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SUMMARY

UNDERLYING NEED FOR ACTION

Electrical consumers in the Pacific Northwest and Western states need increased power production to serve increasing demand, and high-voltage transmission services to deliver that power.

BACKGROUND

The Umatilla Generating Company, L.P., a Delaware limited partnership, proposes to construct a gas-fired combined cycle electric power generation plant near Hermiston, Oregon. The plant would have a nominal generation capacity of 550 megawatts (MW). Electric power from the proposed plant would enter the regional grid at the Bonneville Power Administration's McNary Substation. The Umatilla Generating Company, L.P. has requested that Bonneville Power Administration provide the necessary electrical connection at the McNary Substation. Providing the connection triggers the requirement for the Bonneville Power Administration to conduct an environmental analysis pursuant to the National Environmental Policy Act (NEPA). Bonneville Power Administration (BPA) has prepared this environmental impact statement to fulfill that requirement.

RELATED STATE ACTIONS

Oregon does not have a state law equivalent to NEPA. Instead, environmental review is conducted through the state's energy facility siting procedures. Before construction of an energy facility is approved in Oregon, the Energy Facility Siting Council (EFSC) must find that the proposed facility meets certain standards, including environmental standards, pursuant to Oregon Administrative Rule Chapter 345, Division 21, Section 045. If satisfied that a proposed project meets the standards, the EFSC issues a Site Certificate that permits the project to be built.

In 1995, the Umatilla Generating Company, L.P. proposed to build a 481-MW power plant at the same site as the currently proposed 550-MW plant. An application for a site certificate was submitted to the Energy Facility Siting Council in July 1995, but before a certificate could be issued the Umatilla Generating Company requested that its processing be delayed. After modifying the proposed project somewhat, the Umatilla Generating Company, L.P. submitted an amended application for a site certificate in February 2001. Review of the amended application by state agencies will proceed concurrent with the NEPA review process.

SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

This environmental impact statement contains an evaluation of two primary alternatives: the proposed action and the No Action Alternative. In the No Action Alternative, BPA would decide not to provide a connection to the regional electric power transmission grid for the proposed Umatilla Generating Project. In the proposed action, BPA would provide a connection to the regional grid for the Umatilla Generating Project at the McNary Substation. Without access to the grid, the proposed Umatilla Generating Project would not be feasible. Thus, in the No Action Alternative, the Umatilla Generating Project would not be built. A summary of the predicted performance of the proposed action and no action alternatives in accordance with technical, economic and environmental decision factors is provided in Table S-1.

COMPONENTS OF THE PROPOSED ACTION

The principal components of the proposed action are as follows:

- modifications to the McNary Substation to accommodate power from the Umatilla Generating Project

- a new 550-MW gas-fired combined-cycle electric power generation plant located on lands zoned for industrial purposes near Hermiston, Oregon

- approximately 11 miles (18 kilometers) of reconductored electric power transmission line and approximately one-half mile (0.8 kilometers) of new electric power transmission line on new power poles

- up to five miles (eight kilometers) of new natural gas pipeline to deliver fuel to the proposed power plant site

- approximately one-third mile (one-half kilometer) of new pipeline to deliver raw water to the proposed power plant site

- approximately three miles (five kilometers) of new pipeline on Madison Farms property, including the short pipeline between the proposed power plant site and the Hermiston Generating Plant, used to deliver reclaimed water from the proposed power plant for irrigation of cropland

MAJOR CONCLUSIONS

The Umatilla Generating Project would have no significant adverse effects on the environment. No mitigation measures other than those included in the proposed project are necessary. The following paragraphs briefly summarize the factors leading to this conclusion.

Geology, Soils, and Seismicity

The proposed project would have minimal effects on geology, soils and seismicity. The proposed power plant would be located on a flat site. The associated natural gas, water and reclaimed water pipelines and electric power transmission lines would be located in gently sloping areas. The proposed project would not be especially vulnerable to geologic hazards and thus would not increase the overall or cumulative vulnerability of the project area to geologic hazards.

Land with soils suitable for agriculture is often consumed by urban development. The proposed power plant would be located on a 77-acre parcel of land surrounded by freeways, other roads and industrial facilities. Umatilla County has zoned the parcel for industrial and commercial use and does not intend it to be used for agricultural purposes. The proposed power plant site was formerly used as a gravel yard and currently is sparsely vegetated.

Portions of the natural gas pipeline and the reclaimed water lines would traverse lands used for agriculture. Topsoil would be removed during construction of the pipelines and replaced after pipe installation. The agricultural productivity of the land would be unaffected.

Hydrology and Water Quality

The proposed project would use water diverted from the Columbia River by the Port of Umatilla, consistent with the port's existing water rights. The Umatilla Generating Company L.P. would receive a maximum of 3.74 million gallons per day for use at the proposed project. This is about 2% of Port of Umatilla's water right. The amount of water used by the proposed project, a maximum of 3.74 million gallons per day, would be small compared to the discharge of the Columbia River in the reach near Umatilla. It would represent less than 0.005% of river discharge and consequently its diversion would have a negligible effect on downstream beneficial uses of the river.

Wastewater from the proposed project would be reclaimed and applied to cropland in an area several miles south of the proposed power plant site. Reclaimed water would be blended with surface water from another source to reduce its total dissolved solids content to a level no greater than would occur if groundwater were used for irrigation.

Vegetation

In the project area, much of the native shrub-grassland and grassland has been replaced by irrigated agriculture, industrial and commercial facilities, highways and residences. The only element of the proposed project that would permanently alter vegetative cover is the proposed power plant. The power plant would occupy about 20-acres of land that currently falls within Habitat Category 6, as established by the Oregon Department of Fish and Wildlife. Category 6 is the lowest habitat category and includes severely degraded areas of shrub-steppe and shrub-grass and developed or barren lands. The remaining habitat at the site would continue to be classified as Category 6.

The natural gas, water and reclaimed water pipelines would be primarily built in areas with low habitat value. Short sections of the natural gas and reclaimed water pipelines pass through moderate quality shrub-steppe and shrub-grass. In these areas, topsoil would be retained and replaced, and the disturbed area would be re-seeded with native vegetation.

Wildlife

Because the proposed project would not result in a permanent loss of high value habitat, it would not have an adverse impact on wildlife. Some wildlife species could be temporarily disturbed by noise and human activity during the construction period. Mitigation measures are included in the project to lessen these adverse effects.

Fish

The proposed project would have no direct effects on fish. The amount of water withdrawn from the Columbia River for the proposed project would be very small relative to river discharge. It would have a negligible effect on fish habitat.

Air Quality

The proposed project would use advanced combined-cycle gas turbine technology, clean-burning natural gas, and high-efficiency air emission control technology. Air pollutant emissions would meet or exceed current applicable emission limits.

Existing air quality in the project region is better than state and federal standards. The proposed project alone would not cause existing air quality to deteriorate significantly. It would contribute to the cumulative deterioration in air quality that is likely to result from the operation of a number of new electric power generation plants in Eastern Oregon and Washington.

Traffic and Circulation

The proposed project would create approximately 10 permanent jobs and an estimated 40 trips per day. The small increase in trips on local roads associated with the proposed project would not be expected to create traffic congestion or a diminution of level of service at any affected intersections.

Visual Quality and Aesthetics

The proposed project would add a large industrial structure to a local landscape already dominated by several other large industrial structures, including the Hermiston Generating Plant, the Lamb-Weston potato processing plant, and a number of potato sheds. These structures are within one mile of the proposed project site. At times, the proposed project would emit a visible steam plume from its cooling towers. Similar plumes are emitted by the cooling towers at the Hermiston Generating Plant and the Lamb-Weston facility. The proposed project would not greatly alter or have a significant adverse effect on aesthetic qualities.

Cultural Resources

Although cultural and historic resources exist within the vicinity of the proposed project, none would be directly affected by the proposed project. One element of the project, a natural gas pipeline, would cross under the Highline Canal, an historical irrigation canal, but would not affect either its appearance or its structural integrity.

Land Use Plans, and Policies

The proposed project would be consistent with current land use plans and policies and consequently would have no adverse effect on land use. The power plant site is zoned for light industrial use, and related or supporting facilities cross different zones.

Socioeconomics

The proposed project would create approximately 10 full-time jobs that could cause a very small in-migration of skilled workers and a small increase in local population. It would contribute to the current moderate population and economic growth rate in Umatilla County.

Public Services and Utilities

The proposed project would result in a substantial increase in the local property tax base but very little increase in the demand for public services. Consequently, the proposed project would provide funding for of a better level of public services than are available today.

Health and Safety

Some elements of the proposed project could potentially increase risk to public health and safety. They include the transmission of natural gas in an underground pipeline and use and storage of hazardous chemicals. Although safety features would be built into the proposed project to reduce hazards to public health and safety, the risk of accidents cannot be completely eliminated. The same is true for all existing and future industrial facilities in the area. Thus, the proposed project and other industrial facilities in the vicinity pose some cumulative risk to public health and safety.

The proposed project would be a new source of noise but one that complies with Oregon's noise control regulations. Other significant noise sources in the vicinity of the site include the Hermiston Generating Plant, traffic on Interstate Highways 82 and 84, and trains on the Union Pacific Railroad line.

Oregon's noise control regulations limit noise levels at residences and other sensitive noise receptors. The proposed project would not cause noise levels to exceed applicable standards at the residences nearest to the proposed project.

The proposed project would cause an increase in electric and magnetic fields at some locations close to the reconductored transmission line.

AREAS OF CONTROVERSY

The proposed project does not appear to be controversial. Approximately 30 people attended the scoping meeting including representatives of BPA and the project proponent. Nine comments were recorded at the meeting. In addition, BPA received one comment letter, two e-mail comments and one telephone comment. None of the commentators objected strongly to the proposed project. Topics raised in the comments included alternatives to the proposed project, visual impacts, air quality, climate change, cumulative impacts, the need for quantification of impacts, where possible, impacts on health and safety, water consumption and the use of union labor. All of these topics are addressed in this EIS with the exception of the last, which is outside the scope of the analysis required by NEPA.

ISSUES TO BE RESOLVED

The primary purpose of this EIS is to provide BPA with the environmental information it needs to resolve whether to connect the Umatilla Generating Project to the regional electric power grid at BPA's McNary Substation. Also to be resolved, is into which bay at the McNary Substation will the connection be made. Two alternatives are described in the EIS. The exact routing of the natural gas pipeline that would supply the proposed project is currently unresolved. Three alternatives are described in the EIS

Table S-1:
Performance Summary

DECISION FACTOR	PROPOSED ACTION	NO ACTION
Technical Performance	The proposed project would generate 550 MW of electric power.	No electric power would be generated.
Economic Performance	The proposed project would generate electric power at a lower unit cost than existing plants using older technology.	No economic costs or benefits would be created.
Environmental Performance	No significant adverse environmental effects would result.	No change in existing conditions would result.

1.0 INTRODUCTION

1.1 PROPOSED ACTION

The Umatilla Generating Company L.P., a Delaware limited partnership, proposes to construct a natural gas-fired combined cycle electric power generation plant near Hermiston, Oregon. The plant would have a nominal generation capacity of 550 megawatts (MW). Electric power from the proposed plant would enter the regional grid at the Bonneville Power Administration's McNary Substation.

The Umatilla Generating Project is only feasible if the Bonneville Power Administration (BPA) agrees to provide the necessary connection to the regional grid. Before agreeing, Bonneville Power Administration must fulfill its responsibilities under the National Environmental Policy Act (NEPA) by assessing the potential environmental consequences of providing the connection.

1.2 PURPOSE AND NEED FOR THE ACTION

1.2.1 Underlying Need for Action

Recent national and regional forecasts project increasing consumption of electrical energy to continue into the foreseeable future, requiring development of new generation resources to satisfy the increasing demand.

According to the United States Energy Information Administration,

> With the number of U.S. households projected to rise by 1.0 percent per year between 1999 and 2020, residential demand for electricity is expected to grow by 1.9 percent annually (Figure 1-1). Residential electricity demand changes as a function of the time of day, week, or year. During summer, residential demand peaks in the late afternoon and evening, when household cooling and lighting needs are highest. This periodicity increases the peak-to-average load ratio for local utilities, which rely on quick-starting gas turbines or internal combustion engines to satisfy peak demand. Although many regions currently have surplus baseload capacity, strong growth in the residential sector is expected to result in a need for more "peaking" capacity. Between 1999 and 2020, generating capacity from gas turbines and internal combustion engines is projected to increase from 75 gigawatts to 211 gigawatts.[1]

[1] Energy Information Administration, Annual Energy Review 1999, DOE/EIA-0383(2001). Washington, D.C., July 2000.

The Western Systems Coordinating Council[2] (WSCC) similarly forecasts peak demand in the western part of the continental United States, Canada, and Mexico to increase at a compound rate of 2.1 percent per year from 1999 through 2009.[3] WSCC forecasts the same rate of increase for the Northwest Power Pool (the states of Washington, Oregon, Idaho and Utah; the Canadian provinces of British Columbia and Alberta; and portions of Montana, Wyoming, Nevada, and California).

Also, the Northwest Power Planning Council (NWPPC) recently conducted an analysis of the Pacific Northwest's electrical power supply. The NWPPC study concluded,

> Over each of the next few winters (the months of December, January, and February), with no new resources added to the system beyond those already under construction, there is a relatively high probability of one or more "generation insufficiency events" in which generation supply is not adequate to meet loads. … The probability of a generation shortfall reaches approximately 24 percent by 2003.
>
> * * *
>
> The (NWPPC) believes that a 24-percent probability of supply inadequacy is unacceptably large. There are a number of different reliability measures used in the electricity industry, but the 24 percent falls into a category called Loss of Load Probability (LOLP), which is the probability of some generation shortfall over a specified period of time. The traditional utility standard for generation LOLP in the (United States) is 5 percent, or one event in 20 years. The results of this study show a likelihood of interruption almost five times higher than this traditional standard. In order to meet that standard, we estimate that it would require almost 3,000 megawatts of new generating resources by 2003.[4]

All three reports recognize the need to develop multiple new types of resources to satisfy increasing demand. The NWPPC study concludes, "(S)ignificant amounts of new resources are required to bring the loss of load probability down to a level consistent with our interpretation of industry standards. We now have a competitive generation market in which

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[2] The WSCC, organized in August 1967, provides coordination essential in operating and planning a reliable and adequate electric power system for the western part of the continental United States, Canada, and Mexico. The WSCC region encompasses approximately 1.8 million square miles, representing a service area equivalent to more than one-half of the contiguous area of the United States. WSCC is the largest, geographically, of the ten regional councils of the North American Electric Reliability Council.

[3] WSCC. October 2000. *10-Year Coordinated Plan Summary, 2000-2009: Planning and Operation for Electric System Reliability.* Salt Lake City, UT.

[4] Northwest Power Planning Council. March 6, 2000. *Northwest Power Supply Adequacy/Reliability Study Phase 1 Report*. Portland, OR.

new generation development is typically undertaken by independent (non-regulated) developers. We would expect some part of the needed new resources to be supplied by new generation developed in response to market forces."

Generation resources typically require interconnection with a high-voltage electrical transmission system for delivery to purchasing retail utilities. Bonneville Power Administration (BPA) owns and operates the Federal Columbia River Transmission System (FCRTS), comprising more than three-fourths of the high-voltage transmission grid in the Pacific Northwest and including extra-regional transmission facilities. BPA operates the FCRTS, in part, to integrate and transmit "electric power from existing or additional Federal or non-Federal generating units."[5] Interconnection with the FCRTS is essential to deliver power from many generation facilities to loads both within and outside the Pacific Northwest.

In summary, electrical consumers in the Pacific Northwest and Western states need increased power production to serve increasing demand, and high-voltage transmission services to deliver that power.

Because the Umatilla Generating Company L.P. has requested to integrate power from its proposed Umatilla Generating Project into the FCRTS at McNary Substation in Umatilla County, Oregon, BPA must decide whether and how to grant that request.

1.2.2 Purposes

BPA intends to base its decision on the following objectives:

- An adequate, economical, efficient and reliable power supply to the Pacific Northwest, including FCRTS electrical stability and reliability;
- Consistency with BPA environmental and social responsibilities; and
- Cost and administrative efficiency.

1.3 NATIONAL ENVIRONMENTAL POLICY ACT REVIEW

The National Environmental Policy Act (NEPA), signed into law in 1970, requires that the environmental consequences of any proposed action by a federal agency be determined before a final decision on the action is taken. Where the action could have a significant adverse impact on the environment, an environmental impact statement (EIS) must be prepared. Because the proposed power plant and its connection to the regional grid could potentially have a significant adverse impact on the environment, this EIS has been prepared.

[5] 16 U.S.C. 838b.

1.3.1 Public Involvement

NEPA requires that the public be provided an opportunity to participate in the EIS process, both before environmental analysis begins and after a draft EIS is completed. Public comments on the scope of an EIS are solicited before EIS preparation begins. This early solicitation of public comments is referred to as the scoping process.

As required by NEPA, BPA published a Notice of Intent (NOI) to prepare an EIS on the Umatilla Generating Project in the Federal Register dated January 5, 2001. The NOI announced the commencement of a 45-day scoping period during which comments from the public would be accepted. It also invited members of the public to a scoping meeting held at Hermiston High School on January 30, 2001. The meeting was in the form of an open house. After signing in, members of the public were invited to examine exhibits describing the proposed project and to discuss it with representatives of BPA and the Umatilla Generating Company, L.P. Comments and suggestions for topics to be addressed in the EIS were recorded.

To inform the general public of the scoping meeting, paid public announcements were placed in local papers (the Hermiston Herald, the Tri-City Herald and the East Oregonian) in editions published about one week before the meeting. Letters were sent to all land-owners with property within several hundred feet of the proposed facilities. Also, letters were sent to local, state and federal agencies and Native American organizations that might have an interest in the proposed project.

After the meeting and at the conclusion of the comment period, BPA prepared a report documenting results of scoping. The scoping report was mailed to the all parties on the NOI mailing list and attendees at the public meeting.

1.3.2 Comments Received

Approximately 30 people attended the scoping meeting, including representatives of BPA and the project proponent. Nine comments were recorded at the meeting. Several parties expressed the same concerns. BPA received one letter (U.S. Environmental Protection Agency), two e-mails and one telephone comment. Topics raised in the comments included alternatives to the proposed project, visual impacts, air quality, climate change, cumulative impacts, the need for quantification of impacts, where possible, impacts on health and safety, water consumption and the use of union labor. The comments are listed in the scoping report, which is contained in Appendix B.

All comments received are addressed in this EIS, with the exception of comments regarding the use of unionized labor at construction sites. That issue is beyond the scope of this EIS.

1.4 STATE OF OREGON ENVIRONMENTAL REVIEW

Oregon does not have a state law equivalent to NEPA. Instead, environmental review is conducted through the state's energy facility siting procedures. Before construction of an energy facility is approved in Oregon, the Energy Facility Siting Council (EFSC) must find that the proposed facility meets certain standards, including environmental standards, pursuant to Oregon Administrative Rule Chapter 345, Division 21, Section 045. If satisfied that a proposed project meets the standards, EFSC issues a Site Certificate that permits the project to be built.

In 1995, the Umatilla Generating Company proposed to build a 481-MW power plant at the same site as the currently proposed 550-MW plant. An application for a site certificate was submitted to EFSC in July 1995, but before a certificate could be issued the Umatilla Generating Company, L.P. requested that its processing be delayed. After modifying the proposed project somewhat, the Umatilla Generating Company submitted an amended application for a site certificate in February 2001. Review of the amended application by state agencies will proceed concurrent with the NEPA review process.

1.5 SCOPE AND ORGANIZATION OF THE EIS

Chapter 2 of this EIS describes the proposed action and its alternatives. The action is defined comprehensively to include both the federal action(connection of the proposed power plant to the regional electric power transmission grid) and construction of the power plant and its related and supporting facilities. The related and supporting facilities include a natural gas pipeline, raw and reclaimed water pipelines, and electrical power transmission lines. Chapter 3 describes the environmental consequences of the proposed action. An assessment of the effects of the proposed action on geology, soils and seismicity, hydrology and water quality, vegetation and wildlife, fish, air quality, noise, traffic, visual quality and aesthetics, cultural resources, land use, socioeconomics, public services and health and safety are included in Chapter 3. Cumulative and unavoidable impacts are also addressed in Chapter 3. Cumulative impacts are the impacts of the proposed action viewed collectively with the impacts of other past, contemporary, or reasonably predictable future actions. Unavoidable impacts are those impacts that are unavoidable and remain significant even with the application of mitigation measures. Chapter 4 describes how the proposed action would comply with various legal and regulatory requirements. Contributors to the EIS are listed in Chapter 5. Recipients of the EIS are listed in Chapter 6. References, a glossary and an index are provided in Chapters 7, 8 and 9, respectively.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 INTRODUCTION

This section contains a description of the two alternatives being considered in this EIS: the proposed action and the No Action Alternative. In the No Action Alternative, BPA would decide not to provide a connection to the regional electric power transmission grid for the proposed Umatilla Generating Project. In the proposed action, BPA would provide a connection to the regional grid for the Umatilla Generating Project at the McNary Substation.

2.2 NO ACTION

In the No Action Alternative, BPA would decide not to provide a connection to the regional electric power transmission grid for the proposed Umatilla Generating Project. Without access to the grid, the proposed Umatilla Generating Project would not be feasible. Thus, in the No Action Alternative the Umatilla Generating Project would not be built.

2.3 PROPOSED ACTION

In the proposed action, BPA would provide a connection to the electric power transmission grid for the Umatilla Generating Project at the McNary Substation. The Umatilla Generating Project would be built and operated by the Umatilla Generating Company, L.P. It would consist of a 550-MW gas-fired combined-cycle power generation plant. The existing Westland-McNary transmission line would be upgraded to convey electric power from the plant to the McNary Substation. The location of the proposed power plant and its related and supporting facilities are shown in Figure 2.1.

The Umatilla Generating Project would be fueled by natural gas from the existing PG&E Gas Transmission Northwest (GTN) pipeline. The pipeline is located about eight kilometers (five miles) south of the proposed power plant site. Natural gas would be conveyed from the GTN mainline to the power plant site via one of three alternative pipeline routes proposed by the Umatilla Generating Company, L.P.

Water would be needed at the facility to generate steam and cool the steam process. Water would be supplied from the Port of Umatilla's regional raw water system. A recirculating cooling system employing mechanically induced draft evaporative cooling towers would be used to minimize water use. Water would be added to the cooling system to compensate for evaporative losses (make-up water) and blowdown. Blowdown is the water bled from the cooling system to limit the build up of salts. Blowdown would be conveyed to agricultural land in new and existing pipelines and applied to crops at agronomic rates in accordance with the provisions of the Wastewater Pollution Control Facility (WPCF) permit issued by the Oregon Department of Environmental Quality (ODEQ).

The principal components of the proposed action are as follows:

- modifications to the McNary Substation to accommodate power from the Umatilla Generating Project

- a new 550-MW gas-fired combined-cycle electric power generation plant located on lands zoned for industrial purposes near Hermiston, Oregon

- approximately 18 kilometers (11 miles) of reconductored electric power transmission line and approximately 0.8 kilometer (0.5 mile) of new electric power transmission line on new power poles

- up to eight kilometers (five miles) of new natural gas pipeline to deliver fuel to the proposed power plant site

- approximately one-half kilometer(one-third mile) of new pipeline to deliver raw water to the proposed power plant site

- approximately five kilometers (three miles) of new pipeline on Madison Farms property, including the short pipeline between the proposed power plant site and the Hermiston Generating Plant, used to deliver reclaimed water from the proposed power plant for irrigation of cropland

2.3.1 Modifications to McNary Substation

Electric power generated by the proposed power plant would be conveyed to the McNary Substation using the existing Westland-McNary transmission line. The existing 115 kilovolt (kV) transmission line would be upgraded to 230 kV. The new circuit would run from the proposed power plant to the McNary Substation.

At McNary Substation, two alternative arrangements for connecting the new 230 kV circuit to the BPA system are being considered. They are shown in Figures 2.2 and 2.3. Figure 2.2 shows an interconnection into vacant Bay No. 18 in the 230 kV portion of the McNary Substation. This alternative would require a little less than 0.40 kilometer (0.25 mile) of new transmission line and up to four new towers. Figure 2.3 shows the second alternative, which would be an interconnection into the 500 kV portion of the McNary Substation, where the voltage would be increased from 230 kV to 500 kV. This alternative would require approximately 0.8 kilometer (0.5 mile) of new transmission line and up to seven new towers.

