected from use of this existing wastewater treatment system.

Impacts to the irrigation pond during plant construction would be direct and long term. The impact would be caused by filling 1.25 ha (3 acres) of the pond with gravel (presently 4.36 ha [10.4 acres]) for the plant foundation. No impact is expected from plant operation. Mitigation for filling the pond is not expected to be required as pits excavated in dry land for obtaining fill, sand, or gravel are not regulated under the Clean Water Act (40 CFR328.3(e)) or under Oregon's Removal-Fill Law (OAR 141-85 010).

PGE has registered for coverage under General Permit 1200, and would provide a site-specific erosion control plan that would meet the required standards of Oregon's Department of Environmental Quality at least 30 days prior to beginning construction. These actions should prevent construction-caused sediment from entering Messner Pond, the Columbia River or other surface water. (See PGE, 1993.)

Hazardous materials would be handled on-site and transported to the site according to applicable Federal and state requirements. Planning for spill prevention and contingency would be based on a Spill Prevention Countermeasure and Control Plan (see Exhibit F, PGE, 1993). Accidental release or spill of hazardous materials is unlikely, and no adverse impacts to protected areas are expected.

Groundwater - Water for the plant would be supplied from three deep and shallow ground water wells. The Port has applied to the Oregon Department of Water Resources for construction of two new wells, one in the basalt aquifer and one in the alluvial aquifer.

An application for construction of a well in the alluvial aquifer will not be reviewed at this time. When the Northwest Power Planning Council determines the critical flow levels necessary for salmon recovery, the well permit would be reviewed. The alluvial aquifer is connected hydrologically to the Columbia River. Because there is a potential to impact water levels in the river, no new permits are being issued.

An application for construction of a well in the basalt aquifer has been granted with conditions. The Water Resources Department has identified two significant issues: water availability and conservation. The permit requires these actions: (1) no interference with senior water rights, (2) a biennial conservation report, (3) a search for an alternate water supply, and (4) monitoring and testing. A moderate impact (lowering the water level by 7.6 m [25 ft.]) may be expected to occur to the basalt aquifer. If the water level is lowered, the well would not be used until water levels recover. (See ODOE, 1993).

There is enough water from already licensed or permitted sources to operate the proposed plant.

Air Impacts - Cogeneration Plant

Turbine and auxiliary boiler operations would generate significant quantities of NO_x and carbon monoxide as well as lesser quantities of particulate matter, sulfur dioxide and VOCs. (See Table 5-2.) The quantity of pollutants emitted from the turbines would vary with ambient air density and load conditions; the denser the air and the greater the load, the greater the emissions. Emissions from the auxiliary boilers are more consistent and vary only with load. Worst case emission rates are expected to occur in the winter because cold air is denser than warm air and because the load is higher in the winter. The values presented as Plant Site Emission Limits in Table 5-2 reflect worst case operating conditions. Varying emission rates (including worst case) were used to predict impacts to existing air quality.

Table 5-2
Potential Annual Emissions of Criteria Pollutants

ID	Description	Maximum Operating Hours ^a	Pollutant	Emissions		Total tons/yr	Combined Total tpy ^b
				ppm	lb/hr		
1. 2	HRSG A & HRSG B Stacks	8,760 each	NO _x	9	59.4	260	<u>520</u>
			CO	15	49	215	430
			SO ₂	NA	1.09	4.8	<u>10</u>
			TSP/PM ₁₀	NA	9	39	<u>78</u>
			VOC	1.4	3.0	13	<u>26</u>
3	Aux Boiler A & Aux Boiler B Common Stack	8,760 each	NO _x	40	17.7	77.5	155
			CO	200	58.6	257	<u>513</u>
			SO ₂	NA	0.22	0.96	2
			TSP/PM ₁₀	NA	1.84	8.06	16
			VOC	10	1.66	7.27	15

a. Expected operating hours:

1. HRSG emissions — 7,760 hours/year/unit.

2. Auxiliary boilers — 1,000 hours/year/unit.

Note: There may be cases where one turbine and one auxiliary boiler would operate simultaneously. However, the emissions from this operating scenario will not exceed the case where just two turbines are operating simultaneously.

b. Underlined values are proposed annual plant site emission limits (PSELs). Figures are rounded off to the nearest whole number.

NA – Not applicable.

Impact of criteria pollutants emitted from the proposed facility were evaluated under the Prevention of Significant Deterioration/New Source Review process. Several criteria pollutants such as volatile organic compounds, sulfuric acid and beryllium are exempt from PSD process for this facility because they would be emitted in small quantities. Two EPA-approved Gaussian dispersion models (ISC2ST and COMPLEX1) were used to predict the proposed facility's impacts on the Boardman air shed. Impacts were predicted for oxides of nitrogen, carbon monoxide, particulate matter, ammonia and formaldehyde. The emission points considered were the two 64 m (210 ft.) high turbine stacks, and the 56 m (185 ft.) high stack serving the two auxiliary boilers. Impacts were predicted for emission rates reflecting various loads. For each load condition, three separate model runs were made, one for each of the representative ambient temperatures 22.5°, 52.8°, and 85°F (-5.3°, 11.6°, and 29°C). EPA screening meteorological conditions and additional wind speed/stability category combinations suggested by DEQ were used for all modeling runs. Mixing heights were set equal to worst case conditions as determined by the EPA SCREEN dispersion model. The models receptor grid extended approximately 21 km (13 miles) from the proposed facility. Receptors were spaced at 500 m (1,640 ft.) intervals except for fence line and maximum impact receptors (around Canoe Ridge, Washington), which were spaced at 100 m (328 ft.) intervals.

Maximum predicted ambient concentrations due only to proposed facility emissions are shown on Map 10. Canoe Ridge, 7.2 km (4.5 miles) northwest of the proposed facility in Washington, had the highest predicted impacts. Ambient concentrations on Canoe Ridge were predicted to be: NO_2 2.8 $\mu\text{g}/\text{m}^3$ (annual average), PM-10 1.2 $\mu\text{g}/\text{m}^3$ (24-hour average), CO 23.7 $\mu\text{g}/\text{m}^3$ (1-hour average), Ammonia 13.8 $\mu\text{g}/\text{m}^3$ (1-hour average) and formaldehyde 0.0057 $\mu\text{g}/\text{m}^3$ (annual average). The EPA NO_2 Significant Impact Level (40 CFR 51.165 (2) b (2)) is exceeded in both Washington and Oregon. Exceedance of the NO_2 significant impact level triggers the requirement for more comprehensive modeling of other competing NO_2 sources in the airshed (see discussion below). Predicted ambient concentrations of other priority pollutants did not exceed state or Federal significant impact levels, indicating that emission of these pollutants from the proposed facility would not significantly impact existing air quality. The maximum predicted PM-10 concentration in Oregon (0.956 $\mu\text{g}/\text{m}^3$ - 24-hour average) approached the Oregon Significant Impact Level of 1 $\mu\text{g}/\text{m}^3$ (OAR 340-20-220). Also note that the maximum Washington 24-hour PM-10 concentration (1.2 $\mu\text{g}/\text{m}^3$) exceeds the Oregon significant impact level. See Map 11 for NO_2 contours and locations of maximum impact.

NO_2 competing-source modeling was accomplished for 37 significant NO_2 sources in the region, including two natural gas-fired cogeneration plants proposed for the Hermiston area. Competing-source modeling determined the amount of PSD increment remaining in the airshed after all proposed facilities are operational. The modeling also determined if the NAAQS would be exceeded. The entire airshed, with existing and proposed sources, would consume 13.6 percent of the available 25 $\mu\text{g}/\text{m}^3$ NO_2 increment. PGE's Boardman Coal Plant is included in the computer modeling as a source, but is not considered an increment consumer because the plant was built prior to EPA's PSD regulations. The amount of NO_2 increment consumed by the Coyote Springs facility is 2.824 $\mu\text{g}/\text{m}^3$. In addition to increment evaluation, the competing source model determined that the NAAQS would not be exceeded with the additional emissions from this proposed project and by the other two proposed cogeneration plants. The maximum combined impact of the proposed facility and the 37 other NO_2 sources was predicted to be 31.9 $\mu\text{g}/\text{m}^3$ NO_2 (annual average), occurring 500 m (1,640 ft.) southwest of the proposed facility. DEQ has determined that this area's background NO_2 concentration is 30 $\mu\text{g}/\text{m}^3$. The predicted NO_2 combined impact (31.9 $\mu\text{g}/\text{m}^3$) coupled with background concentration gives a total maximum impact of 61.9 $\mu\text{g}/\text{m}^3$. The NAAQS NO_2 standard is 100 $\mu\text{g}/\text{m}^3$.

The NAAQS are designed to protect human health and the environment. Because none of the NAAQS would be exceeded in the Boardman airshed, no measurable effects to local vegetation, soils, wildlife or human health should be expected to occur as a direct result of facility emissions.

Odor - Ammonia is the only pollutant emitted from the proposed facility in significant quantity to possibly pose an odor problem. The highest predicted one hour ammonia concentration in Oregon was 6.47 $\mu\text{g}/\text{m}^3$, and 13.8 $\mu\text{g}/\text{m}^3$ in Washington, which are below the odor threshold for ammonia (26.6 $\mu\text{g}/\text{m}^3$). No odor impacts are expected.

Coyote Springs Project

Maximum Air Emission Impacts from Coyote Springs Cogeneration Plant

- ▲ Existing BPA Substation
- ▲ Proposed Plant Site
- Measurement Site
- - - Proposed Pipeline Extension
- - - Existing BPA Transmission Line

Pollutant	Predicted (ug/m3)	Av. Period
1 PM10/TSP	1.213	24hr*
AMMONIA	13.8	1hr
CO	23.7	1hr
	17.8	8hr
2 PM10/TSP	0.459	Annual
NO2	2.824	Annual
FORMALDEHYDE	0.0057	Annual
3 PM10/TSP	0.956	24hr
AMMONIA	6.47	1hr
4 PM10/TSP	0.188	Annual
FORMALDEHYDE	0.0023	Annual
5 NO2	1.260	Annual
6 CO	46.17	1hr
	32.32	8hr
7 NO2*	31.9	Annual

* highest combined source concentration

KILOMETERS

0 1 2

MILES

0 1 2

Coyote Springs Project

Maximum Predicted NO2
Impacts from Coyote
Springs Cogeneration
Plant

* micrograms per cubic meter

Class I Areas and National Scenic Areas - The Valley screening mode of COMPLEX1 was used to predict the potential impacts to Class I areas. Modeled impacts were well below PSD Class I increments for all criteria pollutants and below detection limits in most cases. Model predictions indicate that there would be no measurable impacts to these sensitive areas from the criteria pollutants emitted by the proposed facility.

Affects of NO₂ on plant life in these Class I areas was also considered. Maximum modeled impacts of NO₂ are at least two orders of magnitude below the U.S. Forest Services' *No Impact Level* for lichen and all plant species. Impacts on aquatic resources in Class I areas are also expected to be nondetectable.

EPA-recommended visibility analysis model VSCREEN was used to evaluate the visibility impacts of the proposed facility on nearby Class I areas. Modeled results predict that the proposed facility would not adversely degrade visibility in the nearby Class I areas or in the Columbia Gorge Scenic Area.

Because no protected area is closer than 6 km (4 miles) to the proposed plant, no significant impacts are expected.

Air Toxics - Chester Environmental estimated emission rates of air toxics from the proposed facility (see Tables 5-3 through 5-7). Emission rates for the boilers and the turbines were derived from one of two methods: the California Air Resource Board Speciation Manual, or by using emission factors based on heat input published in EPA's *Toxic Air Pollutant Emission Factors* (EPA-450/290-011). Ammonia emission rates were provided by the selective catalytic reduction unit vendor (Peerless). Emissions from the cooling tower were calculated using mass balance techniques.

Calculated emission rates were compared to DEQ's significant emission rates. Dispersion modeling must be performed for all compounds emitted from new sources which exceed these rates. Dispersion modeling predicts the pollutants' ambient concentration. From this prediction an estimate of the environmental impacts can be made. Emissions less than the specified significant emission rates are presumed to have an insignificant effect on the environment. Only two toxic compounds were found to exceed the significant emission rates: formaldehyde and ammonia. Ammonia generated from the selective catalytic reduction unit is estimated at 214 tons/year. Formaldehyde, a by-product of natural gas combustion, is estimated at 1,029 kilograms (2,269 pounds)/year. Impacts from these two pollutants were modeled using an EPA-approved model (ISC2).

The highest predicted formaldehyde concentration in Oregon was 0.0023 ug/m³, at a location on the bombing range approximately 10 km (6.2 miles) south-southwest of the proposed facility (Map 10). At this low level the only concerns are long-term health effects such as cancer. This concentration has an associated cancer risk of 2.49×10^{-8} , nearly two orders of magnitude less than EPA's acceptable risk level of one in a million (1×10^{-6}) excess cancer cases. The highest formaldehyde concentration in Washington was 0.0057 ug/m³ at a location on Canoe Ridge (Map 10). Formaldehyde emissions would not harm plants or animals.

The maximum predicted one hour ammonia concentration in Oregon was 6.47 ug/m^3 at a location on the bombing range approximately 8 km (5 miles) southwest of the facility. This one hour impact corresponds to a 4.5 ug/m^3 8-hour average. Oregon's Acceptable Ambient Concentration for ammonia is 170 ug/m^3 (8-hour average). The maximum ammonia concentration in Washington was 13.8 ug/m^3 (1-hour average) at a location on Canoe Ridge. Washington's Acceptable Source Impact Level for ammonia is 59.9 ug/m^3 (24-hour average) and 0.077 ug/m^3 (annual average) for formaldehyde. Both the Oregon and Washington maximum predicted ammonia impacts are an order of magnitude below state safety thresholds and an order of magnitude below the inhalation **No Observed Effects Level (NOEL)** (Integrated Risk Information System 12/93). Maximum predicted ammonia concentrations would not adversely effect animals or plants. Maximum impact locations are presented on Map 10.

Table 5-3
Non-Metal Air Toxics Emitted from Coyote Springs Cogeneration Plant

Pollutants of Concern	Emission Rate (lb/hr)	
	Turbine ^a	Aux. Boiler ^b
Ammonia	24.4 ^c	
Benzene	0.0112	0.1170
N-Butane	0.1274	0.2934
Cyclohexane		0.0313
Formaldehyde	0.1106	0.2765
Hexane		0.0324
N-Pentane	0.0126	0.1944
Pentane	0.0126	0.2916
Toluene		0.0590

- Emission rate calculated by multiplying the weight fraction by the unburned hydrocarbon (UHC) emission rate supplied by Parsons Brinckerhoff, May 26, 1993.
- Emission rate calculated by multiplying the weight fraction by the UHC from the auxiliary boiler. UHC = non-methane hydrocarbons (NMHC) + Methane. NMHC emission rate is 1.6 from Parsons Brinckerhoff, 5/26/93. Methane is 56% of UHC; therefore, UHC = $1.6 + 0.44 = 3.6 \text{ lb/hr}$. Source of information is the State of California Air Resources Board "Identification of Volatile Organic Compound Species Profiles," CARB Speciation Manual Second Edition, Volume 1 of 2, unless otherwise noted.
- Emission rate supplied by Parsons Brinckerhoff, May 26, 1993.

Table 5-4
Metal Air Toxics Emitted from Coyote Springs Cogeneration Plant

Pollutants of Concern	Emission Rate (lb/hr)	
	Turbine ^a	Aux. Boiler
Chromium (Cr)	0.0045	
Cobalt (Co)	0.0045	
Copper (Cu)	0.0045	
Manganese (Mn)	0.0045	
Mercury (Hg)	3.46×10^{-6} b	7.9×10^{-7} b
Nickel (Ni)	0.0045	

- a. Emission rate calculated by multiplying the weight fraction by the PM emission rate supplied by Parsons Brinckerhoff, May 26, 1993 (see Appendix A).
- b. Emission rate calculated by multiplying the rate of fuel consumption by the Hg content in the fuel. Hg content in the fuel is 32 ng/m³ (provided by Pacific Gas Transmission Co.).

Table 5-5
Emission Rates for Known and Suspected Carcinogenic Pollutants

Pollutants of Concern	Total Emissions Firing Turbines ^a (lb/yr)	Total Emissions Firing Auxiliary Boilers ^b (lb/yr)	Total Emissions Firing Both (lb/yr)	DEQ Significant Emission Level (lb/yr)
Benzene	174	234	408	3,100
Formaldehyde	1,716	553	2,269	2,000

- a. Assumes 7,760 hours/year/turbine multiplied by emission rate (lb/hr) in Table 5-3.
- b. Assumes 1,000 hours/year/boiler multiplied by emission rate (lb/hr) in Table 5-3.

Air Impacts from the Cooling Tower - Air toxins emitted from the cooling tower are presented in Table 5-6. All listed pollutants are emitted in small quantities and no impacts are expected to result from their release. Three compounds are not listed in Table 5-6: tolyltriazole, acrylate copolymer and potassium hydroxide. These chemicals are corrosion/deposit inhibitors. Potassium Hydroxide, tolyltriazol and acrylate copolymer are not assigned Oregon Significant Emission Rates, Washington Acceptable Source Impact Levels or Oregon Acceptable Ambient Concentrations. However, Washington's Acceptable Source Impact Level for potassium hydroxide is 6.7 ug/m^3 -24-hour average.

A hard-water mist, 5.6 liters (1.5 gal)/minute with 2400 mg/L total dissolved solids would be emitted from the cooling tower. The volume of mist and distance the mist would travel before evaporating or condensing would vary with ambient temperature and humidity. On cold, moist days less mist would be emitted than on warmer days. During damp, cold periods, the mist emitted would condense and deposit relatively close to the tower. During sunny, hot weather the mist would rapidly evaporate and disperse into the atmosphere.

Fogging would take place during cold moist periods and is expected to occur occasionally on Ullman Boulevard west of the plant but is not expected to occur on I-84. On average, the mist is expected to evaporate within 305 m (1000 ft.) of the tower, leaving behind a small amount of dissolved solids to disperse as particulate matter (0.14 tons/year). (PGE, 1993.) Moisture emitted from the cooling tower which condenses and impacts the ground is called drift. Drift from the cooling tower would be one gallon/minute. The dissolved solids would contain small amounts of iron, silica, arsenic and barium (see Table 5-6). In addition, small amounts of tolyltriazole, acrylate copolymer and potassium hydroxide (corrosion inhibitors/deposit control agents) would be emitted. The small amount of pollutants emitted from the tower would have no impact on the Boardman *air-shed*.

**Table 5-6
Calculated Cooling Tower Emission Rates**

Chemicals	Emission Rate ^a (lb/8 hr unless noted otherwise)	DEQ Significant Emission Rate (lb/8 hr unless noted otherwise)
Iron (Fe, soluble)	1.2×10^{-2}	2
Copper (Cu)	ND	2
Zinc (Zn)	ND	27.4 ^b
Silicon Dioxide (SiO ₂)	0.9	27.4 ^b
Antimony (Sb)	ND	0.9
Arsenic (As)	0.286 lb/yr	6 lb/yr
Barium (Ba)	3.05×10^{-3}	0.9
Beryllium (Be)	ND	11 lb/yr
Cadmium (Cd)	ND	14
Chromium (Cr)	ND	2.2 (as Cr VI)
Lead (Pb)	ND	1.10 ^c
Mercury (Hg)	ND	0.09
Selenium (Se)	ND	0.4

a. Source of information: Betz Industrial, Cooling System Analysis (May 17, 1993).

b. Based on PM₁₀ significant emission rate of 15 tons/yr.

c. Based on Pb significant emission rate of 0.5 tons/yr.

ND - not detected.

Table 5-7
Emission Rates for Non-Carcinogenic Pollutants

Pollutants of Concern	Total Emissions Firing Turbines ^a (lb/8 hr)	Total Emissions Firing Auxiliary Boilers ^a (lb/8 hr)	DEQ Significant Emission Level (lb/8 hr)
Ammonia (NH ₃)	390.4	0	31
N-Butane	2.04	4.7	3,500
Cyclohexane	0	0.50	1,920
Hexane	0	0.5	3,210
N-Pentane	0.2016	3.1	3,300
Pentane	0.2016	4.7	3,300
Toluene	0	0.9	685
Chromium (Cr)	0.07	0	0.9
Cobalt (Co)	0.07	0	0.09
Copper (Cu)	0.07	0	2
Manganese (Mn)	0.07	0	6
Mercury (Hg)	0.00	0	0.2
Nickel (Ni)	0.07	0	2

a. Based on converting emission rates in Tables 5-3 and 5-4 to lb/8 hr.

Air Impacts from Construction Operations - Emissions generated during construction of the proposed facility would originate from temporary fuel oil tank(s), construction equipment, fugitive dust, and vehicles used by workers to commute to the site. Vehicle exhaust connected with construction operations would be insignificant compared to exhaust generated by traffic on I-84, located directly south of the proposed facility. Fugitive dust generated by construction operations would be minimized by soil wetting on an as-needed basis. Though dust would be controlled, there is expected to be some adverse, but short-term effects on local air quality during the early phases of construction.

Global Warming - Gases contributing to global warming are commonly referred to as "greenhouse" gases. Greenhouse gases include: CO₂, methane (CH₄), nitrous oxide (N₂O), NO_x, non-methane VOCs and stratospheric ozone depleting substances such as chlorofluorocarbons.

The quantity of CO₂ emitted when fossil fuels are burned is proportional to the carbon content of the fuel. The more carbon present, the more CO₂ emitted. The proposed plant would use natural gas to fire the combustion turbines. Natural gas is primarily composed of methane, which contains one carbon atom and four hydrogen atoms. Because of its low carbon content, natural gas combustion produces about 40 percent to 50 percent less CO₂ than coal and approximately 25 percent less than petroleum products (Cornot-Gandolphe, 1993).

As mentioned above, the plant would use methane to fire the turbines. Methane is at least 20 times more potent a greenhouse gas than CO₂. Because of this, it is important to keep methane releases to a minimum. Methane emitted from the world's natural gas pipelines and natural gas mining operations is less than 10 percent of methane emitted from natural sources such as tundra, swamps, forest floors, termites and cows (Sheppard, et al., 1982). In addition, most natural gas leaks occur within residential distribution systems and not in wholesale distribution systems such as the one linked to this plant. New techniques have virtually eliminated methane escape during drilling.

The source of natural gas for the proposed cogeneration plant is from actively producing gas fields in Alberta and British Columbia, Canada. The number of natural gas wells that would be needed to supply PGE requirements was estimated by PGT. The average total yield of Canadian natural gas wells was divided into the total requirements of the Coyote Springs Plant (41 billion BTUs per day). Using this method, the output of 16 gas wells would be used each year by the Coyote Springs Plant (PGT, 1993). For perspective, 4,000 Canadian gas wells were drilled in 1991 and the total number of wells in Canada number in the 100's of thousands (PGT, 1992). Thus the Coyote Springs Plant would use only a small amount of gas compared to that available in Canada. The world's proven reserves are expected to last approximately 58 years at the present consumption rate (*Inside Energy/with Federal Lands*, 1993).

Emissions of NO_x and N₂O from the facility would be controlled by **best available control technology**.

Reducing greenhouse gas emissions also involves energy conservation. If less fossil fuel is consumed, fewer pollutants are generated. Cogeneration facilities are considered energy efficient because excess steam generated from power production is used by nearby industries that would otherwise generate their own steam, which would consume energy.

On April 21, 1993, President Clinton committed the United States to reducing its greenhouse gas emissions to 1990 levels by the year 2000. The Clinton administration has issued a Climate Change Action Plan to accomplish this objective. The plan encourages the use of natural gas for power generation, energy conservation measures, and reforestation projects. Currently, PGE does not plan to offset plant CO₂ emissions with reforestation.

In summary, the proposed plant's comparatively low CO₂ emissions, the gas industry's low percentage of losses in the wholesale gas distribution system, the plant's control of NO_x and N₂O emissions, and the facilities cogeneration capability combine to minimize the plant's global warming impacts. However, plant impacts could be further reduced by reforestation.

Acid Rain - SO₂ and NO_x are the main precursors to acid rain. The proposed facility would emit significant quantities of NO_x but not SO₂. NO_x emissions are being minimized by selective catalytic reduction. The selective catalytic reduction process not only reduces NO_x emissions, it also releases ammonia into the atmosphere. Ammonia has the capacity to act as a buffer and helps minimize nitric acid (acid rain) formation. Because of these factors, the proposed plant is not expected to significantly contribute to downwind acid rain.

Photochemical Pollutants - NO_x and VOCs emitted from the proposed facility can form other pollutants in the presence of sunlight. During stable atmospheric conditions, when sufficient quantities of ultraviolet light are present, NO_x can form detectable levels of tropospheric ozone, peroxyacetal nitrate and peroxybenzoyl nitrate, which are respiratory and/or eye irritants at elevated concentrations. In addition, these pollutants, along with NO₂, form aerosols that reduce visibility and give the atmosphere a brownish cast. Most volatile organic compounds emitted from the facility can form ozone in the presence of ultraviolet light. Volatile organic compounds are not emitted in large enough quantities to form detectable levels of ozone. Photochemical pollutants from plant emissions are expected to have a negligible impact on the Boardman air-shed and no detectable impact on human health.

There are several reasons why photochemical pollutants would not accumulate in this area: (1) this area is rural and does not generate many pollutants, (2) at this latitude, high angle radiation necessary for photochemical pollutant formation only occurs during a short period of the year, (3) wind channeling by the Columbia River prevents pollutant build up, and (4) stable atmospheric conditions (necessary for pollutant buildup) only occur in this area approximately 5 percent of the year, predominately during night and early morning hours when UV radiation is absent or at too low of an angle to generate photochemical pollutants (Thorkildson, 1993). Aerosols formed from photochemical pollutants and NO₂ may have some impact on local visibility during stable atmospheric conditions.

Vegetation/Wetland Impacts - Cogeneration Plant

No impacts to wetland plant communities are expected from construction or operation of the plant.

Socioeconomic Impacts - Cogeneration Plant

The construction, operation and maintenance, and eventual decommissioning of a major cogeneration facility can create both short-term and long-term impacts on the social and economic resources in a community. Socioeconomic impacts have been separated here into short-term impacts (preconstruction/construction/maintenance and decommissioning) and long-term

impacts (facility operation). The study area to identify these impacts includes portions of Morrow and Umatilla counties in eastern Oregon.

Short-term socioeconomic impacts would include those impacts associated with construction of the proposed project, so-called "boom/bust" effects. Long-term impacts would include impacts on population, housing, employment, and impacts on local government services and infrastructure such as schools, health care, library services, solid waste disposal and water and sewer services.

It is difficult to forecast the short-term socioeconomic impacts related to large construction projects in rural areas. Uncertainties such as labor disputes, material shortages or weather-related problems may affect the peak level of the number of construction workers. Construction employment is the key variable affecting socioeconomic impacts for the short term.

Other impacts could include secondary impacts on the local economy, such as an increase in the supply and demand for goods and services, which could affect the price of these goods and services; an increase in crime with an increased population; and the temporary disruption to the agricultural resource from crop disturbances. Secondary impacts related to the construction work force are expected to be minor.