2.3.2 Electric Power Generation Plant

Site Location

The proposed power plant would be located approximately 6 kilometers (four miles) southwest of the city of Hermiston, in an unincorporated area of Umatilla County, Oregon. The proposed power plant site comprises approximately 31 hectares (77 acres) in the northeast quarter of Section 25, Township 4 North, Range 27 East. The site is bounded by Interstate 82 on the west, Lamb Road on the north, Westland Road on the east, and the Union Pacific Railroad tracks on the south. It lies approximately 1.21 kilometers (0.75 mile) north of Interstate 84 and about 0.8 kilometers (0.5 mile) west of the existing Hermiston Generating Plant. The site is currently vacant except for an irrigation canal located near its eastern boundary. The proposed power plant would occupy approximately 6 hectares (15 acres) toward the western end of the 31-hectare (77-acre) site.

Power Generation Facilities

A process flow diagram for the proposed power plant is shown in Figure 2.4. The plant would consist of two essentially identical combustion turbine generators (General Electric Frame 7FB or equivalent), two heat recovery steam generators (HRSG) and one steam turbine. It would be fueled by natural gas that would be utilized in the combustion turbines. Expanding gases from combustion would turn rotors within the turbines that are connected to electric generators. The hot gases exhausted from the combustion turbines would be used to raise steam in the HRSGs. Steam from the HRSGs would be expanded through a steam turbine that drives its own electric generator. Spent steam from the HRSGs would be condensed and routed to the cooling towers.

The combustion turbines would be housed in an enclosure that provides thermal insulation, acoustical attenuation and fire extinguishing capability. The enclosure would allow access for routine inspection and maintenance.

Site Plan and Buildings

A site plan for the proposed power plant showing the location of roads, buildings and other structures is contained in Figure 2.5. Access to the site would be from Lamb Road. The combustion turbines and steam turbine would be located at the center of the site with the switchyard to the west, the cooling towers to the east and the control room and administrative offices to the north.

Most of the structures at the proposed power plant site, including the combustion and steam turbines and generators, the heat recovery steam generator and the control rooms, would be contained within a 137-meter by 122-meter (450-foot by 400-foot) area. Most of the

structures would be less than 30 meters (100 feet) tall. The tallest elements of the project would be the two stacks at approximately 65 meters (213 feet) above ground level. The switchyard would be contained within a 91-meter by 91-meter (300-foot by 300-foot) area. The footprint of the cooling towers would occupy an area approximately 152 meters by 30 meters (500 feet by 100 feet). Elevations of the structures at the proposed power plant site are shown in Figure 2.6a and 2.6b.

Water Supply

Water for the proposed power plant would be obtained from the Port of Umatilla's regional raw water supply system. The Port of Umatilla diverts water from the Columbia River into its regional raw water supply system in accordance with an existing municipal water use permit from the State of Oregon. The water used by the proposed power plant would be within the limits of that permit. Raw water would be treated at the proposed power plant before use.

The primary uses of water at the proposed power plant would be boiler water make-up for steam generation and cooling water make-up for the recirculating cooling water system. Water would also be used for potable supply and available for fire suppression. Peak average water demand would be approximately 14,081.73 m^3/day (3.72 mgd). Average annual water demand at the proposed power plant would be approximately 12,529.71 m^3/day (3.31 mgd). Approximately 90 percent of the water supplied to the proposed power plant would be lost to evaporation. The remainder, consisting primarily of cooling water blowdown, would be reused for irrigation of cropland in accordance with a WPCF permit issued by ODEQ. A water balance diagram for the proposed project is shown in Figure 2.7.

A water tank would meet the cooling towers' peak water demand if and when it exceeds the amount of water allocated to the proposed power plant under its contract with the Port of Umatilla. The water storage tank would be approximately 14.4 meters (47.3 feet) high, 20 meters (60 feet) in diameter, and could store up to 3,785 kiloliters (one million gallons) of water. To fill the tank, water would be diverted to the tank during periods in which plant water demand is less than the available water supply.

Fuel and Chemical Storage Facilities

Natural gas for fueling the proposed power plant would not be stored on site. Diesel fuel for the fire pumps would be stored in a small, above-ground tank. Water treatment chemicals would be stored in permanent above-ground tanks or portable plastic tanks (totes). Chemical storage areas would be curbed concrete pads. The volume of the curbed concrete pad would be sufficient to contain any spill of fuel or chemicals without overflow to unsurfaced areas. In the event of a rupture of a tank or tote, the contents would be contained within the curbed pad and removed by a licensed spill response contractor.

Reservoirs containing turbine oil and hydraulic fluids for the combustion and steam turbines, as well as area transformers containing transformer (mineral) oil, would be located on the concrete floor of the power island. This floor is designed to contain the full loss of these fluids from their reservoirs. Liquid spills on the concrete floor of the power island would be collected in area sumps, which drain to an oil/water separator. The oily component would be collected and removed by a licensed waste disposal contractor. The aqueous component would be routed to the cooling tower basin, where it would be used for cooling tower make-up. In the event of a large spill of turbine oil or transformer oil, the sumps can be isolated to contain the spill until it can be removed by a licensed spill response contractor.

Major transformers located in the switchyard are mounted on concrete pads with rock blotters. In the event of a failure of the transformer that results in the loss of transformer oil from its reservoir, the oil is contained in the rock blotter and drained into an underground sump located in the switchyard. In the event of a spill, the transformer oil collected in the sump would be removed and disposed by a licensed spill response contractor.

Fire Prevention and Control

A complete fire protection system would be installed within the buildings and yard areas at the proposed power plant site. The system would be designed to meet the requirements of the Uniform Fire Code, as amended by Oregon and the National Fire Protection Association, and all other applicable fire protection standards. The fire protection system would include a fire water system, dry chemical extinguishing system, a CO_2 extinguishing system and portable fire extinguishers.

The fire water system would include a fire water supply loop, fire hydrants, sprinkler systems and hoses placed at appropriate locations. The primary source of fire suppression water is the Port of Umatilla raw water system. In the event of a failure of this system, there would be reserve capacity in the cooling tower basin for fire suppression.

The turbine housings, the mechanical/electrical control enclosures of the turbines, the switchgear room and the battery room would be protected by CO_2 systems. If the systems activate, an alarm would sound or a visual indicator would light up on the gas turbine control panel.

Portable fire extinguishers would be placed at key locations within the power plant site. The type and number of portable extinguishers would conform with code requirements.

Wastewater Management, Reuse and Disposal

Sanitary sewage, process blowdown, and cooling system blowdown would be generated at the power plant site. Sanitary sewage from bathrooms would be routed to an on-site disposal system consisting of a septic tank and leach field located at the power plant site. The average volume of sanitary sewage would be 1,893 l/day (500 gal/day). Process blowdown is washdown water, filter backwash or other non-sanitary liquid wastes produced within the proposed power plant. Process water would be recycled in the cooling system.

Cooling system blowdown is water withdrawn from the cooling system to control the build-up of dissolved salts. The average volume of cooling system blowdown would be 1,135,624 l/day (300,000 gal/day). Blowdown would be conveyed to the Hermiston Generating Plant and then to Madison Farms, approximately three miles (five kilometers) south of the proposed power plant, where it would be applied to cropland at agronomic rates in accordance with the WPCF permit issued by ODEQ.

Storm Water Management

Storm water from roofs and paved areas would be collected and discharged to a lined detention basin where it would evaporate. Excess storm water would be pumped to the cooling tower basin. Storm water from the power block would drain to area sumps where it would be processed by an oil/water separator. Any oily component would be collected and removed by a licensed waste disposal contractor. The aqueous component would be routed to the cooling tower basin where it would be used for cooling water make-up.

Solid Waste Management

It is expected that operation of the proposed Umatilla Generating Project would produce approximately 36 metric tons per year (40 tons per year) of domestic solid waste. Waste would be stored in closed on-site roll-off bins. Recyclable materials would be separated from the solid waste stream. Solid waste would be collected periodically by a private contractor and hauled to a properly licensed disposal facility.

In addition to the domestic solid waste, additional solid waste would be generated from the water pretreatment system. The primary source of the solid waste would be silt from the raw water supply. The silt would be removed from the raw water through a combination of filtration, flocculation, and clarification. A nonhazardous solid waste product (filter cake) would be discharged from the filter press system. Accumulated filter cake would be disposed of at a suitable disposal facility.

2.3.3 Electrical Transmission Line

The proposed Umatilla Generating Project would deliver electric power to the regional power grid at the Bonneville Power Administration's McNary Substation in Umatilla using the Umatilla Electric Cooperative's (UEC's) existing Westland-McNary Transmission Line. The location of the approximately 11-mile-long (18-kilometers-long) existing transmission line is shown in Figure 2.1. Presently, the line consists of one 115 kV circuit and one 230 kV circuit carried on steel poles approximately 28 meters (92 feet) high. A typical pole is shown in Figure 2.8. The existing 115 kV circuit between McNary Substation and the take-off at the new Umatilla Generating Project switchyard bus would be removed and replaced with a 230 kV circuit.

A short new 230 kV radial transmission line-tap would be constructed on the proposed power plant site to connect the switchyard at the proposed power plant to the new 230 kV circuit on the Westland-McNary Transmission Line.

2.3.4 Gas Pipeline

The proposed power plant would be fueled by natural gas from the existing GTN pipeline that passes approximately eight kilometers (five miles) south of the proposed power plant site. There are three gas pipeline alternatives under consideration. They are shown in Figure 2.9.

The first alternative (and preferred route) is labeled as GTN Alternative 1 and would consist of a new 30 centimeter (12-inch) diameter pipeline lateral from the GTN line to the power plant site. The new lateral would connect to the GTN mainline at the same location as the existing Cascade Natural Gas pipeline lateral that supplies the existing Hermiston Generating Plant. GTN Alternative 1 would parallel the CNG line for about three kilometers (two miles) until the latter turns to the northeast. It would then turn northwest and cross open land to Jordan Road. It would follow Jordan Road north before again turning northwest and crossing I-84 to reach the power plant site. The total length of GTN Alternative 1 would be about 7.6 kilometers (4.7 miles).

A second alternative, GTN Alternative 2, would follow the same alignment as GTN Alternative 1 until Jordan Road intersects with Center Street (Point A to Point C on Figure 2.9). GTN Alternative 2 would turn west at Center Street, following the undeveloped road right-of-way for approximately 793 meters (2,600 feet). The proposed route would then turn north following First Street, an undeveloped road right-of-way, for approximately 914 meters (3,000 feet) until Interstate 84 (Point E to Point D), at which point GTN Alternative 2 would follow approximately the same route as GTN Alternative 1 to the energy facility site (Point F). The total length of GTN Alternative 2 would be approximately eight kilometers (five miles).

Figure 2.9 shows a slightly different route between Point D and Point F for GTN Alternative 1 and GTN Alternative 2. Either alternative could follow either of the routes between Point D and Point F in Figure 2.9. The final route selected will depend on land-owner preferences and ease of construction.

The third alternative for providing fuel to the proposed power plant is conceptually different in that it would expand the Cascade Natural Gas (CNG) system that currently transports gas to the existing Hermiston Generating Plant. Labeled as the CNG Alternative, this route would require a new pipeline to be constructed by CNG from the existing metering facility at the Hermiston Generating Plant to the proposed power plant site. The length of the new lateral would be approximately 0.8 kilometers (0.5 mile). In addition, CNG would expand the capacity of the southern section of its existing pipeline lateral that conveys gas from the GTN mainline to the Hermiston Generating Plant. A section of new pipeline approximately three kilometers long (two miles long) would be built paralleling the existing Hermiston Generating Plant pipeline lateral.

2.3.5 Water Supply Pipeline

The proposed power plant would be supplied with water from the Port of Umatilla's regional raw water supply pipeline which is located 0.8 kilometers (0.5 mile) to the east of the proposed power plant site at the Hermiston Generating Plant. The Port of Umatilla's 61-centimeter (24-inch) diameter municipal raw water line is capped off adjacent to the Hermiston Generating Plant. A 46-centimeter (18-inch) diameter lateral supplies water to the Hermiston Generating Plant. A new 46-centimeter (18-inch) diameter supply line would be built from the end of the existing 61-centimeter (24-inch) diameter line to the power plant site within the corridor shown in Figure 2.10.

2.3.6 Reclaimed Water Pipeline

Blowdown from the proposed power plant would be conveyed by a new 15-centimeter (6-inch) diameter pipeline which would be built from the proposed power plant site to the Hermiston Generating Plant within the corridor shown in Figure 2.10. This pipeline would be connected to the Hermiston Generating Plant's existing reclaimed water pipeline to Madison Farms. The proposed power plant would use the existing reclaimed water line to convey blowdown to Madison Farms. Madison Farms would use the reclaimed water for crop irrigation. The water would be applied at agronomic rates in accordance with the WPCF permit issued by ODEQ. Construction of new segments of irrigation distribution piping would be required to convey the reclaimed water to irrigation circles. The new segments of pipe are shown in Figure 2.11. Approximately 324 hectares (800 acres) of land would be irrigated with a mixture of freshwater and reclaimed water. Madison Farms has sufficient existing water rights to provide the freshwater for blending.

2.3.7 Construction Schedule and Activities

The Umatilla Generating Company, L.P. expects to begin construction of the proposed project in the spring of 2002. Construction is expected to take 20 months and would therefore be completed in the fall of 2003 if BPA decides to go forward with the proposal.

The maximum size of the construction crew at the proposed power plant site would be 400 workers. It is expected that most of the construction workers would come from the Hermiston, Umatilla and the Tri-Cities area. Equipment used at the site would include light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines and power hand tools. Foundation piling equipment may also be used. Excess excavated materials would be sold and removed from the site or trucked offsite and properly managed at an appropriate facility (e.g., transported to an approved disposal site or fill staging area, used as cover material at a permitted landfill, incorporated as a soil amendment on agricultural lands, etc.). Recyclable materials would be separated from the solid waste stream. Solid waste that cannot be recycled would be trucked to an approved disposal site. Sanitary waste facilities would be provided for the construction workers. They would be installed and serviced by a commercial operator.

Typically, the same construction crew would build the proposed power plant and the proposed water supply and reclaimed water lines. If a separate crew built the water and wastewater pipeline, it would consist of about 10 workers.

The maximum size of the construction crew that builds the gas transmission line would be 50 workers. Equipment used along the pipeline alignment would include light and heavy trucks, excavators, bulldozers, graders, cranes, air compressors, welding machines and power hand tools. Some specialized boring equipment would be used to install the pipeline under the High Line Canal.

A crew of 15 would be needed to reconductor the transmission line. Equipment used along the transmission lines route would include light and heavy trucks, cranes, winches and power hand tools.

2.4 OTHER ALTERNATIVES

In the early 1990s, BPA prepared a number of NEPA documents that analyzed the environmental effects of various alternative policies and business strategies. In 1993, BPA published a document entitled “Resource Program Final Environmental Impact Statement” (DOE/EIS-0162). The EIS included a detailed analysis of the environmental consequences of alternative strategies for managing demand and increasing the supply of electrical energy in the Pacific Northwest. Alternatives analyzed included various combinations of

conservation, development of renewable resources (including hydropower, geothermal, wind and solar power), efficiency improvements, cogeneration, combustion turbines, nuclear power and coal.

In the mid-1990s, responding to changes in the electric utility market, BPA modified its business plan and prepared a document entitled "Business Plan Final Environmental Impact Statement" (DOE/EIS-0183). It was published in June 1995 and incorporated a number of earlier NEPA documents by reference, including the Resources Program Final Environmental Impact Statement.

The Business Plan Final Environmental Impact Statement included a description of how it would be used in BPA's decision-making process. It notes that:

> "This BPA EIS is a programmatic EIS: that is, it addresses 'umbrella' policies and concepts. Approaches, strategies and general agency direction – not site-specific actions – are recommended here. As the Administrator implements his broader policies and business strategies, other more specific business decisions such as the development of individual energy generation resources and transmission facilities will have their own environmental review and decision processes. These additional environmental reviews will look at site- specific actions, using the information and decision in this EIS as a base to understand how they fit into more global policies and business strategies. This process is called 'tiering', where more specific additional information on potential environmental consequences adds to the understanding for subsequent decisions."

The Business Plan Final EIS includes a figure that shows diagrammatically the relationship between the Business Plan EIS and subsequent site-specific NEPA documents, including those for generation and transmission projects. The figure is reproduced here as Figure 2.12.

The purpose of tiering is to promote orderly and properly sequenced decision-making for complex, multi-stage projects that may have adverse effects on the environment. It also avoids unnecessarily and duplicative technical analysis. Broad policies and strategies are first examined in a programmatic EIS. The site-specific environmental impacts of an individual project that is needed to implement the larger policy or strategy are then examined in a site-specific EIS. The analysis of the broad political and strategic alternatives is included in the site-specific EIS by reference and does not need to be repeated.

Consistent with this approach, this EIS for the Umatilla Generating Project confines itself to analysis of the site-specific environmental impacts of the proposed action. The analyses of larger policy and strategy alternatives are contained in the programmatic Business Plan EIS and Resource Program EIS and are included here by reference.

The Umatilla Generating Company,L.P. considered various alternatives before developing the proposed project. Minimization of environmental impacts was one of the criteria used in the company's evaluation of alternative sites and the development of the project's features. The proposed power plant site was chosen because it is close to an existing natural gas pipeline and an existing electric power transmission line and thus would minimize the need for construction of new lines to McNary Substation. This offers both economic and environmental advantages. Furthermore, the site is zoned for industrial use and has very little value as wildlife habitat.

Dry cooling was considered by the Umatilla Generating Company,L.P. as an alternative to the conventional water cooling system that is a part of the proposed power plant. Dry cooling was rejected for economic reasons and because it would reduce the efficiency of the proposed power plant: less electric power would be generated per cubic foot of gas consumed.

Because the environmental impacts of the proposed project are relatively minor, no alternatives (other than the proposed action and no action) are analyzed in this EIS.

3.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION

This chapter includes a detailed assessment of the effects of the proposed action on various environmental elements including geology, soils and seismicity, hydrology and water quality, vegetation and wildlife, fish, air quality, traffic, visual quality and aesthetics, cultural resources, land use, socioeconomics, public services and health and safety.

3.1.1 Mitigation Measures

The sections of this chapter which address each environmental element include a discussion of mitigation measures. Mitigation measures are measures taken to avoid or reduce environmental impacts. Two kinds of mitigation measures are described in this chapter, measures included in the proposed project and recommended mitigation measures. The mitigation measures included in the proposed project are those mitigation measures that the Umatilla Generating Company, L.P., has proposed in its application to EFSC for a site certificate. The environmental analyses contained in this chapter were made assuming that these mitigation measures would be implemented as part of the proposed project.

Recommended mitigation measures are measures that would further reduce the environmental impacts of the proposed project. If the proposed action is approved, these mitigation measures will be considered for inclusion in the Record of Decision.

3.1.2 Environmental Impacts of the No Action Alternative

If the No Action Alternative were selected, neither the Umatilla Generating Project nor the connection to the regional electric power transmission grid would be built. The proposed project's contribution to the need for more electrical power in the region would be foregone. Because no physical facilities would be built, the No Action Alternative would have no adverse effects on the environment, other than the unmet need for additional generating capacity in the region.

3.1.3 Significant and Unavoidable Impacts of Proposed Project

An assessment of the impact of the proposed action on various elements of the environment is contained in this chapter. The assessment concludes that the proposed action, including the mitigation measures proposed by the project proponent, would have no significant and unavoidable adverse impacts on the environment. In some cases, additional mitigation measures are suggested and may be implemented by the project proponent. However, the additional mitigation measures are not needed to achieve a level of adverse environmental impact that is less-than significant.

Table 3.1:
Summary of Affected Environment and Environmental Consequences

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Geology and Seismicity	The project is sited within the Yakima Fold Belt (YFB) of the Columbia Plateau with fault and fold structures that are still in formation today. Seismicity is distributed along the east-west-striking compressive faults and folds of the YFB.	**3.2.2** Safe operation of the plant is subject to ground-shaking and post-construction soil movement. Geotechnical investigations and seismic studies would provide information to properly design the facility in accordance with current standards.	No change in the existing conditions would result.
Topography and Soils	Topography of the project area is relatively flat, ranging in elevation from 213 meters (700 feet) to 91 meters (300 feet) above msl. Slopes are generally less than 5 percent. Soil series identified within the project area are largely formed in gravelly alluvial deposits interbedded with fine-grained material that is well-drained to excessively drained. Some are well suited for irrigated crops, and some are prone to wind erosion.	**3.2.1** Construction of the project would entail some clearing and grubbing, grading and land leveling, excavation and heavy equipment operation. These activities would be limited to a 6-hectare (15-acre) area at the power plant site, and an approximately 8-kilometer (5-mile) long and 30-meter (100-foot wide) gas pipeline corridor, and other shorter pipeline segments. Construction activities would increase the potential for sediment transport and soil erosion. Temporary erosion and sediment control measures would be used to minimize these impacts during construction. Permanent measures such as revegetation would enhance protection against impacts in the long term. Recommended mitigation measures. Construct proposed project in the dry season to the extent practicable.	No change in the existing conditions would result.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Hydrology	The area of concern is the Columbia-Umatilla Plateau hydrologic sub-basin. Flow in all major rivers and creeks (Columbia River and Umatilla River) in the study area are extensively managed. Most of the surface water in streams in the Umatilla Basin has been appropriated for agricultural use. There is a moratorium on granting new water rights on the Columbia River. There is a deep aquifer and a shallow aquifer beneath the project area.	**3.3.1** Water for operation of the proposed power plant will be supplied by the Port of Umatilla's regional water supply system. The amount of water the Port of Umatilla would divert from the Columbia River for the proposed power plant would represent 0.005% of the river discharge during the low flow period. Water use would be minimized at the proposed power plant by a recirculating cooling system.	No change in the existing conditions would result.
Water Quality	The quality of the Columbia River water in the reach closest to the project area is good. Groundwater in the area where cooling system water would be applied to crops is of moderate quality.	**3.3.2** Sanitary sewage, process blowdown, cooling system blowdown and storm water runoff would be generated by the proposed power plant site. An on-site septic tank and leach field would treat the small volume of sanitary sewage. Process blowdown would be recycled in the cooling system. Cooling system blowdown, essentially clean water with elevated total dissolved solids content, would be reclaimed for irrigation of cropland. Storm water runoff would be discharged to a lined detention basin where most of it would evaporate. These actions would eliminate the need for discharge to surface waters and minimize effect on surface and groundwater quality. **3.3.3** Various chemicals would be stored at the proposed power plant site in permanent above-ground storage tanks and in temporary containers (totes). All chemical storage would be in curbed concrete areas. In case of a spill, design features such as this secondary containment area, and the lined detention basin acting as a tertiary treatment would enable safe removal of the chemicals by a licensed spill response contractor without contamination of groundwater.	No change in the existing conditions would result.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Vegetation and Wildlife	Vegetation in the project area has been extensively altered by human activities. Highways, industrial facilities, agriculture, and rural residences have replaced native plant species with engineered structures or introduced species. The elimination of the native shrub-steppe vegetative community throughout much of the area has resulted in a decline or loss of wildlife species that depend on this habitat.	**3.4.1** Permanent removal of non-native weedy plants sparsely covering the 15 acres upon which the power plant will be constructed would occur. The few new transmission towers to be erected would permanently alter less than one acre of area. A 50 to 100-foot wide swath of vegetation would be removed during construction of the natural gas and water pipelines. This vegetation would be restored once construction is complete. Very minor, temporary disturbance of vegetation around the existing transmission line would occur during reconductoring. Most reconductoring activity will be conducted from existing maintenance roads. **3.4.2** The deposition of cooling tower drift on vegetation would have minor beneficial effect to agricultural crops in the area as macronutrients commonly used as fertilizers (including nitrates) would be components of the drift. Saline drift from the cooling tower is not anticipated to adversely impact crops as the salt deposition would be at a lower rate than what has been shown in studies to be harmful to crops. The area just east of the power plant site and supports one of the few stands of only slightly degraded native vegetation in the vicinity of the proposed project and it would be subject to the most intense deposition from the cooling towers, though deposition rates of salt and macronutrients are expected to be very low. In addition, cooling tower drift would be minimized and total dissolved solid content monitored to ensure that deposition rates would be below rates that would result in an adverse impact on surrounding vegetation. **3.4.3** Noise and human activity resulting from construction of the proposed power plant would affect wildlife, particularly nesting bird species in the area. Construction activity would therefore avoid the nesting season to the extent possible, or else a contribution to the Oregon Wildlife Fund or a non-profit organization like the Nature Conservancy that purchases and manages native wildlife habitat within the same physiographic province as the proposed project would be made. **3.4.4** There is the potential for bird (raptor) mortality as a result of collision with power lines. All new transmission towers would be designed in accordance with accepted standards for avoidance of electrocution of raptors.	No change in the existing conditions would result.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Fish	Columbia River supports steelhead trout and three species of salmon and represents a fishery resource of global importance. The fishery is depleted as a result of overfishing and habitat destruction.	**3.5.1** Average annual water demand at the project would be 0.15 cubic meters per second. The water diverted under the Port of Umatilla's existing water right and provided for the proposed project would represent about 0.005 % of river discharge during the low flow period and about 0.01% during extreme droughts. Such a small change in river discharge would not be expected to have any effect on the Columbia River fishery. In addition, the proposed project would include a number of features that minimize water use.	No change in the existing conditions would result.
Air Quality	Eastern Oregon has a dry, continental climate (low humidity), with large variations in temperature from winter to summer. The proposed power plant site is located in an area currently designated as unclassified or in attainment of all state and national Ambient Air Quality Standards (AAQS).	**3.6.1** Best Available Control Technology for air pollutants has been incorporated into the design of the power plant to reduce emissions of criteria pollutants. Air quality modeling indicated that the measures included in the power plant as proposed would be adequate to mitigate the potential impacts of emissions.	No change in the existing conditions would result.
Traffic and Circulation	Important roadways in the project area include Interstate Highways 82 and 84, State Highway 207, Westland Road and Lamb Road. The results show LOS A with little or no delay for northbound left turns along Westland Road. Critical turning movements for stopped vehicles along Lamb Road show only short delays of 10 to 15 seconds, resulting in LOS B.	**3.8.1** The small increase in traffic travelling through the intersection of Lamb Road and Westland Road as a result of proposed power plant operations would cause little or no perceptible change to level of service. **3.8.2** As a result of construction of the proposed power plant, short-term delays are expected during the AM Peak at the I-82 Southbound Ramp/Lamb Road intersection and during the PM peak at Lamb Road and Westland Road. Recommended mitigation measures. Vanpooling of construction workers and other temporary traffic reduction measures.	No change in the existing conditions would result except for background increases in traffic levels.
Visual Quality and Aesthetics	Project area is largely open agricultural lands used for grazing and growing crops. The proposed power plant site and immediate surrounding area is primarily zoned for industrial use and already	**3.9.1** Elements of the proposed power plant would be able to be seen up to two miles away, with the most visible elements being the exhaust stacks. The vapor plumes and night lighting would add to the overall visibility of the proposed power plant. The plant would not significantly alter the visual character of this already industrial area. The proposed power plant would not be visible from either of the scenic areas designated in the Umatilla County	No change in the existing conditions would result.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
	occupied by several industrial facilities including the Hermiston Generating Plant (with two exhaust stacks) and the Lamb-Weston potato processing plant. Within the five mile (eight kilometer) radius of the proposed power plant site, the Umatilla County Scenic-Historic Road is the only identified visual resource from which the power plant might be visible	Comprehensive Plan, the Umatilla County Scenic-Historic Road and the McNary Lock and Dam. Measures would be taken to minimize visual impact of plant such as using neutral colors and non-reflective paint. **3.9.2** Construction of the proposed power plant, and supporting facilities would have short-term impacts on visual quality from equipment such as cranes, scaffolding, etc, being visible. Additional impacts may occur from dust and construction lighting. Mitigation including removing equipment when not in use, applying water to the site to control dust, and using shielding and directive devices on lighting during nighttime construction is expected to reduce the impacts to less than significant levels. **3.9.3** The new transmission line on new towers at McNary Substation would be visible but not inconsistent with the current visual quality of the area, known for the many power lines that crisscross the area.	
Cultural Resources	Known sites in the vicinity of the proposed project include a multi-component site atop Hermiston Butte (35UM9); a small lithic scatter located along the Umatilla River (35UM58); and a historic can dump on the Umatilla Chemical Depot (35UM16). None of these sites is located near the components of the proposed project. With the exception of sites 35UM 9 and 16, all the known cultural resources are closely associated with the Columbia or Umatilla rivers. In addition, two properties close to the proposed power plant and its components are potentially eligible for nomination to the National Register of Historic Places: the High Line and West Extension irrigation canals.	**3.10.1** The proposed natural gas pipeline alternatives must pass over or under the High Line Canal. To avoid any adverse effects on the canal this section of the pipeline would be installed by boring under the canal rather than trenching through it. A reconductored electrial transmission line would pass over the West Extension Canal. None of the activities associated with reconductoring the transmission line would affect the canal. **3.10.2** To avoid adverse affects on unidentified cultural resources during construction, personnel would be instructed in the identification of cultural materials and directed to halt ground-disturbing activities in the vicinity of a find until a qualified archeologist can evaluate the significance of the find.	No change in the existing conditions would result.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Land Use, Plans, and Policies	The project area is within two local jurisdictions: Umatilla County and the City of Umatilla. Comprehensive plan designations and zoning ordinances from these jurisdictions define land use for the area.	**3.11.1** The construction of the proposed power plant will change current land use. The Umatilla Generating Project would comply with the County of Umatilla and the City of Umatilla comprehensive plans as either permitted or conditional uses. **3.11.2** The project would result in the intensification of industrial activity in an area that is designated for that use. However, the project is not expected to result in land use incompatibilities. Short-term land use incompatibility issues such as noise and dust would be mitigated by construction management practices developed to minimize dust and noise to reduce potential nuisances to nearby land uses.	No change in the existing conditions would result.
Socioeconomics	Umatilla County population in 1999 was 68,000. Housing is somewhat limited. Total 1999 employment for Umatilla County was 33,963, with an unemployment rate of 6.5%. In 1999, the county tax base (net real market value of property) was approximately $3.6 billion.	**3.12.1** Construction of the proposed power plant would result in a short-term population increase, and less likely, a long-term increase during plant operation. To minimize the possibility of adverse affects on housing supply, construction workers and full-time plant operation employees would be hired from the local communities, to the extent practicable. Positive affects on the economy would result from the population of workers associated with the project and money spent in the area. **3.12.2** The project would increase short-term and long-term employment opportunities producing a positive affect on Umatilla County. **3.12.3** Property taxes generated by the project would be $4.3 million annually. This would produce a positive affect in the form of payments to the County's general fund, the Port of Umatilla, Hermiston School District Bonds, fire district, and Umatilla County Special Library, among others.	No benefit of tax dollars to Umatilla County.
Public Services and Utilities	Utilities such as water supply, wastewater treatment, solid waste removal, storm water management, and services such as police and fire protection, schools, libraries, health care are all at or below capacity.	**3.13.1** Utilities will not be adversely impacted by the proposed power plant as the activities will either occur on-site or will be able to be provided by the local communities without jeopardizing the current level of service. **3.13.2** Public services will be supplied by the local communities to the proposed power plant and any increase in population. The level of service is not anticipated to change as a result of services provided to the proposed power plant.	No change in the existing conditions would result, except an increase in demand for services with the current growth rate.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Health and Safety	Potential hazards and safety issues to be addressed include occupational health and safety; fuel management; use, handling, and storage of hazardous non-fuel substances; fire protection; solid and liquid waste disposal; electric shock hazard; and electric and magnetic fields. The only pre-existing condition is the electric shock hazard and electric and magnetic fields created by the existing transmission line connecting the Hermiston Generating Plant to the McNary Substation.	A comprehensive occupational health and safety program is proposed to protect workers during all phases of construction and operation of the power plant. The program would meet or exceed all Federal, state, and local requirements. **3.13.1** The possibility of natural gas leakage and related fire risk as a result of the proposed power plant would be minimized by constructing the natural gas pipeline in accordance with the requirements and designing the fuel control system of the gas turbines with the necessary isolation and shut-off valves. **3.13.2 , 3.13.3, and 3.13.4** Spills of diesel fuel or non-fuel substances stored on-site would be prevented to the extent possible through correct storage conditions and training of personnel who would handle the substances. Curbs would be installed at all chemical storage areas. If a spill occurs, it would be contained in the curbed concrete containment area until it can be removed by a licensed spill contractor. **3.13.5** To reduce the threat caused by fire to people and structures at or near the proposed power plant, a complete fire protection system would be installed within the buildings and yard areas at the proposed power plant site. **3.13.6** To reduce the risk of electrical shock the transmission line would be designed so that induced currents resulting from the transmission line and related facilities would be as low as reasonably achievable and all permanent structures are grounded. **3.13.7** To reduce electric and magnetic fields, overall field reduction will be achieved by rearranging the conductors of the second 230-kV circuit so the phases are A-phase, B-phase, and C-phase (top to bottom) on one side of the tower, and C-phase, B-phase, and A-phase (top to bottom) on the other side. Some increase in EMF will occur in some locations but absolute levels will be relatively low.	In large part, no change in the existing conditions would result, except that reconductoring the transmission line would result in a reduction in electric and magnetic fields.

ENVIRONMENTAL RESOURCE	EXISTING CONDITIONS	IMPACT OF PROPOSED ACTION/MITIGATIONS *	IMPACT OF NO ACTION ALTERNATIVE
Noise	The Umatilla Generating Project would be located in an industrial area near the city of Hermiston. There are several significant noise sources in the vicinity of the proposed power plant site including Interstate Highways 82 and 84 (I-82 and I-84), a railroad line, the Hermiston Generating Plant (a 474 MW combustion turbine electric power generation plant similar to the proposed power plant) and a food processing facility. The nearest sensitive receptor is 1,900 feet away from the proposed power plant site.	**3.13.9** Operation of the proposed power plant would cause noise from the combustion turbines and generators, auxiliary equipment in enclosure, the heat recovery steam generator, the steam turbine, the transformers and the cooling towers. The design of the power plant includes a number of features to reduce noise emissions. The proposed power plant would comply with Oregon's noise standards for new industrial and commercial sources. **3.13.10** Construction of the proposed power plant would involve the operation of a range of construction equipment including light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines and power hand tools. To reduce noise impacts on nearby residences during construction of the proposed project, most heavy construction work would be scheduled to occur during daylight hours when people are generally less sensitive to noise.	No change in the existing conditions would result.

* Recommended mitigation measures are shown in table. If no mitigation measures are shown, none are recommended.

3.2 GEOLOGY, SOILS, AND SEISMICITY

The two predominant issues associated with geology and the project are 1) potential soil impacts due to construction and 2) potential impacts to the project from geologic hazards.

3.2.1 Affected Environment

The site is situated in an area that has been referred to as the Umatilla lowlands. This region is characterized by a relatively flat to gently rolling surface that gradually descends from the Blue Mountains southeast of the proposed power plant site to the Columbia River. The surface topography generally mimics the buried surface of the flood-basalt bedrock of the Umatilla Basin. The bedrock is known as the Columbia River Basalt Group (CRBG). Slopes are generally less than five percent.

3.2.1.1 Topography

A topographic relief map of the project area is presented in Figure 3.2.1.

Proposed Power Plant Site

The proposed power plant site is located approximately 1.0 kilometer (0.6 mile) west of the Cottonwood Bend in the Umatilla River at an elevation of approximately 164 meters (540 feet) above mean sea level (msl). The ground surface at the proposed power plant site is nearly flat with elevations varying about 0.6 meter (2.0 feet) from the northwest down to the southeast.

Gas Pipeline Corridor

Topography along the proposed alignment corridor for the gas pipeline ranges from gently sloping conditions at the southern end (located at the connection with the GTN natural gas pipeline) to generally flat conditions along the remainder of the alignment. Specifically, the GTN pipeline junction is situated on the eastern flank of Ward Butte approximately 180 meters (200 yards) west of the Butter Creek drainage at approximately 213 meters (700 feet) msl. The pipeline trends northward to near flat conditions north of the High Line Canal and drops to approximately 164 meters (540 feet) msl at the proposed power plant site.

Transmission Line Corridor

Topography along the proposed alignment corridor for the reconductored transmission line rises gently in a northward direction from the power plant site to an elevation 198 meters (650 feet) msl at the crest of Coyote Coulee. The transmission line then trends downhill and northward down moderate slopes to the eastward turn in the line located immediately south of Radar Road.

The transmission line alignment then trends eastward approximately 2.0 kilometers (1.2 miles) and climbs gentle to moderate slopes to the bend northward in the alignment at Powerline Road. The line then slopes gently down to its terminus at an elevation of approximately 91 meters (300 feet) msl near McNary Substation.

3.2.1.2 Geology

The proposed power plant and its supporting facilities are located within the Umatilla Basin, a broad lowland that is part of the Columbia Basin that extends across northeastern Oregon, southwestern Washington, and western Idaho. Figure 3.2.2 depicts the regional geology relevant to the proposed power plant site.

The flood-basalt bedrock of the Umatilla Basin is CRBG, a sequence of basalts which erupted from feeder dikes and vents in Northeastern Oregon and Southeastern Washington during Miocene time (between 6 and 17 million years ago). This basalt subsequently spread over an area of approximately 163,170 km^2 (63,000 mi^2) as it flowed westward to the Pacific Ocean. Total thickness of the bedrock basalt reaches over 4,575 meters (15,000 feet) in the Tri-Cities area to the north and tapers out in the Blue Mountains to the southeast of the proposed power plant site. Within the Umatilla Basin, the estimated thickness of the CRBG is 1,525 meters (5,000 feet).

During the eruptions of the flood-basalt and thereafter, extensive tectonic deformation of the layered bedrock resulted in broad bending and folding of the bedrock units. These tectonic processes created numerous synclines (downwarping of the sediments which creates broad structural basins in the project area), anticlines (upwarps which form the higher topographic features), and faults. Based on the predominant structural fabric, the Columbia Plateau has been subdivided into three informal structural subprovinces: Palouse Slope, Blue Mountains, and the Yakima Fold Belt. The proposed power plant is sited within the Yakima Fold Belt of the Columbia Plateau, an area characterized by narrow, asymmetrical anticlines spaced between 5 and 48 kilometers (3 and 30 miles) apart. The fault and fold structures in the general project area are shown on Figure 3.2.3.

Alluvial deposits consisting primarily of sand and gravel mantle the basalt bedrock throughout the Umatilla Basin. These deposits were placed during the late Pleistocene some 13,000 to 40,000 years ago. From approximately 13,500 to 15,000 years ago, glacial advance and retreat created ice dams in Northern Idaho. These dams formed ancient Lake Missoula, a glacial lake that covered a significant portion of what is now Western Montana. These ice dams eventually failed due to the rising water levels and released catastrophic floods that swept across southeastern Washington and along the Columbia River to the Pacific Ocean. As ancient Lake Missoula drained (in an estimated 24-48 hours per event), the region near the project area was repeatedly inundated. The Missoula Floods pooled in the Pasco Basin, then drained down the

Columbia River primarily through Wallula Gap, spreading out within the Umatilla Basin to form ancient Lake Condon. The force of the water completely stripped any existing overburden material and scoured the surface of the CRBG, forming scabland topography. Floodwaters reached an elevation of at least 351 meters (1,150 feet) in Lake Condon, creating a water depth of at least 122 meters (400 feet) near the proposed power plant site. This sequence took place dozens of times, depositing up to 45 meters (150 feet) of unconsolidated to poorly consolidated, crudely stratified sand and gravel alluvium with occasional boulders and silt lenses upon the basalt bedrock within the project area.

Since the cessation of the floods, natural processes such as water and wind have eroded and modified the surface topography, resulting in additional deposits of loess, silts, sands, and gravels throughout the proposed power plant site.

3.2.1.3 Soils

Soil types within the project area were identified using information provided by the National Resource Conservation Service (NRCS) soil survey for Umatilla County (USDA, 1988). Information about each soil series encountered was downloaded from the NRCS website or obtained from the soil survey. A total of 13 soil series were identified within the project area. The following is a list of the series identified within the project area that summarizes important characteristics of the soils. Maps depicting the areal extent of each soil unit relative to the project are presented in Figures 3.2.4, 3.2.5, and 3.2.6.

1b – Adkins fine sandy loam, 0 to 5 percent slopes
This deep, well-drained soil is on strath terraces of the Columbia River and formed as a result of wind deposition. It consists of a fine sandy loam that is generally used for irrigated crops or as rangeland, possesses a low shrink-swell potential, and is very susceptible to wind erosion. This soil type is encountered beneath a large portion of the proposed pipeline corridors and is considered prime farmland.

2b – Adkins fine sandy loam, gravelly substratum, 0 to 5 percent slopes
This deep, well-drained soil is on strath terraces of the Columbia River. It formed in gravelly alluvial deposits mantled by eolian sand and is encountered beneath the McNary Substation at the northernmost end of the transmission line alignment. This soil is very susceptible to being blown by wind during construction.

2c – Adkins fine sandy loam, gravelly substratum, 5 to 25 percent slopes
This deep, well drained soil is on strath terraces of the Columbia River. It formed in gravelly alluvial deposits mantled by eolian sand and is encountered uphill of the Umatilla River floodplain along the northwest flank of the Service Anticline (Umatilla Butte).

14b – Burbank loamy fine sand, 0 to 5 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. It formed in gravelly alluvial deposits mantled by eolian sand and is encountered on the northern slope of the Service Anticline and along a large portion of the transmission line alignment on Coyote Coulee.

70 – Pits, gravel

This map unit consists of excavated areas of rounded to subangular gravels, commonly mixed with sand or other soil material. Most of these areas are being mined for sand and gravel and support little vegetation. These commonly recognizable areas occur within other soil units that consist of soils that have a gravelly substratum.

74b – Quincy fine sand, 0 to 5 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. This soil is a weathering product of eolian sand.

75b – Quincy loamy fine sand, 0 to 5 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. This soil is a weathering product of eolian sand and is very similar to the Quincy fine sand.

75e – Quincy loamy fine sand, 5 to 25 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. This soil is a weathering product of eolian sand and is encountered along the steeper slopes of Coyote Coulee along the transmission line alignment.

76b – Quincy loamy fine sand, gravelly substratum, 0 to 5 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. It formed in gravelly alluvium mantled by eolian sand and is interbedded with Quincy fine sand and Burbank loamy fine sand along the transmission line alignment between the proposed power plant and the crest of Coyote Coulee. This soil has low clay content and is highly susceptible to wind erosion, particularly when excavated.

77c – Quincy loamy fine sand, eroded, 0 to 25 percent slopes

This deep, excessively drained soil is on strath terraces of the Columbia River. It formed in eolian sand and is most suitable as rangeland. This soil is found at the southernmost 900 meters (one half mile) of the proposed gas pipeline corridors and is highly susceptible to wind erosion, particularly when excavated.

95b – Taunton fine sandy loam, 1 to 7 percent slopes

This moderately deep, well drained soil is on strath terraces of the Columbia River, typically between 122 to 335 meters (400 to 1,100 feet) elevation. It formed in eolian sand deposited over cemented alluvium. This unit is encountered about 250 meters (820 feet) north and south of the

High Line Canal and in a small area near the proposed pipeline junction. This soil unit is best suited to irrigated crops but is limited by low natural fertility and moderate permeability.

126a – Xerofluvents, 0 to 3 percent slopes

These deep, somewhat poorly drained to excessively drained soils are encountered on the modern floodplain of the Umatilla River. They are derived from mixed alluvium. These soils flood frequently and are considered a poor construction material due to moderate strength and wetness.

127f – Xerollic Durorthids, 30 to 60 percent slopes

These soils consists of shallow to moderately deep, well drained soils on terrace scarps. These soils formed in loess over cemented alluvium and are encountered along the steepest faces of Coyote Coulee.

3.2.1.4 Seismicity

The seismicity of the Pacific Northwest is primarily driven by convergence between the Juan de Fuca and North American plates and has created a complex, seismically active convergent margin and volcanic arc in the Pacific Northwest (Ludwin *et al.*, 1991).

The chain of active volcanoes that result from plate subduction make up the Cascade Range, which extends roughly north-south through Oregon and stretches from northern California to British Columbia (Figure 3.2.7). Other major tectonic elements of the plate boundary include an active accretionary wedge complex in the offshore region east of the trench and a deformed Tertiary forearc basin that lies seaward of the volcanic arc. The present-day Coast Range and the Willamette Lowland-Puget Sound Basin stand where marine sediments and fragments of oceanic crust were accreted and later deformed during early Tertiary plate convergence and subduction (Unruh *et al.*, 1994). Northwestern Oregon sits on the Oregon Coastal forearc block whose boundaries extend from the Oregon-Washington border south to the Klamath Mountains. Behind the Oregon Coastal block and the Cascade volcanic arc, the Fold and Thrust Belt occupies a region that stretches from central Washington to central Oregon and encompasses the proposed power plant site.

Fold and Thrust Belt Seismotectonic Province

Most significant to the study area is the Fold and Thrust Belt, which contains portions of the Columbia Plateau physiographic province. This province is located in the intermontane region between the Cascades and the Rocky Mountains and is a broad plain mainly comprised of the Miocene Columbia River Basalt Group (CRBG). The Columbia Plateau can be further subdivided into the Blue Mountains and the Yakima Fold Belt (YFB) subprovinces, based on the predominant structural fabric.

The YFB runs through the central part of the Columbia Plateau while the Blue Mountains anticline defines the southeastern boundary of the study region. The proposed power plant site is located in the YFB, which is dominated by east-west and northwest-trending contraction structures that include anticlinal ridges, synclinal valleys, and reverse and transpressional faults. A regional-scale structure, the northwest-striking Olympic-Wallowa Lineament also traverses the region. The lineament is a zone of northwest-directed transpression (Mann and Meyer, 1993) that, in the vicinity of the YFB, consists of a diffuse zone of northwest-trending anticlines (Reidel *et al*., 1989).

The Columbia Plateau includes a number of tectonic basins, one of which is the Umatilla Basin where the proposed power plant site is located. Regional thickness patterns of CRBG and pre-CRBG sediments indicate that these basins have subsided and have been filled with basalts (Reidel *et al*., 1989). Formation of the folds within the YFB are estimated to have begun during the middle Miocene and still continue today. In general, anticlines within the YFB are asymmetrical with the exception of the Columbia Hills anticline. Distribution of seismicity appears to be mainly associated with the east-west-striking compressive faults and folds of the YFB (Geomatrix Consultants, 1995). Earthquakes within the Columbia Plateau typically exhibit reverse (compressive) focal mechanisms along east-west striking faults.

Historical Seismicity

Historically, north-central Oregon and south-central Washington has been characterized by a relatively low level of seismicity. In characterizing earthquake occurrence, historical earthquakes can generally be divided into pre-instrumental and instrumental periods. Prior to adequate seismographic coverage, the detection of earthquakes was generally based on direct observation and felt reports and were correlated with the Modified Mercalli Intensity (see Table 3.2.1) value for the event. These results are strongly dependent on population density and distribution. This part of the Pacific Northwest is typical of much of the western United States, and was sparsely populated in the 1800s. Therefore the detection of pre-instrumental earthquakes shows varying degrees of completeness. The pre-instrumental historical record is estimated to be complete for earthquakes of Richter local magnitude (M_L) 5 and larger since about 1850 for the Portland region (Bott and Wong, 1993). Seismograph stations were established in 1906 in Seattle and 1944 in Corvallis, but adequate seismographic coverage of small events ($M \leq 3.0$) did not begin in northwest Oregon until about 1980 when the University of Washington expanded its regional network. The historical record is complete for M_L 2.5 and greater only since 1980 (Bott and Wong, 1993).

An historical earthquake catalog of all known events within 80 km (50 miles) of the site for the period 1887 to 2000 was compiled from comprehensive databases. Historical earthquakes in excess of magnitude 2.0 are shown in Figures 3.2.8 and 3.2.9, respectively. Earthquakes which

generated a maximum intensity of Modified Mercalli (MM) III or greater at the proposed power plant site are listed in Table 3.2.2. Only one earthquake of unspecified magnitude (M) 6.0 has occurred in the region, and it is located approximately 100 km (62 miles) from the site. Approximately five earthquakes in the catalog have magnitudes between M 5.0 to 5.9, all at distances of approximately 100 km (62 miles) from the proposed power plant site. The one exception is the 1893 Umatilla earthquake (see discussion below).