Increase in Tax Revenue - Construction and operation of the proposed project would significantly improve the assessed value of taxable property in Morrow County, and increase the local property tax revenues received by Morrow County. With PGE's capital investment of between \$150 and \$300 million depending on whether the utility constructs one unit or two, the assessed value of real property within the county would be expected to increase from 20-40 percent. BPA, as a Federal agency, pays no local property taxes so no revenue would be received by the county from BPA's new transmission facilities. BPA's investment in the proposed project, however, is negligible.

The proposed project is within Morrow County tax code area 25-04, one of 33 tax code areas within the County. The current tax rate (for tax year 1993/94) for this tax code area is \$21.24. The actual ad valorem taxes that can be collected under Oregon's Measure 5, has been reduced to \$17.85/per thousand of valuation (for this particular tax code area) for tax year 1993/94. Assuming the first tax year that the proposed plant would be assessed property taxes would be tax year 1995/96, the maximum amount that could be collected for the Morrow County School District would be \$5.00 per thousand, plus any bonded indebtedness, and \$10.00 per thousand for general government, plus any bonded indebtedness. Bond levies are unaffected by Measure 5.

Property taxes generated by the proposed plant would likely range between \$750,000 and \$1,500,000 annually (in 1993 dollars) for the Morrow County School District, and between \$1,500,000 and \$3,000,000 for general county government, plus any bonded indebtedness, depending on whether PGE completed one or both units. Tax revenue received by the County would be shared with the City of Boardman (Sweek, August 1993).

Although the new revenue would be a significant increase in the amount of local taxes received by the county, it is doubtful, according to the Oregon Department of Revenue, that the increase would have the effect of reducing individual tax burdens, due in part to limitations placed on individual taxing districts by Measure 5. New revenue could reduce individual taxes, however, if the total amount collected exceeded the amount required by individual taxing entities (Oregon Department of Revenue, August 1993).

Although the State does not receive any property tax revenues generated at the local level, the State would likely benefit from the proposed project because the State's contribution to Morrow County School District, if any, as a result of the reductions required under Measure 5, are likely to be less with the plant than without it. The State needs to make up the difference of what is collected under Measure 5, and the actual cost of operations of the Morrow County School District, as well as the other 266 school districts in Oregon. Differences have not been computed, because of the number of unknown variables.

Population - The proposed project is not expected to add significantly to the area's population. Assuming half of the permanent jobs come from outside the local area, an added 12 employees and their families would relocate to the area. Assuming 2.5 persons per household, this increase would be 30 individuals. Since this would be a population increase of less than 1 percent of Morrow County's population, there would be a negligible impact to the local population.

Employment - Construction of the proposed plant would likely take place over an 18-month period beginning in 1994. Construction of the power plant and attached substation/switchyard would peak with about 200 construction workers (Mayson, August 1993). In addition, about 130 construction workers would be required to construct the gas transmission line required to serve the facility, and another 20-25 construction workers would be required to construct BPA's portion of the project. While construction of the gas transmission line is expected to last five to six weeks (PGT, May 1993), construction of BPA's portion of the project is expected to be completed in one month or less.

As many as 355 construction workers are expected to work on various portions of the project, but not at the same time. While the three projects are expected to be constructed concurrently, peak employment could reach a total of 355 workers, depending on whether the peak period for the construction of the power plant coincides with construction of the gas pipeline. Because of the number of variables involved, it is difficult to accurately predict the actual number of construction workers in the area during the peak construction period.

Plant operation is expected to create about 20-30 full-time positions over the life of the facility. Three shifts are anticipated to be necessary to operate the plant: 16-20 workers during the day shift, and the remainder during each of two subsequent shifts. While this level of employment would not be considered to be a significant impact on the local area's employment base, due to the existing size of the labor force (28,000), it is considered a positive impact on employment in the local area.

Housing - The influx of non-local construction workers would likely affect the demand for temporary housing facilities in the local area. Construction of the proposed project and related facilities would require 355 workers, most likely from outside the local area. Construction is anticipated to begin in 1994 and be completed in 1995.

It is difficult to predict where construction workers would come from in advance of the award of a construction contract. It is assumed most craft workers would originate from the Tri-Cities area of southeastern Washington. Most individuals would likely commute to Boardman daily. Some of the workers would come from the local area. Some craft workers and laborers would be found in the local labor force. Craft workers would leave when their work is accomplished, to be replaced by other crafts persons. Not all of the construction work force would be present in the area at the same time.

A sufficient supply of temporary housing exists in the area to provide for the temporary housing needs of the non-local construction workers and their families. Because all facilities would likely be constructed concurrently, the vacancy rate is expected to be low, especially during the summer months of 1994-95.

The 1990 Census identified nearly 800 vacant units of rental housing (including both apartment units and single-family structures) in Morrow and Umatilla counties. In addition to these housing units, there are 11 motels that supply about 490 motel rooms in the Hermiston, Umatilla, and Boardman area. There are 20 mobile home parks in the Pendleton, Milton-Freewater, Umatilla, and Hermiston area, with seven RV/mobile home parks in the Hermiston area alone. All are within 70 km (45 miles) of the City Boardman. According to the Electric Power Research Institute (EPRI), which studied socioeconomic impacts from power plant construction and operation, including the Boardman power plant, construction workers frequently commute up to 97 km (60 miles) daily to project sites.

The City Manager of Boardman believes the 200-person construction workforce would create no problems for the City of Boardman. Mobile home parks and motels in the City, and the City itself, have been preparing for the influx of construction workers. (Palmer, 1993.)

Impact on Essential Government Services - Cogeneration Plant

Law Enforcement - Although the proposed project would likely increase the demand for law enforcement services over the life of the project, the Sheriff's Office does not feel this project alone would cause the county to hire additional law enforcement personnel (Morrow County Sheriff's Office, August 1993). Additional property tax revenue expected to be apportioned to the County Sheriff's Office from this project should offset any added costs caused by the proposed project.

Fire Protection - The facility would be designed to meet the code requirements of the UBC, as amended, by the State of Oregon and the National Fire Protection Association (NFPA) Standards. In addition, each gas turbine generator enclosure is protected by a self-contained, low

pressure, CO₂ fire protection system. Various sensors would be provided as part of the system to automatically actuate the CO₂ fire protection system. An existing 7,600 m³ (2 million gal.) water tank about 1 km (0.6 mile) south of the proposed site would also be available for fire suppression.

The permanent on-site work force would be trained in hazardous materials training, as are Boardman Rural Fire Protection District personnel (PGE, 1993).

Water Service - Following completion of a new well the Port has requested a permit for, sufficient water would be available to supply the proposed project. It is proposed that water would be supplied from three sources: (1) one of the Port's existing deep water wells, (2) the City of Boardman's existing shallow aquifer well, and (3) the new alluvial well.

Sewer Service - The proposed project is expected to generate about 33 m³ (8,640 gal.) of sanitary wastewater per day into the City of Boardman's sewage treatment facility. (PGE, 1993.) Wastewater would flow through a 50-cm (20-inch) industrial sewer pipe just south of the proposed plant site. According to the City Manager, the sewer line and treatment facility are sufficiently sized to handle the sanitary wastewater that would be generated by the proposed plant. The City's sewage treatment facility is currently processing about 1,136 m³ (300,000 gal.) per day, with a capacity of 1,520 m³ (400,000 gal.) per day. The additional sanitary wastewater would not adversely impact the City's sewage treatment facility.

Sanitary waste generated during construction of the proposed project would be discharged into chemical facilities. These portable units would be pumped out periodically by licensed contractors into transport vehicles.

Education/Schools - The proposed project would likely impact the Morrow County School District by increasing student enrollment. The school district has recently completed a study that revealed an annual cost increase of \$4,500 (in 1993 dollars) for each student added to the existing student enrollment within the district. Because the proposed plant would create an added 20-30 permanent new jobs in the area, not all filled with members of the Morrow County-Umatilla County labor force, it is likely a portion of the new residents would create an increase in the existing student enrollment, and increase district costs.

Because the proposed project would generate a minimum of an additional \$750,000 in property tax revenue (in 1993 dollars) to the County-wide school district each year, the proposed project would need to impact the school district by more than 165 students before it would negatively impact the school district's budget (166 @ \$4500 = \$747,000).

If at least half of the new hires come from outside the Umatilla-Morrow County area, the in-migrants would need to impact the school district with more than an average of eleven students per household (15 x 11 = 165) to create a negative financial burden on the school district. This is unlikely. The proposed project would likely have a beneficial impact on the school district, and the State of Oregon. Because the State has the responsibility of making up budget shortfalls experienced by school districts across the State, the State would also benefit by the proposed project because its financial responsibility would likely be less.

Library Services - The proposed project would have an impact on the demand for library services offered by the two libraries within the Oregon Trail Library District. The district presently employs four part-time employees, and a full-time director. While the proposed project alone would likely not create the need to hire additional library staff, the additional growth from a portion of the new employees who would relocate to the local area would put an increased demand on library services. This demand, along with the increased demand from growth that would occur because of the plant, would likely create the need for either a new position or an increase in hours worked by existing staff (Oregon Trail Library, August 1993).

The increased property tax revenue received by the library district would likely more than offset any costs incurred by the library as a result of the proposed project. No negative impacts to the library district are anticipated.

Health Care - Health facilities in the local area are sufficiently staffed to handle any medical needs that may arise both for short-term construction personnel and for the increase in the resident population from the proposed project.

Solid Waste Disposal - The proposed plant is expected to generate about 275 kg (600 lb) of solid waste per month. This amount should not create a burden on the landfill.

Impacts to Other Government Services - Other government services, such as maintenance of the County road system, vector control and the cemetery district, would receive tax revenue that would likely offset any increased costs in services. Though the proposed plant site is outside the City of Boardman, Morrow County government shares tax revenues received with other affected jurisdictions. According to the EPRI study mentioned previously on the socioeconomic impacts from 12 power plants, including the Boardman coal-fired power plant, impacts from the Boardman power plant have been minimal. Some impacts to the school district and to county roads were mentioned, but the report stated that the county road system was in poor repair prior to construction of the power plant and a bond issue had been recently passed to construct two new schools and to expand others within the District (EPRI, 1982).

Health and Safety Impacts - Cogeneration Plant

Air Emission Impacts to Public Health - The extent and magnitude of toxic air pollutants being released the atmosphere from the plant were evaluated by Chester Environmental (see page 5-13). Results are summarized in Tables 5-2 through 5-7. The plant would exceed the significant emission rates for formaldehyde, a suspected human carcinogen, and ammonia, a non-carcinogenic pollutant. Pollutants exceeding the significant emission rate were modeled for ambient impact. Ambient concentrations of these pollutants pose no human health risks. Modeled ambient impacts of these pollutants are presented in Map 10.

Toxic or Hazardous Materials - The following hazardous solid wastes are expected to be produced from the project:

- Used lead acid batteries
- Spent Selective Catalytic Reduction (SCR) Catalyst
- Oily rags, oil absorbent materials
- Used hydraulic fluids
- Boiler cleaning waste
- Waste oil

Used batteries and spent SCR catalyst are only produced when the equipment has served its useful life and requires replacement. Batteries are used as a source of backup power for plant system controls and safety-related equipment functions. Typical battery life is expected to range from 10-15 years. Used batteries would be shipped to vendor recycling facilities for recycling to minimize the final amount of waste materials requiring disposal at a hazardous disposal site.

SCR catalytic systems are used to convert NO_x in the gas turbine exhaust into nitrogen and water vapor. The catalyst system contains heavy metals that are considered hazardous materials. SCR catalysts would be shipped to a hazardous waste disposal facility. The amount of waste catalyst materials generated would be minimized by using clean-burning natural gas and through proper operation and maintenance of system components.

Oily rags and oil absorbent materials would be generated if and when oil spills occur. The plant would be operated and maintained according to rigid written operations and maintenance procedures by qualified and properly trained personnel, which would minimize the potential for oil material spills.

Relatively small quantities of used hydraulic fluids (less than 19 liters [5 gal.] per day) occur on an intermittent basis from routine maintenance and operation functions. These would be stored on-site for periods less than 90 days and periodically shipped to an oil recycling facility.

Following mechanical installation of the boilers, they would be chemically cleaned internally prior to start-up. The cleaning solution would dissolve metallic and other debris created during construction. Boiler cleaning waste would be classified as hazardous. The estimated 152 m^3 (40,000 gal.) of waste solution would be shipped off-site to a hazardous waste disposal facility. This is a one-time waste stream associated with boiler construction.

Waste oil would be generated at the facility from various equipment and plant operations. Sources of waste oil include turbine lube oil system waste oil (oil changes at major overhaul maintenance periods), drains from the natural gas knockout drums, and plant oil/water separators (equipment drains). Only a small amount of waste oil is produced at the plant. Most waste oil comes from maintenance oil changes from the gas turbine and steam turbine generators. Waste oil would be collected in a single underground 23 m^3 (6,000 gal.) storage tank. This size tank

would hold a complete lube oil system drained from one of the gas turbine generators. The waste oil would be pumped out by tank truck and trucked off-site to an approved recycling and disposal facility. The underground tank would be of fiberglass double-wall construction to provide corrosion protection and secondary containment. Leakage monitoring would also be provided. (See Tables 3-2 and 3-3 for materials used and stored on site.)

Electric or Magnetic Fields - The proposed plant would produce some levels of electric and magnetic fields within the plant. Workers in that plant would be exposed to these fields during the course of performing their jobs. Exposure and level duration are unknown.

Because scientific evidence about EMF has not established a cause-and-effect relationship between electric or magnetic fields and adverse health effects, specific health risks, or specific potential level of disease related to exposure to EMF are unknown.

Electric field effects are discussed at length under the transmission line impacts discussion on Page 5-38 and in Appendix B.

Visual and Aesthetic Impacts - Cogeneration Plant

Section 4.1.6 discussed the project, impact area visual characteristics, land use designations (visually sensitive), and viewers potentially exposed (see Table 4-7). The following discussion identifies the compatibility or impact of the proposed cogeneration plan with these characteristics. Visual impact findings are based on a field evaluation of visually sensitive sites, and computer-assisted view shed analysis. Table 5-8 identifies the distance from which the project is seen and the significance of visual impact. Map 8 illustrates the sensitive viewer observation areas which are located in the view shed. Unless views are blocked by vegetation all areas in the view shed would see at least part of the project.

The significance of impact (high, moderate, low or none) has been determined based on the sensitivity of viewing activity, the degree of visibility (distance), the significance of the viewing area (designated, protected) and the number or type of viewers. The analysis was based on the visibility of the most significant elements of the project, the main turbine built and emissions stacks and transmission towers. The analysis was completed based on the assumption that strobe lights would be put on the stacks to meet FAA requirements.

The methodology used for determining impact significance was interpreted from the threshold distances proposed to BPA in the 1976 study *Measuring the Visibility of H.V. Transmission Facilities in the Pacific Northwest* and the 1986 *Cape Blanco Wind Farm Feasibility Study Technical Report No. 7 - Visual*. The thresholds distances used were:

High to Moderate Visibility - 1.4 miles or less
 Moderate to Low Visibility - 1.4 to 3.9 miles
 Low Visibility - 3.9 to 18.9 miles

With the exception of the Columbia River, Lake Umatilla, portions of the Umatilla Wildlife Refuge, I-84, nearby residences and Port work areas, Washington State Highway 14, and the Coyote Springs State Wildlife Refuge, the proposed plant would not be visible or would have only low impact significance on any of the key observation areas identified on Table 5-8 and Map 8. The predominant visual features of the facility would be the 64 m and 55 m (210 ft. and 180 ft.) exhaust stacks, associated steam plumes and the new 500-kV transmission towers. On clear days the stacks and transmission towers could be visible from distances as far as 30.6 km (19 miles). However, their visual impact is reduced in significance by the flat terrain surrounding the site and the large number of trees (Russian Olive and cottonwood) in the adjacent area. These trees obstruct views from many of the viewer observation areas. The visual impact is also reduced in significance by the many industrial and transmission structures in the area. In particular, the Boardman Chipping Company facility is a visually dominate feature and tends to attract viewer attention.

During certain times of the year when the relative humidity is high, steam plumes may be visible from the cooling tower, HRSG stack, and auxiliary boiler stack. Plumes would be 107-122 m (350-400 ft.) high. Since the proposed facility is in a semi-arid area, the ambient relative humidity is generally low and plumes would only be visible when temperatures fall below freezing. Plumes would be seen until the temperature of the plume declines to the ambient air temperature.

The views of the facility are particularly open from the Columbia River, and the Washington shoreline. There are several scenic viewpoints, boat ramps and wildlife refuge access roads on the Washington side of the river. They would expose viewers to an open panorama of the site. This views across the river and Umatilla Wildlife Refuge would be the most incompatible. The proposed facility would increase the industrial appearance of the wildlife refuge's natural vistas. However, this impact would be somewhat reduced due to the views of the Boardman Coal Plant and stack, which are visible in the background. The plant site would also be highly visible from I-84. Average daily traffic on I-84, 500 m (1,600 ft.) west of the Boardman interchange, totals over 9,450 vehicles a day (1991). The unimproved appearance of the Port property would be accented by the new plant and associated transmission lines. This could leave a negative visual impression to the public traveling on I-84. The exhaust stacks and steam plumes would attract attention and be highly visible.

Figures 4-4, 4-6, and 4-8 (see Section 4) are simulations of what the plant would look like from key vantage points. These photographs were included in PGE's site application and were taken from I-84 south, east, and west of the proposed site. The view from the Boardman residential area should be similar to the views shown on Figures 4-6 and 4-7.

**Table 5-8
Visual Impact Assessment**

Viewer Observation Areas	View Distance	Visible (yes/no)	Designation in Land Use Plan	Impact Significance
Boardman Marina Park	2.4 kilometers (1.5 miles)	Yes (partly screened)	Not Designated	Low
Boardman Research Natural Area	1.5 kilometers (.95 miles)	Yes	Protected Area	Low (partly screened)
Boardman Sailboard Beach	4.0-4.8 kilometers (2.5-3.0 miles)	Yes	Not Designated	Low
Cold Springs Reservoir	38.6 kilometers (24 miles)	No	Designated	None
Cold Springs National Wildlife Refuge	38.6 kilometers (24 miles)	No	Protected Area	None
Horn Butte BLM Area of Critical Environmental Concern	28 kilometers (17.4 miles)	Yes	BLM Designated and Protected Area	Low
Coyote Springs State Wildlife Area	2.9 kilometers (1.8 miles)	Yes	Not Designated but Protected Area	Moderate
Hat Rock State Park	38.5 kilometers (23.9 miles)	No	Designated and Protected Area	None
I-84 Rest Stop (east & west-bound)	6 kilometers (3.7 miles)	Yes	Not Designated	Low
Irrigon Marina Park (ODFW)	19 kilometers (11.8 miles)	No	Not Designated	None
Irrigon State Wildlife Area	19 kilometers (11.8 miles)	No	Not Designated or Protected	None
Lake Wallula	30.6+ kilometers (19.+ miles)	No	Designated	None
Lake Umatilla	.5+ kilometers (.3+ miles)	Yes	Designated	Moderate-Low
Lindsay Grassland	16 kilometers (10 miles)	No	Designated	None
McNary Lock and Dam	30.6+ kilometers (19+ miles)	No	Designated	None
Messner Pond	0.1 kilometers (400 feet)	Yes	Not Designated	Moderate
Oregon Trail BLM Area of Critical Environmental Concern (Bucks Corner)	29 kilometers (18 miles)	Yes	BLM Designated and Protected Area	Low (can see only stack and steam plume)
Power City Wildlife Area	30.9 kilometers (19.2 miles)	No	Not Designated or Protected	None
Riverside High School	1.6 kilometers (1 mile)	Yes (only stack and plume visible)	Not Designated	Low
Travelers on I-84	0.9+ kilometers (.55+ miles)	Yes	Not Designated	High
Umatilla County Scenic-Historic Road	30+ kilometers (18+ miles)	Yes (only stack and plume visible)	Designated	Low-None
Umatilla National Wildlife Refuge	2.4-3.2 kilometers (1.5-2.0 miles)	Yes	Protected Area	Moderate-Low
Willow Creek State Wildlife Area	20.8 kilometers (12.9 miles)	No	Protected Area	None
Willow Creek Boat Ramp and Recreation Area (Corps of Engineers)	20.8 kilometers (12.9 miles)	No	Designated	None
Wilson's Willow Run Golf Course	6 kilometers (3.7 miles)	No	Not Designated	None

Mitigation - PGE indicated that topographic screening was not practical due to the flat terrain surrounding the site. PGE's conclusions were based on topography or vegetation not being strong visual elements in the site area. However, PGE has proposed several mitigation measures to be used to minimize the visual impact of the plant:

- Paint buildings and exhaust stacks in neutral shades to minimize visual impacts.
- Minimize exterior lighting at night. The minimum number of lights would be used as required by safety standards. The FAA may require aircraft warning lights on the tallest stacks. There is no way to minimize the visual impacts of strobe lights.
- Use native plant materials to enhance the appearance of the site.

Noise Impacts - Cogeneration Plant

Operational Noise - Future noise levels for the plant were calculated by Chester Environmental using a widely used and accepted acoustic computer program called "Noisecalc." Future noise was then compared with Oregon DEQ's nighttime standard of 50 dBA for residential sites and with existing noise levels at these sites. Oregon DEQ's industrial noise standard takes into consideration existing noise levels at industrial sites when evaluating future industrial noise. Its standard is either the maximum existing noise level or the speech interference criteria of 55 dBA. The results of the noise analysis are presented in Table 5-9. Locations of noise recordings are shown on Map 3 (follows page 4-2).

As Table 5-9 shows, Oregon DEQ noise standards are met at each of the noise analysis sites. Several of the noise analysis sites (2,4, and 5) already experience high noise levels. The cogeneration plant would not worsen this condition. It would be possible to hear the turbine generators' high frequency tonal sound at some of the nearest occupied sites. During east to northeast wind conditions, some locations may experience downwind refraction of sound causing short-term noise increases of up to 10 dBA.

**Table 5-9
Future Nighttime Noise Levels**

Site	Site Type	Existing Noise (L-10) *	Predicted Noise (L-10)	DEQ Standard (L-10)
1	Wildlife Area	51 dBA	57 dBA	62 dBA
2	Industrial Site	51 dBA	44 dBA	55 dBA
3	Residential	50 dBA	39 dBA	55 dBA
4	Industrial Site	56 dBA	41 dBA	55 dBA
5	Residential	57 dBA	31 dBA	50 dBA
6	Residential	50 dBA	30 dBA	55 dBA
		Existing Noise (L-50) *	Predicted Noise (L-50)	DEQ Standard (L-50)
1	Wildlife Area	36 dBA	57 dBA	62 dBA
2	Industrial Site	46 dBA	44 dBA	50 dBA
3	Residential	44 dBA	39 dBA	50 dBA
4	Industrial Site	50 dBA	41 dBA	50 dBA
5	Residential	56 dBA	30 dBA	50 dBA
6	Residential	48 dBA	30 dBA	50 dBA

Source: Chester Environmental. * See Glossary

Construction Noise - The exact mix of construction equipment to be used at the plant is unknown. However, experience suggests that certain types of equipment would be used for this type of facility. Table 5-10 lists construction equipment expected to be used to build the plant and the noise levels created by each. The number of each machine used is based on EPA estimates. The usage factor is an estimate of how much time a piece of equipment would be used in an 8-hour work day (expressed as a percentage).

**Table 5-10
Construction Equipment Noise Levels**

Equipment Type	Quantity	Noise at 50 ft. (dBA)	Usage %
Bulldozer	2	80	40
Road Grader	1	78	40
Back Hoe	1	85	20
Crane	1	84	20
Dump Truck	3	85	40
Paving Machine	1	85	10
Paving Roller	1	85	10
Concrete Truck	2	86	20
Air Compressor	2	81	100
Water Pump	2	76	100

Based on the equipment noise levels at 15 m (50 ft.) and the individual usage factor, a composite noise level at 15 m (50 ft.) of 89 dBA (L_{50}) was calculated by Chester Environmental. This noise level would occur up to 4 hours. Taking into account noise reduction due to distance, noise at Messner Pond (the nearest sensitive site), would be 65 dBA, which is less than Oregon DEQ's allowable noise maximum of 68 dBA. Construction noise at the nearest residential site (Site 5) would be under the existing industrial ambient noise, and would be inaudible at Site 3.

Cultural Resource Impacts - Cogeneration Plant

The proposed plant would not be on or within any known historic, cultural, and/or archeological resources. However, site-specific surveys have been performed to check for the presence of historic, cultural, and archeological resources, and provide for any needed protection, recovery, or avoidance. A draft of the survey report is included in PGE's *Application for Site Certificate*.

Protected Resource Impacts - Cogeneration Plant

No impacts to protected resources are anticipated from the proposed project.

5.1.2 Power Integration Impacts

Impacts predicted to occur from power integration facilities are summarized in Table 5-11. Narrative descriptions of predicted impacts are provided below.

Land Use Impacts - Power Integration

Construction of the proposed transmission line would alter the land use within the right-of-way from vacant and agricultural to industrial. The proposed transmission line has been sited on land that has been zoned PI (Port Industrial) and MG (General Industrial). Transmission lines are an allowed use in the PI Zone within Morrow County, however, they are not allowed outright in the MG Zone. To site a transmission line in the MG Zone within Morrow County, PGE first needs to obtain a variance from the County to allow this use. The County Planning Department would process the permit quickly after it is received (Seeger, 1993).

The transmission line would parallel the Port access road as it enters/exists the proposed plant over approximately 900 m (1000 yards). The transmission line would then pass over Columbia Avenue before turning southeast for approximately the same distance before tapping into the existing McNary-Slatt 500-kV transmission line. The applicant would need to obtain a conditional use permit from the county before stringing a transmission line over a public right-of-way. The conditional use permit would specify the minimum clearances required for such use.

Land use restrictions are necessary for land contained within transmission line rights-of-way. Such restrictions would be contained in the easement between PGE and BPA and the Port of Morrow. These restrictions would identify what uses are not allowed within the right-of-way. For example, no structures may be built and no flammable liquids may be stored within a BPA transmission line right-of-way.

Construction of the proposed transmission line across the irrigated agricultural field (circle 53) may cause noxious weeds to spread within the existing field and/or within nearby fields.

Mitigation - PGE would obtain a variance from the county to allow construction of the proposed transmission line in the MG Zone.

PGE would obtain a conditional use permit from the county before stringing a transmission line across Columbia Avenue, a public right-of-way.

PGE would acquire the appropriate easement rights (meeting all BPA easement requirements) from the landowner prior to construction. PGE would assign these rights to BPA.

Noxious weed survey would be undertaken by a qualified individual(s) prior to any earth moving activities taking place.

Natural Resource Impacts - Power Integration

Soils and Geology - Minimal impacts to soils are expected from construction of the substation and tap lines. Determination of soil impacts are based on soil characteristics, topography, vegetation, and presence of erosion elements including water and wind. The proposed project site is nearly flat, dry, and sparsely vegetated. Water erosion is expected to be minimal. Vegetation must be replaced to avoid wind erosion.

Transmission towers would be supported on drilled shaft foundations and the substation equipment would be supported on spread footing foundations. Operating the transmission line and substation would have no impact on site stability.

Water - The substation and transmission line structure locations avoid surface water features. The construction period would be the only period in which water impacts might be caused by power integration facilities. The State of Oregon requires SWPP Plans for construction sites that exceed 2 ha (5 acres), such as the Coyote Springs Plant. This plan would define techniques that would be used to prevent pollution from entering aquatic systems, and prevent wind or water erosion, and ensure that transmission facilities would not adversely affect water resources.

Air Quality - The typically high electric field strength of 500-kV transmission lines causes a breakdown of air at the surface of the conductors called corona. Corona has a popping sound, which is most easily heard during rain storms. When corona occurs, small amounts of ozone and NO_x gases are released. These substances are released in such small quantities that they are generally too small to be measured or to have any significant effects on humans, plants or animals.

Fish and Wildlife Impacts - Power Integration

Fisheries - No fisheries impacts would occur from construction of the electrical transmission line.

Wildlife - Along the electrical transmission line corridor, temporary impacts to wildlife habitat would result from equipment operation to access the transmission tower construction sites, and minimal permanent loss of habitat would occur at the base of the transmission towers. The effect of this habitat loss on wildlife populations is expected to be minor due to the temporary nature of the impact and the small amount of habitat impacted. No excavation would occur except to construct the footings for the transmission towers. Minor amounts of vegetation would be cleared because most of the electrical transmission line route lacks significant vegetation. The proposed mitigation measure to re-establish vegetation (grasses) would provide habitat in areas presently bare. Also, the erection of the transmission towers may provide new perching and nesting habitat for some avian species (e.g., raptors, western kingbird).

Construction activities along the transmission line could also cause disturbance (visual and auditory) and displacement of wildlife from these areas to adjacent areas. Displacement would

Impact Table - Coyote Springs Power Inte

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
WATER				
Resulting from Construction Activities				
Mesuner Pond	Unlikely	None	NPDES Requirements	DEQ 1200 C
Columbia River	Unlikely	None	NPDES Requirements	DEQ 1200 C
Unnamed irrigation pond	Certain	Slight	NPDES Requirements	DEQ 1200 C
Resulting from Facility Operation				
Degradation of water quality	Unlikely	Slight	City of Boardman's sewage treatment facility	None
Lowering of water table in deep aquifer	Possible	Slight	None	(Water Resources Permit)
Spills of fuel or other hazardous materials	Unlikely	Slight	Fulfill requirements of RCRA	None
Fisheries	Unlikely	Slight	Denial of new wells in alluvial aquifer	Water Resources Permit
VEGETATION				
Habitat disturbance	Slight	None	Recontouring and revegetation	None
Wetland vegetation disturbance	Likely	Moderate	Recontouring and Revegetation	None
Sensitive plant species	Unlikely	Unlikely	None	None
WILDLIFE				
Fauna				
Mortality of individuals	Unlikely	Localized	None	None
Temporary displacement	Unlikely	Localized	None	None
Stress in crucial life cycle times	Unlikely	Localized	None	None
Wildlife Habitat				
Wildlife habitat impact	Minimal	Localized	Revegetation	None
FISH				
Mortality/displacement	Unlikely	Localized	None	None
SPECIAL STATUS SPECIES				
None found in project area	None	None	None	None
THREATENED AND ENDANGERED SPECIES (Federally listed)				
Plants				
None found in project area	None	None	None	None

ration (Substation and Transmission Line)

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
THREATENED AND ENDANGERED SPECIES (Federally listed) Cont.				
Wildlife				
Peregrine falcon	Unlikely	Localized during construction	None	None
Bald eagle	Unlikely	Localized during construction	None	None
Fish				
Salmon River fall chinook salmon	None	None	None	None
Salmon River spring/summer chinook salmon	None	None	None	None
Salmon River sockeye salmon	None	None	None	None
GEOLOGIC HAZARDS				
Seismic Hazards (Possibilities that ground shaking, fault offset, soil liquefaction, or seismically induced waves and flooding could affect the integrity of the facility.)	Possible	Project Area	Construct facilities according to the Uniform Building Code, and the appropriate importance factor for essential and hazardous facilities.	Building Permit
Floodplains	Unlikely	Slight	None	None
SOIL				
Wind erosion due to removal of vegetation	Likely	Localized, short-term	NPDES Requirements	DEQ 1200 C
Water erosion due to removal of vegetation	Unlikely	Localized, short-term	NPDES Requirements	DEQ 1200 C
LAND USE				
Land use within the right-of-way will be altered from vacant and agricultural to industrial use.	Certain	Slight	None	None
Transmission lines in the General Industrial zone of Morrow County require a variance.	Certain	Localized	Project developers will seek a variance..	Variance
The transmission line will cross a public right-of-way.	Certain	Localized	As required in permit	Conditional Use Permit
The transmission line will restrict certain uses within the right-of-way.	Certain	Localized	Landowners will be compensated for easement	None

Table 5-11
Impact Table - Coyote Springs Power Integration (Substation and Transmission Line)

Impact Table - Coyote Springs Power In

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
LAND USE (Cont.)				
Construction of the transmission line may cause an infestation of noxious weeds in existing nearby agricultural fields.	Likely	Localized	A noxious weed survey will be conducted by a qualified individual(s) prior to any construction activities taking place. All construction vehicles will be washed prior to entering and before leaving construction area.	None
CULTURAL RESOURCES				
Historic, cultural and archeological resources	Unlikely	None	Site-specific survey	None
SOCIOECONOMIC				
Construction of proposed project will increase the demand for temporary housing.	Likely	Local area	None	None
Construction and operation of proposed project will increase employment in local area.	Likely	Local area	None-Positive impact	None
RECREATION				
Local recreation sites	Unlikely	None	None	None
VISUAL AND AESTHETIC RESOURCES				
Nearby residences, Washington Highway 14, I-84, Columbia River, portions of the Umatilla Wildlife Refuge, and the Coyote Springs State Wildlife Refuge.	Likely	Low	Structures will be located parallel to existing structures if possible. Insulator and tower colors will be matched between lines, etc. Measures will be used to reduce visibility and glare of new conductors and towers.	None
Other key observation points	Unlikely	Slight	(1) Paint buildings in neutral shades to minimize visual impacts. (2) Minimize the amount of exterior lighting at night. (3) Use native material landscaping.	None
PROTECTED RESOURCES				
Oregon DOE designated Protected Resources	Unlikely	Slight	None	None
PUBLIC HEALTH AND SAFETY				
Toxic and hazardous waste (Substation)	Unlikely	Localized	Requirements of SPCC Plan pursuant to the Clean Water Act	None
Electric fields	Likely	Localized	Safety standards to prevent accidental shock.	None
Magnetic fields	Likely	Unknown	Line design to reduce fields.	None

Table 5-11 (continued)

Impact Table - Coyote Springs Power Integration (Substation and Transmission Line)

ation (Substation and Transmission Line)

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
NOISE				
Construction noise	Likely	Moderate, Short-term	None	None
Operation noise (line and substation)	Likely	Localized, insignificant due to existing noise.	Special design of transmission lines and transformers to meet noise standards.	None
AIR QUALITY				
Pollutants from construction equipment	Likely	Slight	None	None
Pollutants released during operation	Likely	Slight	None	None
Fugitive dust	Likely	Slight	Water area as needed.	None

be temporary and most wildlife would likely return to the area after construction is complete. The degree of this disturbance would depend on several factors including time of year, duration of disturbance, and the species' sensitivity to disturbance.

Mitigation - Electrocuting of raptors is unlikely based on the design specifications of the transmission towers, but modifications would be added if warranted to raptor-proof the transmission towers and minimize electrocutions. Because phase-to-phase and phase-to-ground distances of the 500-kV transmission lines and towers are greater than the wing span of eagles and other large birds, electrocution of these species would not be a concern. If, for some unforeseen reason, an individual tower is determined to be a potential hazard, appropriate mitigation measures would be taken (erection of perch guards or modification of the lines as described in Olendorf, et al., 1981) to eliminate the hazard.

Vegetation/Wetland Impacts - Power Integration

Direct but short-term impacts would occur to upland vegetation during construction of the towers.

Socioeconomic Impacts - Power Integration

Socioeconomic impacts for the power integration facilities are minor and cogeneration plant impacts include power integration facilities.

Public Health and Safety Impacts - Power Integration

Toxic and Hazardous Materials - Minimal amounts of hazardous waste would be generated from routine maintenance procedures performed on substation equipment and lines. Kinds and volume of waste would depend on the maintenance procedure and would be the same as that generated at any electrical substation.

Safety Precautions - Power lines, like electrical wiring, can cause serious electric shocks if certain precautions are not taken. These precautions include building the lines to minimize shock hazard. All BPA lines are designed and constructed in accordance with the **National Electrical Safety Code (NESC)**. NESC specifies the minimum allowable distances between the lines and the ground or other objects. These requirements basically determine the edge of the right-of-way and the height of the line, that is, the closest point that houses, other buildings, and vehicles are allowed to the line, to limit electric field effects to acceptable levels.

People must also take certain precautions when working or playing near power lines. It is extremely important that a person not bring anything, such as a TV antenna or irrigation pipe, too close to the lines. BPA provides a free booklet that describes safety precautions for people who live or work near transmission lines (*Living and Working Around High Voltage Power Lines*).

Transmission 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 wood posts insulated from ground. Usually 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. For 500-kV lines, grounding of certain objects near the lines is a routine part of the construction process.

Audible Noise Limits - All new BPA lines are designed and constructed to comply with state noise regulations. The new transmission line would meet the State of Oregon noise standard, 50 dBA.

Electric and Magnetic Fields - BPA recognizes public concern regarding the possible effects of the electrical properties of transmission lines on public health and safety. These effects include electric shocks, noise and potential long-term health effects. In response to the public concern regarding EMF, the agency has taken these steps:

- Developed Interim Guidelines of EMF. These guidelines name EMF as a major decision factor to be considered in locating and designing new BPA facilities.
- Discouragement of intensive uses of rights-of-way. In 1990, BPA revised its right-of-way management practice. BPA no longer encourages new uses in rights-of-way which would increase human exposure to EMF.
- Exposure Mitigation. BPA was among the first to voluntarily adopt practices to mitigate EMF exposures. This means taking reasonable or practical actions that would prevent human exposure to new sources of EMF.

All BPA lines and electrical facilities are designed and constructed in accordance with the NESC to minimize electrical shock hazards. New BPA lines are also designed and constructed to comply with the State of Oregon's electric field strength standard of 9 kv/m maximum on the right-of-way. This project would meet this standard.

Both electric and magnetic alternating-current (a-c) fields induce currents in conducting objects, including people and animals. These currents, even from the largest power lines, are too weak to be felt. However, some scientists believe that these currents might be potentially harmful and that long-term exposure should be minimized. 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. For this reason specific health risks related to exposure to EMF are unknown. A review of some of the studies relating to EMF and possible biological and health effects are included in Appendix B.

Significance of EMF Exposures - Because scientific evidence relating to EMF has not established a cause-and-effect relationship between electric or magnetic fields and adverse health effects, specific health risks, or specific potential level of disease related to exposure to EMF are unknown. BPA conducts *exposure assessments* of magnetic fields from transmission lines. Exposure assessments are estimates of the field levels that people are potentially exposed to.

Exposure Assessment - In general, magnetic field exposure assessments are performed by calculating field levels in locations where there are potential long-term exposures to people. This is usually done by assessing the number of homes, schools or businesses near the proposed project where magnetic field exposures may be created by the proposed project. Estimated magnetic fields along the proposed transmission line are provided in Figure 5-1. Figure 5-1 shows that magnetic fields drop rapidly as distance from the transmission line increases.

Figure 5-1
EMF Exposure Assessment

The proposed transmission line is within the Port of Morrow Industrial Park, thus EMF exposure to people would be limited. There is only one building employing or housing people close enough to the transmission corridor to potentially experience an increase in magnetic field exposure. The onion processing plant is about 130 m (425-450 ft.) from the centerline of the new transmission line. As Figure 5-1 indicates, this building is estimated to experience 2-3 milligauss magnetic field exposure from the new transmission line. The onion processing plant may already receive some magnetic field exposure from the existing 115-kV line along the Port access road. There are two mobile homes in the area owned by the Port that would be removed. Also, two buildings associated with the concrete batch plant are scheduled for removal because the plant is moving to a new location.

Electrical current levels and EMF exposure levels along other parts of the transmission system may be affected because of this project. Increases to the magnetic field environment may occur in some areas along the transmission system, but accurate predictions of these changes cannot be made. Such variables as tower design, conductor configuration, number of transmission lines entering and leaving the corridor, and the presence of substations all can affect magnetic fields. Trying to characterize EMF changes outside the Coyote Springs Cogeneration Project's boundary would be a speculative exercise and would produce numbers that could not be considered reliable.

Visual and Aesthetic Impacts - Power Integration

Section 4.1.6 discussed the project, impact area visual characteristics, land use designations (visually sensitive), and viewers potentially exposed. The following discussion identifies the compatibility or impact of the proposed transmission line and tap with these characteristics. Table 5-8 identifies the sensitive observation areas that can see the project (plant facilities and transmission), the distance, and the degree of significance of the visual impact. Figure 5-2 simulates the appearance of the new transmission line as viewed from I-84.

The significance of impact has been determined based on the sensitivity of viewing activity, the degree of visibility (distance), the significance of the viewing area (designated, protected), and the number or type of viewers. The analysis was based on the visibility of the most significant element of the project, the transmission towers and plant substation. Because of the existing impact and visual dominance of the existing transmission corridors and Boardman Substation, the increased visual impact on viewers or sensitive observation areas beyond 6.3 km (3.9 miles) would be minimal.

The visual impacts of the transmission facilities would occur primarily to the near views. These impacts would occur to people using the Columbia River, portions of the Umatilla Wildlife Refuge, I-84, nearby residences and Port work areas, Messner Pond, Washington Highway 14, and the Coyote Springs State Wildlife Refuge. The proposed transmission line would not be visible or have only low impact significance on any of the key observation areas identified on Table 5-8. The dominant transmission visual features would be the new 500-kV transmission towers and the tap structure that would be within 0.4 km (1/4 mile) of I-84. The proposed trans-

Coyote Springs Cogeneration Plant - Morrow County, Oregon

**Figure 5-2
Transmission Tap and
Loop Line Simulation**

mission line alignment would cross over a vegetated portion of the Messner Pond natural area. Russian olive trees that would be crossed may require clearing, which would increase the visual impact of the project.

Mitigation - Topographic screening is not practical due to the height of the transmission structure and the flat terrain surrounding the site. BPA would use the following measures to minimize the visual impacts of transmission lines structures built for the plan proposed.

- Transmission structures for parallel lines would be designed and located to provide uniformity to the extent practical. That is, structures would be parallel to existing structures. Insulator colors would be matched between existing and new lines.
- The galvanized transmission towers would be specially treated to reduce reflectance and match the existing weatherized transmission towers.
- **Non-specular** conductors could be used to reduce visibility between the existing transmission corridor and the generation plant.
- The substation and tap installations would be designed to be aesthetically pleasing. The substation would be landscaped with native plant materials. Substation structures would be painted in a color compatible with the surrounding area.

Noise Impacts - Power Integration

Power transformers within the Coyote Springs substation switchyard would create noise. While old power transformers at times exceed nighttime noise standards, modern transformers are designed to meet the most stringent noise standards.

Transmission lines also create noise through a process called corona activity. An audible popping sound occurs when air breaks down due to the high fields on the surface of the transmission line conductors. During fair weather, 500-kV lines typically create noise levels of 40 dBA level (L_{50}) at the edge of the right-of-way. During heavy precipitation noise levels increase. The use of conductor bundles (2-4 conductors/phase) has considerably reduced transmission line noise levels.

Considering that no noise sensitive properties are near the transmission line route, no significant noise impacts would result from power integration.

Cultural Resource Impacts - Power Integration

The proposed 500-kV transmission line and substation would not be on or within any known historic, cultural, and/or archeological resources. Site-specific surveys have been performed to check for the presence of historic, cultural, and archeological resources, and provide for any needed protection, recovery, or avoidance. (See Section 4.1.7.)

Should any archeological, historical, or cultural resources be encountered during construction or operation of the proposed facilities, both ORS 358.920 and 36 CFR 800.11 apply. The former statute prohibits the disturbance or excavation of an archeological site on public lands (including lands owned by port districts) without a permit issued by the State under ORS 390.235. The latter regulation addresses procedures in the event of cultural resource finds made during the course of Federally permitted or licensed undertakings. In pursuant of these legal authorities, if any cultural resource discoveries are made during development or operation of Coyote Springs facilities, all ground-disturbing activity in the vicinity of the find would be halted immediately and the following agencies notified: the Oregon State Historic Preservation Office, FERC, and the Confederated Tribes of the Umatilla Indian Reservation.

ORS 97.745 prohibits the disturbance or removal of Indian burials or graves, whether on public or private lands. Should an Indian burial or possible burials be encountered during construction or operations of the Coyote Springs facilities, all ground-disturbing activity in the vicinity would cease immediately and the following agencies notified: the Oregon State Historic Preservation Office, the Oregon Commission on Indian Services, and the Confederated Tribes of the Umatilla Indian Reservation.

Protected Resource Impacts - Power Integration

Construction and operation of the transmission line is not expected to have a significant adverse impact to Protected Resources. The proposed 500-kV electrical transmission line is about 3.7 km (2.3 miles) from the McCormack unit of the Umatilla National Wildlife Refuge and 1 km (0.6 miles) from the Coyote Springs Wildlife Area.

5.1.3 Coyote Springs Extension Pipeline Impacts

Impacts for the pipeline extension and main pipeline proposed by PGT would be evaluated in an EIS being prepared by FERC. Impacts reported here and in Table 5-12 are from environmental resource reports commissioned by PGT and completed by the consulting firm CH2M Hill.

Natural Resource Impacts - Pipeline

Surface water and wetland impacts are unlikely. Mitigation includes NPDES requirements and FERC's Wetland and Waterbody Construction and Mitigation Procedures (see Table 5-12).

Native vegetation and wildlife habitat would be disturbed. Mitigation includes completion of plant surveys to determine areas and sensitive plant species to avoid. Reseeding and native plant restoration would be completed after construction.

Wildlife including Special Status Species (Washington ground squirrel, burrowing owl, pygmy rabbit, and long-billed curlew) are expected to be disturbed. Surveys of critical habitats would be completed and construction activities would be scheduled to avoid impacts. No fish or

Impact Table - Coyote

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
SURFACE WATER				
Erosion of streambanks	Unlikely	Unlikely	NPDES Requirements. Follow guidelines provided by FERC's Wetland and Waterbody Construction and Mitigation Procedures	DEQ 1200 C
Increased sediment transport	Unlikely	Unlikely	(See above)	DEQ 1200 C
Resuspension of toxic contaminants	Unlikely	Unlikely	(See above)	DEQ 1200 C
Spills of fuel or other hazardous fluids	Unlikely	Unlikely	(See above)	DEQ 1200 C
WETLANDS				
Degradation of water quality	None	None	NPDES Requirements (i.e., reseeding disturbed areas, sediment filters, watering to control dust, locating staging areas away from water features, refueling 200 feet from wetland boundaries). Also see above.	DEQ 1200 C
Chemical releases to groundwater	Unlikely	Small, localized and insignificant	(See above)	DEQ 1200 C
Fisheries and aquatic	None	None	(See above)	None
VEGETATION				
Herbaceous habitat disturbance	Likely	Short-term	Native plant restoration after construction	None
Woody shrub habitat disturbance	Likely	Long-term small acreage	Native plant restoration after construction	None
Wetland vegetation disturbance	None	None	Native plant restoration after construction	None
Sensitive plant species disturbance - Lawrence's milkvetch	Potential	Long-term	Plant surveys, avoidance, native plant restoration after construction	None
WILDLIFE				
Fauna				
Mortality of individuals	Likely	Less mobile, or dormant species	Surveys of critical habitat, scheduling construction activities to avoid impacts.	None
Temporary displacement	Likely	Mobile species	(See above)	None
Stress in crucial life cycle times	Likely	Less mobile species	(See above)	None
Wildlife Habitat				
Shrub-steppe	Likely	Conversion to grassland	Reseeding, native plant restoration after construction.	None
Grazing/agriculture	Likely	Disturbance with recovery within 2 seasons	(See above)	None

Coyote Springs Pipeline Extension

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
Wildlife Habitat (Cont.)				
Impact to grassland habitats	Likely	Temporary alteration	(See above)	None
Impact to sandy bitterbrush steppe habitats	Likely	Cheatgrass replacement	(See above)	None
Indirect impacts to wildlife due to increased access	Likely	Slight	None	None
FISH				
None	None	None	Follow guidelines provided by FERC's Wetland and Waterbody Construction and Mitigation Procedures.	None
SPECIAL STATUS SPECIES				
Washington ground squirrel	Likely	Mortality if occupied burrows are excavated. Loss of habitat	Surveys of critical habitats, scheduling construction activities to avoid impacts.	None
Burrowing owl	Likely	Mortality if occupied burrows are excavated. Loss of habitat	(See above)	None
Pygmy rabbit	Likely	Mortality of young or dormant rabbits	(See above)	None
Long-billed curlew	Likely	Loss of eggs, nest abandonment	(See above)	None
Columbia cress	Unlikely	Slight	None	None
Lawrence's milkvetch	Likely	Moderate	None	None
Robinson's onion	Unlikely	Slight	None	None
Thompson's sandwort	Unlikely	Slight	None	None
THREATENED AND ENDANGERED SPECIES				
Plants				
None found	Unlikely	None-slight	Field Survey-Consultation with USFWS	None
Wildlife				
None found	Unlikely	None-slight	Field Survey, Consultation with USFWS	None
Fish				
None	None	None	Field Survey, Consultation with USFWS	None

Table 5-12
Impact Table - Coyote Springs Pipeline Extension

Impact Table - Coyote

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
CULTURAL RESOURCES				
Disturbance of prehistoric and historic archeological sites during construction	Unlikely	Unlikely	Cultural resource survey prior to construction, consultation with SHPO, Tribes, avoidance of identified sites, excavation and recording of the site if avoidance impossible	None
Destruction of standing buildings and structures within the impact area of the pipeline route.	Unlikely	Unlikely	(See above)	None
Vandalism of sites due to increased access.	Unlikely	Unlikely	(See above)	None
SOCIOECONOMIC				
4 person-years of labor (32 short-term skilled craft jobs) would be hired from the local area.	Likely	Short-term employment increase	Socioeconomic effects from the pipeline project are not expected to be significant. No mitigation is planned.	None
12 person years of construction labor (100 non-local workers) would temporarily in-migrate to work on the pipeline.	Likely	Temporary population increase of 173 persons (families of workers).	(See above)	None
Loss of agricultural income within the right-of-way during construction.	Likely	Small acreage impacted for one season.	(See above)	None
Construction workers would place a demand on locally available housing.	Likely	52 units of temporary housing needed.	(See above)	None
Minor demands for local services (primarily the road system).	Likely	Minor impact on schools.	(See above)	None
Real property tax revenues would be paid after the pipeline is complete.	Likely	\$181,000 annually	(See above)	None
Pipeline completion makes several projects (including Coyote Springs Cogeneration Plant) viable.	Likely	Major-positive economic benefits	None	None

Table 5-12 (continued)
Impact Table - Coyote Springs Pipeline Extension

Springs Pipeline Extension

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
GEOLOGY/HAZARDS				
Clearing, grading, trenching, stockpiling of excavated materials would impact topography	Likely	Minimal	Disturbed areas will be graded and restored to approximate preconstruction conditions. Erosion controls will be used at disturbed sites. The pipe design will take into account seismic conditions for the project area.	Oregon Removal or Fill Permit
The proposed pipeline could limit access to exploitable aggregate resources within the pit mine it crosses	Likely	Minor - aggregate supplies in the area are abundant	Compensate owner for loss of income.	None
Geologic hazards could affect the integrity of the pipeline (seismic shaking or erosion at stream crossings)	Likely	Stress to the pipeline and creation of potential weak points.	Increasing thickness of pipe wall could sufficiently accommodate any effects of ground shaking. Placement of riprap or other streambank enhancement structures could reduce the potential for erosion.	None
SOIL				
Construction resulting in: loss of vegetative cover, and topsoil; mixing of topsoil with less fertile subsoil; deposition and sedimentation of lower lying lands from increased soil erosion; soil compaction. Permanent loss of soils/productivity.	Likely	Conversion to grassland	Follow guidelines provided by FERC's Erosion Control, Revegetation, and Maintenance Plan.	None
LAND USE				
Road crossings could disrupt traffic during construction.	Likely	Short-term, minor	Markers, detours, and traffic control measures would be posted in advance to reduce disruption. To avoid disruption of I-84, the pipeline crossing would be installed by boring under the road.	Yes-Oregon DOT
The pipeline could disrupt electric, water, and sewer lines.	Unlikely	Short-term	Utilities would be located prior to construction.	None
Pipeline storage yards would disrupt current land uses until the pipeline is complete and lands are restored to their prior condition.	Likely	Short-term	Storage sites would be selected to minimize land use impacts.	Conditional Use Permit (County and City)

Impact Table - Coyote

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
LAND USES Cont.				
Clearing and construction of the pipeline would disrupt current land uses.	Likely	Short-term, temporary	78% of the proposed route is adjacent to existing, previously disturbed right-of-way. Landowners would be compensated for losses. Land would be restored to prior conditions. Activities such as grazing and agriculture would resume in right-of-way.	Yes-Easement Grants
Pipeline construction, if overlapping with building the power plant, could inconvenience local area residents.	Likely	Short-term, temporary	Construction will occur over a period of about 2 months. Because the period of disruption will be short, no mitigation is planned.	None
RECREATION				
The pipeline crosses the Oregon Trail. Construction would have a short-term (about 1 day) impact on trail users.	Likely	Short-term, minor	The trail would be restored to its original condition after pipeline construction.	None
People using Messner Pond for fishing or birdwatching could be disrupted during construction of the pipeline. Public access would not be impacted.	Unlikely	Short-term, minor	None	None
PROTECTED RESOURCES				
Oregon DOE-designated Protected Resources	Unlikely	Slight	None	None
VISUAL AND AESTHETIC RESOURCES				
The pipeline passes through areas of slightly altered landscapes for most of its length. In these areas impacts would be moderate. In the industrial park the landscape is highly altered and the pipeline would have low impact.	Likely	Moderate to low	Minimizing clearing to reduce contrast. Stockpile and replace native soils in disturbed areas. Restore contours and revegetate disturbed areas with native plants.	None
AIR QUALITY AND NOISE				
Air emissions (carbon monoxide, nitrogen oxides, volatile organic compounds, particulate matter and sulfur dioxide) from construction of the pipeline would be negligible.	Minimal	Localized and slight	None	None
Fugitive dust emissions would occur as a result of soil exposure	Minimal	Localized	Limiting right-of-way clearing. Seeding or mulching to protect soil. Watering exposed soil during periods of high wind. Using low velocity equipment.	None

Coyote Springs Pipeline Extension

POSSIBLE IMPACTS	IMPACT LIKELIHOOD	IMPACT EXTENT	MITIGATION IDENTIFIED	PERMIT REQUIRED
AIR QUALITY AND NOISE (Cont.)				
Construction of the pipeline would increase noise levels.	Likely	Localized	Work will be limited to daytime hours. Mufflers and quieting devices would be used when needed. Work scheduling to avoid periods of noise annoyance. Install temporary or portable noise barriers around stationary noise sources, if needed.	None

Table 5-12 (continued)
Impact Table - Coyote Springs Pipeline Extension

threatened and endangered species are expected to be affected by the construction or operation of the pipeline (see Table 5-12).