Based on the historical record, the proposed project is an area of diffuse seismicity with a few areas of concentrated seismicity. Eastern Oregon is much less active than the Portland region, which is the most seismically active area in Oregon. Most events in eastern Oregon do not appear to be associated with known faults, indicating the presence of many faults which do not have surface expression or faults which are unmapped. Most earthquakes in Oregon and Washington have focal depths of 15 to 20 km (nine to 12 miles) or less, though focal depths deepen in western Oregon-Washington to about 25 to 30 km (16 to 19 miles) (Ludwin *et al.*, 1991). Regional focal mechanisms indicate that the project area lies within a compressional regime characterized by a mostly north-south maximum compression, resulting in reverse/thrust, strike-slip, or oblique faulting (Ludwin *et al.*, 1991).

Significant Earthquakes

Significant earthquakes and earthquakes greater than M 4.0 in the region are shown on Table 3.2.2. The four largest events are further discussed below.

1872 North Cascades Earthquake

On December 15, 1872, a large earthquake occurred in the wilderness of central Washington with an approximate M_L 7.4. The exact source of the earthquake is unknown, though it was felt throughout the Pacific Northwest. Because there were few inhabitants in the region, the only reported damage was to a few log buildings. Extensive landslides occurred throughout the Cascades and along the Columbia River, including a massive landslide at Ribbon Cliff, which blocked the river for several hours. Ground fissures occurred at the eastern end of Lake Chelan, while at Chelan Falls a geyser spouted water as high as nine meters for several days (Stover and Coffman, 1993). The event generated an approximate maximum intensity of MM III-IV near the site (Malone and Bor, 1979) (Figure 3.2.10).

1893 Umatilla Earthquake

On March 3, 1893, a moderate earthquake occurred near Umatilla. The exact location and source of the earthquake are unknown. Studies have shown that the earthquake had a shallow depth, was felt over a relatively small area, and had a maximum intensity of MM V (Squier Associates, 1994).

1936 Milton-Freewater Earthquake

On July 16, 1936, at 07:07:49 Greenwich Mean Time (GMT), an earthquake with an estimated M_L 6.1 occurred near the town of Milton-Freewater on the Oregon-Washington border (Mann and Meyer, 1993). This was the largest and most significant earthquake in northeastern Oregon. The maximum intensity was MM VII+, and it was felt over an area of 275,000 km^2 (106,178 ft^2). The main shock was preceded by two felt foreshocks and was followed by numerous aftershocks. The main shock produced the strongest shaking and caused damage in and around the towns of Milton-Freewater, Umapine, and Stateline, Oregon and Walla Walla, Washington. Ground cracks as large as one to two meters (three to seven feet) wide reportedly occurred west of Milton-Freewater. At the site the intensity was approximately MM V (Figure 3.2.11). This is probably the strongest ground shaking that the site has been subjected to in historical times. A MM V roughly corresponds to a peak horizontal acceleration of 0.18 to 0.34g based on Wald *et al.* (1999).

1976 Deshutes Valley Earthquake

On April 13, 1976, at 00:47:15 GMT, an earthquake of estimated M_L 4.8 occurred near the town of Maupin in north-central Oregon. The maximum intensity was MM V-VI along the Deschutes River Valley, and it was felt over an area of 35,000 km^2 (13,514 mi^2). A composite focal mechanism of the main shock suggests that the earthquake occurred on a west-northwest-striking reverse fault (Wong and Bott, 1995). At the site, the intensity was approximately MM II-IV (Figure 3.2.12).

Seismic Source Zones

All reported Quaternary-aged seismic source zones within the project area have been examined. These are tabulated below in Table 3.2.3 at the end of this section and are depicted in Figure 3.2.13.

Anticipated Level of Ground Shaking

Significant potential earthquake sources located within the project area have been investigated for seismic risk to the proposed power plant. Specific areas considered in this analysis are depicted in Figure 3.2.14. The analysis yields expected level of ground shaking in terms of peak ground acceleration under the Maximum Credible Earthquake (MCE) generated at each source. These are reported at the end of this section in Table 3.2.4.

3.2.2 Environmental Consequences and Mitigation Measures

Impacts associated with geology include impacts on soils native to the project area and impacts to the proposed power plant due to geologic hazards. Potential impacts and mitigation measures for each of these issues are addressed below.

Impact 3.2.1 Local soils could be adversely affected by construction of all elements of the proposed project

Soil Erosion from Surface Water Runoff

Assessment of Impact As shown in Tables 3.2.5 and 3.2.6, the majority of the soils in the project area occur on slopes of less than 5 percent. The runoff potential and water erosion hazard for these soils are low and slight, respectively. Approximately 98 percent of the total project area includes soils with a slight water erosion hazard. In addition, the region typically receives less than 10 inches of rain annually. Approximately 60 percent of the annual precipitation occurs from November through March.

The construction contractor would be required to adopt standard practices for control of soil erosion and sediment runoff at construction sites. These practices would include:

- Revegetation of disturbed areas
- Use of temporary erosion and sediment control measures such as silt fence, straw bales, mulch, and slope breakers and maintenance of these features throughout construction and restoration;
- Installation of permanent erosion control measures, as necessary, during construction, cleanup and restoration.

As a result of natural conditions at the construction sites and the practices that would be adopted by the contractor, surface water runoff at the proposed project would not have a significant adverse impact on soils.

Recommended Mitigation Measures Soil erosion as a result of precipitation and runoff could be eliminated by constructing the proposed project between April and October. It is recommended that, consistent with the objective to have the proposed power plant project commercially operable in August 2003, all ground-disturbing activities should be conducted within the drier months, to the extent practicable.

Soil Erosion from Wind

Assessment of Impact As shown in Tables 3.2.5 and 3.2.6, the wind erosion hazard for the soils in the project area ranges from moderate to very high. Approximately 15 percent of the total

project area has a moderate wind erosion hazard. Seventy-six percent of the total project has a high wind erosion hazard, and about 7 percent of the total project area has a very high wind erosion hazard. Wind erosion is influenced by the climate, vegetative cover, soil texture, soil moisture, length of the unprotected soil surface, topography, and frequency of soil disturbances. The October to November and January to April time periods are the most critical for wind erosion. However, high winds can be expected year round within the region.

The construction contractor would be required to adopt standard practices for control of soil erosion and sediment runoff at construction sites. These practices would include:

- Making reasonable efforts to reduce the area of soil disturbance;
- Removing vegetation only as necessary;
- Minimizing the amount of traffic over unprotected soils or confining equipment use to specific areas;
- Application of water or mulch, as necessary, for emergency wind erosion control during construction;
- Revegetation of construction areas.

As a result of the practices that would be adopted by the contractor, wind erosion at the proposed project would not have a significant adverse impact on soils.

Recommended Mitigation Measures Soil erosion as a result of wind could be reduced by constructing the proposed project between April and October. It is recommended that, consistent with the objective to have the proposed power plant project commercially operable in August 2003, all ground-disturbing activities should be conducted within these months, to the extent practicable.

Reduced Agricultural Yield

Assessment of Impact Construction of the pipeline would require grading, excavations, trenching and backfilling. The mixing of topsoil with less productive subsoil horizons during these activities could lower the soil productivity. It is expected that any adverse effects of the proposed project would be reduced to insignificance by the measures described below:

- Stripping and segregation of topsoil from over the trench and from the trench spoil storage. The construction contractor would strip the topsoil layer to a maximum depth of 30 centimeters (12 inches), or, where topsoil depth is less than 30 centimeters (12 inches), topsoil would be stripped to a depth where the topsoil color changes to the color of the underlying soil horizon or to where an otherwise distinct underlying soil horizon is encountered.

- Storing of stripped topsoil separately and not allowing it to mix with trench spoil, cut-and-fill materials, rock, construction debris, excavated materials or other subsoil.

In the worst case, approximately 67 percent of the project area has soils with a stony or rocky subsoil. Grading, excavation, trenching and backfilling may result in the additional incorporation of stones into the topsoil. Shallow bedrock (less than 60 inches [152 centimeters] depth) was not identified in any of the soils in the project area (Tables 3.2.5 and 3.2.6). Measures used to minimize the introduction of rock into the topsoil would include:

- Segregation of topsoil from the trench spoil.
- Removal of excess rock from at least the top 30 centimeters (12 inches) of the soil to the extent practical in agricultural and residential areas.
- Removal of rock as necessary so the size, density and distribution of rock on the construction area would be similar to adjacent areas not disturbed by construction.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Spread of Noxious Weeds and Soil-Borne Plant Disease

Assessment of Impact The spread of noxious weeds and soil-borne plant disease is a potential problem in agricultural areas. Seed or soil may adhere to construction equipment and be spread from one construction area to another, resulting in the establishment of noxious weed seed and soil-borne plant disease in previously uninfected areas. Straw bales and mulch may also contain noxious weed seed, and the weeds may become established in construction areas where the straw is used for erosion and sediment control.

The construction contractor would adhere to the following practices to reduce the spread of noxious weeds or soil-borne plant disease:

- Thorough cleaning of construction equipment by Contractors with high-pressure washing equipment prior to moving to the job site.
- Consultation with the Oregon Department of Agriculture and other appropriate agencies to identify the presence of noxious weeds in the project area.
- Use of straw bales and straw from fields where the harvested seed has been certified as Oregon certified seed.
- Consultation with appropriate agencies to determine if soil-borne plant diseases of agronomic significance have been identified in the project area.

As a result of these measures, the proposed project would not contribute to the spread of noxious weeds.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended

Impact 3.2.2 The proposed project could be adversely affected by geologic hazards

Soil Hazards

Assessment of Impact Soil hazards in this context are those that lead to excessive post-construction movements (either settlement or swelling) that impede the safe operation of the proposed power plant. Excessive settlement is typically associated with organic-rich soils, loose uncemented silts and sands, or highly plastic silts and clays. Furthermore, excessive settlement can arise from the improper specification, placement, and compaction of backfill. Conversely, highly plastic soils can exhibit extreme swelling characteristics with moderate increases in moisture content.

Based on the studies performed by URS, the proposed project does not encounter significant deposits of organic-rich soils, loose uncemented silts and sands, or highly plastic silts and clays. Therefore, soil-related hazards do not pose a significant risk to the safe construction and operation of the project.

A detailed geotechnical investigation would be conducted during the design of the proposed power plant project. Information gained during the geotechnical investigation would be used to select an appropriate foundation system for the proposed power plant project.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended

Landslides

Assessment of Impact Assessment of landslide hazards was performed by interpreting aerial photograph and evaluating field reconnaissance. The project terrain is marked with relatively flat topography with no evidence of previous landslide activity. Therefore, the risk of landslides to the safe construction and operation of the proposed power plant is low.

Recommended Mitigation Measures None are recommended.

Impacts from Seismic Activity

Potential impacts from seismic activity include volcanic eruptions, strong ground shaking, seismically induced landsliding, liquefaction of subsurface soils, surface rupture by the earthquake, and subsidence. These are discussed further below.

Volcanic Activity

Assessment of Impact There are no active volcanoes, Quaternary lava flows, or cinder cones within the project vicinity. The chain of active volcanoes that result from plate subduction makes up the Cascade Range, which extends roughly north-south through Oregon and stretches from northern California to British Columbia. Presently, the High Cascade Range in southwestern Washington and northwestern Oregon is dominated by late Pleistocene stratovolcanoes, such as Mount St. Helens (located ~240 km from site), Mount Adams (~180 km), Mount Rainier (~230 km), and Mount Hood (~200 km), all of which are considered to be potentially active and have erupted in the last few hundred years. Specific hazards related to volcanic activity include lava or debris flows and ash falls (also known as tephra). The site is located too far from known volcanoes to be at risk from lava or debris flows. Historic ash falls have impacted the site during prior eruptions of Mt. Mazama (Crater Lake) and Glacier Peak. However, the amount of ash likely to fall at the site from future eruptions will not be sufficient to cause structural damage. Air filters leading to the combustion turbines or on-site diesel generators would likely require replacement/cleaning subsequent to an ash fall. Overall, the risk to the safe operation of the proposed power plant from volcanic eruption is low.

Recommended Mitigation Measures None are recommended.

Ground-shaking

Assessment of Impact The project area is subject to periodic ground-shaking from earthquakes. The intensity of the shaking is dependent upon three factors: the magnitude of the earthquake, the distance between the earthquake epicenter and site, and the response of the onsite soils to the motions induced by the earthquake. It is expected that a maximum credible earthquake (MCE) on the Service Anticline would produce accelerations at the proposed power plant ranging from about 0.3 to 0.4 g, depending on fault rupture length of the Service Anticline. This level of ground shaking exceeds Peak Ground Acceleration (PGA) values specified in the Oregon Structural Specialty Code. However, MCE ground motions are overly conservative as a design basis for these types of facilities. To this end, the proposed power plant would be designed using model codes or site-specific seismic studies that account for the expected level of ground shaking on a probabilistic basis. This is the approach commonly used for power plants, buildings, bridges, hospitals, chemical plants, and other facilities. As such, ground-shaking hazards would

be mitigated through proper design and construction and would pose no significant risk to human safety during the construction and operation of the proposed power plant.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Seismically Induced Landslide

Assessment of Impact The absence of steep topography precludes the development of seismically induced landslides that would affect the proposed power plant. Therefore, the risk to public safety from seismically induced landslides is low.

Recommended Mitigation Measures None are recommended.

Liquefaction and Related Phenomena

Assessment of Impact The absence of loose, granular, and saturated soils near the ground surface precludes widespread liquefaction that would affect the proposed power plant site. Therefore, the risk to public safety from seismically induced liquefaction and related phenomena (settlement, lateral spreading, or flow) is low.

Recommended Mitigation Measures None are recommended.

Surface Fault Rupture

Assessment of Impact No known faults traverse the proposed power plant site. Therefore, risk to the safe operation of the proposed power plant from seismically induced surface fault rupture is low.

Recommended Mitigation Measures None are recommended.

Subsidence

Assessment of Impact Faults identified within the proximity of the proposed power plant site are not expected to generate tectonic subsidence. As such, risk to the safe operation of the proposed power plant from seismically induced subsidence is low.

Recommended Mitigation Measures None are recommended.

3.2.3 Cumulative Impacts

The proposed project would have minimal effects on geology, soils and seismicity. The proposed power plant would be located on a flat site. The associated natural gas, water and reclaimed water pipelines and electric power transmission lines would be located in gently sloping areas. Other existing or proposed power generation projects in the vicinity of the proposed project are similarly located in areas with low geologic hazard. The proposed project would not be especially vulnerable to geologic hazards and thus would not increase the overall or cumulative vulnerability of the project area to geologic hazards.

Land with soils suitable for agriculture is often consumed by urban development. Cumulatively, the loss of agricultural land as a result of urban development could result in reduced agricultural productivity. The proposed power plant would be located on a 31-hectare (77-acre) parcel of land surrounded by freeways, other roads and industrial facilities. Umatilla County has zoned the parcel for industrial and commercial use and does not intend it to be used for agricultural purposes. The proposed power plant site was formerly used as a gravel yard and currently is sparsely vegetated. Other existing or proposed power generation projects in the vicinity of the proposed project are similarly located in areas that are zoned for industrial use.

Although, local governments have decided that industrial use is the best use of certain lands previously used for agriculture, the proposed power plant would contribute to the progressive industrialization of the Umatilla/Hermiston area and the cumulative loss of lands with soils suitable for agricultural use.

Portions of the natural gas pipeline and the reclaimed water would traverse lands used for agriculture. Topsoil would be removed during construction of the pipelines and replaced after pipe installation. The agricultural productivity of the land would be unaffected. Thus, the pipelines would not contribute to a cumulative loss of land with soil suitable for agricultural use.

Table 3.2.1:
Modified Mercalli Intensity Scale

Intensity	Modified Mercalli Intensity Scale of 1931[1]
I	Not felt except by a very few under especially favorable conditions.
II	Felt by only a very few persons at rest, especially on upper floors of buildings; delicately suspended objects may swing.
III	Felt quite noticeably indoors, especially on upper floors of buildings, but many people do not recognize it as an earthquake; standing motor cars may rock slightly; vibration like passing of truck; duration estimated.
IV	During the day felt indoors by many, outdoors by few; at night some awakened; dishes, windows, doors disturbed; walls make cracking sound; sensation like heavy truck striking building; standing motor cars rocked noticeably.
V	Felt by nearly everyone, many awakened; some dishes, windows, etc., broken; a few instances of cracked plaster; unstable objects overturned; disturbances of trees, piles, and other tall objects sometimes noticed.
VI	Felt by all, many frightened and run outdoors; some heavy furniture moved; a few instances of fallen plaster or damaged chimneys; damage slight.
VII	Everybody runs outdoors; damage negligible in buildings of good design and construction, slight to moderate in well-built, ordinary structures, considerable in poorly built or badly designed structures; some chimneys broken; noticed by persons driving motor cars.
VIII	Damage slight in specially designed structures, considerable in ordinary substantial buildings, with partial collapse, great in poorly built structures; panel walls thrown out of frame structures; fall of chimneys, factory stacks, columns, monuments, walls; heavy furniture overturned; sand and mud ejected in small amounts; changes in well water; persons driving in motor cars disturbed.
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb; great in substantial buildings, with partial collapse; buildings shifted off foundations; ground cracked conspicuously; underground pipes broken.
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations; ground badly cracked; rails bent; landslides considerable from river banks and steep slopes shifted sand and mud; water splashed over banks.
XI	Few, if any (masonry) structures standing; bridges destroyed; broad fissures in ground; underground pipelines completely out of service; earth slumps and land sips in soft ground; rails bent greatly.
XII	Damage total; practically all works of construction are damaged greatly or destroyed; waves seen on ground surface; lines of sight and level are distorted; objects thrown into air.

[1] From Kramer (1996)

Table 3.2.2:
Significant Historical Earthquakes Which Have or May Have Generated MM III or Greater Intensities at the Site

Date	Origin Time (GMT)	Latitude (degrees)	Longitude (degrees)	Magnitude	Estimated MM Intensity
1872 Dec 15	0:00:00	48.600	-121.400	M_L 7.4	VII+ (III-IV at site)
1892 Mar 5	5:00:00	46.600	-120.500	M_I 5.1	VI*
1893 Mar 5	0:00:00	45.900	-119.333	M_I 5.0	VI*
1918 Nov 1	17:00:00	46.700	-119.500	M_I 5.0	VI*
1921 Sep 14	11:00:00	46.100	-118.250	M_I 5.0	VI*
1924 Jan 5	22:00:00	45.830	-119.250	M_I 5.0	V*
1936 Jul 16	7:07:49	46.208	-118.233	M_L 6.1	VII (V at site)
1951 Jan 7	22:45:00	45.900	-119.200	M_I 4.3	V*
1964 Jan 15	23:06:36	45.900	-120.000	m_b 4.2	Unknown*
1976 Apr 13	0:47:15	45.076	-120.859	M_L 4.8	V-VI (II-IV at site)

* No isoseismal map is known to exist for these earthquakes, but given their location and maximum intensity or instrumental magnitude, it is possible these earthquakes generated MM III
at the site.

GMT	Greenwich Mean Time
M_L	Richter Local
M_I	Intensity-based
m_b	Body-wave

Table 3.2.3:
Significant Quaternary Faults in the Site Region

Fault	Style	Rupture Length (km)	M_{max} (M_w)	Dip	Closest Distance to Project Site (km)	Data Sources
Service Anticline	S-S/R	10 42	6.2 7	Fold	5	Foundation Sciences, 1980; Squier Associates, 1994
Columbia Hills Anticline	R	170	7.7	Fold	22	Geomatrix, 1995; Geomatrix, 1996; Wong et al., 2000b
Rattlesnake-Wallula Trend (RAW) - REVERSE	R	50	7.1	45°NE	46	Geomatrix, 1995; Geomatrix, 1996; Wong et al., 2000b
Rattlesnake-Wallula Trend (RAW) - STRIKE SLIP	S-S	115	7.5	90°	46	West et al., 1996; Geomatrix, 1996; F.H. Swan, pers. omm., 2000; S.P. Reidel, pers. commun., 2000; Wong et al., 2000b
Wallula	S-S	44	7	90°	51	Squier Associates, 1994;
Horse Heaven Hills	R	48	7	45°NE	57	Geomatrix, 1988; Geomatrix, 1990; Wong et al., 2000b
Arlington - Shutler Buttes fault zone	S-S	70	7.2	90°	66	Geomatrix, 1995; Geomatrix, 1996; Wong et al., 2000b
Columbia Hills Anticline fault	R	72	7.2	45°NW	86	Geomatrix, 1995; Geomatrix, 1996; Wong et al., 2000b
Umtanum Ridge	R	141	7.6	45°S	95	Geomatrix, 1995; Wong et al., 2000b
Oak Flat - Luna Buttes zone	S-S	40	6.9	90°	95	Geomatrix, 1995; Wong et al., 2000b
Hite	S-S	60	7.1	90°	99	Geomatrix, 1995;
Toppenish Ridge (Satus Peak segment)	R	30	6.8	45°S	101	Geomatrix, 1988; Geomatrix, 1990; Wong et al., 2000b
Walla Walla Basin	S-S?	12	6.3	70°SW	104	Squier Associates, 1994; Tolan and Reidel, 1989
West Grande Ronde Valley	N	17	6.5	70°NE	107	Geomatrix, 1995
Manastash Ridge	R	40	6.9	45°S	118	Geomatrix, 1988; Wong et al., 2000b

Fault	Style	Rupture Length (km)	M_{max} (M_w)	Dip	Closest Distance to Project Site (km)	Data Sources
Saddle Mountains (Saddle Gap segment)	R	28	6.8	40°S	121	Geomatrix, 1988; Wong et al., 2000b
East Grande Ronde Valley	N	15	6.4	70°SW	126	Geomatrix, 1995
Saddle Mountains (Smyrna Bench segment)	R	16	6.4	40°S	128	Geomatrix, 1990; Geomatrix, 1996; Wong et al., 2000b
Tampico	S-S	16.5	6.5	90°	136	Geomatrix, 1988; Wong et al., 2000b
Frenchman Hills (West Canal segment)	R	30	6.8	40°S	139	Geomatrix, 1995; Wong et al., 2000b
Cowiche Mountain	R	50	7.1	45°N	140	Geomatrix, 1990; Wong et al., 2000b
Wallowa	N	40	6.9	70° NE	151	Geomatrix, 1995

S-S = Strike-slip fault
R = Reverse fault
N = Normal fault

Table 3.2.4:
MCE Median (50th Percentile) Peak Horizontal Accelerations on Soil

Seismic Source	MCE (M_w)	Distance to Project (km)	Peak Horizontal Acceleration (g's)				
			Abrahamson & Silva (1997)	Boore et al. (1997)	Campbell (1997)	Sadigh et al. (1997)	Average PGA
Service Anticline	7	5.0	0.43	0.45	0.47	0.42	0.44
Wallula Fault	7	51.0	0.09	0.10	0.09	0.08	0.09
Columbia Hills Anticline	7.7	22.0	0.26	0.32	0.34	0.33	0.31
Rattlesnake-Wallula Trend	7.5	46.0	0.12	0.14	0.15	0.13	0.13
Rattlesnake-Wallula Trend	7.1	46.0	0.12	0.13	0.10	0.13	0.12

3.3 HYDROLOGY AND WATER QUALITY

Surface water bodies that could potentially be affected by the proposed project include the Columbia River, the Umatilla River and Butter Creek. Shallow and deep groundwater aquifers underlie the project area and could also be affected by the proposed project.

3.3.1 Affected Environment

The proposed project area is located on the Umatilla Plateau, which slopes gently from the Blue Mountains to the edge of the Columbia River Gorge. Slopes are generally less than 5 percent. Elevations in the vicinity of the proposed project vary from about 213 meters (700 feet) above sea level at the connection point with the GTN natural gas pipeline to 91 meters (300 feet) above sea level at the McNary Substation. The project area is in the rain shadow of the Cascade Mountains and is arid, receiving slightly less than 23 centimeters (nine inches) of precipitation annually. Most precipitation occurs between October and April.

Surface Water

Regional Hydrology

The proposed project lies within the Columbia-Umatilla Plateau hydrologic sub-basin of the perennial Umatilla River. The Umatilla River drains an area of 7,313 km^2 (4,545 mi^2) and joins the Columbia River at the city of Umatilla, about 13 kilometers (eight miles) north of the proposed power plant site. The proposed power plant site lies approximately 1.5 kilometers (1.0 mile) west of the Umatilla River.

The other significant natural drainage feature in the vicinity of the proposed project is Butter Creek, a tributary of the Umatilla River. Butter Creek is an intermittent stream that joins the Umatilla River about 3.2 kilometers (2.0 miles) upstream of the power plant site. A portion of the flow of Butter Creek is diverted into the Westland Canal, an irrigation canal that flows through the eastern portion of the proposed power plant site. Surface water features in the vicinity of the proposed project are shown in Figure 3.2.1.

The Columbia River is the region's dominant surface water feature. The Columbia River has an average regulated discharge of approximately 5,663 cubic meters per second (m^3/s) (200,000 cubic feet per second [cfs]) at McNary Dam. Discharge varies seasonally and from year-to-year. Typically, high flows of 6,796 to 7,929 m^3/s (240,000 to 280,000 cfs) occur through April and June. Low flows occur in August through November and typically are in the range 3,030 to 3,228 m^3/s (107,000 to 114,000 cfs).

Local Hydrology

The proposed power plant site is currently undeveloped and includes no defined natural drainage channels. Because the site is flat and soils at the site are permeable, precipitation percolates directly into the ground or briefly accumulates in ponds and then percolates into the ground or evaporates.

The reach of the Umatilla River near the proposed power plant site lies within an approximately 12 meter (40 feet) deep incised channel. The 100-year flood plain is within the channel.

Surface Water Management

Flows in all major rivers and creeks in the project area are extensively managed. Large winter flows are captured in reservoirs and released as needed for agricultural irrigation and hydropower generation. Most of the surface water in the streams of the Umatilla Basin has been appropriated for agricultural use. Cumulative water rights on many streams exceed available flows in summer months. The Umatilla River Basin Plan (State of Oregon, 1988), which regulates and guides future water development in this basin, prohibits further withdrawal of water from the Umatilla River and its tributaries in the Umatilla Plateau sub-basin from June 1 through October 31 of each year (OAR Chapter 690, Division 507).

The Columbia River provides water for many, sometimes competing, beneficial uses. Beneficial uses of the Columbia River include irrigation, navigation, hydropower, flood control, recreation, municipal and industrial water supply, and fish and wildlife use. Three Federal agencies, including BPA, the US Army Corps of Engineers (Corps), and the Bureau of Reclamation, are currently undertaking a major review of the river and its management in an attempt to reconcile all of the competing uses. Additionally, although existing water rights are being honored, Oregon and Washington each have a current moratorium on granting new water rights on the Columbia River except under certain limited conditions (OAR Chapter 690, Division 519; Washington Administrative Code [WAC] 173-563-015(2)).

Surface Water Quality

Water quality in the reach of the Columbia River near the proposed project is good. Water quality data for the Columbia River are shown in Table 3.3.1.

Groundwater

The proposed power plant site is located in the Butter Creek Ground Water Control Area, as designated by the Umatilla Basin Plan. Local and regional groundwater aquifers in this area are frequently used to supplement surface water supplies for irrigation. This has led to overdrafting

of groundwater aquifers. Irrigators have begun attempting to recharge shallow aquifers and increase soil moisture with surface water diverted during the winter.

The overall project area is underlain by two groundwater aquifers, a deep aquifer and a shallow aquifer. In general, groundwater elevations indicate that groundwater flow is from south to north, toward the Columbia River. Local variations in flow directions may occur in the shallow aquifer and are influenced by topography and intervening drainages. Each aquifer is described below.

Shallow Aquifer

The shallow aquifer in the project area is located in the unconsolidated and unconfined sand and gravel deposits that overlie the basalt bedrock in the region. In the project area, permeable gravel interbeds supply water to several high-yielding wells. The aquifer is 31 to 38 meters (100 to 125 feet) thick, with a saturated zone averaging eight meters (25 feet) and ranging from five to 38 meters (15 to 125 feet) thick. Water levels in this aquifer were generally around 17 meters (55 feet) below the ground surface in 1975. Water levels have been dropping by about 0.5 meter (1.6 feet) per year since the mid-1960s. Recharge is provided by less than 25 percent of precipitation, as well as normal irrigation and leaching in the area.

Based on the topography of the area, the shallow groundwater flow direction appears to be north/northwest, toward the Columbia River. Local variations may exist in response to topographic highs and local creeks such as Butter Creek. In some bottomland areas (i.e., along Butter Creek) clay and clayey gravel layers can confine the downward movement of water and result in perched aquifers within about six meters (20 feet) of the surface. This shallow aquifer is hydrologically connected with the creek, and its level drops as creek flows diminish in the summer and fall. Groundwater resources of the shallow aquifer in the Ordnance Critical Groundwater Area, just west of the site, are closed to further appropriation.

Deep Aquifers

Water-bearing zones of significant storage capacity are found within the interbeds of the basalt flows that lie beneath the sedimentary deposits in the region. Though poorly connected, these zones are viewed as one system because of the substantial vertical movement of water through joints in the basalt and through uncased wells drilled into the basalt. Basalt depths in the region are about 213 to 335 meters (700 to 1100 feet) below the ground surface. Static water levels in the primary water-producing zones range from 61 to 91 meters (200 to 300 feet) below the surface and have declined significantly for many years because of over-pumping and slow recharge. Groundwater recharge of this aquifer occurs in the Blue Mountains to the south, while natural groundwater discharge is to the Columbia River and its tributaries. Recharge in the project area is limited by the Willow Creek monocline, a geologic feature south of Madison

Ranches that acts as a barrier to groundwater flow from the south. Groundwater resources in the basalt aquifer in both the Butter Creek Critical Ground Water Area and the Ordnance Critical Ground Water Area are closed to further appropriation.

Groundwater Quality

Groundwater data are available from several wells at Madison Farms south of the proposed power plant site. Groundwater levels and quality for the Madison Ranches wells as measured in the early 1990s are listed in Table 3.3.2. The locations of the wells are shown in Figure 3.3.1. Data obtained in the late 1990s and analyzed for the WPCF Permit Modification Request indicated that the total dissolved solids concentration of groundwater averages about 400 mg/L.

3.3.2 Environmental Consequences and Mitigation Measures

Diversion of water from the Columbia River for use by the proposed power plant could potentially have an adverse environmental effect on beneficial uses of the river that depend on in-stream flow. Wastewater and storm water management, reuse and disposal practices and chemical spills at the proposed project could have an adverse effect on surface and groundwater quality. Construction activities associated with the proposed project could result in the discharge of sediment and other substances that could have an adverse effect on surface water quality.

Impact 3.3.1 Diversion of water from the Columbia River

Assessment of Impact Water for the proposed Umatilla Generating Project would be obtained from the Port of Umatilla's regional water supply system. Under an existing water right, the Port of Umatilla diverts water from the Columbia River near the city of Umatilla and conveys it to users southward in a 61-centimeter (24-inch) diameter pipeline. The pipeline would be extended to supply water to the proposed project. Further information on the Port of Umatilla's water rights is provided in Section 3.5.

Peak average water demand at the proposed project would be 0.16 m^3/s (5.76 cfs). Average annual water demand at the project would be 0.15 m^3/s (5.12 cfs).

As noted above, flow in the Columbia River is typically in the range of 3,030 to 3,228 m^3/s (107,000 to 114,000 cfs) during the low-flow period in the fall. The water diverted for the proposed project would represent about 0.005 % of river flow during a typical low-flow period and less during high flows. The lowest flows recorded in the Columbia River occurred in the late 1930s before most of the major dams were constructed. The dams have a damping effect on extreme flows, reducing the peak flows and increasing low flows. The lowest flow recorded in more recent years was 1,359 m^3/s (48,000 cfs) in 1977. Water diverted for the proposed project would represent about 0.01% of river flow during an extremely dry period.

The small change in river flow attributable to the proposed project would not be expected to have any significant adverse effect on beneficial uses or water quality in the river. Beneficial uses of the Columbia River include protection of fish and wildlife, agricultural irrigation supply, municipal and industrial supply, navigation and hydropower generation. Diversion of water for the proposed project water have no effect on the ability of downstream municipal, industrial or agricultural water users to obtain the water they are permitted to divert. The amount of water diverted for the proposed project would have no measurable effect on water levels and consequently would not affect navigation. The amount of water in the river available for generation of hydropower at downstream dams would be slightly reduced. It was estimated that a similar energy facility now under construction a few miles upstream of the proposed project would reduce power generation at the downstream dams by 756 megawatt hours annually (Hermiston Power Partners, EIS, 1997). Using the same operating assumptions for the downstream dams the reduction in power generation downstream attributable to the proposed project would be 1,036 megawatt hours. This represents about 0.003 percent of the average annual electric power output of the downstream dams.

The potential effects of the proposed project on fish are discussed in Section 3.5 of this EIS. Some believe that locating electrical generating facilities in the Umatilla area would benefit fish in the reach of the Columbia River below the major hydropower dams because it may enable those dams to spill more water (Personal communication, Scott Bettin, BPA, 19 June 2001).

Mitigation Measures included in the Proposed Project

The proposed power plant would include a number of features that reduce water use. A recirculating cooling system using cooling towers with high-efficiency drift eliminators would reduce the volume of water needed to cool the turbines compared to that required by a once-through cooling system. All wash water and other aqueous wastewater streams produced at the proposed power plant would be recycled and used a second time as cooling water. The proposed power plant would employ equipment that does not require water for removing nitrogen oxides from exhaust gases.

Other Possible Mitigation Measures

The effects of the proposed project on the Columbia River could be further reduced by substituting a dry cooling system for the proposed recirculating water cooling system. The applicant evaluated this potential mitigation measure but rejected it because it would reduce the efficiency of the energy facility and increase its operating cost. Overall the adverse environmental effects of water diversion from the river would be insignificant.

Impact 3.3.2 Wastewater and storm water discharge during project operation could affect surface and groundwater quality

Assessment of Impact Sanitary sewage, process blowdown, cooling system blowdown and stormwater runoff would be generated by the proposed power plant. Process blowdown, consisting of wash water, filter backwash, and other non-sanitary liquid wastes produced by the proposed power plant, would be recycled to the cooling system.

No wastewater from the proposed project would be routed to a municipal sewage treatment plant. Cooling system blowdown is essentially clean water which municipal treatment plant operators are often reluctant to accept because it decreases the effectiveness of conventional wastewater treatment processes. The volume of sanitary sewage produced at the proposed project site is too small to justify construction of a pipeline to the nearest sewage treatment plant in Hermiston.

Sanitary sewage

Sanitary sewage would be routed to an on-site disposal system consisting of a septic tank and leach field located at the proposed power plant site. The average volume of sanitary sewage would be 1,893 l/day (500 gal/day). The on-site disposal system would be designed in accordance with Umatilla County's standards for on-site disposal systems. Percolation into the ground of treated sanitary sewage from the septic system from the proposed power plant would not have a significant adverse effect on groundwater quality.

Cooling system blowdown

Cooling system blowdown is essentially clean water with an elevated total dissolved solids content. It is expected that, on average, water in the cooling system would circulate in the cooling system ten times. About 90% of the water entering the cooling system would be evaporated and the remainder would be discharged as blowdown. The total dissolved solids content of blowdown would be approximately ten times that of the source water. The total dissolved solids content of Columbia River water varies somewhat seasonally, but in the reach of the river near the proposed project, it is typically in the range of 110mg/L to 120 mg/L (WPCF Permit Modification Request, Hermiston Generating Company, L.P., 2001). Cooling system blowdown from the proposed project would have a total dissolved solids content of 1,100 to1,200 mg/L.

Three water-conditioning chemicals would be added in small quantities to the cooling system to control pH, prevent growth of algae, and prevent build up of scale. They are sulphuric acid,

sodium hypochlorite solution and Betz 430, a proprietary scale inhibitor. The primary constituents of Betz 430 are HEDP and polyacrylic acid.

It is expected that about 818 kilograms (1,800 lbs) of sulphuric acid would be used each day to maintain pH in the neutral to slightly acidic range. An estimated 13 to 26 liters (50 to 100 gallons) of sodium hypochlorite solution would be used each day to prevent growth of algae. About five liters (17 gallons) of Betz 430 would be added to the cooling system each day.

Cooling system blowdown from the proposed power plant would be reclaimed and reused at Madison Farms for irrigation of cropland in accordance with the WPCF permit issued by ODEQ. Madison Farms is located about five kilometers (three miles) south of the proposed power plant site as shown in Figure 2.11. Cooling system blowdown would be conveyed to Madison Farms in a pipeline shared with the Hermiston Generating Plant, which is located approximately 0.8 kilometer (0.5 mile) east of the proposed power plant.

At Madison Farms, blowdown from the proposed power plant and the Hermiston Generating Plant would be applied to cropland. During the growing season, blowdown would be supplied to center pivot irrigation systems and used to irrigate crops. During the winter, blowdown would be land applied using the same center pivot irrigation systems.

The quantity of blowdown that would be applied to a given acre each year would be regulated by ODEQ to protect water quality. Blowdown water would provide a portion of the crops' water requirement. Columbia River water from Madison Farms' other water sources would provide the balance. Approximately 688 hectares (1,700 acres) of irrigated cropland are needed to meet the combined disposal requirements of the proposed power plant and the Hermiston Generating Plant. This acreage has been allocated by Madison Farms.

As mentioned in the previous paragraph, a Water Pollution Control Facility (WPCF) permit issued by ODEQ regulates the reuse and disposal of blowdown from the Hermiston Generating Plant at Madison Farms. It is expected that ODEQ will modify the existing WPCF permit to allow the joint reuse and disposal of blowdown from the proposed power plant and the Hermiston Generating Plant. It is also expected that the effects of joint reuse and disposal on groundwater quality would be similar to those of the current reuse and disposal operation. The primary regulated constituent in blowdown is total dissolved solids. No significant adverse effect on the total dissolved solids content of groundwater would be expected, because the amount of total dissolved solids applied to a given acre annually would be no greater than the amount applied if the crops were irrigated with existing well water on Madison Farms. Madison Farms projects that the total dissolved solids content of the mixture of blowdown and Columbia River water that would be applied to cropland would be equal to or lower than the total dissolved solids content of groundwater. The total dissolved solids content of ground water in the area

varies from well to well, but averages about 400 mg/L. The applied water would have a similar total dissolved solids content.

The water conditioning chemicals added to the cooling system in small quantities would have no adverse effects on crops or groundwater. The pH of the reclaimed water would be close to neutral. The small chlorine residual maintained in the cooling system by addition of sodium hypochlorite would be dissipated by the time reclaimed water arrives at Madison Farms. The concentrations of HEDP and polyacrylic acid in reclaimed water would be lower than as required for drinking water.

Cooling water conditioning practices at the proposed energy facility would be the same as those at the nearby Hermiston Generating Project. Blowdown from the Hermiston Generating Plant is used as process water by a potato processing plant and must meet drinking water standards and standards set by the Food and Drug Administration.

Storm Water

Storm water from roofs and paved areas would be collected and discharged to a lined detention basin where most of it would evaporate. Excess storm water would be pumped from the detention pond to the cooling tower basin where it would be used as cooling water make-up. Storm water from the area of the power block would be drained to area sumps where it would be processed by an oil/water separator. Any oily component would be collected and removed by a licensed waste disposal contractor. The aqueous component would be routed to the cooling tower basin, where it would be used for cooling water make-up. Because storm water would either be evaporated or reused for cooling purposes, it would have no effect on surface or groundwater quality.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.3.3 Chemical spills at the proposed power plant could affect surface and groundwater quality

Assessment of Impacts Various chemicals, such as cooling tower additives (sulphuric acid, sodium hypochlorite, scale inhibitor), would be stored at the proposed power plant site in permanent above-ground storage tanks and in temporary containers (totes). All chemical storage would be in curbed concrete areas. If a tank or other primary containment ruptured, the volume of the secondary containment (curbed concrete area) would be sufficient to temporarily store the chemical until clean-up by a licensed spill response contractor could be accomplished. In the unlikely event that a spilled chemical entered the storm water drainage system, tertiary containment would be provided by the storm water detention basin. Because of these design

features, any chemical spill that might occur at the proposed power plant would not adversely affect surface or groundwater quality.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.3.4 Wastewater and storm water discharge during project construction could affect surface and groundwater quality

Assessment of Impacts Sanitary wastewater would be produced at construction sites during the construction period. Chemical toilets would be provided at all construction sites. A contractor would supply the toilets and transport sewage to a municipal sewage treatment plant for treatment and disposal. Consequently, disposal of sanitary wastewater from the proposed power plant would have no adverse effect on surface or groundwater quality.

Construction activities would result in disturbance of soil surfaces. If precipitation occurs during the construction period, soil particles could be carried by runoff into surface waters with a consequent adverse effect on surface water quality. This is not expected to be a serious problem at the proposed project's construction sites, because the sites are flat and soils very permeable. Most precipitation would percolate into the ground rather than run across the soil surface. Thus, storm water runoff from construction sites would not have an adverse effect on water quality.

Although contamination of surface water bodies as a result of runoff from construction sites is not expected to be a serious problem for the reasons noted above, the construction contractor would be required to adopt standard practices for control of soil erosion at construction sites. These practices would include installation of silt fences and reseeding of exposed soil surfaces. A settling pond would be constructed at the downstream end of the power plant construction site.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.3.3 Cumulative Impacts

The proposed project would use water diverted from the Columbia River by the Port of Umatilla, consistent with the port's existing water rights. The Port of Umatilla has a municipal water permit issued by the Oregon Water Resources Department that allows the port to divert up to 4.39 cubic m^3/s (100.17 million gallons per day (mgd)) from the Columbia River. A portion of this allotment is withdrawn and pumped south from the Columbia River for use by several entities including the City of Hermiston, J.R. Simplot, Lamb-Weston, Inc., the Hermiston Generating Plant and First Oregon Land Corporation. First Oregon Land Corporation, an affiliate of Umatilla Generating Company, L.P., will transfer its allocation of water to the

Umatilla Generating Company for use by the proposed project. The Umatilla Generating Company, L.P. would receive a maximum of 0.16 m^3/s (3.74 mgd) or about 2 percent of Port of Umatilla's water right. The Port of Umatilla expects to begin supplying water to another electric power generation project, the Hermiston Power Partners project, within the next year.

In addition to the Port of Umatilla, there are many other diversions of water from the reach of the Columbia River near the City of Umatilla. There are ten major water withdrawal points in Oregon according to the water rights map provided by Oregon Water Resources Department for the Columbia River between the City of Irrigon and Cold Springs Canyon. Examples of existing water rights include 0.017 m^3/s (0.605 cubic foot per second) for irrigation of 9.8 hectares (24.2 acres) owned by Royale Columbia Farms, Inc.; 0.03 m^3/s (0.89 cubic foot per second) for gravel washing owned by Logsdon Ready-Mix, Incorporated; and 0.3 m^3/s (11.6 cfs) from four wells in the Columbia River Basin for fish culture operated by the Bonneville Power Administration and the Army Corps of Engineers (Oregon Water Resources Department 2001). The Coyote Springs electric power generation which is currently under construction about ten miles west of the proposed project will obtain water from the Port of Morrow. The Port of Morrow obtains its water from the Columbia River and from wells that are hydraulically connected to the river.
Past diversion of water from the Columbia River for various purposes, principally agricultural irrigation, together with the construction of hydropower and other dams have radically altered the river's flow regime from its pre-development condition. The changes in flow regime and the discharge of contaminants by cities, industries and agriculture have had an adverse effect on river water quality and on the fishery in the river.

River flow could be diminished in the future by additional withdrawals of water but probably only to a rather limited extent. Although some permitted municipal water rights that have not been developed to the maximum extent allowable (including the Port of Umatilla's right) could be developed in the future, it is unlikely that many new rights will be granted. The listing of several salmon species pursuant to the Endangered Species Act has increased regulatory scrutiny of applications to withdraw water from the Columbia River. Currently, the states of Oregon and Washington are only granting permits for new withdrawals under very limited circumstances. Furthermore, the National Marine Fisheries Service has stated that it will oppose any new withdrawals that are not offset by corresponding reductions in existing withdrawals. Consequently, it is expected that all new industrial or power generation projects that are proposed for the lower and middle reaches of the Columbia River basin, and which opt to use surface streams as their water source, would rely on existing water rights. Any reduction in flow attributable to future industrial, power generation or agricultural irrigation projects is likely to be limited by the fact that future diversions will themselves be limited to the amount of water that can be diverted under existing permitted water rights.
The proposed project, in concert with other future projects and projects under construction that rely on existing but currently undeveloped or underdeveloped water rights, would contribute to a

further diminution of flow in the Columbia River. Any cumulative adverse consequence of the proposed project and other future projects for beneficial uses of the river is expected to be relatively minor however, because no new water rights are expected to be granted. The adverse changes that have occurred in the Columbia River and its ecosystem are largely attributable to past practices, particularly the construction of large instream dams and reservoirs and large scale diversion of water for agriculture. The adverse cumulative effects of water diversion for the proposed project and other power projects in the vicinity are expected to be insignificant relative to adverse cumulative effects of past actions.

Wastewater from the proposed project would be reclaimed and applied to cropland in an area, several miles south of the proposed power plant site. Reclaimed water would be blended with surface water from another source to reduce its total dissolved solids content to a level no greater than would occur if groundwater were used for irrigation. The conditions under which reclaimed water could be applied to the land would be specified in a Water Pollution Control Facility Permit issued by the Oregon Department of Environmental Quality.

Agricultural irrigation in arid areas usually results in declining water tables and a build-up of sodium chloride and other salts in the soil and underlying groundwater. In the Butter Creek Ground Water Control Area where the reclaimed water would be applied, salts, transported out of the soils around plant roots by the leaching fraction of irrigation water, are carried down into the geological profile. Because of the great depth to groundwater, ranging from 52 meters to greater than 61 meters (170 feet to greater than 200 feet) and the existence of restricted zones created by geologic barriers, it is expected that salts will be prevented from concentrating in the groundwater. Therefore, it is unlikely that the proposed project would adversely impact ground water quality (Thurman 2001).

Table 3.3.1:
Summary of Columbia River Water Column Measurements
Made by the Washington Department of Ecology at Umatilla

Parameter	Geometric Mean
Conventional Constituent	
Temperature	9.06^{o}C
Conductivity	161.19 μmhos[1/]
Dissolved oxygen	11.36 mg/l
PH	7.99
Suspended solids	8.44 mg/l[2/]
Ammonia-N	0.02 mg/l
Total phosphorous	0.03 mg/l
Hardness	66.34 mg/l as $CaCO_3$
Turbidity	1.97 turbidity units
Fecal coliforms	6.09 colonies/100 ml
Alkalinity	63.13 mg/l
Nitrite-Nitrate	0.11 mg/l
Dissolved nitrite	0.01 mg/l
Metals	
Chromium	0.43 μg/l[3/]
Copper	2.39 μg/l
Lead	1.00 μg/l
Zinc	5.99 μg/l
Cadmium	0.12 μg/l
Mercury	0.06 μg/l

Source: Washington Department of Ecology Ambient Monitoring Program, Umatilla Bridge Station on the Columbia River.

[1/]μmhos – unit of conductivity; reciprocal of μohms

[2/]mg/l – milligrams per liter

[3/]μ/l – micrograms per liter

Table 3.3.2:
Groundwater Quality in the Vicinity of the Proposed Project

Well #	Total Depth (feet)	Water Level Elevation (msl)	Total Dissolved Solids (mg/l)	Chloride (mg/l)	Nitrate (mg/l)	Hardness (mg/l of $CaCO_3$)
1	17	no water in bore hole	347	7.54	3.75	194
2	172	609.7	224	6.07	0.26	87.2
3	38.5	586.1	522	99.2	2.74	573
4	61	578.1	366	12.2	0.74	344
5	17	628.6	449	17.7	4.33	525

Source: Grassetti Environmental Consulting 1993
msl – mean sea level
mg/l – milligrams per liter

3.4 VEGETATION AND WILDLIFE

Vegetation and wildlife habitat at the proposed power plant site and along the alignments of the natural gas, raw water and reclaimed water pipelines and the electrical transmission lines could potentially be affected by the proposed project. For the purpose of analysis, vegetation and wildlife habitat at and within 152 meters (500 feet) of the proposed power plant site and within a 305-meter (1,000-foot) wide corridor centered on the pipelines and transmission lines was surveyed. Potential effects on vegetation from construction or operation of the proposed project are expected to stay within or close to the proposed power plant site and within a 31-meter (100-foot) wide corridor centered on proposed pipelines and transmission lines. The corridor needed for construction of pipelines and transmission lines and reconductoring of existing transmission lines would include the footprint of the pipeline or transmission line and a temporary access road for construction equipment.