Disturbance of cultural resources are unlikely. A cultural resource survey and consultation with SHPO and Tribes would be conducted to identify areas for avoidance.

Permanent loss of soils or productivity is likely. Mitigation includes following FERC's Erosion Control, Revegetation, and Maintenance Plan guidelines.

Geologic hazards could affect the integrity of the pipeline. Pipe design, including thickness of pipe wall, and placement of riprap or other streambank enhancement structures are possible mitigations.

Socioeconomic and Land Use Impacts - Pipeline

Socioeconomic impacts (both negative and positive) would be short term and minor. No mitigation is planned. Minor disruptions are expected to current land uses in some areas. The disruptions would be short term. Several permits are required and landowners would be compensated for losses (see Table 5-12).

Recreation/Protected Resources/Visual and Aesthetic Impacts - Pipeline

Impacts would be negligible. The Oregon Trail would be disturbed for approximately one day and would be restored to its original condition after construction. In all locations clearing would be minimized, native soils would be stockpiled and replaced, and native vegetation and contours would be restored.

Air Quality and Noise Impacts - Pipeline

Air emissions, fugitive dust and increased noise levels would occur during construction of the pipeline. The impacts would be localized and negligible. No impacts are expected after construction. Mitigation would be used to reduce the impacts (see Table 5-12).

5.1.4 Cumulative Impacts

The Council on Environmental Quality (CEQ) defines ***cumulative impact*** as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

Within this context, several cumulative impacts are foreseeable.

Global Warming

The proposed Coyote Springs Plant, together with PGE's existing Boardman Coal Plant, and two other gas-fired cogeneration generators proposed near Hermiston, Oregon, would cumulatively emit a fairly large amount of greenhouse gas. Because cogeneration plants provide steam to nearby industries that would otherwise produce steam from fossil fuels, greenhouse gas emissions are partially offset by reductions in fossil fuel consumption by steam users.

Current CO₂ control technologies for natural gas-fired combustion turbines are ineffective. One mitigating action that has been taken to offset CO₂ emissions is planting trees. Trees use airborne CO₂ to grow. A new policy of the Clinton administration is to grant tax credits to utilities that take actions to offset CO₂ emissions from their generating plants. PGE has not decided to undertake CO₂ offset mitigation at this time.

Transmission Capacity

Integrating the Coyote Springs Cogeneration Plant over the BPA transmission system would diminish surplus capacity on BPA's McNary-Slatt 500-kV transmission line. Presently, the surplus capacity of this line has been rated at 700-800 MW, which is more than the total output of both Coyote Springs generation units. The proposed Hermiston Generation Plant and the Hermiston Power Plant also intend to use BPA's transmission system. Their combined capacity would be 800-900 MW. If all three proposed plants are built, demands would exceed BPA's existing transmission system capabilities. Using projected completion dates for these units and assuming all three were integrated, BPA would need to install additional transmission capacity by the year 2000.

BPA has considered how this might be done. The most favorable solution would be to build a new 500-kV transmission line from McNary Substation adjacent to the 345-kV McNary-Ross transmission line to an interconnection with BPA's existing 500-kV Ashe-Marion lines northeast of Crow Butte, Washington. BPA's Ashe-Marion transmission lines were built in the late 1970s to integrate energy from several nuclear power plants proposed at the Hanford Reservation and near Boardman (Pebble Springs Nuclear Plant). Only one nuclear power plant was completed on the Hanford Reservation, which left surplus capacity on the Ashe-Marion 500-kV transmission lines.

Tapping these lines in Washington north of Crow Butte would provide a path for power from the proposed cogeneration plants west to the Willamette Valley in Oregon. This option and other ways to expand transmission capacities would be evaluated for environmental impacts before a decision is made.

Groundwater

The Coyote Springs Plant, together with the other proposed power plants and industrial developments in the Columbia Basin, could impact groundwater resources. Water from shallow aquifers in the Columbia Basin are being drawn down at a fairly rapid rate. Permits to use shallow water groundwater resources are tightly controlled by the State of Oregon and may become more restrictive. The cumulative impact of the proposed generation plants, coupled with industrial developments that use process steam could cause future requests for groundwater rights to be restricted in favor of parties holding senior water rights.

Water used from the shallow aquifer in the Columbia Basin could affect recovery plans for threatened or endangered salmon. The shallow water aquifers (extensively used in the basin) are hydrologically connected to the Columbia River. The shallow water wells that serve the Port of Morrow and, in turn, the Coyote Springs Project, may face restrictions in future years.

Regional Energy Resource Needs

The Coyote Springs Plant, together with the combustion turbine generation projects proposed near Hermiston, if completed, would provide over 1300 aMW of energy. BPA's 1992 *Pacific Northwest Loads and Resources Study* projects a 3,425 MW deficit in 2003 based on the medium load forecast. These plants in combination would satisfy a significant portion of the Northwest's forecast energy needs.

Tax Revenue

Construction of the Coyote Springs Cogeneration Project in Morrow County and the cogeneration projects proposed for the Hermiston area could offset the tax reduction measures mandated by Oregon's Measure 5 for local governments in the area. The State of Oregon could also benefit, in that the State, under Measure 5, has the responsibility of providing the necessary funding for the local school districts beyond the maximum of \$5/\$1000 of valuation that can be collected for tax year 1995/96 and beyond.

Housing

A shortage of temporary housing facilities in the area could result if all three cogeneration projects' peak construction periods occur concurrently. Construction of large-scale cogeneration plants, such as the proposed projects, normally take place over an 18-24 month period. At peak construction of the Coyote Springs Project, an estimated 200 workers would be on-site (Mayson,

1993). At peak construction for the Hermiston Power Project, 250 workers are expected to be employed (Smith, 1993); U.S. Generating Company's Hermiston Generation Project peak employment is expected to be 450 workers (Oregonian, September 1993).

Both PGE and U.S. Generating Company propose to begin construction sometime in 1994. However, the decision to start construction of the Hermiston Power Project is dependent on BPA's need for power. At this time Hermiston Power Project sponsors state construction would begin between 1995 and the year 2000 (Hermiston Power Partnership). If peak construction were to occur simultaneously, more than 900 workers could be working in the area.

While not all construction workers would likely be from outside the local area, most construction workers are likely to seek temporary housing in the local area. A number of these workers may bring dependents with them during project construction, although this figure is not expected to be significant.

Natural Gas Supply

The source of natural gas for the proposed cogeneration plant is from actively producing gas fields in Alberta and British Columbia, Canada. The number of natural gas wells that would be needed to supply PGE requirements was estimated by PGT. The average total yield of Canadian natural gas wells was divided into the total requirements of the Coyote Springs Plant (41 billion BTUs per day). Using this method, the output of 16 gas wells would be used each year by the Coyote Springs Plant (PGT, 1993). For perspective, 4,000 Canadian gas wells were drilled in 1991 and the total number of wells in Canada number in the 100's of thousands (PGT, 1992). Thus the Coyote Springs Plant would use only a small amount of gas compared to that available in Canada. The world's proven reserves are expected to last approximately 58 years at the present consumption rate (*Inside Energy/with Federal Lands*, 1993).

5.2 Impacts of the No Action Alternative

The No Action alternative assumes the Coyote Springs Plant is not built. Impacts reported for the proposed Coyote Springs Plant and associated transmission facilities and the pipeline would not occur, at least not to the same extent and in the same locations. If the No Action alternative is chosen, PGE's need to replace energy lost through closing the Trojan Nuclear Power Plant would not be met.

Two similar cogeneration plants are proposed at Hermiston, Oregon. The proximity of BPA's transmission lines to these plants makes wheeling of power over BPA's lines almost certain. Surplus capacity on BPA's transmission lines would still be used under the No Action alternative.

As the need for additional power resources would remain under the No Action alternative, PGE would most probably build a generation plant of similar size and type at a different location. PGE could also acquire an equivalent amount of energy from independent power producers. Either option appears likely, considering that two very similar generation plants have been proposed at Hermiston, Oregon, and energy produced by combustion turbines is cost-effective.

PGE's investment in the Coyote Springs Project would be lost under the No Action alternative, as would the time committed to this proposal. Development of another generation proposal would take several years to reach an equal level of refinement. In the interim, PGE would need to acquire power during periods when demand exceeds their energy resources, as was the case in winter 1992-1993. The cost of power acquired during winter peaks is high, which would increase costs to PGE's customers.

6.0 Environmental Consultation, Review, and Permit Requirements

Several Federal laws and administrative procedures must be met by the proposed action. This section lists and briefly describes requirements that may apply to elements of this project, actions taken to assure compliance with these requirements, and the status of consultations or permit applications.

6.1 National Environmental Policy Act

This DEIS was prepared according to NEPA (42 USC 4321 et seq.). NEPA applies to all major Federal actions that may significantly affect the quality of the human environment. BPA will take into account potential environmental consequences and will use all practical means to protect, restore, and enhance the environment.

6.2 Threatened and Endangered Species

The Endangered Species Act (16 USC 1536) provides for conserving threatened and endangered species of fish, wildlife and plants. Federal agencies must ensure proposed actions do not jeopardize the continued existence of any endangered or threatened species, or cause the destruction or adverse modification of their habitat. When conducting any environmental impact analysis for specific projects, agencies must consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) and identify practicable alternatives to conserve or enhance such species.

Informal consultation with the USFWS and NMFS pursuant to the Endangered Species Act has been initiated. A biological assessment of the projects impact on threatened and endangered species was prepared by Beak Consultants, Inc. and is enclosed as Appendix C. BPA concurs with the opinion of the consultant that the proposed Coyote Springs Cogeneration Project is not likely to effect the bald eagle, the peregrine falcon or the Snake River spring/summer chinook salmon. BPA has submitted the biological assessment to the USFWS and the NMFS. Their responses will be reported in the final EIS.

6.3 Fish and Wildlife Conservation

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages Federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires Federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources to conserve or improve wildlife resources.

The cogeneration plant, transmission line, and pipeline have been considered as the impact zone, which is defined as the boundary of the facility site. Within this designated zone, only limited resources that have the capability to promote fish and wildlife habitat were identified. Refer to Section 6.2 regarding endangered and threatened species, and Section 5, which describes natural features and discussion of impacts at the project site.

6.4 Heritage Conservation

Congress has passed many Federal laws to protect the nation's historical, cultural, and prehistoric resources. These include the National Historic Preservation Act, the Archeological Resources Protection Act, the American Indian Religious Freedom Act, the National Landmarks Program, and the World Heritage List. Preserving cultural resources allows Americans to have an understanding and appreciation of their origins and history. A cultural resource is an object, structure, building, site or district that provides irreplaceable evidence of natural or human history of national, state or local significance. Cultural resources include National Landmarks, archeological sites, and properties listed (or eligible for listing) on the National Register of Historic Places.

Construction and operation of the cogeneration plant, transmission line and the gas pipeline could potentially affect historic properties and other cultural resources. Consultation with the Oregon State Historic Preservation Office concluded with the finding that "No National Register or eligible properties are known to exist within the area of the undertaking's potential environmental impact, but it is highly possible that the area contains undiscovered historic sites of potential significance. Therefore, a cultural resources field survey is required."

PGE hired the Museum of Natural History of Eugene, Oregon, to conduct an intensive cultural resources survey for the Coyote Springs Plant site and the transmission line route. PGT similarly conducted an intensive survey of their proposed pipeline route. Two projectile points were found on the slope of the railroad fill on the north border of the plant site. No other resources were found.

The State Historic Preservation Office issued a memo dated June 14, 1993 that acknowledges the survey report by the Museum of Natural History, and states that there are no issues raised by the report that are considered to be significant. The *Draft Staff Report for the Coyote Springs Cogeneration Project* (ODOE Staff Report) makes the following proposed findings:

- (1) Based on the literature review, the site survey covering the proposed facility sites, and the lack of known historic, cultural or archaeological resources within the project impact area, the construction and operation of the proposed facilities will not result in a significant adverse impact to historic, cultural, or archaeological resources.

(2) The site certificate will require that the applicant comply with applicable state laws regarding Indian graves, removal of historic materials and archaeological objects and sites.

The following proposed conditions are also stated in the ODOE staff report:

(1) If the area in which artifacts were found is to be disturbed by construction or operation, the applicant shall obtain the recommendation of the SHPO for clearance requirements for the affected area.

(2) The Applicant shall comply with all laws and regulations relating to historic, cultural and archaeological resources, and with the conditions of the Site Certificate.

6.5 State, Areawide, and Local Plan and Program Consistency

The construction and operation of a power plant and related transmission facilities could conflict with the goals and objectives of local government land use plans.

In January 1986, the Oregon Land Conservation and Development Commission formally acknowledged the comprehensive land use plan and land use regulations of Morrow County, and found that the plan complied with Statewide Planning Goals. The City of Boardman's comprehensive plan and land use regulations were acknowledged in February 1978. Because the state acknowledged these comprehensive plans, the proposed project does not need to address consistency with the Statewide Planning goals, as adopted by Senate Bill 100, and subsequently amended.

The proposed site of the facility is within the Port of Morrow's Industrial Park. The land has been leased from the Port of Morrow. The plant site is in Morrow County on unincorporated land that is within the City of Boardman's Urban Growth Boundary (UGB). The electrical transmission line is also within Morrow County. A portion of the transmission line is within the City of Boardman's UGB. Morrow County has planning jurisdiction over all land required for both the plant site and the transmission line under the Boardman Urban Growth Area Joint Management Agreement, which was signed by Morrow County, the Port of Morrow and the City of Boardman in March 1990 (ODOE, 1993).

The power generation facility site is zoned PI, Port Industrial. Power generation and utility facilities are uses that are permitted outright in this zone. The proposed transmission line will cross land zoned PI and MG (see Map 6). PGE will need a variance from Morrow County for the transmission line to cross MG zoned land. PGE applied to Morrow County for this variance on September 13, 1993 (ODOE, 1993).

Both the City of Boardman and Morrow County signed a Land Use Compatibility Statement for the proposed project, dated September 5, 1993. The statement indicates that the facility is consistent with Morrow County and City of Boardman land use plans. (ODOE, 1993.)

Subject to issuance of the land use variance for the transmission line, the ODOE staff report makes a proposed finding that the "applicant will have demonstrated receipt of necessary local land use approvals and compliance with statewide planning goals." (ODOE, 1993.)

The 1991 Northwest Conservation and Electric Power Plan (Power Plan) recommends that all major power projects, that is, projects over 50 MW, be consistent with the resource acquisition principles and conditions of the current power plan. However, because the output of the proposed project will not be sold to BPA, the Northwest Power Planning Council will not be required to make a consistency determination. Therefore, ODOE did not ask PGE to provide an explanation of consistency with the Power Plan (ODOE, 1993). It is unknown if the proposed project is consistent with the Power Plan.

6.6 Farmland Protection

The Farmland Protection Policy Act (7 USC 4201 et seq.) directs Federal agencies to identify and quantify adverse impacts of Federal programs on farmlands. The Act's purpose is to minimize the amount Federal programs contribute to unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

The gas pipeline and new 500-kV transmission line will cross irrigated farmlands for a distance of 0.5 km (1500 ft.). Agricultural activities are permitted to continue over the pipeline and within the transmission line right-of-way. Irrigation equipment will be adjusted to minimize impacts to agricultural lands. It is expected that less than 0.2 ha (0.5 acres) of farmland (roads and tower sites) would be taken from agricultural production.

The transmission line crosses lands zoned industrial. The site is committed to urban development, therefore, no farmland as defined in the Farmland Protection Policy Act will be affected and the project is in compliance with the Act.

6.7 Recreation Resources

Recreation resources are areas designated by the Wild and Scenic Rivers Act, the National Trails System Act, the Wilderness Act, or parklands, and other ecologically sensitive areas. None of these resources are impacted by the proposed project.

6.8 Floodplains

Floodplains are mapped by the Federal Emergency Management Agency as 100-year floodplains. Areas designated 100-year floodplains have a 1 percent chance of being flooded in a given year. Under Executive Order 11988, floodplain development is discouraged whenever there is a practicable alternative. If specific projects are proposed that might cause development in a floodplain, alternatives to developing in the floodplain will be considered.

The Columbia River shoreline is approximately 190 m (625 ft.) north of the proposed plant site. The plant and transmission line are within the *historic* Columbia River floodplain. However, dams on the Columbia River now regulate its flows, so the proposed plant site and transmission line corridor are considered outside the Columbia River's 100-year floodplain.

6.9 Wetlands

Areas inundated by surface or groundwater sufficient to support vegetation requiring saturated or inundated soil conditions for growth and reproduction are known as "wetlands." Examples include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflow areas, and mudflats. Under Executive Order 11990, construction in wetlands is discouraged whenever there is a practicable alternative. For specific projects other regulations also may apply:

- Section 404 of the Clean Water Act
- Section 10 of the Rivers and Harbors Act of 1899
- National Environmental Policy Act
- Fish and Wildlife Coordination Act
- Oregon's Removal-Fill law

If a permit is needed for a specific project, permitting agencies must find that the project's public values exceed the resource's public values, and that there are no other practicable alternatives.

Wetlands close to the project are shown on Map 4. The wetland bordering Messner Pond is nearest to proposed facilities. The proposed plant site, transmission line corridor, and pipeline route all avoid wetland areas. The proposed project will not impact wetlands and complies with Executive Order 11990.

6.10 Global Warming

Gases contributing to global warming are commonly referred to as "greenhouse" gases. Greenhouse gases include: CO_2 , CH_4 , N_2O , NO_x , non-methane volatile organic compounds and stratospheric ozone-depleting substances such as chlorofluorocarbons.

The quantity of CO_2 emitted when fossil fuels are burned is proportional to the carbon content of the fuel. The more carbon present, the more CO_2 emitted. The proposed plant would use natural gas to fire the combustion turbines. Natural gas is primarily composed of methane, which contains one carbon atom and four hydrogen atoms. Because of its low carbon content, natural gas combustion produces about 40-50 percent less CO_2 than coal and approximately 25 percent less than petroleum products (Cornot-Gandolphe, 1993).

As mentioned above, the plant will use methane to fire the turbines. Methane is at least 20 times more potent a greenhouse gas than CO_2 . Because of this, it is important to keep methane releases to a minimum. Methane emitted from the world's natural gas pipelines and natural gas mining operations is less than 10 percent of methane emitted from natural sources such as tundra, swamps, forest floors, termites and cows (Sheppard, et al., 1982). In addition, most natural gas leaks occur within residential distribution systems and not in wholesale distribution systems such as the one linked to this plant. New techniques have virtually eliminated methane escape during drilling.

The source of natural gas for the proposed cogeneration plant is from actively producing gas fields in Alberta and British Columbia, Canada. The number of natural gas wells that would be needed to supply PGE requirements was estimated by PGT. The average total yield of Canadian natural gas wells was divided into the total requirements of the Coyote Springs Plant (41 billion BTUs per day). Using this method, the output of 16 gas wells would be used each year by the Coyote Springs Plant (PGT, 1993). For perspective, 4,000 Canadian gas wells were drilled in 1991 and the total number of wells in Canada number in the 100's of thousands (PGT, 1992). Thus the Coyote Springs Plant will use only a small amount of gas compared to that available in Canada. The world's proven reserves are expected to last approximately 58 years at the present consumption rate (*Inside Energy/with Federal Lands*).

Emissions of NO_x and N_2O from the facility will be controlled by best available control technology.

Reducing greenhouse gas emissions also involves energy conservation. If less fossil fuel is consumed, fewer pollutants are generated. Cogeneration facilities are considered energy efficient because excess steam generated from power production is used by nearby industries that would otherwise generate their own steam, which would consume energy.

On April 21, 1993, President Clinton committed the United States to reducing its greenhouse gas emissions to 1990 levels by the year 2000. The Clinton administration has issued a Climate

Change Action Plan to accomplish this objective. The plan encourages the use of natural gas for power generation, energy conservation measures, and reforestation projects. Currently, PGE does not plan to offset plant CO₂ emissions with reforestation.

In summary, the proposed plant's comparatively low CO₂ emissions, the gas industry's low percentage of losses in the wholesale gas distribution system, the plant's control of NO_x and N₂O emissions, and the facilities cogeneration capability combine to minimize the plant's global warming impacts. However, plant impacts could be further reduced by reforestation.

6.11 Coastal Zone Management Consistency

The Coastal Zone Management Act of 1972 requires Federal actions be consistent, to the maximum extent practicable, with approved state Coastal Zone Management Programs. If proposed projects could affect the coastal zone, BPA will consult with the state and ensure consistency with state programs.

The project does not occur in the coastal zone, and thus is not subject to provisions of the Act.

6.12 Energy Conservation at Federal Facilities

The proposed plant is not a Federal facility. PGE would design buildings to meet Oregon energy conservation standards.

6.13 Pollution Control at Federal Facilities

The proposed plant will not be a Federal facility.

6.14 Noise Control

The proposed plant is within an industrial site. An analysis of plant noise and compliance with Oregon noise standards was conducted by Chester Environmental, a consulting firm hired by PGE. Noise contributed by construction and operation of the plant was found to be in compliance with Oregon noise standards. The ODOE staff report makes the following Proposed Finding:

Based on the applicant's commitment to design and operate the proposed facility so as to meet the noise standard and limits of OAR Chapter 340, Division 35, and based on the noise analysis report documenting the ability to meet those standards and limits, the CSCP [plant] is capable of meeting the noise regulation standards and limits, and facility operation should cause no significant impacts to the surrounding area.

6.15 Federal and State Licensing and Permit Requirements for New Power Resources

This section describes licensing and permit requirements for new power resources. Information on mitigating environmental impacts in the legislation requiring licenses or permits, or references to appropriate regulations covering mitigation, are included in the discussion. The focus here is licensing and permit requirements needed at the generation site. The required permits for fuel procurement and transportation to the generation site are also important topics, but are outside the scope of this document. The following two Federal licensing requirements do not apply:

- Nuclear Regulatory Commission (NRC) licensing
- Federal Energy Regulatory Commission licensing of hydroelectric facilities

6.15.1 Certification to DOE under the Powerplant and Industrial Fuel Use Act

The Powerplant and Industrial Fuel Use Act of 1978, amended in 1981 and 1987, requires that baseload power plants with natural gas or petroleum as the primary energy source must have the capability to use coal or another alternative fuel as its primary energy source in lieu of natural gas or petroleum. Certification must be submitted to DOE prior to constructing a new powerplant or converting an existing power plant to baseload operation. Both BPA and PGE have contacted DOE. The Coyote Springs Cogeneration Project falls within an exemption clause of the Act. PGE is preparing a letter to DOE requesting exemption in accordance with this Act.

6.15.2 Emission Permits under the Clean Air Act

The basic statute for regulating air quality in the U.S. is the Clean Air Act. Clean Air Act-related permits described here apply to a new power resource.

Air Quality Regulations

Ambient Air Quality Standards - (40 CFR 50) (OAR 340-31-005 through 040) The U.S. Environmental Protection Agency has established national ambient air quality standards (NAAQS) to protect public health with an adequate margin of safety. NAAQS exist for a set of pollutants known as criteria pollutants (NO_x , SO_2 , SO_4 , hydrogen sulfide (H_2S), CO, particulates (TSP/PM-10), lead, asbestos, beryllium, mercury, vinyl chloride, fluorides, sulfuric acid mist, and ozone (O_3). EPA has designated all areas of the United States as attainment, non-attainment, or unclassified areas. Areas are classified by specific pollutants. Morrow County is designated as an unclassified/attainment area for criteria pollutants.

Prevention of Significant Deterioration (PSD)/New Source Review (NSR) - (40 CFR 52.21) (OAR 340-20-220 through 276) Any new source with emissions that exceed specified significance levels (OAR 20-225, Table 1) must undergo a NSR process. As part of this process, PSD applicability is determined. The PSD program is designed to protect air quality in areas cleaner than the NAAQS (attainment and unclassified areas). New fossil fuel-fired steam electric plants in attainment or unclassified areas that emit or have the potential to emit more than 100 tons per year of any criteria pollutant must acquire a PSD permit prior to construction. To obtain a PSD permit the proposed facility must: (1) use best available control technology to control emissions; (2) perform an air quality analysis to demonstrate that facility emissions do not cause a violation of NAAQS or PSD increments; (3) analyze impacts to soils, vegetation and visibility; (4) demonstrate that the project does not affect Class I areas; and (5) undergo adequate public participation. PSD increments (mentioned above) are the maximum ambient concentrations of criteria pollutants (as predicted by air quality dispersion modeling) allowed within attainment areas. The increments are small in Class I areas (pristine areas such as national parks) and higher in Class II and Class III areas. EPA has not yet designated any Class III areas (highly industrialized regions), which leaves the rest of the nation designated as a Class II area. Boardman is in a Class II area.

The proposed Coyote Springs Plant has the potential to emit 520 tons/year NO_x , 513 tons/year CO and 78 tons/year TSP/PM-10, therefore, it is subject to NSR/PSD requirements for these pollutants. EPA has delegated the implementation of the Federal PSD program to DEQ. DEQ exercises its PSD delegated authority using its own regulations that are intended to be at least as stringent as Federal requirements.

New Source Performance Standards (NSPS) - (40 CFR part 60) (OAR 340-25-505 through 675) NSPS apply to new sources and address particulate, opacity, SO_2 and NO_x emissions. Emission standards for stationary gas turbines (OAR 340-25-645) and industrial commercial institutional steam generating units (OAR 340-25-553) are applicable to this facility. Whenever any source is subject to more than one emission limitation rule, regulation, provision or requirement relating to the control of any air contaminant, the most stringent applies.

Air Contaminant Discharge Permit - (OAR 340-20-140, 20-185) and Fees (OAR 340-20-155) Any source emitting more than 10 tons/year of any criteria pollutant, or any source category listed in Table 1 (OAR 340-20-155) must acquire an Air Quality Contaminant Discharge Permit from State or local air pollution authorities.

Notice of Construction and Approval of Plans - (OAR 340-20-020 through 032) Any process with emissions to the atmosphere is required to obtain a notice of construction from the State of Oregon prior to facility construction.

Plant Site Emission Limits (PSEL) - (OAR 340-20-300 through 320) All sources subject to State Air Contaminant Discharge Permit requirements are also subject to PSEL requirements. PSEL are baseline emission limits based on facility-wide emission rates.

Fugitive Emissions/Odors - (OAR 340-21-050 through 060) No odor impacts are expected.

Visibility - (OAR 340-21-015) This rule covers plume opacity. The proposed facility will comply with this rule.

Air Toxics - *Significant Emission Rates (SER) for the Hazardous Air Pollutant Interim Program*, December 1991. (Not a regulation but an interim DEQ policy.) Emissions will be below standards.

General Conformity Rule - The proposed facility will not fall under the General Conformity Rule because it is required to obtain a PSD/NSR permit and is therefore presumed to conform with State Implementation Plans.

6.16 Discharge Permits under the Clean Water Act

Aquatic systems intended to be protected as waters of the U.S. under the Clean Water Act are, in general, rivers, streams, lakes, estuaries, and special aquatic sites, including wetlands. Permits for discharges into waters of the U.S. are required under Sections 402 and 404. Section 402 regulates incidental discharges from construction activities. Section 404 regulates intentional discharges into waters of the U.S. to create dry land. Two sections of the Clean Water Act and their relationship with this project are discussed below.

Section 402 - National Pollutant Discharge Elimination System (NPDES) regulated by Oregon Department of Environmental Quality (DEQ).

PGE has registered for coverage under the General Permit 1200 C and will provide a site specific erosion control plan that will meet the required standards of Oregon's DEQ at least 30 days prior to beginning construction.

Section 404 - This section of the Clean Water Act is regulated jointly in Oregon, by both the U.S. Army Corps of Engineers and by Oregon Division of State Lands under the Oregon Removal Fill Law. Section 404 is not intended to regulate pits excavated in dry land for the purpose of obtaining fill, sand, or gravel (40 CFR328.3(e)).

Discharging fill into the gravel mining pond is not a regulated activity under Section 404.

Oregon Removal Fill Law - With the Corps, Oregon DSL regulates the discharge of fill or the removal of material from waters of the State. Oregon does not regulate surface mining pits if the site is not protected in the local comprehensive plan.

The gravel mining pit is not regulated under Oregon Removal Fill law.

6.17 Safe Drinking Water Act

6.17.1 Underground Injection Permits

The principal Federal program applicable to intentional discharges to groundwater is the Underground Injection Control (UIC) Program established by Section 1421 of the Safe Drinking Water Act. The UIC program and permits in Oregon are issued by the Department of Environmental Quality. No underground injection wells are proposed as a part of the Coyote Springs Cogeneration Project.

6.17.2 Critical Water Protection

The Safe Drinking Water Act regulates critical aquifer protection areas under Section 1427. The aquifers involved in this project are being analyzed for protective designation.

6.18 Permits from the Army Corps of Engineers

The U.S. Army Corps of Engineers administers several permit programs that may apply to certain new power resource projects.

6.18.1 Rivers and Harbors Act

A permit from the Corps is needed under Section 9 of the Rivers and Harbors Act of 1899 for constructing a dam or dike in navigable waters. The term "navigable waters" generally covers waters subject to the ebb and flow of the tide and/or waters usable for commerce transportation.

A permit from the Corps is also required under Section 10 of the Rivers and Harbors Act for constructing structures or work in or affecting navigable waters. No construction is proposed in navigable waters.

6.18.2 Clean Water Act

(See Section 6.16)

6.19 Notice to the Federal Aviation Administration

Construction of tall facilities such as emission stacks and transmission lines at a power generation site may require notice to the Federal Aviation Administration (FAA). Specifically, building any facility 61 m (200 ft.) or more above ground level requires notice to FAA. FAA must also be notified when facilities are to be constructed near airports. PGE will submit plans for Coyote Springs facilities to FAA.

6.20 Permits under the Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal (TSD) facilities. Each TSD facility owner or operator is required to have a permit issued by EPA or the state. Construction and maintenance activities in BPA's experience have generated small amounts of hazardous waste. These typically include: solvents, pesticides, paint products, motor and lubricating oils, and cleaners. Under EPA and Oregon regulations, the amounts of these wastes generated by the Coyote Springs Cogeneration Plant would fall within the definition for a "small quantity generator." PGE will formulate a hazardous waste management program that meets all Federal and State hazardous waste requirements.

7. List of Preparers

Alder, Mike P.E. Facilities Engineering Project Manager. Responsible for location and design of BPA transmission lines and location and site development for BPA project management. Education: B.S., Civil Engineering. Experience: Transmission line design and project management. With BPA since 1981.

Anderly, Steven Contract Specialist in BPA's Division of Contracts and Rates. Responsible for the general transmission agreement with PGE. Education: B.A., General Science; MBA. Experience: Writing contracts. With BPA since 1977.

Barnhart, Ken Project Environmental Coordinator. Responsible for coordination and completion of environmental requirements. Education: B.S., Landscape Architecture. Experience: Environmental analysis, facility planning, and landscape architecture. With environmental consulting firms and BPA since 1971.

Concannon, Kathleen Writer/editor providing contractor support. Responsible for writing and editing the EIS. Education: B.S., Geology. Experience: Environmental analysis, resource planning and NEPA process. With BPA from 1980 to 1990. Providing consulting services to BPA since 1990.

Forslund, Debra Environmental Specialist in air quality. Responsible for writing air quality section of EIS. Education: B.S., Cellular Biology, and M.S., Public Health. With environmental consulting firms and BPA since 1987.

French, Jon, P.E. Electrical Engineer. Responsible for transmission system planning. Education: B.S., Electrical Engineering. Experience: Substation design and transmission system planning. With BPA since 1971.

Goranson, Robert Area Engineer for the Snake River Area. Responsible for engineering matters dealing with customer services/engineering and Area services in the Snake River Area. Education: B.S., M.S., Electrical Engineering. Experience: Worked in meter relay, Power Management, and as a staff engineer before becoming Area Engineer. With BPA for 29 years, twelve of those years as the Area Engineer for the Snake River Area.

Havens, Phil Environmental Specialist/Wildlife Biologist. Responsible for managing cultural resources and threatened and endangered species contracts for BPA's Division of Facilities Engineering. Education: B.S., Biological Sciences and graduate studies in wildlife management. Experience: Analysis of timber harvests and transmission line impacts on fish and wildlife. With BPA since 1983.

Hooson, John Environmental Specialist/Landscape Architect. Responsible for developing section on aesthetics (visual analysis) in the EIS. Education: M.S.L.A., Landscape Architecture. Experience: Facility Planning Manager and environmental coordination. With BPA since 1973.

Leonard, Randall On-site contractor. Responsible for reviewing threatened and endangered species investigations, fish and wildlife impacts/conservation and toxic and hazardous waste permitting. Education: B.S., Zoology (ecology) and M.S., Wildlife and Range Resources. Experience: Environmental/engineering studies, biological assessments, technical research, regional planning and feasibility analyses. Providing contractor support as an environmental planner to BPA since 1991.

Luiz, Johnny Senior Electrical Engineer. Responsible for overall management of project. Education: B.S., Physics, and B.S., Electrical Engineering. Experience: Employed by various consulting firms and BPA since 1972.

Lynard, Gene Environmental Specialist and Assistant Project Environmental Coordinator. Responsible for assisting the Project Environmental Coordinator and writing land use and socio-economic portions of the EIS. Education: B.A., Geography, and M.C.R.P., (City and Regional Planning). Experience: land use development economics, and facility and environmental planning. Employed by a number of consulting firms and BPA since 1977.

McFarling, Kathleen Civil Engineer. Responsible for location of towers and transmission line design. Education: B.S., Civil Engineering. Experience: transmission line design. With BPA since 1991.

Romans, Rita On-site contractor. Responsible for geotechnical investigation and writing the natural resources portions of the EIS. Education: B.S., General Science, and B.S., Geology. Experience: Eight years experience in geochemical surveying/wellsite geology and as a natural resources officer in land management. Providing contractor support to BPA since early 1993.

Sanchez, Leroy Visual Information Specialist. Responsible for graphic support relating to transmission facilities, assessment analysis. Education: Graphic design. Experience: GIS mapping, EIS graphics. With BPA since 1978.

Seiffert, Randy Environmental Engineer. Education: B.S., Chemical Engineering. Experience: NEPA compliance, air quality/thermal resource evaluation and industrial facility impact analyses.

Spiering, Colleen Environmental Specialist. Responsible for health, coordination, and analysis with respect to electromagnetic fields (EMF). Education: M.P.H., Health Education and Planning, B.S., Health Education. Experience: Health education and planning/public involvement/environmental analysis. With BPA since 1991.

Stearns, Rick Electrical Engineer. Responsible for engineering aspects of health and safety data with respect to EMF. Education: B.S., M.S., Electrical Engineering. Experience: Transmission line design issues related to corona and electric and magnetic field effects. With BPA since 1978.

Tawney, Patricia Responsible for public involvement. Education: B.S. and M.S., Political Science. Experience: Community development, manager and board member of a small utility. With BPA since 1971.

Thoms, Chris On-site contractor. Responsible for wetland identification and delineation. Education: B.S., Natural Sciences. Experience: Providing wetland consulting services since 1988. With BPA since 1991.

Zimmerly, John On-site contractor. Responsible for geographic information system (GIS) data base automation, geographic analysis and cartographic output. Education: B.S., Biology, and graduate studies in GIS. Experience: Providing consulting services to BPA since 1988.

8. List of Agencies, Organizations, and Persons to Whom Copies of the EIS are Sent

Federal Agencies

- U.S. Environmental Protection Agency
- U.S. National Oceanic and Atmospheric Administration
- U.S. Department of Interior
 - Bureau of Land Management
 - Fish and Wildlife Service
 - Bureau of Reclamation
 - National Park Service
 - Bureau of Indian Affairs
 - National Marine Fisheries Service
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture
 - Soil Conservation Service
 - Forest Service Region 1
 - Mount Hood National Forest
 - Umatilla National Forest
- U.S. Department of Energy
 - Federal Energy Regulatory Commission
- U.S. Department of Transportation
 - Federal Highway Administration
 - Federal Aviation Administration

State Agencies

Oregon

- Department of Energy
- Department of Fish and Wildlife
- Department of Transportation
- Department of Environmental Quality
- Department of Economic Development
- Department of Land Conservation and Development
- Department of State Parks and Recreation
- Executive Office
- Public Utility Commission

Washington

Energy Facility Site Evaluation Council
Office of Energy
Wildlife Commission
Department of Community Development
Department of Ecology

Other Agencies and Local Government Organizations

Columbia River Gorge Commission
Columbia River Intertribal Fish Commission
Mid Columbia Council of Governments
Affiliated Tribes of Northwest Indians
Umatilla Tribe
City of Boardman
Port of Morrow
City of Portland
City of Irrigon
City of The Dalles
County of Umatilla
County of Morrow
Northwest Power Planning Council

Interest Groups

Audubon Society of Portland
Common Cause
Columbia Improvement District
Forelaws on Board
Friends of the Earth
Industrial Customers of Northwest Utilities
Izaak Walton League
League of Women Voters
League of Oregon Cities
Association of Oregon Counties
Association of Washington Cities
National Wildlife Federation
Nature Conservancy
Northwest Conservation Act Coalition
Northwest Environmental Defense Center
Oregon Hay Producers

Oregon Natural Desert Association
Oregon Natural Resources Council
Oregon People's Utility District Association
Oregon Rivers Council
Oregon Rural Electric Coop Association
Oregon Shores Conservation Coalition
Oregon State Grange
Oregon Wilderness Society
Salmon for All
Sierra Club

Depository Libraries

State of Oregon Library Building, Salem, OR
Walter M. Pierce Library, Eastern Oregon State College, La Grande, OR
Blue Mountain Community College Library, Pendleton, OR
Central Oregon Community College, Bend, OR
Aubrey R. Watzek Library, Lewis and Clark College, Portland, OR
Bonneville Power Administration Library, Portland, OR
Danial J. Evans Library, Evergreen State College, Olympia, WA
Washington State Library, Olympia, WA
Penrose Memorial Library, Walla Walla, WA
Boise Public Library, Boise, ID
Government Documents Library, Boise State University, Boise, ID
Regional Depository Millar Library, Portland State University, Portland, OR
U.S. Department of Energy Reading Room, Forrestal Building, Washington, D.C.

Others

Many businesses and individuals also are included in the mailing list. Their number is too extensive to list.

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10. Glossary/Acronyms

The following is a list of the technical terms and acronyms used in this document with definitions for each.

Access roads	Roads that are necessary to first construct and then to maintain a transmission line. Access roads are initially built where no roads conveniently exist. Where county roads or other access is already established, access roads are constructed as spurs directly to the structure sites. Access roads are usually maintained to provide access to tower sites, except where they pass through cultivated land.
Air-shed	An air supply of a given geographical area, usually defined by topographic barriers or atmospheric conditions that confine air emissions.
Alluvial	Pertaining to sediments deposited by flowing water.
Ambient air	Air surrounding a particular spot, such as a power plant.
Anhydrous	Being without water, especially water of crystallization.
Aquifer	A geologic formation or structure that contains and transmits water in sufficient quantity to supply the needs for water development. Aquifers are usually saturated sands, gravel, or fractured rock.
Angle point	Where a transmission line must change direction, it forms a corner, or angle. This is an angle point. Special reinforcement is needed to counter the stress on the structure.
Attainment area	A geographic area where the concentration of specific air pollutants does not exceed Federal standards.
Average megawatt (aMW)	The number of megawatts that could be produced by a power plant multiplied by the percent of time the power plant would normally be in operation over a specific period of time, usually one year.

BACT	Best available control technologies. An emission limitation based on the maximum degree of reduction of each pollutant subject to regulation and emitted from, or which results from, any major emitting facility.
Best management practices	A practice or combination of practices that are the most effective and practical means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with air or water quality goals.
Blowdown	Removal of liquids or solids from a process vessel or storage vessel using pressure.
B. P.	Before the present.
BPA	Bonneville Power Administration.
British Thermal Unit (BTU)	A quantity of heat required to raise the temperature of .45 Kg (1 pound) of water one degree Fahrenheit.
Bundle	A group of two, three or four conductors assembled together to transmit high voltage electric power, usually 500-kV.
Bus	A set of two or more electrical conductors that serve as common connections between load circuits and each of the phases (in alternating current systems) of the source of electric power.
Capacity	A measure of the ability of a transmission line to carry electricity.
Capital cost	The total investment needed to complete a project and bring it to an operable status.
Centimeter (cm)	A unit of measurement (in the metric system) equivalent to 0.3937 inches.
CH₄	Chemical formula for methane gas.
Circuit breakers	An electromagnetic device that opens a circuit automatically when the current exceeds a predetermined value.

Class I Area	Area designated for the most stringent degree of protection from future degradation of air quality.
Class II Area	Any area cleaner than the Federal air quality standard designated for a moderate degree of protection from future air quality degradation. Moderate increases in new pollution may be permitted in a Class II area.
Cogeneration	The technology of producing electrical energy together with useful thermal or mechanical energy for industrial, or commercial purposes, through the sequential use of an energy source.
Cold lime water	A water-softening process in which water is treated with hydrated lime (sometimes in combination with soda ash), which reacts with dissolved calcium and magnesium compounds to form precipitates that can be removed as sludge.
Combined cycle	The use of waste heat from a gas turbine topping cycle for the generation of electricity in a steam turbine generator system, thereby increasing the efficiency of heat use.
Combustion turbine	An integral part of cogeneration facilities operating on fuels that are capable of converting heat energy into electrical energy.
Conductor	The cable strung between transmission towers around which electric current flows at the speed of light.
Cooperating Agency	Any Federal agency, other than a lead agency, that has jurisdiction by law or special expertise for involvement in a proposal (or a reasonable alternative) for legislation or other major Federal action significantly affecting the quality of the human environment.
CO	The chemical formula for Carbon monoxide. Carbon monoxide is a colorless, odorless and poisonous gas formed by incomplete combustion of carbon or a carbonaceous material, such as gasoline and natural gas.
CO₂	The chemical formula for carbon dioxide. Carbon dioxide is a colorless, odorless, incombustible gas formed during respiration, combustion and organic decomposition, and commonly used in food refrigeration, carbonated beverages, inert atmospheres, fire extinguishers and other aerosols.

Criteria pollutant	An air pollution substance for which the Environmental Protection Agency has established environmental significance thresholds. If emissions will exceed threshold criteria, added requirements such as pollution offsets are imposed.
CT	Combustion turbine.
Cultural resources	Nonrenewable evidence of human occupation or activity as seen in any district, site, building, structure, artifact, ruin, object, work of art, architecture, or natural feature that was important in human history at the national, state, or local level.
Cumulative impact	The impact on the environment that results from an action when added to other past, present, and reasonable foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over time.
dba	The first two letters (dB) are an abbreviation for the term “decibel” the unit in which sound is most commonly measured. The last letter (A) is an abbreviation for the scale (A scale) on which the sound measurements were made. A decibel is a unit for expressing relative difference in power, usually between acoustic signals, equal to 10 times the common logarithm of the ratio of two levels.
d.b.a.	Abbreviation for “doing business as.”
Depository libraries	Selected libraries where copies of the reference materials such as the environmental documents associated with this proposed project are kept for review and comment by the public. A list of the depository libraries related to the Coyote Springs Cogeneration Project are contained in Section 8 of this draft EIS.
DEIS	Draft Environmental Impact Statement
DEQ	Department of Environmental Quality (Oregon).
Disconnect switches	A power system switch used to open a circuit in which a negligible amount of current, or no current, is flowing. Disconnect switches are manually or motor operated and are not used to interrupt a circuit under load.
Drift	Portion of the moisture emitted that recondenses on a surface.

Double-circuit	Two sets of lines (circuits) on a single tower (a single circuit consists of three conductors).
DSL	Division of State Lands.
Easement	A grant of certain rights for use of a parcel of land, normally for a single purpose. BPA's easements normally provide for the right to enter a specific right-of-way, and to build, maintain, and repair facilities located there.
EIS	Environmental Impact Statement. A document defined at 40 CFR 1508.11 and prepared in accordance with the requirements of section 102(c) of NEPA, the Council on Environmental Quality Regulations, and DOE NEPA Guidelines.
Electric and magnetic fields (EMF)	The two types of fields of force that are produced by electricity i.e., those that are produced by voltage (electric fields) and those that are produced by current (magnetic fields). Electric fields are produced by the force that causes current to flow through a conductor (voltage) and are measured by kilovolts per meter (kV/m). Magnetic fields are produced by the force that causes electrons to move in a conductor (current) and are measured in milligauss (mG).
Electric field	An energy field produced by voltage, measured in kilovolts per meter.
Emergent	As used here, a plant that is rooted and has parts extending above a water surface.
Emissions	Substances discharged into the environment as waste material, such as discharge into the air from cooling towers or discharges into the water from waste streams.
Endangered	A plant or animal that is in danger of extinction throughout all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment, or because of overexploitation, disease, predation, or other factors; Federally endangered species are officially designated by the U. S. Fish and Wildlife Service.

Energy	The ability to produce electrical power over a period of time, expressed in kilowatthours.
Environmental impact statement	A detailed disclosure of environmental impacts that would result from an action, written as required by the National environmental Quality Act of 1969, as amended.
Environmentally preferred	Designates the lowest-impact alternative locations and/or design options, based on the results of an environmental analysis.
EPA	U.S. Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission. An agency in the U.S. Department of Energy that regulates interstate transfers of electrical energy, certificates for natural gas pipelines, resource development, and other energy actions.
Fiber optic cable	Special glass wire installed on a transmission line that is used for communication between one location and another.
Firm energy	The amount of electricity that can be transferred over the system in the case of one failure. Firm energy is the equal to the single contingency rating of a transmission system.
Generation	The power that is produced through some type of power plant.
Generator	A machine that converts mechanical energy into electrical energy.
Global Warming	The phenomenon of gradually increasing average temperatures in the earth's atmosphere due primarily to accumulation of carbon dioxide. Carbon dioxide comes from the burning of fossil fuels and removal of forests and vegetation that take carbon dioxide out of the air.
Greenhouse gas	A gas that contributes to global warming.
Groundwater	The supply of fresh water under the earth's surface in an aquifer or soil.

gpm	Gallons per minute.
Habitat	The environment occupied by individuals of a particular species, population, or community.
Hazardous materials	Substances which, if released in an uncontrolled manner, can be harmful to the environment.
Hectare (ha)	An area equivalent to 10,000 square meters or 2.471 acres.
Hectometer	A unit of measurement (metric) equivalent to one million cubic meters (263,000,000 gallons).
Historic Preservation	Includes identification, evaluation, recordation, documentation, acquisition protection, management, rehabilitation, restoration, stabilization, maintenance, or reconstruction or any combination of these activities.
Human environment	Interpreted comprehensively to include the natural and physical environment and the relationship of people with that environment.
Hydrocarbons	Chemical compounds containing hydrogen and carbon. Some hydrocarbons may become air pollutants. Some hydrocarbon air pollutants are carcinogenic, and some react with other air pollutants to form photochemical smog.
Impact	Positive or negative environmental consequences of a proposed action.
Increment	Allowable increase in pollutants over ambient conditions.
Isolates	Small isolated cultural resource sites containing prehistoric artifacts.
Kiloliter (kL)	1,000 liters.
Kilometer (km)	1,000 meters.
Kilovolt	One thousand volts.
Kilowatt (kW)	An electrical unit of power equal to 1000 watts.
Kilowatt hour (kWh)	A basic unit of electric energy equal to one kilowatt for the period of one hour.

Knot	The distance of one nautical mile - or one minute of latitude.
Lattice steel	Refers to a transmission tower constructed of multiple steel members that are connected together to make a frame.
Level 1 audit	A initial on-site visit and records search to predict previous contamination.
Liter (L)	A unit of volume equivalent to 0.2642 gallons.
L_{MAX}	A symbol that represents the maximum permitted noise level (measured in decibels).
L₅₀	A symbol that represents the maximum permitted noise level a project may create 50 percent of the time in a day.
Load	The amount of electric power delivered to a given point on a system, or the total amount of demand on the system.
Loop	To tie a substation into an existing transmission line in such a manner as to complete the circuit along that line. Running a double-circuit loop line to a substation would allow an incoming line and an outgoing line.
Magnetic field	An energy field produced by the movement of electrons in a wire (current), measured in milligauss (mG).
Megawatt (MW)	One thousand kilowatts (kw) or one million watts (W).
Methane (CH₄)	An odorless, colorless, flammable gas formed by the anaerobic decomposition of organic matter. Methane is the major component of natural gas, making up 90-95 percent of the volume. In addition to its use as a fuel, methane is an important source of hydrogen and is used in a wide variety of organic compounds.
Mitigation	Actions to avoid, minimize, reduce, eliminate, or compensate for the impact of a proposed activity or management practice.
Meter (m)	Unit of length equal to 3.28 feet.
m³	Cubic meter. Equal to 1,000 liters or 263 gallons.

Natural gas	A mixture of hydrocarbon gases that occurs with petroleum deposits, chiefly methane, together with varying quantities of ethane, butane, propane, and other gases. In addition to its use as a fuel, it is commonly used in the manufacture of organic compounds.
NAAQS	National Ambient Air Quality Standards of the U.S. Environmental Protection Agency.
NEPA	National Environmental Policy Act. Major Federal legislation passed by Congress in 1969 that requires that environmental impacts of major Federal actions be identified in a detailed statement of environmental impact, along with reasonable alternatives to the proposed actions. Furthermore, environmental impacts must be made known to the public and to the decisionmaker, prior to a decision being made on the project.
NESC	National Electric Safety Code.
Nonattainment	An area which does not meet air quality standards set by the Clean Air Act for specified localities and time periods.
Non-specular	To reduce the reflectivity of any object (such as electrical conductors) so that it does not reflect an inordinate amount of light.
NOEL	No Observed Effects Level. The dose at which adverse effects are not observed in laboratory animal exposures.
NO_x	Oxides of nitrogen.
N₂O	The chemical formula for nitrous oxides. Nitrous oxide is a colorless sweet inorganic gas commonly known as laughing gas.
NO₂	The chemical formula for nitrogen dioxide. Nitrogen dioxide is a mildly poisonous brown gas often found in exhaust fumes and smog. It is synthesized for use as a catalyst and oxidizing or nitrating agent.
NPDES	National Pollution Discharge Elimination System. Federal water quality program administered by the State agency responsible for water quality.
NSPS	New Source Performance Standards

NSR/PSD	New Source Review/Prevention of Significance.
ODOE	Oregon Department of Energy
ONHP	Oregon National Heritage Program.
Outage	The period which a facility is out of service.
O₂	The chemical formula for oxygen. Oxygen is a colorless, odorless gas constituting 21 % of the earth's atmosphere by volume. It is a necessity constituent to most combustion and combustion processes.
Palustrine	General freshwater wetlands classification associated with partially saturated areas not part of a surface water system.
Particulates	Fine solid particles which remain individually dispersed in stack emissions
PGE	Portland General Electric Company.
PGT	Pacific Gas Transmission Company.
PM 10	Particulate matter smaller than 10 microns
ppm	Parts per million.
PSD	Prevention of significant deterioration
Prevailing wind direction	The wind direction most frequently observed during a given period, such as a month, a season, or a year. The prevailing wind direction is the direction from which the wind originates, usually expressed as "out of" or "from."
Record of Decision (ROD)	A document prepared in accordance with the requirements of 40 CFR 1505.2, that provides a concise public record of the agency's decision on a proposed action for which an EIS was prepared, and identifies alternatives considered before reaching the decision, the environmentally preferred alternative(s), factors balanced by the agency making the decision, and whether all practical means to avoid or minimize environmental harm have been adopted and if not, why.

Right-of Way (ROW)	An easement for a certain purpose over the land of another, such as a strip of land used for a transmission line, roadway or pipeline.
Riprap	A wall of rocks, cobbles, or boulders put together without order to protect an embankment against water erosion.
Scoping	A method to determine the range of issues requiring examination in studying the environmental effects of a proposed action. Scoping generally takes place through public consultation with interested individuals and groups, as well as with agencies with jurisdictions either over portions of the project area or resources within the project area. Scoping is mandated by the Council on Environmental Quality.
SHPO	State Historic Preservation Office
Significant Emissions Rate	Annual rate of emissions for specific pollutant that identifies a "major" air pollution source in DEQ regulations
SO₂	The chemical formula for sulfur dioxide. Sulfur dioxide can be found in either a gaseous or liquid state. It is commonly used in the manufacture of sulfuric acid.
Structure	Refers to the type of supports used to elevate transmission lines or substation equipment
Supercooling	Cooling a substance below the temperature at which a change of state would ordinarily take place without such a change of state occurring. For example, cooling a liquid below its freezing point without freezing taking place. This creates a metastable state.
Superheating	Heating a substance above the temperature at which a change of state would ordinarily take place without such a change taking place. For example, heating a liquid above its boiling point without boiling taking place.
SWPP	Storm Water Pollution Prevention Plan.
Tap	To tie a substation into an existing transmission line through a connection.
Tap Point	The point where two transmission lines interconnect.

Therm	The equivalent of 100,000 Btu's
Threatened species	Those species officially designated by the U. S. Government that are likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
Tower	See structure.
Transformer	A device for transferring energy from one circuit to another in an alternating-current system. Its most frequent use in power systems is for changing voltage levels.
Transmission	The act or process of transporting electrical energy in bulk from a source or sources of supply to other principal parts of a system or to other utility systems
Transmission line	The structures, insulators, conductors and other equipment used to transfer electrical power from one point to another.
Trojan	Trojan Nuclear Power Plant located near Rainier, Oregon. Trojan recently ceased generating electric power.
Uniform Building Code (UBC)	A code published by the International Conference of Building Officials. Covers the fire, life and structural safety aspects of all building and related structures.
Urban Growth Boundary (UGB)	A mutually agreed upon boundary between a city and the county. It includes an area which has been set aside for future urban growth. The boundary line separates land that can be developed from rural lands.
ug/m³	Unit of measurement commonly used to measure pollutants in air, specifically the number of micrograms per liter.
VOC	Volatile organic compounds. Compounds containing carbon that evaporate readily at normal room temperature and pressure.
USFWS	U.S. Fish and Wildlife Service.
Volt	The unit of voltage or potential difference. It is the electromotive force which, if steadily applied to a circuit having a resistance of one ohm, will produce a current of one ampere.