3.4.1 Affected Environment

Vegetation in the vicinity of the proposed Umatilla Generating Project has been extensively altered by human activities. Much of the land around the proposed power plant site is used for highways, industrial facilities, agriculture and rural residences. Native plant species have been largely replaced by crops and invasive and/or introduced plants except on the U.S. Army's Umatilla Chemical Depot just west of the proposed power plant site. The elimination of the native shrub-steppe vegetative community throughout much of the area has resulted in a decline or loss of wildlife species that depend on it.

Vegetation, Wildlife and Wildlife Habitat

The proposed project lies within the shrub-steppe region of the Columbia Basin Province (Franklin and Dyrness, 1973). Prior to introduction of grazing and agriculture this part of the Columbia Basin was dominated by bunch grasses, including bluebunch wheatgrass (*Agropyron spicatum*) and Idaho fescue (*Festuca idahoensis*) and shrubs such as big sage brush (*Artemisia tridentata*) and bitterbrush (*Purshia tridentata*). One of the few remaining large remnants of native shrub-steppe in eastern Oregon is located within the Umatilla Chemical Depot, where lands have been protected from grazing. Shrub-steppe habitat is expected to be listed shortly as a threatened habitat type in Oregon.

Cultivation and urban/rural development have eliminated most of the native shrub-steppe communities from the areas affected by the proposed project. Undeveloped sites typically have a history of disturbance by grazing or cultivation and are generally dominated by cheatgrass (*Bromus tectorum*) and other weedy herbs and shrubs. Heavy grazing tends to eliminate larger bunchgrasses such as bluebunch wheatgrass and results in the establishment of cheatgrass and other annual grasses. Abandoned fields are usually dominated by

cheatgrass (Franklin and Dyrness, 1973). A stand of cheatgrass apparently can maintain itself indefinitely, even if disturbance is eliminated (Daubenmire, 1975).

The elimination and modification of the native shrub-steppe vegetative community has resulted in a decline or loss of wildlife species that depend on it. Native habitat destruction and fragmentation favors generalist wildlife species that can use a variety of disturbed habitats and are tolerant of human activity. Field surveys indicate that wide-ranging wildlife species such as coyote (*Canis latrans*), badger (*Taxidea taxus*), red-tailed hawk (*Buteo jamaicensis*), northern harrier (*Circus cyaneus*), American kestrel (*Falco sparverius*) and black-billed magpie (*Pica pica*) occur in nearly all habitats in the area.

Rather than simply mapping vegetation types, the biological surveyors mapped and categorized potentially affected wildlife habitat using rules recently adopted by the Oregon Department of Fish and Wildlife for mitigation of wildlife habitat losses (OAR 635-415-0000 through –0025). The rules define a series of wildlife habitat categories. Most categories are associated with a particular assemblage of plant species but take account not only of the vegetation type but also of its condition and value as wildlife habitat. Habitats fall within six major categories. Category 1 habitats have the highest value and Category 6 habitats have the least. There are a number of subcategories within each major category. Wildlife habitat categories that occur within the study area are described briefly below. The acreage of each category within the study area is shown in Table 3.4.1, and its occurrence in the study area is shown in Figures 3.4.1, 3.4.2, 3.4.3 and 3.4.4.

Category 1 – Mainstem perennial stream provides irreplaceable and essential habitat for threatened or endangered species (WM1)

The Umatilla River is defined as a Category 1 stream, because it provides critical habitat for the Middle Columbia steelhead Evolutionarily Significant Unit (ESU) (*Oncorhynchus mykiss*), both as a migration corridor and juvenile rearing habitat. This habitat is considered irreplaceable and essential to this species. The existing transmission line, which would be reconductored for the proposed project, crosses the Umatilla River just south of the city of Umatilla.

Category 2 – Shrub-steppe, high quality and large patch size may support rare species (SS2)

Category 2 shrub-steppe supports at least two state sensitive species, the western burrowing owl (*Athene cunicularia*) and grasshopper sparrow (*Ammodramus savannarum*), both of which were observed in this habitat during field surveys. Shrub-steppe habitat is expected to be soon listed as a threatened habitat type by the Oregon Department of Fish and Wildlife. Other species commonly observed in this habitat are ground-nesting birds such as the western meadowlark *(Sturnella neglecta*), ring-necked pheasant (*Phasianus colchicus*) and horned lark (*Eremophila alpestris*). Dominant vegetation may include big sagebrush,

bitterbrush, bluebunch wheatgrass, Sandberg's bluegrass (*Poa sandbergi)*, and needle and thread grass (*Stipa comata*). More disturbed sites generally contain increased populations of gray and green rabbitbrush (*Chrysothamnus nauseosus* and *C. humilis*) and an assortment of non-native weedy species that may include: cheatgrass, tarweed fiddleneck (*Amsinckia* sp.), tumblemustard (*Sisymbrium loeselii*), Russian starthistle (*Salsola kali*), hairy goldaster (*Chrysopsis villosa*) and filaree (*Erodium cicutarium*). This habitat occurs along the existing transmission line corridor and along one of the irrigation pipeline corridors at Madison Farms.

Category 2 – Grassland Steppe, high quality, large patch size may support sensitive species (SG2)

Typical vegetation in this community is a mixture of native bunchgrasses such as bluebunch wheatgrass and Sandberg's bluegrass with relatively sparse cover of invasive species such as cheatgrass, fiddleneck tarweed, and/or tumblemustard. This habitat category occurs within the existing transmission line corridor and at the proposed power plant site.

Category 3 – Developed, nesting habitat for bank swallows (DE3)

Bank swallows (*Riparia riparia*) nest and roost in vertical sandy banks. Two bank swallow colonies exist in active quarries within the existing transmission line corridor.

Category 3 – Permanent ponds (WP3)

Category 3 permanent ponds are rare in this bioregion. The few permanent ponds that exist within the project area have been defined as important habitat, limited physiographically, for sensitive species. Examples of this habitat occur near the Umatilla Chemical Depot along the transmission line corridor. No rare species were observed in this habitat during the investigation, but long-billed curlews are considered very likely to forage in this habitat, as they were observed foraging in other parts of the project area where shallow waters existed.

Category 4 – Grassland-steppe, severely grazed/weedy (SG4)

Typical vegetation in this community is a mixture of native bunchgrasses such as bluebunch wheatgrass and Sandberg's bluegrass with a prevalence of weedy species such as fiddleneck tarweed, tumblemustard, and Russian starthistle. Although degraded, this vegetative community is important for the shrub-steppe species capable of surviving in fragmented habitats. Rare species that are known to occasionally occur in this habitat include the grasshopper sparrow, loggerhead shrike (*Lanius ludovicianus*), Swainson's hawk (*Buteo Swainsoni,* foraging) and western burrowing owl. This habitat is common in the project area and occurs within the existing and new transmission line corridors, the natural gas pipeline corridors, the irrigation pipeline corridors and at the proposed power plant site.

Category 4 – Non-irrigated agricultural land, may support common wildlife (AD4)

Typical vegetation at these sites consists of a variety of introduced, weedy grasses such as pasture grasses and forbs such as crested wheat grass, cheatgrass, tumble mustard, and tarweed fiddleneck. Two rare species, the long-billed curlew (*Numenius borealis*) and grasshopper sparrow, were observed on a few occasions during the surveys in this habitat type. It is not known if these birds were nesting in this habitat, but they were observed foraging. This habitat type occurs within one of the alternative gas pipeline corridors.

Category 4 – Irrigated pasture and row crops (AW4)

Irrigated pastures and row crops are importance to some wildlife species. Long-billed curlews, a state sensitive species, have been observed foraging in irrigated pasture containing standing water south of Interstate 84 along Jordan Road and also in row crops (Kronner, pers. comm. 2000b). Dominant vegetation in pastures may include non-native grasses and a variety of weedy species such as cheatgrass, tarweed fiddleneck, tumblemustard, and woolly sunflower (*Eriophyllum lanatum*). Typical row crops grown in the area include soybeans, safflower, mustard, corn, and potatoes. This habitat is common in the project area and occurs within the existing and new transmission line corridors, the natural gas pipeline corridors, the irrigation pipeline corridors and at the proposed power plant site.

Category 4 – Shrub-steppe, moderately grazed or weedy (SS4)

Dominant vegetation in this habitat category is similar to that described for Habitat SS2, but there are generally more weeds present, such as tumblemustard and fiddleneck tarweed, due to effects of grazing or agricultural disturbance. Patch size is typically much smaller than for habitat SS2, more isolated from other patches and thus not as valuable as habitat. Rare species observed or otherwise documented in this habitat include long-billed curlew, grasshopper sparrow and western burrowing owl. This habitat is common in the project area and occurs within the existing and new transmission line corridors, the natural gas pipeline corridors, the irrigation pipeline corridors and at the proposed power plant site.

Category 4 – Dirt-lined irrigation canal (WS4)

Dirt-lined irrigation canals often support emergent vegetation that may be important to some wildlife species. Two dirt-lined irrigation canals, the Westland Canal and the High Line Canal and a similar modified natural channel, Butter Creek, are classified as Habitat WS4. The natural gas pipeline corridors cross the two canals, and the Westland canal passes through the power plant site.

Category 6 – Developed, residential lots/ industrial/commercial buildings/barren (DE6)

Vegetation (if present) in this habitat category is usually dominated by non-native horticultural or sparse weedy plants. Residential areas are included and are often dominated by lawns with small numbers of trees and shrubs. This habitat is not important for wildlife. It is common in the vicinity of the proposed project and occurs within the existing and new transmission line corridors, the natural gas pipeline corridors and at the proposed power plant site.

Category 6 – Concrete-lined canal (WS6)

This habitat type is of little importance to wildlife. Two concrete-lined canals occur in the vicinity of the proposed project, the Brownell Ditch that crosses the existing transmission line corridor just south of McNary Substation and north of SR 730 and the West Extension Irrigation Canal that crosses the existing transmission line west of the Umatilla River.

Sensitive Species

Sensitive species are species that are listed or being considered for listing as threatened or endangered, pursuant to the federal Endangered Species Act or the Oregon Endangered Species Act, or are considered State Sensitive by Oregon Department of Fish and Wildlife. Sensitive species that occur or may occur in the vicinity of the proposed project are shown in Table 3.4.2. Their status under the Oregon Natural Heritage Program and the Nature Conservancy Natural Heritage Network are also shown in the table. The only sensitive species observed in the field or known to occur at or near the proposed power plant site or along the pipeline and transmission line corridors are the bald eagle (*Haliaeetus leucocephalus*), Swainson's hawk, long-billed curlew, western burrowing owl, bank swallow and grasshopper sparrow. No special-status plant species were found.

Bald eagles are known to winter along the Umatilla River in the vicinity of the project site (both at the transmission line crossing and near the Hermiston Generating Plant), and a pair attempted but failed to nest several miles to the east near Stanfield. Swainson's hawks forage in the vicinity of the proposed project and may nest in the riparian areas along the Umatilla River. The long-billed curlew is fairly common in the project area. Curlews typically nest in grasslands, particularly those dominated by cheatgrass and forage on invertebrates in nearby irrigated croplands. Surveys in 1993 indicated that grasshopper sparrows were nesting in the vicinity of the natural gas pipeline corridors. They were observed in 2000 in the portion of the transmission line corridor that is in the Umatilla Chemical Depot. Western burrowing owls were observed in the same location. Two bank swallow colonies were observed at two active quarries within the transmission line corridor. Only one colony was present when surveys were made in 1993.

Wetlands

Seven wetland sites were investigated (Figure 3.4.5) within the project area. Two of the wetlands located within the project area (sites 2 and 4) are included on the National Wetland Inventory map (and, therefore, the Statewide Wetland Inventory of the Division of State Lands [DSL]). The other five wetland sites (1, 3, 5, 6 and 7) appear to be potentially jurisdictional wetlands and were not included on the NWI map. Four of the wetland sites are located along the existing electrical power transmission line, two wetland sites are located along the proposed gas pipeline corridor and one wetland site (a canal) passes by but not through the power plant site. The identified wetland features include a portion of the riparian corridor along the Umatilla River, a pond that has been constructed and used for storage of potato processing reuse water, an intermittent tributary to the Umatilla River, and irrigation canals. No wetlands are located within the area that would be permanently disturbed at the proposed power plant site.

3.4.2 Environmental Consequences and Mitigation Measures

The proposed project could result in a temporary or permanent loss of vegetation and wildlife habitat, vegetation could be injured by cooling tower drift and wildlife could be disturbed by noise and human activity associated with the proposed project. Birds could also be injured or killed in collision with transmission lines or stacks.

Impact 3.4.1 Construction and operation of the proposed project could cause a temporary or permanent loss of vegetation and wildlife habitat

Assessment of Impact The only element of the proposed project which would permanently alter vegetation and wildlife habitat is the proposed power plant. The proposed power plant would occupy about 6 hectares (15 acres) of a 31 hectare (77-acre parcel). The site is sparsely covered with mostly non-native weedy plants. It is classified as Category 6 (DE6) habitat according to Oregon Department of Fish and Wildlife Habitat Mitigation Policy. Category 6 habitat has a low potential to become essential or important habitat for fish and wildlife. Thus, construction of the proposed power plant would not have a significant adverse effect on wildlife habitat.

Construction of several project elements would have a temporary adverse effect on vegetation and wildlife habitat. They include the natural gas pipeline, the raw and reclaimed water pipelines, and the new and reconductored transmission lines.

The natural gas and raw and reclaimed water lines would be installed underground. A swath of vegetation 15 to 30 meters (50 to 100 feet) wide would be cleared during pipeline installation. The wildlife habitats that would be disturbed are classified as Categories 4 and 6. Affected habitats include irrigated pasture and row crops (AW4), grassland-steppe,

severely grazed (SG4), non-irrigated agricultural land (AD4), shrub-steppe, moderately grazed (SS4) and developed, residential lots/industrial/commercial/barren (DE6). Category 4 habitat is important but not essential habitat for fish and wildlife.

Once construction of the pipelines is completed, the disturbed area would be restored. Topsoil removed during construction would be replaced and disturbed areas would be reseeded with a seed mix recommended by the Natural Resource Conservation District in Pendleton for restoration of native range.

The reconductoring of the transmission line would occur within the existing transmission line right-of-way. No vegetation removal or excavation would be necessary, but vehicles and other construction equipment operating in the right-of-way could damage vegetation. Habitat affected by reconductoring would primarily be classified in Categories 4 and 6. Category 3 habitat for one of the bank swallow colonies is located about 23 meters (75 feet) from the existing transmission line, and the other is located about 137 meters (450 feet). Neither colony would be directly affected by construction. The indirect effects of construction on bank swallows are described under Impact 3.4.3. Once reconductoring was completed, the disturbed area would be reseeded with a seed mix recommended by the Natural Resource Conservation District in Pendleton for restoration of native range.

Two short sections of new transmission line would be built in areas with relatively low wildlife habitat value at the power plant site and near the McNary Substation. The effects of construction of the new line on vegetation would be similar to those of reconductoring but would include vegetation removal at up to ten power pole sites. Once construction was completed, disturbed areas would be restored as described above.

The proposed water lines would cross the Westland Canal (Wetland Site 5, Figure 3.4.5) on the power plant site before crossing the road to enter the Hermiston Generating Plant. This crossing would be constructed at a time when the canal was dry, and since there is no emergent vegetation lining this canal, there would be no impacts to wetlands from this crossing.

Recommended Mitigation Measures No mitigation measures beyond those included in the proposed project are recommended.

Impact 3.4.2 Drift from the cooling towers could harm vegetation

Assessment of Impact Cooling tower drift is the term used to describe the plume of water droplets and vapor that emanates from evaporative cooling towers. Minerals and other substances that would be contained in the water circulating in the power plant's cooling system would also be contained in cooling tower drift. If these substances were deposited on the land surface they could be harmful to vegetation and soils.

Water used in the cooling system at the proposed project would be obtained from the Columbia River. Columbia River water is of very high quality and typically has a total dissolved solids content of about 100 mg/L (835 lb/million gallons). Water would be continuously added to the cooling system to compensate for evaporative losses and blowdown. Blowdown is the water bled from the cooling system to limit the build-up of salts. Because water would recirculate in the cooling system ten or twelve times, the total dissolved solids content of the water in the system and in the water droplets and vapor emitted from the towers would be about 1,200 mg/L.

The Seasonal and Annual Cooling Tower Impacts (SACTI) model was used to predict the likely deposition rate of salts from the cooling tower. Meteorological data from three years (1995, 1996 and 1997) were used in the model to make predictions of the solids deposition rate. The highest estimated solids deposition rate outside the approximately 6 hectare (15-acre) project site was 17.58 kg/km^2 (100.38 lb/mi^2) per month. This would occur at the eastern end of the 31 hectare (77-acre) parcel that contains the project site.

The effects of deposition of cooling tower drift on vegetation depend on the types of plants that are exposed to it. Some of the lands surrounding the proposed project are zoned for agriculture and may be used to grow crops. Some of the chemical components of the solids deposited by cooling tower drift are known to be beneficial to crops and others are known to be harmful. Five chemical components (calcium, magnesium, potassium, sulfates and phosphates) are macronutrients and are used by crops in relatively large quantities. However, the quantities of these essential nutrients that would be deposited by cooling tower drift would be much less than typical fertilizer applications for crops. Thus, cooling tower drift would have a very minor beneficial effect on crops.

Saline drift from cooling towers can be harmful to crops. Studies have shown that yields of cantaloupe, alfalfa and cotton grown in an arid environment are not reduced by salt deposition rates of 6908 kg/km^2 (39,444 lb/mi^2) per month (Hoffman et al, 1987). The highest salt deposition rates associated with the proposed project are about 300 times lower than this, so the proposed project would not be expected to have any adverse effects on crops.

Less is known about the effects of saline drift from cooling towers on native vegetation. Both the salts and the nutrients in the drift could have an adverse effect on native vegetation. The area subject to the most intense deposition from the cooling towers is located just east of the power plant site and supports one of the few stands of only slightly degraded native vegetation in the vicinity of the proposed project. However, because predicted salt deposition rates are low compared to rates known to affect crop yields it is unlikely that native vegetation would be adversely affected.

The following measures would be included in the proposed project to minimize the effects of drift:

- The cooling towers would be designed to limit drift to one-thousandth of 1 percent of the circulating water.
- The cooling tower circulating water system, the cooling towers, and the circulating water cleanup systems would be operated to maintain the total dissolved solids in the circulating water at less than 1,500 ppm.
- Tests would be performed during the initial operational period to ensure that the actual drift rate does not exceed the manufacturer's guaranteed drift rate.
- Periodic sampling would be performed to ensure that the total dissolved solids in the circulating water is maintained within the design parameters.

Recommended Mitigation Measures No mitigation measures beyond those included in the proposed project are recommended.

Impact 3.4.3 Construction and operation of the proposed project would cause noise and human activity that could disturb wildlife

Assessment of Impact Noise and human activity associated with construction and operation of the Umatilla Generating Project would result in increased disturbance to wildlife in the project vicinity. General disturbance would be greatest during the construction period due to heavy equipment use, traffic, and increased human activity over a relatively wide area. Noise-related disturbances would be greatest during power plant operation but would be limited to the area in the vicinity of the power plant.

Wide-ranging species would be expected to avoid areas disturbed by construction activities. Consequently, their use of habitats adjacent to the power plant site, transmission line right-of-way, and gas pipeline right-of-way would probably decline temporarily during the construction period. A number of bird species, some of special concern, are known to nest in the vicinity of the proposed project and could be adversely affected by construction activities during the nesting season. They include the bald eagle, Swainson’s hawk, bank swallow and various ground-nesting birds.

The use by bald eagles of the vicinity is focused along the Umatilla River, mostly outside of the project area, except at the crossing site of the transmission line. Since reconductoring would not physically change the power line, no adverse impact to eagles is expected. The eagles inhabiting this vicinity seem tolerant of human disturbance, and their focus on the Umatilla River indicates that project construction would not have any adverse effects on them.

Surveys of nesting Swainson's hawks in the project area were conducted by URS (and Woodward-Clyde) in 1995, 1997, and 2000. Swainson's hawk nest sites and the years they were occupied are shown in Figure 3.4.6. Most of the nesting sites were located south of I-84 and in the general vicinity of the proposed gas pipeline alternatives. Several nests were active during construction of the natural gas pipeline for the Hermiston Generating Project and did not appear to be adversely affected by construction-related noise. These locally nesting birds may have a relatively high tolerance for disturbance, because they have continued to nest in this rural residential and industrial area as it has developed. However, if new nest sites are established closer to the gas pipeline construction area, Swainson's hawks could be adversely impacted by construction occurring during the critical breeding and nesting period for this species (approximately May through August).

A new Swainson's hawk nest site was discovered very close to the existing Hermiston Generating Plant in 2000. The proposed reconductoring of the electric transmission line would occur within about 152 meters (500 feet) of the nest site. If this nest site is active during the construction period, construction activities could have an adverse effect on the birds, although they appear to be very tolerant of human activity at the nearby Hermiston Generating Plant and the Lamb-Weston potato processing facility.

Reconductoring of an existing transmission line would occur within about 23 meters (75 feet) and 137 meters (450 feet), respectively, of two bank swallow colonies. The bank swallow colony located approximately 23 meters (75 feet) west of the transmission line was present at the time the transmission line was built for the Hermiston Generating Project. It is still present, indicating that construction activities had no lasting adverse effect. The other bank swallow colony did not exist when the transmission line was built. It is located within an active gravel quarry, suggesting that these birds are also tolerant of human activities.

It is possible that bank swallows could be adversely affected by construction activities associated with reconductoring the transmission line if such activity occurs during the critical breeding and rearing period for this species (April to July). However, because reconductoring activities involve relatively few people and machines and would take only a few days at a particular site, the possibility of lasting adverse effects is low, especially since the birds appear to be accustomed to human activity.

There is a low to moderate likelihood that sensitive ground-nesting species, including grasshopper sparrows, western burrowing owls, and long-billed curlews, could be adversely affected by construction activities, if a nest is located within disturbance distance (estimated to be 152 meters [500 feet]), and construction takes place during critical breeding and rearing periods (grasshopper sparrow: March to July; burrowing owl: late March to June; curlew: April to June). Known burrowing owl nest sites from previous years are shown in Figures 3.4.6 and 3.4.7. Potentially suitable nest habitat for these species exists in a few scattered

areas located near some of the proposed facilities. No long-term adverse impacts to populations of ground-nesting birds are expected, however, because all of these species were present in the area during the Hermiston Generating Plant construction period, and they remain in the area today. Short-term adverse impacts to ground-nesting birds could occur near the segment of new transmission line that would be constructed just north of the proposed power plant.

Noise and human activities associated with operation of the proposed project are not expected to have an adverse effect on wildlife. Because the proposed power plant would be located near an existing power plant, several highways, railroad tracks and other industrial development, wildlife use of the vicinity is low. Most of the area nearby consists of croplands and disturbed grasslands, which also receive relatively low use. Although impulse noise, such as blasting and sonic booms, has been shown to disturb some wildlife species (Institute for Raptor Studies 1981), the typical response to constant noise is either habituation or avoidance.

The Umatilla Generating Company, L.P. would attempt to avoid all adverse impacts on nesting Swainson's hawks, bank swallows, long-billed curlews, burrowing owls and grasshopper sparrows by careful scheduling of potentially harmful construction activities outside the peak nesting season. If it were not possible to avoid construction in the vicinity of the bank swallow colonies during the nesting season, suitable nesting habitat would be created at a protected site. If it is not possible to avoid construction during the nesting seasons of the Swainson's hawks, long-billed curlews, burrowing owls and grasshopper sparrows, the Umatilla Generating Company, L.P. would make a contribution to the Oregon Wildlife Fund or a non-profit organization like the Nature Conservancy that purchases and manages native wildlife habitat within the same physiographic province as the proposed project.

Recommended Mitigation Measures No mitigation measures beyond those included in the proposed project are recommended.