Watt	The electrical unit of power or rate of doing work. The rate of energy transfer equivalent to one ampere flowing under the pressure of one volt.
Wetlands	An area where the soil experiences anaerobic conditions because of the inundation of water during a portion of any given year. Indicators of a wetland include types of plants, soil characteristics and hydrology of the area.
Wheeling	Use of transmission facilities of one utility system to transmit power to another utility system or between customer facilities within a single utility system.
Work	Transference of energy that occurs when a force is applied to a body that is moving in such a way that the force has a component in the direction of the body's motion; it is equal to the line integral of the force over the path taken by the body.
Wastewater	Water that carries wastes from buildings, institutions, and industrial establishments.

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DRAFT ENVIRONMENTAL IMPACT STATEMENT

Coyote Springs Cogeneration Project

**Appendix A
Wildlife and Vegetation Surveys**

**Prepared by:
Beak Consultants Incorporated**

January 1994

**Wildlife and Vegetation Surveys
of the Proposed Coyote Springs
Cogeneration Facility
Port of Morrow, Oregon**

Project No. 73624

Prepared for:

**Portland General Electric
121 SW Salmon, Portland, Oregon 97204**

July 14, 1993

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1.0 INTRODUCTION

Portland General Electric Company (PGE) has submitted an Application for Site Certification (ASC) to the Oregon Department of Energy for the development of the Coyote Springs cogeneration power plant in the Port of Morrow, Oregon. The ASC includes information on vegetation and wildlife resources (Exhibits N, P, and R) within the project area. However, site-specific surveys necessary to address compliance with state regulations regarding threatened, endangered, and special-status plant and animal species were not completed at the time of ASC submittal.

This report presents the results of surveys conducted during late spring/early summer 1993 to provide information on the vegetative and wildlife resources of the project area, including threatened and endangered species. This report serves as an addendum to Exhibits N (Vegetation), P (Fisheries and Wildlife), and R (Threatened and Endangered Species) in the ASC, and the results were utilized in the assessment of potential impacts of the proposed project in each of these exhibits.

A pre-field determination of the "species of concern" (i.e., threatened, endangered, sensitive, and candidate) was based primarily on consultation with the Oregon Department of Fish and Wildlife (ODFW). Other agencies contacted for additional information included the Oregon Department of Agriculture (ODA), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and a data base search by the Oregon Natural Heritage Program (ONHP). The list of plant and animal species of concern and comments on their habitat and/or occurrence is presented in Exhibit R of the ASC. Scientific names of all plant and animal species referenced in this report are presented in Appendices A (plants) and B (animals).

Based on discussions with the ODFW, the project area for this survey was defined as the proposed plant site, electrical substation site, transmission line corridor (approximately 1.5 miles long), and a 500-foot (plants) or 0.5 mile (animals) radius of the perimeter of these facilities.

2.0 METHODS

2.1 PLANTS

A survey was conducted on June 23 for populations or individuals of Lawrence's milkvetch. Suitable habitat for three other plant species of concern; Robinson's onion, Columbia cress, and Thompson's sandwort, is not present within the project area, and thus these species were not part of the survey. A conversation with Karl Urban, botanist on the Umatilla National Forest, indicated that the survey date was appropriate for Lawrence's milkvetch based on a late flowering phenology this year.

The survey consisted of a 5-hr search of the project area by a BEAK botanist with an emphasis on areas of suitable habitat for Lawrence's milkvetch (i.e, slightly rocky soils in association with bunchgrasses). Plants recognized as members of the same genus as Lawrence's milkvetch (*Astragalus*) were identified to species. In addition, unique habitats (e.g., wetlands) were surveyed with a greater intensity for the presence of other species of concern. All plant species observed during the survey were identified for inclusion into the species list.

During the course of the wildlife surveys (see dates below), plant communities of the project area were identified and described.

2.2 ANIMALS

Wildlife surveys were conducted during 4 visits to the project area (May 3 and 20 and June 8 and 23). Each survey consisted of an "area search" technique where a BEAK wildlife biologist traversed the area recording evidence of any wildlife species (e.g., sign, vocalizations, direct observations). Areas identified as potential habitat for any of the species of concern received the emphasis of the survey effort (e.g., Messner Pond for aquatic/riparian associated species; substation site and transmission line corridor for grassland/steppe species).

Each wildlife survey was a one-day effort from dawn to dusk to increase the potential for observation of species active at different times of the day. Multiple visits were made to each portion of the project area during the course of the day. In general, time-of-day dictated the emphasis of the survey (e.g., passerine birds - morning; raptors - afternoon; amphibians - dusk; mammals - all day). However, cognizance of potential observations of all species occurred throughout the day.

The surveys were not conducted under inclement weather conditions (e.g., rain, strong winds). If appropriate weather conditions were not present during a scheduled survey day, an alternate survey day was selected.

In addition to the general "area search" several specialized aspects of the wildlife survey include:

- auditory surveys around Messner Pond at dusk for spotted frog and northern leopard frog;
- identification of all tree nests with follow-up to determine occupancy;
- shoreline wading for visual identification of painted turtle, spotted frog, and northern leopard frog.

During the surveys, wildlife habitat types and vegetative cover types within the project area were mapped and described.

In addition to the aforementioned wildlife surveys, data from incidental observations by PGE biologist Steve Bullock were utilized to supplement the survey effort. The dates of these incidental observations include April 28, May 19, June 3, June 4, and June 17.

3.0 RESULTS

3.1 PLANTS

The plant composition of the project area is indicative of highly disturbed areas. The dominant species are cheatgrass, tumble mustard, tumbleweed, and rabbitbrush. The plant species list presented in Appendix A is based on the plant survey and additional observations during the wildlife survey.

3.1.1 SPECIES OF CONCERN

No occurrences of Lawrence's milkvetch or any other sensitive species were recorded. In addition, there were no occurrences of any members of the genus Astragalus.

3.1.2 COMMUNITIES

3.1.2.1 Wetland

The only location of a wetland plant community is south of Messner Pond and north of the proposed transmission line. This site is outside the construction impact zone (as described in the ASC, there are no wetlands within the impact zone). The dominant species are cattail and bulrush with reed canary grass and rush present to a lesser degree.

3.1.2.2 Riparian

The principal riparian community is adjacent to Messner Pond (primarily Russian olive trees with a few cottonwoods). Other smaller riparian communities are associated with a pond just west of Messner Pond and a pond behind the Ready-Mix gravel company. All of these areas are outside of the construction impact zone.

3.1.2.3 Shrub-steppe

The shrub-steppe plant community comprises the majority of the project area, although the existing shrub-steppe community is highly disturbed. The least disturbed shrub-steppe occurs in a small area northeast of Messner Pond where some antelope bitterbrush, sagebrush, and bunchgrass is present; although the predominant herbaceous species is cheatgrass and the predominant shrub species is rabbitbrush.

3.1.2.4 Agricultural

The agricultural plant community is shrub-steppe that has been converted to an irrigated circle plot with a cultivated, monocultural plant composition. The only location within the project area is between the proposed substation site and the existing BPA transmission line near the freeway (I-84).

The principal crop types in these areas include alfalfa and wheat.

3.2 ANIMALS

The number of species recorded during the survey includes 65 birds, 4 mammals, 2 amphibians, and 3 fish. All species were identified in the field with the exception of Great Basin spadefoot tadpoles which were collected and identified by Char Corkoran, a consultant working on an amphibian project in Morrow County. A wildlife species list for the project area is presented in Appendix B, with comments on abundance and occurrence presented in Appendix C.

3.2.1 SPECIES OF CONCERN

No listed (i.e., threatened or endangered) animal species were recorded during the surveys. Three state sensitive species (American white pelican, bank swallow, and Franklin's gull) and one federal candidate species (long-billed curlew) were recorded. All three of the state sensitive species were observed at Messner Pond. The long-billed curlew was recorded northeast of Messner Pond in grassland-shrub habitat. Bank swallows were also observed throughout the project area including a small colony at the proposed facility site. Numerous other bank swallow colonies were also observed in the Hermiston-Umatilla area and at Carty Reservoir and in the vicinity of the Boardman Coal Plant. Based on this survey and other recent observations, bank swallow populations appear more abundant than previously believed.

3.2.2 HABITAT TYPES

3.2.2.1 Agricultural Fields

The one irrigated circle plot agricultural field (located between the proposed substation site and the interstate) provides poor quality wildlife habitat. The only wildlife use observed during the survey was by ring-necked pheasants and barn swallows coursing over the field.

3.2.2.2 Open Water

Open water habitat occurs primarily in Messner Pond and the Columbia River. Other locations include several gravel ponds of varying sizes (e.g., on the facility site, west and southwest of the facility site, and behind the Ready-Mix gravel operation east of the facility site) and two ponds (approximately 3 acres each) at the Boardman sewage pond facility. Numerous waterfowl, primarily mallard and Canada goose, are the dominant species in this habitat. In addition, hundreds of swallows forage above the water.

3.2.2.3 Wetland/Riparian

The wetland/riparian habitat type includes the wetland identified in Section 3.1.2.1 above, and areas of trees and shrubs adjacent to water bodies. Species diversity is relatively high in this community. Common species include red-winged blackbird, black-billed magpie, mule deer, and California quail. In addition, amphibian use in the project area likely primarily occurs here.

3.2.2.4 Shrub-grassland

Shrub-grassland is the predominant habitat type within the project area. Common species include western kingbird, western meadowlark, mule deer, and barn swallow. This habitat type likely provides the best habitat within the project area for the long-billed curlew.

3.2.2.5 Disturbed

This habitat type includes buildings, unvegetated areas (e.g., roads, parking lots) and sparsely vegetated ground adjacent to and utilized by the commercial businesses. Common species include house sparrow, killdeer, and barn swallows nesting on the buildings.

4.0 DISCUSSION

4.1 PLANTS

The vegetative composition of the project area has been highly disturbed and is dominated by exotic invader species. There are no native plant communities present within the project area and limited composition of native species. Based on these factors, the lack of suitable habitat within the project area for three of the four plant species of concern, and the negative results of a survey for Lawrence's milkvetch, it is unlikely that any plant species of concern occur within the project area.

4.2 ANIMALS

Resident and migratory wildlife species identified during the survey are considered to be typical of the faunal community of the region based on the habitats present. Although four species of concern (i.e., American white pelican, Franklin's gull, bank swallow, and long-billed curlew) were documented to occur in the project area, only the bank swallow colony on the facility site would be impacted by the proposed project. In addition to the species of concern identified during the survey, additional species of concern are known or suspected to occur during other seasons. These species (e.g., bald eagle, Barrow's goldeneye, bufflehead) are discussed in Exhibit R of the ASC.

The limited amphibian occurrences during the survey is consistent with the results of an on-going amphibian survey in Morrow County being conducted by Char Corkoran.

The limited mammal occurrences are likely due to several factors including the specialized survey methods (e.g., trapping) required for some species, their more secretive and less visual presence (e.g., ground squirrels), and the nocturnal nature of many of the species (e.g., raccoon).

Appendix A. Plant species recorded during the survey period for the Coyote Springs project area in the Port Of Morrow, Oregon.

<u>Common Name</u>	<u>Scientific Name</u>
Tumblemustard	<i>Sisymbrium altissimum</i>
Western yarrow	<i>Achillea millefolium</i>
White sweet clover	<i>Melilotus alba</i>
Crested wheatgrass	<i>Agropyron cristatum</i>
Intermediate wheatgrass	<i>Agropyron intermedium</i>
Needle and thread grass	<i>Stipa comata</i>
Bottlebrush squirreltail	<i>Sitanion hystrix</i>
Cheatgrass	<i>Bromus tectorum</i>
Bermuda grass	<i>Cynodon dactylon</i>
Saltgrass	<i>Distichlis stricta</i>
Lawrence's milkvetch*	<i>Astragalus collinus</i> var. <i>laurentii</i>
Robinson's onion*	<i>Allium robinsonii</i>
Thompson's sandwort*	<i>Arenaria franklinii</i> var. <i>thompsonii</i>
Columbia cress*	<i>Rorippa columbiae</i>
Russian olive	<i>Elaeagnus angustifolia</i>
Black cottonwood	<i>Populus trichocarpa</i>
Reed canary grass	<i>Phalaris arundinacea</i>
Cattail	<i>Scirpus</i> spp.
Rush	<i>Juncus</i> spp.
Bulrush	<i>Scirpus</i> spp.
Antelope bitterbrush	<i>Purshia tridentata</i>
Rabbitbrush	<i>Chrysothamnus</i> spp.
Bunchgrass	<i>Agropyron</i> spp.
Sagebrush	<i>Artemisia</i> spp.
Tumbleweed	<i>Salsola kali</i>

* Species not recorded during the survey, but referenced in the text.

Appendix B. Wildlife species recorded during the survey period for the Coyote Springs project area in the Port of Morrow.

Birds

American pelican	<i>Pelecanus erythrorhynchos</i>
Great-blue heron	<i>Ardea herodias</i>
Black-crowned night heron	<i>Nycticorax nycticorax</i>
Eared grebe	<i>Podiceps nigricollis</i>
Canada goose	<i>Branta canadensis</i>
Wood duck	<i>Aix sponsa</i>
Blue-winged teal	<i>Anas discors</i>
Mallard	<i>Anas platyrhynchos</i>
Cinnamon teal	<i>Anas cyanoptera</i>
Gadwall	<i>Anas strepera</i>
Redhead	<i>Aythya americana</i>
Northern shoveler	<i>Anas clypeata</i>
Bufflehead	<i>Bucephala albeola</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
American coot	<i>Fulica americana</i>
American widgeon	<i>Anas americana</i>
Lesser Scaup	<i>Aythya affinis</i>
Ring-necked duck	<i>Aythya collaris</i>
Wilson's phalarope	<i>Phalaropus tricolor</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
California quail	<i>Callipepla californica</i>
Ring-necked pheasant	<i>Phasianus colchicus</i>
Mourning dove	<i>Zenaida macroura</i>
Rock Dove	<i>Columba livia</i>
Forster's tern	<i>Sterna forsteri</i>
Franklin's gull	<i>Larus pipixcan</i>
Western gull	<i>Larus occidentalis</i>
Herring gull	<i>Larus argentatus</i>
Ring-billed gull	<i>Larus delawarensis</i>
Spotted sandpiper	<i>Actitis macularia</i>
Least sandpiper	<i>Calidris minutilla</i>
Killdeer	<i>Charadrius vociferus</i>
Semipalmated plover	<i>Charadrius semipalmatus</i>
Long-billed curlew	<i>Numenius americanus</i>
American avocet	<i>Recurvirostra americana</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Black-billed magpie	<i>Pica pica</i>
American crow	<i>Corvus branchyrhynchos</i>
American robin	<i>Turdus migratorius</i>
Cedar waxwing	<i>Bombycilla cedrorum</i>
Barn swallow	<i>Hirundo rustica</i>
Bank swallow	<i>Riparia riparia</i>
Cliff swallow	<i>Hirundo pyrrhonata</i>
Gray flycatcher	<i>Empidonax wrightii</i>
Western wood-pewee	<i>Contopus sordidulus</i>
Western kingbird	<i>Tyrannus verticalis</i>

Appendix B, continued

Birds

Solitary vireo	<i>Vireo solitarius</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Yellow-rumped warbler	<i>Dendroica coronata</i>
Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Song sparrow	<i>Melospiza melodia</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
White-crowned sparrow	<i>Zonotrichia leucophrys</i>
Chipping sparrow	<i>Spizella passerina</i>
Dark-eyed junco	<i>Junco hyemalis</i>
Lazuli bunting	<i>Passerina amoena</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Western meadowlark	<i>Sturnella neglecta</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>
Northern oriole	<i>Icterus galbula bullockii</i>
American goldfinch	<i>Carduelis tristis</i>
House finch	<i>Carpodacus mexicanus</i>
House sparrow	<i>Passer domesticus</i>
European starling	<i>Sturnus vulgaris</i>

Mammals

Mule deer	<i>Odocoileus hemionus</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Coyote	<i>Canis latrans</i>
Nutria	<i>Myocastor coypus</i>

Amphibians

Great Basin spadefoot	<i>Spea intermontana</i>
Bullfrog	<i>Rana catesbeiana</i>

Fish

Carp	<i>Cyprinus carpio</i>
Smallmouth bass	<i>Micropterus dolomieu</i>
Yellow perch	<i>Perca flavescens</i>

Appendix C. Comments on wildlife species occurrence and relative abundance for the Coyote Springs project area in the Port of Morrow, Oregon.

<u>Birds</u>	<u>Comments</u>
American pelican	approx. 30 on Messner Pond on June 3; 8 on Messner Pond on June 4; 13 on Messner Pond on June 17
Great-blue heron	1 or 2 seen near water bodies on all visits
Black-crowned night heron	1 on Messner Pond on June 3
Eared grebe	5 on sewage ponds on May 20; likely migrants
Canada goose	common on all water bodies; 30-40 goslings on Messner Pond
Wood duck	pair on Messner Pond on May 3 only
Blue-winged teal	pair on Messner Pond on May 3
Mallard	common on all water bodies; numerous broods seen
Cinnamon teal	1 on Messner Pond on May 3; 2 on Messner Pond on June 3
Gadwall	pair on pond next to Messner Pond on May 19 and 20
Redhead	3 on pond west of Messner Pond on May 3, 2 on May 19; pair on sewage ponds on May 20;
Northern shoveler	1 on sewage ponds on May 20
Bufflehead	3 on Messner Pond on May 3
Ruddy duck	2-10 on sewage ponds on all visits
American coot	common on sewage pond (nesting); also seen on pond west of Messner Pond
American widgeon	pair on Messner Pond on May 3
Lesser Scaup	4 on sewage pond on May 20; at least 10 on June 3
Ring-necked duck	3 on sewage pond on May 20
Red-tailed hawk	1 or 2 along BPA transmission line on most visits
California quail	common in field and Russian olive adjacent to Messner Pond
Ring-necked pheasant	1 or 2 heard in shrub grassland or agricultural field on all visits
Mourning dove	2-4 in Russian olive around Messner Pond on May 19, June 4, and June 17; 15 on ground at ODFW rock quarry on June 3
Rock Dove	common near buildings, along railroad tracks
Forster's tern	2 on Messner Pond on May 3, 1 on Messner Pond on June 3
Franklin's gull	1 flyover Messner Pond on May 20
Western gull	3 on Messner Pond on May 3
Herring gull	3 on facility site on June 23
Ring-billed gull	40 on shoreline of Messner Pond on June 3
Wilson's phalarope	3 on sewage pond on May 20
Spotted sandpiper	1 at edge of Messner Pond on May 20; 1 in ODFW rock quarry on June 3
Least sandpiper	group of 7 on Messner Pond on May 3; likely migrant only
Killdeer	common; 5-10 birds seen on all visits adjacent to ponds and in disturbed bare ground areas
Semipalmated plover	1 bird seen on Messner Pond on May 3; likely migrant only

Appendix C, continued

<u>Birds</u>	<u>Comments</u>
Long-billed curlew	2 in shrub-grassland north east of Messner Pond on June 4
American avocet	1-4 birds seen on all visits; at Messner Pond and sewage ponds
Black-necked stilt	2-6 birds seen on all visits; at Messner Pond and sewage ponds
Black-billed magpie	common; several seen on all visits; nesting in Russian olive next to Messner Pond
American crow	common; several seen on all visits in all habitats
American robin	common; few birds seen on all visits in all habitats, but mostly around Russian olive
Cedar waxwing	6 in cottonwoods next to Messner Pond on June 3
Barn swallow	common; numerous birds on all visits in all habitats
Bank swallow	common; hundreds of birds on all visits; associated with all water bodies
Cliff swallow	1 at facility site on May 20; 2 on Messner Pond on June 23; nests on high school gymnasium
Gray flycatcher	1 in Russian olive along Messner Pond on May 3; likely migrant only
Western woodpewee	1 heard in Russian olive around Messner Pond on June 3
Western kingbird	common in shrub-grassland; nesting in tree south of Messner Pond
Solitary vireo	1 in Russian olive adjacent to Messner Pond on May 20
Common yellowthroat	2 in wetland/riparian around Messner Pond on May 19
Yellow-rumped warbler	1 in Russian olive adjacent to Messner Pond on May 20
Black-headed grosbeak	1 or 2 birds on all visits in Russian olive adjacent to Messner Pond and around edge of wetland
Song sparrow	common on all visits, particularly around wetland and riparian of ponds
Savannah sparrow	many seen in shrub-grassland near substation site on May 3; likely migrant only
White-crowned sparrow	many seen in field east of Messner Pond and shrub-grassland near substation site on April 28 and May 3; likely migrant only
Chipping sparrow	1 seen in flock of sparrows in field east of Messner Pond on May 3; likely migrant only
Dark-eyed junco	1 seen in flock of sparrows in field east of Messner Pond on May 3; likely migrant only
Lazuli bunting	2 birds seen on May 20 and June 3 in field east of Messner Pond
Brown-headed cowbird	common on all visits in all habitats, particularly in Russian olive around Messner Pond
Western meadowlark	common in shrub-grassland; several seen on all visits
Red-winged blackbird	common around all water bodies and wetland next to Messner Pond

Appendix C, continued

<u>Birds</u>	<u>Comments</u>
Yellow-headed blackbird	flock of 40-50 fly over Messner Pond at dawn on May 3
Northern oriole	1 or 2 on each visit in Russian olive around Messner Pond and field east of Messner Pond
American goldfinch	2 flyovers on May 3; likely migrant only
House finch	pair along BPA powerline and substation site on all visits
House sparrow	common around buildings and facilities (e.g., BPA substation)
European starling	common around buildings and facilities (e.g., BPA substation)

Mammals

Mule deer	common; particularly in field and Russian olive next to Messner Pond
Black-tailed jackrabbit	1 seen in Port of Morrow maintenance building on June 3
Coyote	sign common on all visits
Nutria	several in Messner Pond on May 3

Amphibians

Great Basin spadefoot	2 tadpoles collected in ephemeral pond within ODFW rock quarry adjacent to Messner Pond
Bullfrog	several heard at pond behind Ready Mix

Fish

Carp	hundreds spawning in Messner Pond on June 3
Smallmouth bass	caught by fisherman on June 3
Yellow perch	caught by fisherman on June 3

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Coyote Springs Cogeneration Project

**Appendix B
EMF Supplement**

**Bonneville Power Administration
U.S. Department of Energy**

January 1994

Appendix B

Review of biological and epidemiological studies relating to EMF

A study in Denver, Colorado, (Wertheimer and Leeper, 1979) and one in Sweden (Tomenius, 1986) first reported that some cancer risks were about 2-3 times greater for children living near certain types of power lines assumed to be carrying high current. Those researchers suggested that the finding may be related to the magnetic fields of 2-3 milligauss (mG) and above produced in homes by such lines. The possibility could not be ruled out, however, that other factors, or chance, may be involved. If certain power lines actually do influence cancer rates, this would mean that two or three children out of 10,000 children exposed to such lines would develop cancer each year, compared to the average rate of 1 in 10,000 per year (Ahlbom, et al., 1987).

A second study done in Denver (Savitz, et al., 1988) found results that were generally consistent with the earlier work on childhood cancer by Wertheimer and Leeper (1979). However, the relative risk* in the new study (1.5) was smaller than that reported earlier (2-3). It was also on the borderline of statistical significance, which means that it could have been due to chance. Results of another study, from the Seattle area, found no association between power lines and leukemia in adults (Severson, et al., 1988). An earlier powerline study in Denver by Wertheimer and Leeper (1982) also found no increase in adult leukemia. However, the earlier Denver study did find an increased risk for some other types of adult cancers.

A study done in Los Angeles County, California provided additional support for an association between childhood leukemia risk and high current power lines (London, et al., 1991). The odds ratio for very high current lines compared to very low current and underground lines was 2.15. Associations with actual measured electric and magnetic fields, however, were weaker and not statistically significant.

A new study done in Sweden found that the relative risk for leukemia in children living near transmission lines was 3.8 where magnetic fields were greater than 3 mG (Feychting and Ahlbom, 1992). Sweden's National Electrical Safety Board issued a document called *Revised Assessment of Magnetic Fields and Health Hazards* on February 25, 1993. It states that the agency "has revised the previous assessment of health hazards to the extent that the Board in the future *will act on the assumption* that there is a connection between exposure to power frequent magnetic fields from power lines and childhood cancer, when preparing regulations on electrical installations." The document also notes that a connection between cancer and magnetic fields has not been scientifically proven. (Swedish National Board for Electrical Safety, 1993.)

* Results of case-control studies are given in terms of relative risk (or odds ratio). A relative risk of 1.0 means that exposure to some factor (assumed to be EMF in this case) is the same for people with a disease (cases) as for people without the disease (controls). A value of 2 means cases were exposed to the factor twice as often as the controls. This establishes a "statistical association" between the disease and the factor. This may not represent a cause-and-effect association, however.

Preliminary information on a larger study done in Denmark indicates no increased risk of leukemia for children living near transmission lines in that country (Olsen, 1992). However, there was an elevated risk of lymphoma reported in the Danish study. A Danish blue ribbon panel examining the EMF issue has recommended against government regulation:

[There is] no scientific reason for establishing standards with respect to high-current plants. New research results must be followed closely in the future. (*EMF Health and Safety Digest*, June 1993)

Earlier studies in Rhode Island (Fulton, et al., 1980), in Taiwan (Lin and Lu, 1989) and in England (Myers, et al., 1985) found no significant association between childhood cancer and powerlines. Other community studies in England found no consistent evidence to support a power line-cancer association (Coleman, et al., 1985; McDowall, 1986).

A study in Washington State first reported that men in various "electrical occupations" had died more frequently from leukemia than men in other occupations (Milham, 1982). Other studies reported similar findings, suggesting an increased risk of around 20-50 percent (Savitz and Calle, 1987; Coleman and Beral, 1988). However, the studies were primarily based on information only from death certificates (i.e., job title, and cause of death). It was not possible to determine whether the preliminary findings were related to electric and magnetic fields, or to other exposures, such as from chemicals.

Research on electric and magnetic fields and cancer was reviewed in a draft report by the U.S. Environmental Protection Agency (EPA, 1990). The EPA concluded that magnetic fields are a possible but unproved cause of cancer in humans and more research is needed. The EPA's Science Advisory Board also reviewed the issue and reached a similar conclusion. The Science Advisory Board, however, recommended that the EPA report should be rewritten to correct inconsistencies in the report (Science Advisory Board, 1991).

In addition to research on humans and laboratory animals, several studies have investigated possible effects of transmission line electric and magnetic fields on plants, wildlife, and domestic animals (U. S. Department of Energy, Bonneville Power Administration, 1993). Crop growth is not noticeably affected by even the largest transmission lines. Trees allowed to grow too close to transmission line conductors can be damaged by the strong electric fields near the conductors. Normally, trees are not allowed close to conductors to prevent electrical flashover, which is a spontaneous arcing of electrical current from lines to trees.

Studies have shown that honey bees in commercial hives can be adversely affected by strong transmission line electric fields. Shocks received by bees while in the hive cause decreased honey production and increased mortality. As a precaution, BPA recommends that hives not be placed directly on the transmission line right-of-way.

Wildlife responds to effects (e.g., changes in food supply), of cleared rights-of-way. However, there is no evidence that their behavior is noticeably affected by the presence of electric and magnetic fields. Few studies have attempted to determine whether wildlife may be affected by long-term exposure to these fields. As noted above, some effects of electric and magnetic fields have been found in laboratory animal studies. It is not known whether such effects occur in wildlife similarly exposed to these fields.

Several studies have looked at the behavior and production of livestock raised near transmission lines. These studies found no indication that electric or magnetic fields have any major effects on livestock. Most of the studies were not designed to detect any subtle field effects. However, more detailed information on the potential health effects of electric and magnetic fields can be found in two free BPA publications (incorporated here by reference): *Electrical and Biological Effects of Transmission Lines: A Review*, (1993) and *Electric Power Lines: Questions and Answers on Research Into Health Effects* (1993). Copies may be obtained by calling BPA's document request line, 800-622-4520.

DRAFT ENVIRONMENTAL IMPACT STATEMENT

Coyote Springs Cogeneration Project

**Appendix C
Biological Assessment**

**Prepared by:
Beak Consultants Incorporated**

January 1994

Biological Assessment
Coyote Springs Cogeneration Project

Project No. 73624

Prepared for:

Portland General Electric
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November 1993

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1.0 INTRODUCTION

1.1 BACKGROUND INFORMATION

The Bonneville Power Administration (BPA) proposes to modify its electrical transmission system to connect the proposed Coyote Springs Cogeneration Facility being built by Portland General Electric (PGE) to an existing BPA transmission line north of Interstate 84 near Boardman, Oregon. The modifications include a transmission line tap at the existing BPA transmission line, and a 500-kilovolt (kV) loop line from the tap point to the cogeneration facility, a distance of approximately one mile. The proposed action addressed in this Biological Assessment includes both the transmission line modifications (Federal action) and construction and operation of the cogeneration facility (non-Federal action) because of the interdependency of the actions. Alternatives to the proposed action have been considered and are documented in a Draft Environmental Impact Statement (DEIS) prepared for this project (BPA 1993).

As another integral part of the project, Pacific Gas Transmission (PGT) will build a natural gas pipeline to the cogeneration facility from their existing pipeline near Ione, Oregon. The proposed pipeline must be permitted by the Federal Energy Regulatory Commission (FERC) and is not considered as a part of this proposed action.

PGE requested information from the Portland and Olympia Field Offices of the U.S. Fish and Wildlife Service (USFWS) regarding the occurrence of threatened or endangered species near the proposed project (Altman pers. comm., 2 Nov. 1992, and 17 Dec. 1992). In reply, the USFWS identified the bald eagle (Haliaeetus leucocephalus) and the peregrine falcon (Falco peregrinus) as Federally-listed species that are known or suspected to occur in the vicinity of the proposed project (Peterson pers. comm., 16 Nov. 1992, and Frederick pers. comm., 9 Feb. 1993). In September 1993, an updated list was requested from the Portland and Olympia offices (Munn pers. comm., 16 Sept. 1993). The responses to this request did not include any changes to the previously-requested species list.

PGE also requested information from the National Marine Fisheries Service (NMFS) regarding the occurrence of threatened or endangered species near the proposed project (Altman

pers. comm., 17 Dec. 1992). In reply, the NMFS identified the Snake River spring/summer chinook salmon (Oncorhynchus tshawytscha), Snake River fall chinook salmon (Oncorhynchus tshawytscha), and Snake River sockeye salmon (Oncorhynchus nerka) as species known or suspected to occur in the vicinity of the project (Tuttle pers. comm., 21 Jan. 1993). In September 1993, an updated list was requested from NMFS (Munn pers. comm., 16 Sept. 1993). The response to this request did not include any changes to the previously-requested species list.

This Biological Assessment has been prepared in partial fulfillment of the requirements of Section 7 (c) of the Endangered Species Act of 1973 as amended. This assessment describes the results of an investigation conducted to evaluate whether or not the proposed action would adversely affect the bald eagle, peregrine falcon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, or Snake River sockeye salmon.

For the purposes of this document, the project vicinity is defined as the area within a 50-mile radius of the proposed action. The project area refers to a 0.5-mile radius of project facilities. The construction zone includes the area which will be physically impacted by construction activities. All activities associated with the project are considered to be *proposed* although not repeatedly stated as such in the document.

1.2 PROJECT DESCRIPTION

The reader is referred to the Application for Site Certificate (ASC) Coyote Springs Cogeneration Project (PGE 1993) and the DEIS (BPA 1993) for a detailed description of the project. The following is a brief summary of the proposed action.

A transmission line tap would be built into an existing BPA transmission line just north of Interstate 84 and east of Boardman (Figure 1). A double circuit 500-kV loop line would be constructed from the transmission line tap to the cogeneration facility, a distance of approximately one mile. The new transmission line would run north from the tap to an existing concrete batch plant, and then east and parallel with an existing transmission line to the cogeneration facility substation (Figure 1).

Figure 1. Location of project and associated facilities.

PGE proposes to construct a 442 megawatt (MWa) cogeneration plant on a 14-acre site within the Port of Morrow Industrial Park (Figure 1). Associated facilities include an electrical substation, water storage tanks, cooling towers, a warehouse, and administrative offices. The site is approximately two miles east of central Boardman, and is immediately west of Messner Pond, an approximately 30-acre embayment pond created by diking the northern end of the bay from the Columbia River.

Construction is currently scheduled to begin in early 1994 and the first phase, 221 MWa, will be completed no later than 31 December 1997.

1.3 SITE DESCRIPTION

1.3.1 Land Use

Land zoning at the cogeneration facility is industrial. The plant site has been extensively dredged for aggregate (rock and sand) and will require filling and leveling. A pond created by an ongoing dredging operation lies immediately next to the proposed eastern property line of the plant site. Along the transmission line corridor, current land use includes an existing public right-of-way, a gravel quarry, a vacant field, a portion of the City of Boardman's sewage treatment evaporation fields, and an irrigated agricultural field. In the project area, land use is dominated by industry, and irrigated agriculture.

1.3.2 Habitat Description

Plant associations of the project area are typical of disturbed areas within the shrub-steppe vegetation zone of the Columbia Basin physiographic province. Dominant species include: tumbleweed (Salsola kali), tumbled mustard (Sisymbrium officinale), cheatgrass (Bromus tectorum), tarweed (Amsinckia lycopsoides), and rabbitbrush (Chrysothamnus nauseosus).

The cogeneration facility site is characterized by bare soil, sparse vegetation, and a pond created by ongoing dredging activities. No wetland vegetation is associated with this pond.

Tumbleweed and cheatgrass provide most of the sparse vegetative cover. There are no trees present on the construction site, although trees are present adjacent to Messner Pond.

Habitat along the transmission line corridor is primarily disturbed vegetative cover that includes cultivated crops within one center-pivot irrigation field and disturbed shrub-steppe dominated by the aforementioned species. In addition, a portion of the transmission line corridor is within a gravel road.

Other habitat types in the project area include the open water of Messner Pond, the Columbia River, and the sewage treatment ponds; a riparian fringe of Russian olive (Elaeagnus angustifolia) around Messner Pond; emergent wetlands grading into forested wetlands associated with Messner Pond; and highly disturbed industrial sites.

1.4 EVALUATION METHODS

Information presented in this Biological Assessment is based on field investigations; consultation with the USFWS, ODFW, and NMFS; conversations with BPA and PGE employees familiar with the project; a noise analysis study (see Appendix G in the ASC); fish passage data; and a literature review. The field investigations included a reconnaissance level visit in December 1992; four wildlife surveys conducted in May and June 1993; and several site visits with agency and project personnel. The field work included an evaluation of habitat suitability for listed species. The evaluation of the potential impacts of the project was based on the results of field investigations and available information on project construction and operation from the ASC and DEIS.

Several factors were evaluated to assess potential effects of the proposed action on the listed species. These include: direct mortality, visual disturbances, auditory disturbances, habitat loss or modification, and impacts on foraging and food supply. Direct mortality of listed species was assessed by a consideration of project design and an examination of factors that could result in the death of individuals. Visual disturbances were assessed based on distance and line-of-sight conditions.

Auditory disturbances were assessed based on the change between existing and predicted noise levels. Existing noise levels at the west end of Messner Pond (closest to the cogeneration facility) were measured during acoustical tests conducted in January, 1993. Noise levels during construction and operation of the facility were predicted through a program called "noisecalc" which includes correction factors for atmospheric absorption, topographic or man-made barriers, vegetative absorption, distance attenuation, and machinery noise levels. A worst-case scenario was assumed by using the closest point of Messner Pond to the construction zone, and peak noise levels during construction and operation.

Noise disturbance impacts on foraging bald eagles were evaluated by determining whether noise levels from project construction or operation exceeded certain threshold values. In a bald eagle noise disturbance study by Bottorff et al. (1987), target levels for acceptable noises were not to exceed 65 decibels (dBA) and 10 dBA above background peak levels at a distance of 0.5 miles from the construction zone. For purposes of this assessment, noise levels exceeding 65 dBA and 10 dBA above existing noise levels were considered to pose potential adverse impacts on foraging bald eagles.

Habitat modification and loss for the bald eagle were assessed based on project design and a determination of habitat suitability within the project area. Habitat modification or loss for listed salmon species were assessed by an examination of potential changes in water quantity and quality in the Columbia River. Data on use of the Columbia River adjacent to the project site by listed salmonid species were provided by the Fish Passage Center. The data utilized are from McNary Dam, the nearest dam to the project site, approximately 20 miles upstream. However, these data are of limited use since they do not differentiate between hatchery-reared and natural stocks, nor between Snake River and mid-Columbia stocks of salmon. According to Dave Marvin of the Fish Passage Center (pers. comm., 1 Nov. 1993), most salmon counted at McNary Dam are from mid-Columbia stocks.

Impacts to foraging and food supply were evaluated by determining potential project impacts to food resources, and impacts to behaviors and structures important to foraging activities.

2.0 REGULATORY GUIDELINES

Under Section 7 of the Endangered Species Act (ESA), Federal agencies must insure that their actions are "not likely to jeopardize the continued existence" of a listed species, "or result in the destruction or adverse modification of habitat of such species." The ESA has defined "jeopardize the continued existence" to mean;

to engage in an action that reasonably would be expected directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species;

and "destruction or adverse modification" to mean:

a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of a listed species. Such alterations include, but are not limited to, alterations adversely modifying any of those physical or biological features that were the basis for determining the habitat to be critical.

2.1 BALD EAGLE

The bald eagle is protected under the Federal ESA, and is listed by the USFWS as threatened in the states of Oregon and Washington. Guidelines have been established to protect the bald eagle and its habitat from actions that may jeopardize the "continued existence" of the species. Guidelines applicable to this assessment (nesting guidelines are not included since the species does not nest in the project area) are presented below.

The Bald Eagle Management Guidelines for Oregon and Washington (USFWS 1981) include several recommendations to minimize human actions which may disrupt foraging by eagles, and to ensure adequate and uncontaminated food supplies. For example, perch trees used by foraging eagles should be preserved within 200 feet of the shoreline of feeding waters. Communal roosts should be protected by a 0.25-mile buffer zone around the core area of the roost.

The Pacific Bald Eagle Recovery Plan (USFWS 1986) recommends protection of key wintering areas (i.e., perches and communal winter roosts) from disturbance between approximately 15 November and 15 March. Nesting, perching, and winter roost trees should also be protected.

2.2 PEREGRINE FALCON

The peregrine falcon is protected under the Federal ESA, and is listed by the USFWS as endangered in the states of Oregon and Washington. Guidelines have been established to protect the peregrine falcon and its habitat from actions that may jeopardize the "continued existence" of the species. Guidelines applicable to this assessment (nesting guidelines are not included since the species does not nest in the project area nor is suitable nesting habitat available in the project area) are presented below.

The Pacific Coast Peregrine Falcon Recovery Plan (1982) recommends efforts be conducted to identify and develop management plans for important migrant and wintering habitat. However, specific information on the location of these sites is deficient, thus guidelines regarding their protection are lacking.

2.3 SALMON SPECIES

The three salmon species are protected under the Federal ESA. The Snake River spring/summer chinook salmon and Snake River fall chinook salmon are listed as threatened by the NMFS, and the Snake River sockeye salmon is listed as endangered. Guidelines have been established to protect these species and their habitat from actions that may jeopardize the "continued existence" of the species.

In late 1991 and early 1992, the NMFS determined that three Evolutionary Significant Units (ESU) or stocks of salmon from the Snake River Basin were endangered or threatened under the Endangered Species Act (ESA), including sockeye salmon, spring/summer chinook salmon, and fall chinook salmon. As well, NMFS recently proposed the designation of critical habitat for the listed species (57 FR 57051, December 2, 1992). Under Section 7(a)(4) of the ESA, agencies must confer, rather than consult, on actions that are likely to result in destruction or adverse modification

of critical habitat. Any critical habitat conference required for a proposed action will be conducted in conjunction with the consultation on that action. Because the salmon recovery planning process is incomplete, NMFS currently utilizes interim goals, methods and information during the section 7 consultation process.

Because so few Snake River sockeye salmon remain, the approach used for evaluating the impacts of an agency action on the listed sockeye salmon species is expected to differ from the approach used for evaluating impacts on Snake River spring/summer and fall chinook salmon. The human-induced mortality of even one adult sockeye, or an equivalent impact, is a matter of grave concern. NMFS strongly recommends that all Federal agencies take measures to reduce adverse human impacts on Snake River sockeye salmon to minimal levels in order to insure that their actions are not likely to jeopardize the continued existence of this species.

For 1993 consultations for listed Snake River spring/summer and fall chinook salmon, NMFS will analyze agency actions in two steps. In the first step, NMFS will consider each action individually with respect to reductions in mortality from a specified base period. In the second step, NMFS will evaluate the combined effects of all actions using the available Columbia/Snake River salmon life cycle models. The combined effects analysis is an attempt to assess whether all agency actions, as modified to provide adequate reductions in mortality, together with other natural and human-induced causes of mortality, will result in stabilizing Snake River chinook salmon population abundance.

3.0 NATURAL HISTORY AND SPECIES OCCURRENCE

3.1 BALD EAGLE

3.1.1 Natural History

Bald eagles in the Pacific Northwest usually select the largest, most dominant trees in coniferous stands for nesting (Anthony et al. 1982). Nests are usually built on limbs just below the crown, with the canopy above providing cover (USFS 1977). Most nest sites in the Pacific Northwest are located within one mile of permanent water (Anthony and Isaacs 1989). Bald eagle pairs in Oregon usually have alternate nests in their territory that are utilized in different years (Anthony and Isaacs 1981).

As opportunistic foragers, bald eagles in the Pacific Northwest consume a wide variety of food items and their diet is most often determined by prey availability and/or vulnerability (Fielder 1982, Garrett et al. 1988). Foraging areas almost always are associated with rivers, lakes, and coastal shorelines where fish, waterfowl, seabirds, and invertebrates are preyed upon (USFS 1985). The foraging habitat of bald eagles is typically in large open areas with a wide visual field and suitable perching trees near the food source (USFS 1985). Fish are the most commonly consumed food item of bald eagles foraging in the Columbia River estuary, although consumption of waterfowl and seabirds increases in winter as these prey species become more abundant (Garrett et al. 1988; Watson et al. 1991). Elsewhere in the Pacific Northwest, waterfowl, mammals, and various types of carrion are utilized with considerable local and seasonal variation as to importance in the diet of bald eagles (USFWS 1986).

In general, bald eagle foraging activity is concentrated around one or two periods of time. Feeding activity most often occurs between sunrise and 10:00 am, and a second period of foraging may occur just prior to sunset (Garrett et al. 1988).

Bald eagles generally use large snags or other tall trees as perch sites, although they may also perch on fenceposts, powerlines, logs, or on the ground under certain conditions. Proximity to an available food source appears to be the chief reason for selection of perch sites. Most perch trees

used by eagles are taller than surrounding vegetation and provide unobstructed views (USFS 1977, Steenhof 1978).

Bald eagles winter along ice-free lakes, streams, and rivers. Their concentrations reflect winter food sources, although perch availability and level of human disturbance are also important (USFS 1977, Steenhof 1978, Stalmaster 1980). Swenson et al. (1981) observed that 71 percent of the wintering bald eagles in southeastern Montana were along rivers and the remaining 29 percent were observed wintering on uplands, primarily near smaller rivers. They suggested that bald eagles observed on uplands utilized terrestrial food sources when the rivers were frozen. If sufficient winter food sources are available around a nesting pair and adjacent water bodies do not freeze, the nesting pair may remain in the area throughout the winter (Swenson et al. 1986). Most eagles that breed in Oregon and Washington winter in the vicinity of their nests (Garrett et al. 1988).

Communal roosts are used by bald eagles primarily during the winter months. In the Pacific Northwest, communal roosts consist of the largest trees or snags in a mature timber stand with sturdy lateral limbs near the crown that provide easy entry and exit (Keister and Anthony 1983). Roost sites are generally in dense stands of live conifers which may provide a favorable thermoregulatory environment thereby reducing energy expenditures (Stalmaster and Newman 1979). In some areas, bald eagles roost within a few miles of feeding sites, but in the Klamath Basin the distance from major communal roosts to feeding areas ranges from 6 to 12 miles (Keister and Anthony 1983).

The following chronology as described by Isaacs et al. (1983) is typical for bald eagles throughout Oregon. Nesting behaviors typically begin in January with egg laying and incubation occurring in February and March. Young are reared throughout April, May, and June. Fledging occurs in July and August.

3.1.2 Species Occurrence

There are no bald eagle nest sites within the project vicinity. Bald eagle use of the project vicinity is restricted to migration and wintering (November through March). Approximately 20-100 bald eagles regularly winter along the Columbia River in the Columbia Basin (Annear pers. comm.,

11 July 1991). Winter surveys in 1992-93 estimated 25-30 bald eagles in the project vicinity (Kirsch pers. comm., 22 Oct. 1993). The Columbia River and associated bays that do not freeze in the winter provide food availability for bald eagles. Fish are available as prey as long as river flows are not excessive and turbidity does not increase to a level where fish cannot be seen in the water. Waterfowl are also abundant in the project vicinity during the winter and likely provide an important food source. The bays and ponded embayments (e.g., Messner Pond) present in the area provide foraging habitat in areas of slow or slack waters.

No studies of bald eagle use of Messner Pond have been conducted, but bald eagles have been occasionally observed foraging at Messner Pond during the winter. Based on general observations, bald eagle use of Messner Pond likely averages about 1-3 birds for 2-3 days per week (Kirsch pers. comm., 22 October 1993). This use is dependent upon the availability of open water to attract waterfowl and provide access for foraging on fish.

Two principal winter roosts are located in the project vicinity. One is west of the town of Irrigon, approximately 0.5-mile from the Columbia River and 8 miles from the project area. The other is southwest of Boardman near Kunzie Road, approximately 1.5-miles from the Columbia River and 2 miles from the project area (Kirsch, pers. comm., 22 Oct. 1993). In addition to these roosts, a large cottonwood tree on the Columbia River north of the Port of Morrow office is occasionally used. This tree is approximately 1 mile from the cogeneration facility. The Boardman roost is a grove of old cottonwood trees that extends for 3-4 miles and the location and use of roosting bald eagles within the grove is variable.

3.2 PEREGRINE FALCON

3.2.1 Natural History

The peregrine falcon is almost exclusively a cliff-nesting species, usually nesting near water. Preferred nest sites are sheer cliffs 150 feet or more in height with a small cave or overhung ledge. Availability of nest sites may be a limiting factor in some areas. Acceptable surrounding habitat includes a broad range of cover types (Pacific Coast Peregrine Falcon Recovery Plan 1982).

Peregrine falcons forage over wide areas, but often utilize the same locations regularly (e.g., waterfowl concentration areas) if prey is readily available. Frequently utilized foraging habitats include marshes, shorelines of bodies of water, wooded areas adjacent to water, and grasslands. The presence of diverse or abundant prey and the ease of prey capture probably dictate the choice of foraging habitat. In winter, coastal estuaries and interior wetlands often attract wintering peregrine falcons (Pacific Coast Peregrine Falcon Recovery Plan 1982).

The diet of the peregrine falcon consists almost exclusively of birds. In the western U.S., preferred prey species during the breeding season include rock dove (Columba livia), mourning dove (Zenaida macroura), and band-tailed pigeon (Columba fasciata) when they are available (Pacific Coast Peregrine Falcon Recovery Plan 1982). During winter, shorebirds and waterfowl are the principal prey. Large passerines (e.g., jays, robins) are also preyed upon.

3.2.2 Species Occurrence

Peregrine falcon use of the project vicinity is during migration only. The Umatilla National Wildlife Refuge lists the peregrine falcon as rare in its bird checklist. Usually 2-3 birds occur on the refuge during spring and fall migrations and they remain in the area for about two weeks (Annear pers. comm., 11 July 1991). No peregrine falcons have been reported around Messner Pond, although an occasional bird may utilize the area.

3.3 SNAKE RIVER SPRING/SUMMER CHINOOK SALMON

3.3.1 Natural History

For detailed information on the Snake River spring/summer chinook salmon, see Matthews and Waples (1991) and 56 Federal Register 29542 (June 27, 1991). The Snake River spring and summer chinook ESU is comprised of 15 metapopulations in major subbasins and Salmon River tributaries, and segregated into more than 30 subpopulations. Most salmon enter individual subbasins from May through September. Juvenile Snake River spring/summer chinook salmon begin emerging from the gravel from February through June (Perry and Bjornn 1991). Typically, after rearing in their nursery stream for about one year, smolts begin their seaward migration in April through May (Cannamela 1992). Adult Snake River spring/summer chinook salmon migrate past Bonneville Dam from March through July.

The timing of the different components of the spring/summer chinook salmon smolt migration varies greatly at Lower Granite Dam and encompasses virtually the entire spring and early summer migration period. Wild summer chinook salmon are present and peak with hatchery-reared spring chinook salmon in late April. Hatchery-reared summer chinook salmon typically peak during the mid-migration period in early May. The latest and most protracted outmigrations are of wild spring chinook salmon. Although they are present in small numbers throughout the entire outmigration, most are detected from mid-May to mid-June (Matthews et al. 1990). Run timing can be expected to vary somewhat each year due to differing environmental conditions. After reaching the mouth of the Columbia River, it is believed that spring/summer chinook salmon inhabit nearshore areas before beginning their northeast Pacific Ocean migration which lasts two to three years.

3.3.2 Species Occurrence

The estimated annual number of wild adult Snake River spring/summer chinook salmon passing over Lower Granite Dam averaged 9,674 from 1980 through 1990, with a low count of 3,343 in 1980 and a high count of 21,870 in 1988 (Matthews and Waples 1991). Estimated wild adult

Snake River spring/summer chinook salmon passing over Lower Granite Dam in 1991 was 8,457, and the preliminary estimate for 1992 was 4,260.

Snake River spring/summer chinook juvenile migrate past the McNary Dam between approximately April 20-June 30 (Ross 1993). The Fish Passage Center provided data on the number of chinook passing at the McNary Dam. However, as described in Section 1.4, these data do not differentiate between hatchery-reared and natural stocks of chinook, nor do they differentiate between mid-Columbia and Snake River stocks of chinook. Approximately 1.8 million yearling and 1.2 million subyearling chinook salmon were counted at McNary Dam from April through June 1993. According to Dave Marvin of the Fish Passage Center (pers. comm., 1 Nov. 1993), most of these fish would be from mid-Columbia stocks.

3.4 SNAKE RIVER FALL CHINOOK SALMON

3.4.1 Natural History

For detailed information on the Snake River fall chinook salmon, see Waples et al. (1991b) and 56 Federal Register 29542 (June 27, 1991). The Snake River fall chinook ESU is comprised of a single stock, consisting of all naturally spawning fall chinook in the mainstem Snake River and the lower reaches of major tributaries from Lower Granite pool to Hells Canyon Dam; plus the Lyons Ferry hatchery population, presumably derived from that natural stock. Fall chinook salmon generally spawn from October through November and fry emerge from March through April. Downstream migration generally begins within several weeks of emergence with juveniles rearing in backwaters and shallow water areas through mid-summer prior to smolting and migration. Adult Snake River fall chinook salmon enter the Columbia River in July and migrate into the Snake River from August through October.

Juvenile fall chinook salmon begin arriving at Lower Granite Dam in mid-May, but most pass this site in June and July (Fish Passage Center 1992). Subyearlings are present in the Columbia River estuary from June to October. Approximately 80 percent of all juveniles enter the Columbia River estuary from April through September (Dawley 1986). They will spend one to four years in the Pacific Ocean before beginning their spawning migration.

3.4.1 Species Occurrence

Snake River fall chinook juveniles migrate past the McNary Dam in July and early August. Estimated wild Snake River fall chinook salmon returning to Lower Granite Dam in 1992 was 533 (LaVoy 1993). As discussed in Section 3.3.2 above, no reliable estimates are available for Snake River stocks of chinook salmon counted at McNary Dam.

3.5 SNAKE RIVER SOCKEYE SALMON

3.5.1 Natural History

For detailed information on the Snake River sockeye salmon see Waples et al. (1991a) and 56 Federal Register 58619 (November 20, 1991). Snake River sockeye salmon adults enter the Columbia River primarily during June and July. Arrival at Redfish Lake (Idaho), which now supports the only remaining run of Snake River sockeye salmon, peaks in August and spawning occurs primarily in October (Bjornn et al. 1968). Eggs hatch in the spring between 80 and 140 days after spawning. Fry remain in the gravel for 3 to 5 weeks, emerging in April and May and moving immediately into the lake, where juveniles feed on plankton for 1-3 years before migrating to the ocean (Bell 1986). Migrants leave Redfish Lake from late April through May (Bjornn et al. 1968), and smolts migrate almost 900 miles (1440 kilometers) to the Pacific Ocean.

Passage at Lower Granite Dam (the first Snake River Dam in the juveniles' migration) ranges from late April to July, with peak passage from May to late June (Fish Passage Center 1992). During the early summer months, smolts remain inshore or within the Columbia River influence. Later, they migrate through the northeast Pacific Ocean. Snake River sockeye salmon usually spend two to three years in the Pacific Ocean and return in their fourth or fifth year of life.

Recently, scientific evidence has mounted which indicates that there is a residual population of sockeye salmon in Redfish Lake that is part of the ESU listed by NMFS as an endangered species. Therefore, this population is subject to all the protection, prohibitions, and requirements of the Endangered Species Act that apply to Snake River sockeye salmon (March 19 1993 letter from N. Foster (NMFS) to Federal agencies).

3.5.2 Species Occurrence

Escapement of Snake River sockeye salmon to the Snake River has declined dramatically in recent years. Counts made at Lower Granite Dam since 1975 have ranged from 531 in 1976 to 0 in 1990. In 1988, the Idaho Department of Fish and Game conducted spawning ground surveys that identified four adults and two redds. In 1989, one adult reached Redfish Lake and one redd and a second potential redd were identified. No redds or adults were identified in 1990. In 1991, three males and one female returned to Redfish Lake. One male returned to Redfish Lake in 1992.