Impact 3.4.4 Birds could be injured or killed by collisions with power lines

Assessment of Impacts Electrocution is the primary hazard power lines pose to birds of prey, commonly referred to as raptors (Postovit and Postovit 1987). Electrocution occurs when a bird simultaneously touches two power lines or a line and a grounded object. Raptors are particularly susceptible to electrocution because of their size and wing span (Olendorff et al. 1981). In general, a 1.5-meter (5-foot) minimum separation of lines will prevent raptor electrocution (Olendorff et al. 1981). Consequently, most raptor electrocutions involve distribution lines, particularly those carrying less than 69 kV (Olendorff et al. 1981). The spacing of larger transmission line conductors is usually wide enough to preclude simultaneous contact of two conductors by even the largest raptors (Olendorff et al. 1981).

Both the new and reconductored transmission lines that are a part of the proposed project would have relatively widely spaced conductors. Neither would increase the risk of electrocution of raptors.

Raptors do not appear to be susceptible to collisions with transmission lines, most likely because of their keen eyesight, nonflocking behavior, and flight maneuverability (Williams and Colson 1988). However, transmission lines do present a collision hazard to other birds, primarily waterfowl (Anderson 1978). BPA studies indicate that most collisions are with overhead ground wires (Beaulaurier 1981). Collision potential can be reduced by a variety of techniques, including locating transmission lines away from major flyways and water, orienting lines parallel to predominant flight paths and improving visibility by clustering lines or marking them with colored objects (Williams and Colson 1988).

The proposed project involves the reconductoring of about 18 kilometers (11 miles) of existing transmission line and construction of up to 0.8 kilometer (0.5 mile) of new transmission line. Because reconductoring of the existing line would simply involve replacing one conductor with another, it would not increase the potential for collisions with birds. The proposed few hundred feet of new transmission line adjacent to the proposed power plant site would be close to an existing transmission line and the power plant stacks. While the new line could represent a collision hazard for birds, it would be expected that most waterfowl would avoid the immediate area because of the concentration of industrial facilities. The other section of new transmission line would be located close to the existing McNary Substation in an area where many transmission lines converge. Again, the risk of bird strikes would be reduced by the density of industrial structures in the area.

All new transmission towers would be designed in accordance with accepted standards for avoidance of electrocution of raptors.

Recommended Mitigation Measures No mitigation measures beyond those included in the proposed project are recommended.

3.4.3 Cumulative Impacts

In the project area, much of the native shrub-grassland and grassland has been replaced by irrigated agriculture, industrial and commercial facilities, highways and residences. The only element of the proposed project that would permanently alter vegetative cover is the proposed power plant. The power plant would occupy about 20 acres of land that currently fall within Habitat Category 6, as established by the Oregon Department of Fish and Wildlife. Category 6 is the lowest habitat category and includes severely degraded areas of shrub-steppe and shrub-grass and developed or barren lands. Structures, roads and graveled

areas at the power plant would replace the existing weedy or barren lands. Habitat at the site would continue to be classified as Category 6.

The natural gas, water and reclaimed water pipelines would be built primarily in areas with low habitat value. Short sections of the natural gas and reclaimed water pipelines pass through moderate quality shrub-steppe and shrub-grass. In these areas, topsoil would be retained and replaced, and the disturbed area would be reseeded with native vegetation.

Because the proposed project would not result in a loss of high value habitat, it would not contribute to the cumulative loss of native vegetation and high value habitat associated with agricultural and urban development. If temporary disturbance of wildlife habitat during the construction period cannot be avoided, the project proponent would make a donation to The Nature Conservancy and Boise State University as mitigation for the impact. The donation to The Nature Conservancy would fund acquisition and protection of high quality wildlife habitat, and the donation to Boise State University would support continuing research on the Swainson's hawk, one of the potentially affected wildlife species.

Because the proposed project would not result in a loss of high value habitat, it would not have an adverse impact on wildlife. Consequently, it would not contribute to the cumulative loss of wildlife habitat and wildlife associated with agricultural and urban development.

Insert Excel Table 3.4.1

Table 3.4.2:
Sensitive Plant and Animal Species that Occur or May Occur within the Analysis Area

Common and Scientific Name	Status				Observed?
	Federal	State	ONHP	TNC	
Birds					
American white pelican (*Pelecanus erythrorhynchos*)	N/A	SV	2	G3 S1	N
Northern goshawk (*Accipiter gentilis*)	SOC	SC	3	G5 S3	N
Swainson's hawk (*Buteo swainsoni*)	N/A	SV	3	G5 S3B	Y
Ferruginous hawk *(Buteo regalis)*	SOC	SC	3	G4 S3B	N
Greater sandhill crane *(Grus canadensis tabida*)	N/A	SV	4	G5T4 S3B	N
Long-billed curlew (*Numenius americanus)*	N/A	SV	4	G5 S3S4	Y
Northern pygmy owl (*Glaucidium gnoma)*	N/A	SC	4	G5 S4?	N
Western burrowing owl *(Athene cunicularia hypugea)*	SOC	SC	3	G4TU S2?B	Y
Willow flycatcher *(Empidonax trailii brewersti)*	N/A	SU	4	G5TU SUB	N
Loggerhead shrike *(Lanius ludovicianus)*	N/A	SV	4	G5 S4B,S2N	N
Yellow-billed cuckoo *(Coccyzus americanus)*	N/A			G5 S1B	N

Common and Scientific Name	Status				Observed?
	Federal	State	ONHP	TNC	
Bank swallow *(Riparia riparia)*	N/A	SU	4	G5 S4B	Y
Grasshopper sparrow (*Ammodramus savannarum)*	N/A	SV/SP	3	G5 S2?B	Y
Mammals					
White-tailed jackrabbit (*Lepus townsendii)*	N/A	SU	3	G5 S4?	N
Pale western big-eared bat *(Corynorhinus townsendii pallescens)*	SOC	SC	3	G4T4 S3	N
Pacific western big-eared bat *(Plecotus townsendii townsendii)*	SOC	SC	3	G4T4 S3?	N
Small-footed myotis *(Myotis ciliolabrum)*	SOC	SU	3	G5 S3	N
Long-eared myotis *(Myotis evotis)*	SOC	SU	4	G5 S3	N
Fringed myotis *(Myotis thysanodes)*	SOC	SV	3	G5 S3	N
Long-legged myotis *(Myotis volans)*	SOC	SU	3	G5 S3	N
Yuma myotis *(Myotis yumanensis)*	SOC	N/A	4	G5 S3	N
Amphibians & Reptiles					
Western toad *(Bufo boreas)*	N/A	SV	3	G4 S4	N
Woodhouse's toad *(Bufo woodhousei)*	N/A	SP	3	G5 S2	N

Common and Scientific Name	Status				Observed?
	Federal	State	ONHP	TNC	
Columbia spotted frog *(Rana luteiventris)*	SOC	SC	2	G3T3 S2	N
Northern leopard frog *(Rana pipiens)*	N/A	SC	2	G5 S2?B	N
Painted turtle (*Chrysemys picta)*	N/A	SC	2	G5 S2	N
Northern sagebrush lizard *(Sceloparus graciosus graciosus)*	SOC	SV	4	G5T5 S5?	N
Fish					
Margined sculpin *(Cottus marginatus)*	SOC	SV	3	G3 S3	N
Interior redband trout (*Oncorhynchus mykiss gibbsi)*	SOC	SV	3		N
Pacific lamprey *(Lampreta tridentata)*	SOC	SV	3	G5 S3	N
Middle Columbia steelhead (*Oncorhynchus mykiss)*	T	SV	3	G5T3Q S3?	Y
Plants					
Rosy balsamroot *(Balsamorhiza rosea)*	N/A	N/A	2-EX	G4 SH	N
Laurence's milk-vetch *(Astragalus collinus var. laurentii)*	SOC	LT	1	G5T1 S1	N
Gray cryptantha *(Cryptantha leucphaea)*	N/A	N/A	2-EX	G4G5 SH	N
Watson's desert-parsley *(Lomatium watsonii)*	N/A	N/A	2	G4 S1	N

Common and Scientific Name	Status				Observed?
	Federal	State	ONHP	TNC	
Hepatic monkeyflower *(Mimulus jungermanniodes)*	SOC	C	1	G2 S2	N
Columbia yellow-cress *(Rorippa columbiae)*	SOC	C	1	G3 S3	N
Thompson's sandwort *(Arenaria franklinii var. thompsonii)*	N/A	C	1-X	G3TH SH	N
Retrorse sedge *(Carex retrorsa)*	N/A	N/A	2	G5 S1	N
Robinson's onion *(Allium robinsonii)*	N/A	N/A	2-EX	G3 SH	N

State and Federal Status Definitions

LE – Listed Endangered. Taxa listed by the USFWS or NMFS as Endangered under the Endangered Species Act (ESA), or by the Departments of Agriculture (ODA) and Fish and Wildlife (ODFW) of the state of Oregon under the Oregon Endangered Species Act of 1987 (OESA). Endangered taxa are those which are in danger of becoming extinct within the foreseeable future throughout all or a significant portion of their range.

LT – Listed Threatened. Taxa listed by the above agencies as Threatened; defined as those taxa likely to become endangered within the foreseeable future.

PE – Proposed Endangered. Taxa proposed by the above agencies to be listed as endangered.

PT – Proposed Threatened. Taxa proposed by the above agencies to be listed as threatened.

C – Candidate. Candidate taxa for which NMFS or USFWS have sufficient information to support a proposal to list under the ESA, or which is a candidate for listing by the ODA under the OESA.

SoC – Species of Concern. Former Category 2 candidates for which additional information is needed in order to propose as threatened or endangered under the ESA; these species are under review for consideration as Candidates for listing under the ESA.

ONHP Definitions

List 1 - taxa that are threatened with extinction or presumed to be extinct throughout their entire range.

List 2 – taxa threatened with extirpation or presumed extirpated from Oregon; often peripheral or disjunct species which are of concern considering species diversity within Oregon; can be very significant in protecting the genetic diversity of the taxon; ONHP regards extreme rarity as a significant threat and has included species which are very rare in Oregon on this list.

List 3 – taxa for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

List 4 – taxa which are of conservation concern but not currently threatened or endangered; including taxa that are very rare but considered secure as well as those declining in numbers or habitat but still too common to be proposed as threatened or endangered; these taxa require continued monitoring.

TNC Natural Heritage Network Ranks

The Natural Heritage Network ranks are part of a national system of ranking species throughout the world and is used throughout the U.S., Canada, and 13 Latin American countries. Both global and state ranks are provided in ONHP (1998), abbreviated as "G" and "S".

1 – Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation, typically with 5 or fewer occurrences.

2 – Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation), typically with 6-20 occurrences.

3 – Rare, uncommon or threatened, but not immediately imperiled, typically with 21-100 occurrences.

4 – Not rare and apparently secure, but with cause for long-term concern, usually with more than 100 occurrences.

5 – Demonstrably widespread, abundant, and secure.

H – Historical occurrence, formerly part of native biota with the implied expectation that it may be rediscovered.

X – Presumed extirpated or extinct.

U – Unknown rank.

ODFW Ranks

SC – State Critical. Species for which listing is pending; or those for which listing may be appropriate if immediate conservation activities are not taken. Also considered critical are some peripheral species which are at risk throughout their range, and some disjunct populations.

SV – State Vulnerable. Species for which listing as threatened or endangered is not believed to be imminent and can be avoided through continued or expanded use of adequate protective measures and monitoring. In some cases the population is sustainable, and protective measures are being implemented; in others, the population may be declining and improved protective measures are needed to maintain sustainable populations over time.

SP – Peripheral or Naturally Rare. Peripheral species refer to those whose Oregon populations are on the edge of their range. Naturally rare species are those which had low population numbers historically in Oregon because of natural limiting factors. Maintaining the status quo for the habitats and populations of these species is a minimum requirement. Disjunct populations of several species which occur in Oregon should not be confused with peripheral.

SU – Undetermined Status. Animals in this category are species whose status is unclear. They may be susceptible to population decline of sufficient magnitude that they could qualify for endangered, threatened, critical or vulnerable status, but scientific study would be required before a judgment can be made.

3.5 FISH

The Columbia River supports steelhead trout and three species of salmon and represents a fishery resource of global importance. Withdrawal of water from the Columbia River for the proposed power plant could potentially have an adverse effect on the fishery.

3.5.1 Affected Environment

Anadromous fish in the Columbia River that pass through McNary Dam at Umatilla include steelhead and three species of salmon: chinook, coho, and sockeye (*Oncorhynchus nerka*). Spring, summer, and fall runs of chinook and summer and winter steelhead are present during appropriate times of the year when adults and smolt migrate to and from spawning areas (Woodward-Clyde Consultants 1993).

The National Marine Fisheries Service in 1991 and 1992 listed spring/summer and fall chinook runs in the Snake River as threatened and the Snake River sockeye as endangered. Both species were noted by the USFWS as occurring in the project vicinity (personal communication, Peterson 1994).

The mid-Columbia steelhead trout (Middle Columbia River Evolutionarily Significant Unit [ESU]) (*Oncorhynchus mykiss*) is federally listed as threatened. This is part of an ESU occupying the Columbia River Basin from above the Wind River in Washington and the Hood River in Oregon upstream to include the Yakima River, Washington. All steelhead in the Columbia River Basin upstream from the Dalles Dam are summer-run, inland steelhead (Schreck et. al. 1986, Reinsenbichler et. al. 1992, Chapman et. al. 1994) and include steelhead in the vicinity of the proposed project.

Total steelhead abundance in the ESU has increased recently, but the majority of natural stocks for which data exists have declined. This includes steelhead in the John Day River, the largest producer of wild steelhead. Hatchery steelhead are widespread within the mid-Columbia ESU, though the ESU primarily consists of within-basin stocks. Steelhead in this ESU are vulnerable to degradation from grazing and water diversions.

ONHP had one record of the mid-Columbia steelhead within 5 miles of the proposed project (ONHP 2000). This record was established from Oregon Department of Fish and Wildlife distribution maps that show undocumented but potential occurrences of the mid-Columbia steelhead in the Umatilla River and its tributaries.

Cutthroat trout (*Oncorhynchus clarki*) occurring in the vicinity of the facility would be considered part of the recently proposed Southwestern Washington/Columbia River ESU. This cutthroat trout ESU is proposed as threatened by the U.S. Fish and Wildlife Service. This ESU comprises cutthroat trout in the Columbia River and its tributaries downstream

from the Klickitat River in Washington and Fifteenmile Creek in Oregon (inclusive) and the Willamette River and its tributaries downstream from Willamette Falls (Weitkamp et al., 1996). The ESU also includes cutthroat trout in Washington coastal drainages from the Columbia River to Grays Harbor (inclusive). Support for these ESU boundaries comes primarily from ecological and genetic information. Ecological characteristics of this region include the presence of extensive intertidal mud and sandflats, similarities in freshwater and estuarine fish faunas, and differences from estuaries to the north of Grays Harbor and to the south of the Columbia River. Genetic samples from coastal cutthroat in southwestern Washington also show a relatively close genetic affinity to the samples from the Columbia River.

The decline of cutthroat trout is attributed to habitat destruction and/or modification and overfishing (Bryant and Lynch, 1996; NMFS, 1997; and NMFS, 1998b). ONHP had no record of the Columbia River cutthroat trout within the vicinity of the proposed project. Although coastal cutthroat trout may exist above the City of The Dalles, the referenced ESU applies only to those stocks below Fifteenmile Creek at the City of The Dalles, well downstream of the mouth of the Umatilla River. Therefore, this ESU of the species is very unlikely to occur within the proposed project's analysis area.

3.5.2 Environmental Consequences and Mitigation Measures

The proposed project has the potential to affect the fisheries of the Umatilla and Columbia Rivers. Although the proposed project is located within the Umatilla River watershed, the proposed project would neither withdraw water from the Umatilla River nor discharge wastewater to it. Consequently, the proposed project would have no adverse impact on water quality or fisheries in the Umatilla River.

Impact 3.5.1 Diversion of water from the Columbia River.

Assessment of Impact The primary uses of water at the proposed project would be to generate steam and cool the steam process. The proposed project would include a number of features that minimize water use. A recirculating cooling system using cooling towers with high-efficiency drift eliminators would minimize the volume of water needed to cool the turbines. All wash water and other aqueous wastewater streams produced at the proposed power plant would be recycled and used a second time as cooling water. To remove nitrogen oxides from exhaust gases, the proposed plant would employ equipment that does not require water. Peak average water demand would be 0.16 cubic meters per second (5.76 cfs). Average annual water demand at the project would be 0.15 cubic meters per second (5.12 cfs).

The source of water for the proposed project is the Port of Umatilla's regional water supply system. The Port has a municipal water use permit (Permit No. 49497) issued by the Oregon

Water Resources Department. Permit No. 49497 has a priority date of January 19, 1979 and authorizes the Port to divert up to 155 cfs from the Columbia River.

All "in river" improvements (steel piles and intake tubes) are adequate to deliver the water required for the proposed project. The intake tubes are equipped with fish screens. The Port likely will need to install a new pump and upgrade an existing pump inside the existing pump house in order to serve additional demand, including from the proposed project and an unrelated energy project currently under construction. The Port does not need to modify or enlarge the intake. Any modifications will be within the existing pump house authorized under the Army Corps of Engineers Permit No. 93-00941. The permit was issued to the Port of Umatilla on March 14, 1994, under Section 10 of the Rivers and Harbors Act (for work in or affecting navigable waters of the United States) and Section 404 of the Clean Water Act (for discharge of dredged or fill material into waters of the United States). The permit authorized the installation by the Port of Umatilla of 50 piles to support a pump station. The permit was issued following consultation with the National Marine Fisheries Service pursuant to Section 7 of the Endangered Species Act. Consultation included preparation of a Biological Assessment ("Port of Umatilla Water Intake Project Biological Assessment," CH2M Hill, Northwest, December 1993). The "Permit Evaluation and Decision Document" prepared by the Corps of Engineers in conjunction with Permit No. 93-00941 includes an Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) in compliance with NEPA requirements. The EA indicates that the Port's intake project would have the capacity to withdraw approximately 62 cfs from the Columbia River. The Port can meet the needs of the proposed Umatilla Generating Project without exceeding that capacity. Moreover, as discussed above, there will be no additional work in the river, and therefore no requirement for a new permit from the Corps of Engineers or for consultation with the National Marine Fisheries Service.

Discharge in the Columbia River is typically in the range of 3,030 to 3,228 cubic meters per second (107,000 to 114,000 cfs) during the low-flow period in the fall. The water diverted under the Port of Umatilla's existing municipal water use permit and provided for the proposed project would represent about 0.005 % of river discharge during the low-flow period and less during high flows. During the worst drought of record the water diverted for the proposed project would represent about 0.01 % of river discharge. Such a small change in river discharge would not be expected to have any effect on the Columbia River fishery. Additionally, as noted above, the contemplated withdrawal for the proposed power plant will come from the Port of Umatilla's existing Columbia River allotment. This allotment is included in the long-term Columbia River water management plan that, in part, assures fishery protection.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.5.3 Cumulative Impacts

The proposed project would have no direct adverse effects on fish because the withdrawal of water from the Columbia River for the proposed project would be very small in volume relative to river discharge.

The Columbia River salmon fishery has been adversely affected by human activities over the last 150 years. Adverse effects are attributable to over fishing, the construction of large dams that alter the natural patterns of river flow and restrict or block fish passage, diversion of water, introduction of non-native fish species and the replacement of native vegetation by crops in the watershed. In the last decade, several government agencies have begun acting to try to restore the salmon runs. Their efforts have been accelerated by the listing of several salmon species under the Endangered Species Act. As part of these efforts, there is an effective moratorium on new diversions of water from the Columbia River as described in Section 3.3.3. Any cumulative effect of water diversion for the proposed project, together with other diversions, is expected to be limited to diversions that have already been permitted.

3.6 AIR QUALITY

The proposed power plant would produce sufficient emissions to qualify as a major emissions source and therefore falls under the Oregon Department of Environmental Quality's (ODEQ) Prevention of Significant Deterioration (PSD) rules. Modeling of the power plant's emissions by the project proponent indicates that they would be within acceptable limits compared with state and federal emission standards, and the power plant would not by itself have a significant effect on local and regional ambient air quality. Potential cumulative air quality impacts with other reasonably foreseeable projects in the region are addressed in Section 3.6.3. Phase 2 of BPA's Regional Air Quality Modeling Study (described in Section 3.6.3) will provide additional information for the final EIS regarding project-specific impacts to visibility for the proposed project.

The combustion of natural gas at the proposed power plant would add slightly to the worldwide production of carbon dioxide (CO_2), a greenhouse gas believed to contribute to global warming. The project's CO_2 emissions are about 3 percent of existing CO_2 emissions in Oregon.

3.6.1 Affected Environment

3.6.1.1 Regulatory Procedure for Evaluating Air Quality Impacts from a Proposed Project

The proposed power plant site is located in an area currently designated as unclassified or in attainment of all state and national Ambient Air Quality Standards (AAQS). The goal of the air quality analysis is to demonstrate that a proposed power plant will not significantly deteriorate air quality and that the new emissions, when added to existing sources, will not cause ambient pollution levels to exceed established standards for health and safety. To establish that a new project will comply with the state and Federal regulations, a project developer must follow a series of steps designed to screen out insignificant sources in order to identify and study those emissions with the potential to cause a significant impact. In Oregon, this process is known as ODEQ's New Source Review (NSR) Program. A flow chart of the NSR process is presented in Figure 3.6.1. The process consists of: (1) determining if the project qualifies as a major source and if the *quantity* of emissions is significant; (2) performing a screening analysis to determine if the *impacts* of emissions are significant; and, if necessary, (3) performing detailed modeling of background sources and the significant proposed impacts and comparing them to the standards. This process is followed for each regulated pollutant. After the process has been completed and the project has demonstrated that it meets ODEQ standards and that the best available control technology (BACT) has been included in the design, an Air Contaminant Discharge Permit (ACDP) can be issued, allowing the project to be constructed.

Air quality impacts of a new source of emissions are determined by four interrelated factors; 1) climate and meteorology; 2) existing air pollution sources and current air quality in the area; 3) the site configuration and surrounding terrain; and 4) the source. ODEQ has developed a set of procedures that determines a project's air quality impacts, demonstrates compliance with all regulations, and ensures protection of human health and the environment.

The proposed power plant, as a major new source of air emissions, would be subject to NSR and must develop and submit a PSD application to ODEQ. The PSD application must demonstrate that emissions from the facility would result in ambient concentrations of air pollutants that are less than state and Federal AAQS for criteria and toxic air pollutants. Furthermore, the facility would not be allowed to contribute to ambient air quality concentrations greater than the AAQS. Concentrations resulting from power plant emissions must not exceed the allowable PSD increments.

3.6.1.2 Air Quality Factors in the Existing Environment

Climate and Meteorology: Eastern Oregon has a dry continental climate (low humidity), with large variations in temperature from winter to summer. Daily temperatures in January average a little over zero °C (32 °F), and a typical winter includes only a few days with minimum temperatures below –18 °C (zero °F). July temperatures average around 21 °C (70 °F), and a typical summer has only a few days with maximum temperatures in excess of 38 °C (100 °F). Very little precipitation falls in the area. Annual precipitation in the project area is slightly less than 23 centimeters (nine inches). Most of this precipitation is due to winter storms crossing the region. Consequently, the peak precipitation months are November, December, and January. Average annual snowfall is about 25 centimeters (10 inches) with over 75 percent of this amount occurring from December through March. There is very little rain during the summer months. Summer rain is usually associated with a thunderstorm and can be heavy for short periods.

There are two predominant 'bimodal' wind directions in the immediate vicinity of the proposed power plant, aligning along the Columbia River Valley, which has a channeling effect on the flow of air near the river. This river valley effect combines with prevailing westerly flow in the region to produce prevailing winds from the west-southwest. The other most common is caused by cold air flowing down the river valley during the night and early morning hours, producing winds from the east-northeast.

Existing Air Pollution Sources and Current Air Quality: Air quality in an area is defined by ambient ground-level concentrations of specific pollutants. Acceptable air quality exists when the pollutant concentrations are below the state and federal standards. The air quality in an area can be determined either by direct measurement or by modeling. Since current monitoring data are often unavailable, modeling is commonly

used as an acceptable method for evaluating air quality. Limited ambient air quality data are available from PGE's Coyote Springs, Unit 1 Project at the Port of Morrow. These pre-construction monitoring data were collected from August 1994 through August 1995. No other monitoring data are available for the project vicinity. The maximum short term and annual average observed concentrations are presented in Table 3.6.1. These data indicate that existing ambient concentrations are well below the State and Federal Ambient Air Quality Standards (AAQS) shown in Table 3.6.1.