Of the approximately 1 million sockeye salmon counted at McNary Dam between April and August 1993, only a miniscule portion is from the Snake River stock (Marvin pers. comm., 1 Nov. 1993).

4.0 EFFECTS OF IMPLEMENTATION

4.1 DIRECT MORTALITY

Bald eagles and peregrine falcons will likely avoid the project area during construction. This will preclude any potential for direct mortality of these species during construction of the project. During operation of the project, electrocution of bald eagles or peregrine falcons is unlikely due to the configuration of the 500-kV towers (see Section 6.0).

Juvenile mortality of salmon species in the Columbia River can be attributed to flow and flow-related problems such as temperature, predation by other species such as squawfish, illegal harvest, and spill and turbine-related mortalities. Primary sources of mortality for adult salmon in the Columbia River include delayed migration because of dam facilities and operations, fallback through turbines, and illegal harvest. The lack of impact on waters of the Columbia River by the project in any of the aforementioned manners precludes any potential for direct mortality of listed salmon species.

4.2 VISUAL DISTURBANCES

Construction activity may be visible to bald eagles foraging at Messner Pond. Bald eagle use of Messner Pond could be inhibited during construction due to visual disturbances associated with construction activity at the cogeneration facility site or along the transmission line. However, estimated bald eagle use of the pond is low (2-3 days per week). As well, visual disturbances associated with trains and trucks currently exist adjacent to the pond, and recreational use presently occurs within and adjacent to the pond. Thus, visual disturbances resulting from construction activities are not anticipated to adversely impact foraging bald eagles. Visual disturbances during operation of the cogeneration plant are not expected as foraging bald eagles are likely to become acclimated to the sight of stationary buildings and routine activities that are similar to other industrial operations ongoing in the area.

The nearest communal roost (Kunzie Road) is located approximately 2 miles southwest of the construction zone, and is out of line-of-site. An occasionally used roost tree on the Columbia

River north of the Port of Morrow Office is approximately 1 mile west of the construction zone. Thus, the closest distance between a roost site and the construction zone exceeds the recommended buffer distance (0.25 mile). The distance of the project facilities from known roost sites precludes any adverse impacts on roosting bald eagles from visual disturbances during construction or operation of the facility.

The rarity of occurrence of the peregrine falcon minimizes the likelihood of any adverse impacts from visual disturbances during construction or operation of the project. The proposed action will not result in visual disturbance to listed salmon species.

4.3 NOISE DISTURBANCES

Bald eagles are known to be sensitive to human presence and some levels of noise disturbance. However, there can be a high degree of variability in the reactions of individual birds depending on their past experience, the degree and type of impact, and the time of the year. Little is known about the impacts of auditory disturbances on bald eagles, and most of the available information refers to nesting birds. Bottorf et al. (1987) reported that no wintering bald eagles perched within 0.5 mile of construction activities despite their presence in the area prior to construction. In general, Steenhof (1978), Watson and Anthony (1986), and others have noted that bald eagles are more tolerant of disturbance at foraging sites than at nests or resting sites.

Acoustical tests conducted in early January 1993 (see Appendix G of the ASC) determined that existing noise levels at the west end of Messner Pond (worst-case scenario) averaged 38 dBA (range of 35 - 42 dBA) over a 24-hr period. Projected peak noise level at the same location during construction is estimated to be 68 dBA (up to an estimated four hours per day on days when air compressors and pumps are used). This projected noise level for construction slightly exceeds the guidelines of 65 dBA and 10 dBA above existing levels. However, several conservative factors inherent in the analysis lessen the potential that this slight exceedance will result in an adverse impact on foraging bald eagles during construction. These include: the analysis was a worst case scenario in which estimated peak noises were utilized, the noise levels were measured at the western edge of the pond (the most proximate point to the cogeneration facility) and further attenuation of sound to the middle or eastern side of the pond may result in noise levels below the guidelines, the

peak noise levels result primarily from compressors and water pumps which are anticipated to be used for up to four hours a day only, and the present estimated level of eagle use of the pond is low and intermittent (2-3 days/week).

Projected peak noise level at the same location during the operation of the facility is estimated to be 57 dBA, well below the guidelines. Thus, no adverse effects are anticipated for bald eagles foraging at Messner Pond from noise disturbances during operation of the facility.

Peregrine falcons are known to be sensitive to human disturbance, but like the bald eagle, a high degree of variability exists between the reactions of individual birds. All of the information on reaction to noise disturbance is based on sensitivity to disturbance at nest sites. The rarity of occurrence of the peregrine falcon minimizes the likelihood of any adverse impacts from auditory disturbances during construction or operation of the project.

The proposed action will not result in auditory disturbance to listed salmon species.

4.4 HABITAT MODIFICATION AND LOSS

No bald eagle nesting or roosting habitat will be lost as a result of implementation of the project. No loss of eagle foraging habitat will occur. Foraging areas are outside of the limits of the construction zone. No potential nest, roost, or perch trees will be removed or disturbed during construction. No trees in the construction zone have been identified as bald eagle feeding or loafing perches.

There is no peregrine falcon nesting habitat within the project area, thus no nesting habitat will be lost or altered as a result of implementation of the project. The loss of 14 acres at the plant site will not adversely affect foraging peregrine falcons since the site is depauperate in avian species and is not likely to attract foraging peregrine falcons.

Implementation of the proposed action will not result in modification or loss of habitat for the listed salmon species. There will be no impact to Columbia River flow or dam operations, nor will riparian habitat along the river be impacted. All water required for this project will be

supplied by the Port of Morrow water system, with the City of Boardman water system as a supplement. The project will receive water from ground water wells, not directly from the Columbia River. Primary natural sources of recharge to the alluvial groundwater system are precipitation and loss from surface water (Exhibit O of the ASC, PGE 1993). Alluvial aquifers in the project area are highly connected to the Columbia River, although the ultimate effect of shallow alluvial wells adjacent to the Columbia River on streamflow is not known at this time. Even assuming direct interconnection with the river, water requirements will be less than 0.009 percent of flow in the Columbia River (based on maximum theoretical project needs and minimum daily river flow recorded in the 1992 water year for The Dalles gaging station [U.S Geological Survey 1992]).

No impacts to the water quality or quantity of the Columbia River are anticipated from the project. Sanitary wastewater and stormwater runoff will be piped to the existing City of Boardman's sanitary wastewater system, with pretreatment as necessary. Process wastewater will be discharged to the Port of Morrow industrial wastewater system. This existing system is a reuse irrigation land application system that is covered by an Oregon Department of Environmental Quality permit.

4.5 IMPACTS ON FORAGING AND FOOD SUPPLY

The presence of trees or snags for use as perches is an important feature of bald eagle foraging habitat; eagles seem to prefer to hunt where perches are available. All known foraging areas are outside the construction zone and no known perch trees will be removed or otherwise physically disturbed by the project.

The project will not affect bald eagle food resources. Waterfowl and fish populations will not be reduced or permanently displaced by construction activities. Furthermore, measures will be taken to prevent water quality impacts which could adversely affect fish resources. During facility operation, no project wastestreams will be directed to Messner Pond (see Exhibit M of the ASC [PGE 1993]). Sanitary wastewater and stormwater runoff will be directed to the City of Boardman sanitary wastewater system, with pretreatment as necessary. Process wastewater will be discharged to the existing Port of Morrow industrial wastewater system. During facility construction, stormwater

runoff will be directed to a temporary, lined settling pond. Water outflow from the settling pond will be discharged to Messner Pond after suspended solids have settled and the water is clear.

Noise and visual disturbance from construction activities may result in eagles avoiding the project area and construction zone. However, during the nonbreeding season, territories are not actively defended; at this time, bald eagles often fly greater distances for food, and often forage together where food is abundant. As a result, the potential impact to foraging from project construction during the non-breeding season is not as critical.

McGarigal (1988) recommends protection of *prime* feeding sites with buffer zones to prevent bald eagle avoidance. A buffer of 1,312 feet is thought to provide 95% protection from moving disturbance and 50% protection from stationary disturbance. This buffer is recommended to be extended for sensitive bald eagle pairs to 2,624 feet. Messner Pond is not considered a prime feeding site for wintering eagles based on its low and intermittent use (see Section 4.3). Thus, a minimum buffer of 2,624 feet will be maintained for this project.

Steenhoff (1978) suggests that bald eagles generally tend to be more tolerant of human activities and disturbance in foraging areas than when loafing or roosting. The area around Messner Pond is currently subjected to considerable noise and visual disturbance so it is expected these birds are acclimated to some levels of disturbance. Further, little foraging activity occurs when construction activities will be at their peak; foraging generally occurs before 10:00 a.m. and during the two hours before sunset.

Implementation of the proposed action will not result in adverse impacts on foraging or food supply for the listed salmonid species. There will be no impact to Columbia River flow or dam operations, nor will riparian habitat along the river be impacted. Although migrating adult salmon generally do not feed, there will be no project impacts to foraging or potential food supply.

4.6 CUMULATIVE IMPACTS

Cumulative impacts result from future non-Federal actions (Federal actions are subject to the same consultation requirements as this action, thus are not considered cumulative to the

proposed action) that are reasonably certain to occur within the project vicinity of the proposed action. No future non-Federal actions were identified, although expansion of the Port of Morrow Industrial Park and the City of Boardman are likely to occur. Actions on private and other public lands include industrial, agricultural, and recreational activities. It is anticipated that such activities will continue to occur, although the rate and frequency cannot be predicted.

5.0 ADHERENCE TO REGULATORY GUIDELINES

The proposed action be consistent with impact goals established in the Pacific Bald Eagle Recovery Plan (USFWS 1986). This project conforms to recommendations in USFWS (1981) and (1986) for protection of perch trees, communal roosts, and key wintering areas. The proposed action will also be consistent with goals established in the Pacific Coast Peregrine Falcon Recovery Plan (USFWS 1982).

The proposed activity will not jeopardize the continued existence of endangered or threatened Snake River salmon species. As well, the proposed activity will not impact critical habitat of the listed salmon species.

6.0 CONSERVATION MEASURES

The following measures will be implemented to minimize potential adverse effects on species addressed in this Biological Assessment:

1. Because phase-to-phase and phase-to-ground distances of the 500-kV transmission lines and towers are greater than the wing span of eagles and peregrine falcons, electrocution of these species will not be a concern. If, for some unforeseen reason, an individual tower creates a hazard, appropriate mitigation measures will be taken (erection of perch guards or modification of the lines as described in Olendorff et al. 1981) to eliminate the hazard.
2. Construction workers will receive information regarding the importance of keeping habitat modification and visual and auditory disturbances to a minimum.
3. Trees will be planted in the spring of 1994 along the west shore of Messner Pond (between the pond and the cogeneration facility) to provide a visual and auditory buffer for foraging bald eagles. Immediately west of and adjacent to the existing riparian zone of Russian olive, three rows of Lombardy poplar (Populus nigra) or hybrid poplar and one row of black locust (Robina pseudo-acacia) (or similar species) will be planted at 10-foot intervals for a distance of approximately 600 feet. The plantings will extend north-south from the railroad embankment to the existing gravel pond and will occupy much of the area currently covered by young Russian olive and other saplings. Irrigation will be provided for as long as necessary to ensure survival of the transplants.
4. If it is determined that actions during construction or operation of the facility are adversely affecting the listed species addressed in this document, appropriate measures will be implemented in consultation with the USFWS and/or NMFS to minimize or avoid the affect.
5. Messner Pond will be protected from potential water quality degradation resulting from stormwater runoff. During facility construction, surface runoff from the construction zone will be directed to a temporary sedimentation pond (see Exhibit M of the ASC [PGE

1993)). Water outflow from the settling pond will flow to Messner Pond after suspended solids have settled out and the water is clear. During facility operation, stormwater runoff will be discharged to the City of Boardman sanitary system.

7.0 CONCLUSIONS

It is anticipated that no adverse impacts to bald eagles will occur as a direct result of implementation of the proposed action. This conclusion is based upon strict adherence to the conservation measures outlined in Section 6.0. The project will not result in loss or modification of bald eagle habitat and is not expected to result in direct mortality or visual disturbances. Worst-case scenario of noise disturbances during construction may result in the avoidance of Messner Pond. However, several factors lessen the potential of this causing an adverse effect on bald eagles.

Implementation of the proposed action is not expected to result in adverse impacts on the peregrine falcon. The lack of nesting habitat and the rarity of the species in the project area minimize the likelihood of any adverse impacts.

Implementation of the proposed action will not alter flow in the Columbia River and will not modify any physical or biological features of the habitat for the listed salmon species. Implementation of the proposed action is not expected to result in direct mortality or adverse disturbance (visual or auditory) to the listed species addressed in this document.

Based on the preceding documentation of findings, it is concluded that the proposed action "may effect, but is not likely to adversely effect" individuals or populations of the bald eagle or its habitat. It is also concluded that the proposed action "will not effect" individuals or populations of the peregrine falcon, Snake River spring/summer chinook salmon, Snake River fall chinook salmon, and Snake River sockeye salmon or their habitat. These conclusions are based on strict adherence to the conservation measures described herein, and are subject to subsequent review by the Endangered Species Branch of the USFWS and NMFS for compliance with the Endangered Species Act.

A time period separates the preparation of this Biological Assessment and the proposed start of construction. The conclusions and conservation measures outlined in this assessment are based on information available as of October 1993. If new information about listed species is available prior to construction, the potential impact of construction and operation of the project will be reevaluated, in consultation with the USFWS and/or NMFS, and if necessary, an addendum will be prepared to this document for concurrence with the determination of effect.

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9.0 APPENDIX - COMMUNICATIONS RECEIVED FROM FEDERAL AGENCIES

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Station
2600 S.E. 98th Avenue, Suite 100
Portland, Oregon 97266

November 16, 1992

Ref: 1-7-93-SP-40

Bob Altman
Beak Consultants
317 SW Alder, Suite 800
Portland, OR 97204-2583

Dear Mr. Altman:

This is in response to your letter, dated November 2, 1992, requesting information on listed and proposed endangered and threatened species that may be present within the area of the proposed Port of Morrow Cogeneration facility. The U.S. Fish and Wildlife Service (Service) received your letter on November 3, 1992.

We have attached a list (Attachment A) of threatened and endangered species that may occur within the project area. The list fulfills the requirement of the Service under Section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 et seq.). The Federal Energy Regulatory Commission's (FERC) requirements under the Act are outlined in Attachment B.

Should your biological assessment determine that a listed species is likely to be adversely affected by the project, the FERC should request formal Section 7 consultation through this office. We would appreciate receiving a copy of the biological assessment even if it shows a "no effect" or "beneficial effect" situation.

Attachment A includes a list of candidate species under review for listing. These candidate species have no protection under the Endangered Species Act but are included for consideration as it is possible candidates could become formal proposals and be listed before project completion. Therefore, if the proposed project may affect candidate species, you are not required to perform a biological assessment or to consult with the Fish and Wildlife Service. However, if early evaluation of the project indicates that it is likely to adversely impact a candidate species, you may wish to request technical assistance from this office.

Attachment A only lists species occurring in the State of Oregon. To obtain information on species in the State of Washington contact the Service's Olympia Field Office, 3704 Griffin Lane SE, Suite 102, Olympia, Washington 98501-2192. Your site radius may also include threatened or endangered fish species under the jurisdiction of the National Marine Fisheries Service (NMFS). Additional information on fish species may be obtained from NMFS in Portland, (503)230-5419.

Your interest in endangered species is appreciated. If you have questions regarding FERC's responsibilities under the Act, please contact Diane Sotak at (503) 231-6179. All correspondence should include the above referenced case number.

Sincerely,

for Russell D. Peterson
Field Supervisor

231-6179

Attachments

DS/lc/SP40FERC.LTR

cc: PFO-ES
BFO-SE
ODFW (Nongame)
ONHP
NMFS, Portland
USEWS, Olympia, WA 98501-2192

LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND
CANDIDATE SPECIES THAT MAY OCCUR IN THE AREA OF THE PROPOSED
PORT OF MORROW COGENERATION FACILITY
1-7-93-SP-40

LISTED SPECIES^{1/}Birds

Bald eagle	<i>Haliaeetus leucocephalus</i>	T
Recorded occurrence:	T2N R24E Sec. 4	
	T5N R26E Sec. 30	

PROPOSED SPECIES

None

CANDIDATE SPECIES^{2/}Birds

Ferruginous hawk	<i>Buteo regalis</i>	
Recorded occurrence:	T2N R25E Sec. 22	
	T3N R24E Sec. 34	

Long-billed curlew	<i>Numenius americanus</i>	C2
Recorded occurrence:	T1N R25E Sec. 2	3C
	T2N R24E Sec. 18	
	T2N R25E Sec. 6	
	T3N R25E Sec. 5	
	T3N R26E Sec. 28	
	T4N R27E Sec. 9	
	T5N R26E Sec. 30	
	T3N R28E Sec. 2	
	T4N R27E Sec. 9	
	T5N R28E Sec. 23	

Plants

Laurence's milk-vetch	<i>Astragalus collinus</i> var. <i>laurentii</i>	C2
Recorded occurrence:	T2N R26E Sec. 18	

Columbia cress	<i>Rorippa columbiae</i>	C2
Recorded occurrence:	T5N R28E Sec. 18	

Thompson's sandwort	<i>Arenaria franklinii</i> var. <i>thompsonii</i>	3B
Recorded occurrence:	T4N R28E Sec. 11	

(E) - Endangered (T) - Threatened (CH) - Critical Habitat

- (C1)- Category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.
- (C2)- Category 2: Taxa for which existing information indicates may warrant listing, but for which substantial biological information to support a proposed rule is lacking.
- (3A)- Category 3A: Taxa for which the Service has persuasive evidence of extinction.
- (3B)- Category 3B: Names that on the basis of current taxonomic understanding do not represent taxa meeting the Act's definition of "species."
- (3C)- Category 3C: Taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

^{1/} U. S. Department of Interior, Fish and Wildlife Service, July 15, 1991, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12.

^{2/} Federal Register Vol. 56, No. 225, November 21, 1991, Notice of Review-Animals

^{3/} Federal Register Vol. 55, No. 38, February 21, 1990, Notice of Review-Plants

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

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 insure 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 they have determined if their 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 adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Major Construction Projects ^{1/}

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 are/is 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, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. 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 on-site 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 for 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 FWS, National Marine Fisheries Service, State conservation departments, 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. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

^{1/}A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332.(2)c). On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Portland Field Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266

OCT 20 1993

October 19, 1993

Ref: 1-7-93-SP-40.B

Nancy Munn
Beak Consultants
317 S.W. Alder, Suite 800
Portland, OR 97204-2583

Dear Ms. Munn:

This is in response to your letter, dated September 16, 1993, requesting concurrence on your list of endangered, threatened, and candidate species for consideration at Coyote Springs Cogeneration Plant in Morrow County, Oregon. The U.S. Fish and Wildlife Service (Service) received your letter on September 17, 1993. The following comments are provided as an addendum to our letter dated November 16, 1992 (Case No. 1-7-93-SP-40).

We have reviewed your list and have two additional species to recommend, Chinook salmon (*Oncorhynchus tshawytscha*)--Spring/summer and fall runs in the Snake River, and Snake River Sockeye salmon (*Oncorhynchus nerka*)--Salmon River tributary to the Snake river, Idaho. Provided the inclusion of the two aforementioned fish species, your current list fulfills the requirement of the Service under Section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 USC 1531 et seq.). Your requirements under the Act are outlined in Attachment B.

Should the Federal Energy Regulatory Commission's (FERC) biological assessment determine that a listed species may be affected by the project, FERC should consult with the Service following the requirement of Federal Regulation 50 CFR 402 which implement the Act.

If you have questions regarding your responsibilities under the Act, please contact Diana Hwang at (503) 231-6179. For questions regarding anadromous fish, please contact National Marine Fisheries Service, 911 NE 11th Ave., Room 620, Portland, Oregon, (503) 230-5420. All correspondence should include the above referenced case number. Your interest in endangered species is appreciated.

Sincerely,

for Russell D. Peterson
State Supervisor

Attachments

SP40.B

ONHP/DH/mh

cc: PFO-ES
BFO-SE
ODFW (Nongame)
ONHP

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTIONS 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

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 insure 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 they have determined if their 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 adverse modification of proposed Critical Habitat.

SECTION 7(c) - Biological Assessment for Major Construction Projects ^{1/}

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 are/is 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, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. 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 on-site 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 for 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 FWS, National Marine Fisheries Service, State conservation departments, 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. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

^{1/}A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332.(2)(c)). On projects other than construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.

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

February 9, 1993

Bob Altman
Beak Consultants, Inc.
317 S.W. Alder, Suite 800
Portland, Oregon 97204-2583

FILE COPY
PROJECT J 73624
TASK 1 341

FEB 1993

FWS Reference: 1-3-93-TA-260

Dear Mr. Altman: *new ref no. 1-3-93-SA-930*

This is in response to your letter dated December 17, 1992, and received in this office on December 21. Enclosed is a list of proposed species and candidate species (Attachment A) that may be present within the area of the proposed construction of the Port of Morrow Cogeneration facility near the Umatilla National Wildlife Refuge in Benton County, Washington.

We are providing this information to assist you in determining possible impacts to species of federal concern. Should there be future federal agency involvement with this project (through funding, permitting, licensing, or other authorization), then the involved federal agency will be required to assure that its responsibilities under Section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act), are met. We are also enclosing an outline of those responsibilities for your information (Attachment B).

To the best of our present knowledge, there are no listed species occurring within the area of the subject project. However, there are proposed species and/or proposed critical habitat, and candidate species which may occur in the vicinity of the project. Should a species become officially listed before completion of your project, and should there be federal involvement with your project at that time, the involved federal agency will be required to reevaluate its responsibilities under the Act.

Since listed species are not found within the project area, under Section 7(c) of the Act, the involved federal agency would not be required to address impacts to proposed species and/or proposed critical habitat. However, it would be in the best interests of the involved federal agency to address impacts to such species or habitat, since the listing process should be completed within a year. Information gathered on proposed species or proposed critical habitat could be used to address consultation needs should the species be listed or critical habitat designated.

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.

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.

We appreciate your concern for endangered species. If you have any questions regarding the Act, please contact Jim Michaels or Richard Carlson of this office at the letterhead phone/address.

Sincerely,

A handwritten signature in black ink, appearing to read "David C. Frederick", with a large, stylized flourish at the end.

David C. Frederick
State Supervisor

rc/kr

Enclosures

SE/1-3-93-TA-260/Benton

c: WDW, Olympia (Nongame)

WNHP, Olympia

Attachment A

**LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES AND
CANDIDATE SPECIES WHICH MAY OCCUR WITHIN IN THE VICINITY OF THE PROPOSED
PORT OF MORROW COGENERATION FACILITY NEAR THE UMATILLA NATIONAL
WILDLIFE REFUGE IN BENTON COUNTY, WASHINGTON
(T4N R24E S1-3, T4N R25E S2-6, T5N R24E S24-26/35/36,
T5N R25E S13-35, R5N R26E S19)**

1-3-93-TA-260

LISTED

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

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 and implementation (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

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.

Ferruginous hawk (*Buteo regalis*) - may occur in the vicinity of the project.

Loggerhead shrike (*Lanius ludovicianus*) - may occur in the vicinity of the project.

ATTACHMENT B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 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.

* "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.

U.S. FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT

OLYMPIA FIELD OFFICE
3704 GRIFFIN LANE SE, SUITE 102
OLYMPIA, WASHINGTON 98501
(206) 753-9440 FAX: 753-9008

TO: Dr. Nancy Munn

FROM: K. Swisher

SUBJECT: Species list

TOTAL PAGES: 1

MESSAGE: Please be advised that the Coyote
Sprints Species list (ref: 1-3-93-IB-260)
is still accurate, as long as the
scope and actions of the project
have remained unchanged.

new ref no 1-3-93-IB-260

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
ENVIRONMENTAL & TECHNICAL SERVICES DIVISION
911 NE 11th Avenue - Room 620
PORTLAND, OREGON 97232
503/230-5400 FAX 503/230-5435

F/NWO3

JAN 22 1993

Mr. Bob Altman, Wildlife Biologist
Beak Consultants Incorporated
317 S.W. Alder, Suite 800
Portland, Oregon 97204-2583

FILE COPY
PROJECT # 73624
TASK # 341

RE: December 17, 1992, Species List Request for the Project:
Port of Morrow Cogeneration facility near Boardman, Oregon

Dear Mr. Altman:

The National Marine Fisheries Service has completed its review of your December 17, 1992, letter requesting a list of endangered, threatened, or proposed species under the Endangered Species Act (ESA) in the subject project area.

The Columbia River in the project vicinity is utilized by Snake River spring/summer chinook salmon (threatened), Snake River fall chinook salmon (threatened), and Snake River sockeye salmon (endangered) as a migratory corridor.

You requested this species list under the authority of section 7 of the ESA. Section 7 of the ESA applies only to Federal agency actions. Action is defined in 50 CFR 402.02 as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part by Federal agencies in the United States or upon the high seas. Examples include, but are not limited to: (a) actions intended to conserve listed species or their habitat; (b) the promulgation of regulations; (c) the granting of licenses, contracts, leases, easements, rights-of-way, permits, or grants-in-aid; or (d) actions directly or indirectly causing modifications to the land, water, or air." Section 7 applies to all actions in which there is discretionary Federal involvement or control (50 CFR 402.02).

If the subject action is not a Federal action meeting this definition, section 7 does not apply. However, you may want to consider whether an ESA section 10(a)(1)(B) permit for nonfederal incidental take is warranted.

Please direct any questions regarding this project to Valerie Elliott, of my staff, at (503) 230-5432.

Sincerely,

Merritt E. Tuttle
Division Chief

Metric Conversion Chart

Symbol	When You Know Number Of	Multiply By	To Find Number Of	Symbol
in	inches	25.4	millimeters	mm
ft	feet	0.3048	meters	m
yd	yards	0.9144	meters	m
mi	miles	1.6093	kilometers	km
yd ²	square yards	0.8361	square meters	m ²
ac	acres	0.4046	hectares	ha
yd ³	cubic yards	0.7645	cubic meters	m ³
lb	pounds (avdp)	0.4535	kilograms	kg
° F	degrees Fahrenheit	5/9 (after sub- tracting 32)	degrees Celsius	° C
m	meters	3.2808	feet	ft
km	kilometers	0.6213	miles	mi
m ³	cubic meters	263	gallons	gal.
hm	hectometers	263,000,000	gallons	gal.
ha	hectares	2.4710	acres	ac
kg	kilograms	2.2046	pounds (avdp)	lb
° C	degrees Celsius	9/5 (then add 32)	degrees Fahrenheit	° F
kg	kilograms	1000	metric tons (tonnes)	t

Gas (heat) Conversions

1050 British Thermal Units (BTUs) = 1 cubic foot of gas

105,000 BTUs = 100 cubic feet of gas

95 cubic feet of gas = 1 therms

1 therm = 100,000 BTUs

414194

FILMED

DATE

END