Ambient Air Quality Standards: The Clean Air Act of 1970 (CAA) mandated that the EPA establish ambient ceilings for certain pollutants based on the identifiable effects that pollutants may have on the public health and welfare. Subsequently, EPA promulgated regulations that establish national AAQS for a number of pollutants. These pollutants, called criteria pollutants, include sulfur dioxide (SO_2), particulate matter less than 10 microns in diameter (PM_{10}), nitrogen dioxide (NO_2), carbon monoxide (CO), photochemical oxidants such as ozone (O_3), and lead (Pb). The Federal PM_{10} standard replaces an earlier standard for total suspended particulate matter (TSP); however, ODEQ has retained the TSP standard. The national and Oregon AAQS are shown in Table 3.6.2.

In July 1997, EPA revised the standards for ozone and particulate matter. The revised standards are shown in Table 3.6.3. EPA also revised the form (but not the level) of PM_{10} 24-hour and annual standards. The revised standards for ozone, PM_{10} and $PM_{2.5}$ were promulgated by EPA in September 1997. However, EPA has estimated that it would take three to five years to implement the standards fully, and it is expected that $PM_{2.5}$ attainment and nonattainment area designations would take at least three to five years, with an additional three to seven years needed to implement control measures. For the interim, PM_{10} standards may be used as a surrogate for $PM_{2.5}$ standards in meeting NSR requirements until technical difficulties involving measurement are resolved (EPA, 1997). Although promulgated, the new standards are not currently enforced by EPA and the states.[1]

Attainment Status: Section 107 of the 1977 Clean Air Act Amendments required both the EPA and individual states to evaluate the attainment of the national AAQS. Areas not meeting national AAQS are designated as nonattainment areas. Areas that lack sufficient data to be used in the determination of attainment status are unclassified but are treated as attainment areas until designated otherwise. The classification of an area is made on a pollutant-specific basis. The proposed power plant site is located in Umatilla County, Oregon; air quality throughout the nearby region is currently designated as unclassified or

[1] A 1999 federal court ruling temporarily blocked implementation of the new 8-hour ozone and 24-hour $PM_{2.5}$ standards. The U.S. Supreme Court subsequently overturned the U.S. Federal Appeals Court ruling in February 2001, but directed EPA to revise its implementation policy before implementing the ozone standard. EPA and the states are currently working to develop ozone implementation plans. Before implementing the $PM_{2.5}$ standard, EPA and the states are required to collect and analyze 3 years of ambient data, which will not be completed until 2002 or later. In the meantime, these new standards are not implemented.

in attainment of each state and national AAQS. Portions of Yakima County, Washington, approximately 60 kilometers (37 miles) northwest of Hermiston, and the Wallula area, approximately 40 kilometers (25 miles) northeast of Hermiston, are designated as PM_{10} nonattainment areas. The U.S. Environmental Protection Agency recently re-designated the Wallula area as serious nonattainment.[2] These represent the closest nonattainment areas to the power plant site.

Toxic Air Pollutants: In addition to criteria pollutants, ODEQ also regulates emissions of toxic air contaminants. No data exist on the ambient concentrations of air toxics in the project area.

Site Configuration and Surrounding Terrain: The configuration of nearby buildings and facilities and the topography of the land within about a 16-kilometer (10-mile) radius of an emission source can influence the dispersion of exhaust plumes and affect ground-level pollutant concentrations. The terrain immediately surrounding the power plant site is generally level. Foothills rise around the site in all directions about 3.2 to 14.5 kilometers (2.0 to 9.0 miles) out from the site. Hills or mountains higher than the stacks are important in the air quality analysis because the exhaust plume can be affected by the elevated terrain before the plume has a chance to disperse. Therefore, the topography is explicitly accounted for in the air quality modeling performed for the proposed power plant.

Buildings near a stack can create wind turbulence. If stack exhaust gases are emitted into this turbulence, the plume can become mixed with ground-level air within a very short distance of the stack, resulting in high pollutant concentrations. This condition is called "downwash" and occurs only when the stack height is too short for the plant configuration (Schulman and Hanna 1986, Schulman et al. 1985). Good Engineering Practice was followed in the design of the turbine stacks for the proposed power plant, taking into account the size of the nearby buildings in calculating the height of the stacks (EPA 1985). This resulted in a stack height of 65 meters (213 feet) for the proposed power plant. Extensive engineering experience and observation have shown that a stack built to Good Engineering Practice guidelines will not cause downwash.

3.6.2 Environmental Consequences and Mitigation Measures

Potential impacts on air quality, such as compliance with ambient air quality standards, regional haze, nitrogen and sulfur deposition, associated with construction and operation of the proposed power plant include:

[2] Although the serious nonattainment designation is being enforced, ambient data indicate that concentrations do not currently exceed state/federal standards. EPA's redesignation of the Wallula area to serious nonattainment status was based on historic ambient monitoring data that may have been unduly influenced by blowing fugitive dust. Based on more recent monitoring data that shows no violations, Washington Ecology is working with EPA to redesignate the area to attainment. The redesignation process may take one or more years to complete.

- Emissions of pollutants into the atmosphere as a byproduct of natural gas combustion.

- Emissions of very low levels of pollutants in steam resulting from pollutants in cooling water.

- Production of a visible steam plume from the cooling towers.

- Fog and ice on local roadways and railroads caused by steam from the cooling towers.

- Contributions to the world's production of greenhouse gases that may cause global warming.

- Production of construction machinery exhaust emissions and fugitive particulate matter during construction.

Impact 3.6.1 Emissions from the Combustion Turbines and Auxiliary Emergency Equipment

Assessment of Impact Each combustion turbine in the power plant would produce extremely hot exhaust gases from the combustion of natural gas. Much of the heat in these gases would be used to produce steam in the heat recovery steam generator for additional power generation. Under certain operating conditions, additional natural gas is combusted in the inlet to the heat recovery steam generator. This is called supplemental duct firing and is used to generate additional steam during periods of high electrical demand. The heat recovery steam generators reduce the exhaust gas temperature to about 91 °C (195 °F). The exhaust gas from each combustion turbine and heat recovery steam generator then flows to a separate stack. The chemical composition and physical parameters (i.e., temperature and volumetric flow) of the exhaust gas vary with the ambient temperature and load conditions. This is because the ambient temperature affects the fuel usage, power output, and combustion conditions.

To maintain operational flexibility, the power plant may be required to shut-down and subsequently restart one or both of the turbines. Pollutant mass emission rates during start-up can exceed normal operational emission rates because control equipment has not yet reached operating temperatures.

The start-ups are classified as hot, warm, and cold, based on the duration of the preceding shut-down period. A hot start is defined as a turbine start-up following a shutdown period of up to 8 hours. A warm start is preceded by a shutdown period of between 8 and 48 hours, while a cold start is preceded by shutdown periods in excess of 48 hours. The time required to bring the power block to full rated capacity is highly dependent on a complex series of variables and varies substantially with turbine and plant design.

In order to determine the maximum potential emissions, the proposed power plant has been analyzed for a number of operating modes and ambient temperatures: Base-load (100 percent) with and without supplementary duct firing and part load (80 and 60 percent, both without supplementary duct firing), and –18, 12, and 45 °C (zero, 53, and 113 °F).

The maximum predicted emissions of regulated pollutants from the combustion turbine at the proposed power plant are listed in Table 3.6.4. Expected emissions due to testing of emergency equipment (firewater pump engine) are also included in this table.

All predicted emission rates presented in Table 3.6.4 represent emissions with emission controls included in the power plant design. As described previously, the proposed power plant includes a continuous emissions monitoring system (CEMS) for each unit. CEMS will be provided for NO_x and CO. The CEMS allows operators to ensure that pollutant emission rates do not exceed the permitted rates. Additionally, each CEMS is equipped with alarms to alert the operators and regulators when emission rates approach the permitted limits. Most importantly, the CEMS provides the operator with valuable information on the performance of the power plant so that facility efficiency is optimized and pollutant emissions are minimized.

The air quality analysis that has been performed for the proposed power plant follows.

New Source Performance Standards: The EPA has promulgated a set of national emission standards that apply to specific categories of new sources. The New Source Performance Standards (NSPS) for boilers with heat input greater than 264 gigjoules/hr (250 MMBtu/hr) (40 CFR 60, Subpart Da) sets forth maximum allowable emissions for NO_x and SO_2. This applies to the duct burners. The NSPS for gas turbines with heat input greater than 10.72 gigajoules/hr (10.16 MMBtu/hr) (40 CFR 60, Subpart GG) sets forth maximum allowable emissions for NO_x and SO_2. The standards applicable to the proposed power plant are as follows.

- The NO_x emission standard applicable to each of the proposed duct burners is 0.09 kg NO_x/gigajoule (0.20 lb NO_x/MMBtu). Uncontrolled emissions are estimated at 0.04 kg NO_x/gigajoule (0.10 lb NO_x/MMBtu), less than the NSPS of 0.09 kg NO_x/gigajoule (0.20 lb NO_x/MMBtu). Reduction of NO_x emissions by the SCR system would further reduce the emissions.

- The NO_x emission standard applicable to each of the proposed turbines is 114 parts per million by volume (ppmv) corrected to 15 percent oxygen on a dry basis. The proposed power plant's estimated NO_x emissions of 2.5 ppmv are well below the NSPS of 114 ppmv.

- For SO_2, the NSPS limits the sulfur content of the fuel to 0.8 percent (weight basis). The natural gas proposed for the power plant has a sulfur content of 0.0024 percent by weight. This concentration is far below the NSPS of 0.8 percent.

Applicability Determination: There are three basic criteria in determining whether PSD rules apply to a project. The first and primary criterion is whether the proposed power plant's emissions would be great enough to be a "major" source. The second criterion is whether the new source would be located in an area that has been classified attainment or nonattainment. The third criterion is whether the pollutants would be emitted in "significant" amounts.

The proposed plant site would not be located within 10 kilometers (6 miles) of any Class I areas, which could also trigger PSD. There are, however, several Class I areas that require analysis due to their proximity to the project (within 200 kilometers [124 miles]). The closest Class I area would be the Eagle Cap Wilderness Area, located about 140 kilometers (87 miles) east of Hermiston. The ODEQ and United States Forest Service (USFS) Federal Land Manager (FLM) also require that the Columbia River Gorge National Scenic Area (CRGNSA) be treated like a Class I Wilderness Area although it is not classified as such. The CRGNSA is located approximately 117 kilometers (73 miles) west of the power plant site.

Major Source: A new source is major if it has the potential to emit any regulated pollutant in amounts equal to or exceeding specified major source thresholds (91 metric tons [100 tons] per year for gas turbine generators over 268 gigajoules [254 MMBtu]). The proposed power plant exceeds these major source thresholds for NO_x, CO, and PM_{10}.

Attainment Status of Air Quality Control Region: New projects located in nonattainment areas must apply for a Nonattainment Area permit. Those in attainment areas complete a PSD review. Since the Hermiston area is considered in attainment for criteria pollutants, the proposed power plant meets the second criterion for PSD review.

Significant Emissions: Significant emissions are defined as those that equal or exceed the Oregon Significant Emission Rates. To determine if the power plant has significant emissions, the annual emission rates in Table 3.6.4 are compared to the significant emission rates for each pollutant, also shown in the table. The proposed power plant's potential to emit exceeds major stationary source PSD thresholds and significant emission levels, as defined in OAR 340.200.0020, for NO_x, CO, PM_{10}, and VOC.

Air Quality Impact Analysis: The proposed power plant meets the criteria for PSD review. Therefore, air quality modeling is required to determine maximum ground-level concentrations caused by project emissions.

Dispersion modeling was performed by the project proponent using the EPA's Industrial Source Complex Short-Term 3 (ISCST3) model (Version 00101). The turbine stacks and

firewater pump were modeled as separate point sources. Additional parameters required for modeling point sources include source location, stack base elevation, stack height, stack inner diameter, stack gas exit velocity, and stack gas exit temperature. The modeling simulates the behavior of the exhaust plumes from the stacks. The plume would initially rise before leveling off and drifting downwind, because it is hotter than the atmosphere (Briggs 1971).

The ambient air quality modeling was performed using one year of onsite meteorological data. The onsite meteorological data were collected starting January 1, 1994 and were collected to PSD standards. These data were previously processed and used in support of the ACDP permit application for the Hermiston Generating Project.

A total of 33 computer simulations for 'worst-case' operating scenarios (for each pollutant and averaging period) were performed to estimate ground-level concentrations resulting from the power plant's emissions. Dispersion modeling results, shown in Table 3.6.5, indicate that air quality impacts resulting from the operation of the facility will be less than the Oregon DEQ Significant Air Quality Impact (SAQI) levels. The SAQI levels are equivalent in nature to the Significant Impact Levels (SILs) in the federal Prevention of Significant Deterioration rules. The SAQIs are a small fraction (0.2 – 6%) of the ambient air quality standards. Facilities that have air quality impacts less than the SAQI levels are considered to have no significant adverse impact on air quality and are not required to include emissions from other nearby sources in air quality analyses for permitting. Note that models used for this analysis are conservative (i.e., likely to overstate actual emissions).

Emissions of criteria pollutants (NO_x, CO, PM_{10}, VOC, and SO_2) to the atmosphere would occur from the combustion of natural gas in the combustion turbines and duct burners, and the combustion of diesel fuel in the firewater pump. The project proponent's modeling analysis has been reviewed and approved by Oregon DEQ modeling staff and shows that the maximum predicted concentrations are below the SAQIs for for all criteria pollutants. Thus, following federal and state air quality rules, the proposed power plant would not be expected to have a significant adverse impact on air quality in the project area. Although some areas as near as 40 kilometers (25 miles) from the power plant site are designated nonattainment for PM_{10}, the power plant would not have a significant impact on this area because PM_{10} impacts from the power plant would be below SAQIs. Phase 2 of BPA's Regional Air Quality Modeling Study (described in Section 3.6.3) will provide additional information for the final EIS regarding project-specific impacts to visibility for the proposed project.

Mitigation Measures included in the Proposed Project

Efficient air pollutant emission control measures are incorporated into the design of the power plant to reduce emissions of criteria pollutants. For example, the project design incorporates the use of clean natural gas to minimize emissions of PM_{10} and $SO_{2.}$ The design also includes the use of special catalysts to control NO_X, CO and VOC to very low levels. The Oregon DEQ has preliminarily determined that these control measures constitute Best Available Control Technology. Oregon DEQ reviewed other available control technologies in making that determination. No other available cost effective control technologies would achieve greater reductions in emissions.

Other Possible Control Measures

If a project is found to have significant adverse impacts, the project proponent may consider additional mitigation measures from other sources to partially offset the project's emissions and impacts. To be effective, such mitigation measures must target undercontrolled sources of groups or similar undercontrolled sources that may make substantial contributions to air pollution. On that basis, the following three examples of potential mitigation measures for regional haze impacts are evaluated below:

1) Diesel freight train locomotives that travel generally east-west through the project region along the Columbia River currently emit NOx, PM10 and SO2. These freight trains typically travel long distances, including interstate travel. The locomotive engines might be retrofitted to burn cleaner fuels such as natural gas to reduce emissions of all three pollutants, but this measure is considered not feasible for the following reasons:
   - This technology would require major and very costly engine modifications, or the purchase of new locomotives and has not been demonstrated to be economically feasible for large diesel locomotives to date.
   - Technology for safely transferring and storing sufficient quantities of fuel onboard for long-distance hauling would need to be developed and demonstrated.
   - An extensive infrastructure along the rail system would be required for refueling the trains, potentially in multiple states. None of this infrastructure exists today and would be very costly to develop for this project.

2) A program could potentially be implemented to retrofit or retire aging vehicles that are used in the project region. Retrofitting aging non-catalyst vehicles with catalysts to reduce local regional nitrogen oxide emissions is not cost effective in most cases because catalyst retrofits also require extensive engine modifications. The pre-catalyst (generally pre-1974) automobiles do not have the necessary computer systems and engine controls in place. Catalyst and engine retrofits are cost-prohibitive for these aging vehicles according to interviews that have been conducted with automotive

repair shops. In addition, remaining vehicles of this age have approached or exceeded their normal life span. Retrofitting such vehicles would not produce lasting emission reductions since most of these cars would naturally be replaced with newer cleaner cars during the life of the proposed power plant.

3) A program to replace conventional (i.e., pre-1986) wood stoves with certified (i.e., post-1986) stoves in the project region could reduce existing regional NOx and PM10 emissions. For example Oregon DEQ (Mr. Steve Aalbers, July 27, 2001) has estimated that approximately 77% of homes in Hood River County use wood burning stoves, one third of which are conventional stoves (numbering approximately 2590 units). These conventional stoves in Hood River County produce an estimated 500,000 pounds (250 tons) of PM10 annually according to DEQ. Converting all of these stoves to certified non-catalytic stoves would reduce their PM10 emissions by about 36% to approximately 320,000 pounds/year (160 tons/year). The replacement cost would range between $600 and $3000 per stove unit, according to DEQ. Thus, the net decrease would be about 180,000 pounds/year (90tons/year), at a cost of $1.55-7.76 million. The related cost per ton of emission reduction ($17,000–86,000 per ton) is considered cost prohibitive. This is more than double the range that is considered cost-effective by Oregon DEQ Best Available Control Technology (Mr. Doug Welch, Oregon DEQ, July 31, 2001).

Impact 3.6.2 Emissions from the Cooling Towers

Assessment of Impact Columbia River water used in the power plant's operation would contain trace amounts of impurities, such as dioxins, furans, and radionuclides (including natural and manmade isotopes of carbon, hydrogen, phosphorous, iron, cobalt, cesium, strontium, and uranium). Dioxins and furans strongly associate with solid particles in the river water, some of which would be removed by filtration before the water is used in power plant processes. Radionuclides can also be associated with solid particles, or can be dissolved in the water. The cooling towers would be the dominant pathway for process water contact with air at the power plant although drift would be reduced by the installation of high efficiency drift eliminators.

Most of the water entering the cooling towers evaporates and may carry the more volatile impurities with it. However, it is expected that most of the unfiltered impurities will remain dissolved or bound to particles in the liquid water that exits the cooling tower as blowdown into the power plant reclaimed water stream. Approximately 1.9 liters per minute (0.5 gallon per minute) of liquid water exit the cooling towers as small droplets called "drift." Drift is predominantly river water that has been concentrated 10 times by evaporation within the cooling tower, so 1.9 liters per minute (0.5 gallon per minute) of drift will contain impurities from about 19 liters per minute (five gallons per minute) of river water. At this rate, the project's total contribution of drift-borne river water impurities will not substantially increase the existing atmospheric loading of river mist

from sources such as wind/wave interaction on the Columbia River and dam spillways. Based on the above analysis, cooling tower drift emissions are not expected to pose a significant health or environmental risk.

Recommended Mitigation Measures None.

Impact 3.6.3 Fogging and Icing

Assessment of Impact Cooling towers remove unusable excess heat from the power plant by evaporating water in cooling towers. The moist air emitted from the cooling towers often condenses to form a visible white plume of steam. Generally, the steam plumes disappear by evaporating in a short distance. However, the steam plume can remain visible for long distances under certain meteorological conditions.

Occasionally, the steam plume will settle down to the ground near the power plant site. This is known as cooling tower-induced fogging. When conditions are right for fogging and the temperature is below freezing, icing can occur. Potential occurrences of cooling tower-induced fogging and icing were modeled using a standard model and three years of surface meteorological data from the Umatilla Chemical Depot.

Icing Impact: Based on the modeling, there are no predicted occurrences of cooling tower-induced icing on nearby roads.

Fogging Impact: The results of the modeling analysis show that a total of 2.5 hours of offsite ground-level fogging are predicted from the three years of meteorological data. The extent of the ground level fogging was limited to 1600 meters (5,249 feet) from the center of the cooling tower along an east northeasterly plume heading.

The risk of fogging and icing as a result of the proposed project would be reduced by the installation of high efficiency drift eliminators. Also, the orientation of the cooling towers was adjusted during the design process to minimize the impacts of fogging and icing.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended..

Impact 3.6.4 Effects of Emissions on Visibility and other Air Quality Related Values

Assessment of Impact Emissions from the proposed power plant must be assessed to ensure that ecosystems and pristine vistas in Wilderness Areas and National Parks are not deteriorated by pollutants in the air. Air Quality Related Values (AQRVs), including visibility, were analyzed for the Class I areas within 200 kilometers (124 miles) of the Project site. Table 3.6.6 lists the Class I areas and their distances from the project site.

To assess visibility beyond 50 kilometers (31 miles) from a proposed project, the USFS requires that the analysis be based on an assessment of the impact on "regional haze" at the closest boundary of the Class I area. The "regional haze" assessment described below was performed with Level I screening methods outlined in the Interagency Workgroup on Air Quality Modeling (IWAQM) (EPA, 1993), as amended by guidance from the ODEQ.

Visibility is usually characterized by either visual range (VR) (the greatest distance that a large dark object can be seen) or by the light-extinction coefficient (b) (the attenuation of light per unit distance due to scattering and absorption by gases and particles in the atmosphere). The basis of the regional haze assessment is a calculation of the change in the light extinction coefficient. A percent change of less than 5% is considered insignificant by the Federal Land Manager's AQRV Workgroup (FLAG) Phase I Report (FLAG, 2000).

The peak modeled change in the background extinction coefficient would occur at the Mount Adams Wilderness Area. The calculated maximum percent change in the extinction coefficient is 4.89% and would occur one day per year or less. This predicted change is less than the 5% significance level for Class I areas. The modeled change in extinction coefficient for the Class I areas are presented in Table 3.6.7.

Estimates of nitrate and sulfate deposition were determined to assess the proposed power plant's effect on vegetation, aquatic, and biological resources/ecosystems at the nearby wilderness areas. The estimates were calculated from modeled concentrations of NO_x and SO_2. The estimates are compared to suggested 'no-injury levels' for both total nitrogen deposition and sulfur deposition as given in the USFS Guidelines for Evaluating Air Pollution Impacts on Class I Wilderness Areas in the Pacific Northwest (1992). Nitrogen deposition can be expected to have no effect if levels are below 3 kg/ha-yr (3 lb/acre-yr) for coniferous forests, shrubs, and herbaceous plants and 5 kg/ha-yr (5 lb/acre-yr) for hardwood forests. The maximum predicted deposition of nitrogen as nitrate for all Class I Areas in the region, 0.14 kg/ha-yr (0.2 lb/acre-yr) at Goat Rocks, is between 2.8 and 4.7 percent of the no injury levels. Maximum nitrate deposition will be less at other Class I Areas. The suggested no-injury level for sulfur deposition is 5 kg/ha-yr (5 lb/acre-yr). The maximum predicted sulfur deposition rate is 0.02 kg/ha-yr (0.02 kg/ha-yr), or approximately 0.4 percent of the no-injury level. The results of this conservative modeling analysis indicate that the maximum deposition values should not present significant ecosystem impacts.

Detailed calculations and evaluations of the AQRV analyses are provided in the ACDP application. The results of these very conservative analyses indicate that the proposed power plant would not cause AQRV or visibility impacts to any Class I areas (UGC 2001).

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.6.5 Global Warming

Assessment of Impact The proposed power plant would emit CO_2 during both the construction and operation phases. If increased atmospheric CO_2 is leading to a global warming effect, then the proposed power plant would contribute to CO_2 emissions and to global warming.

Although CO_2 emissions are not currently regulated by any ambient concentration standard, in order to receive a site certificate from the Energy Facility Siting Council (EFSC), the Umatilla Generating Company, L.P. must demonstrate compliance with the State of Oregon's carbon dioxide emissions standard for energy facilities. Specifically, EFSC must find "that the net carbon dioxide emissions rate of the proposed facility does not exceed 0.306 kilogram (0.675 pounds) of carbon dioxide per kilowatt hour of net electric power output, with carbon dioxide emissions and net electric power output measured on a new and clean basis" (OAR 345-024-0550). For carbon dioxide emissions from duct burning, EFSC must find that the incremental emissions do not exceed 0.32 kilogram (0.70 pound) of carbon dioxide per kilowatt hour of net electric power output, also measured on a new and clean basis. The proposed power plant's gross carbon dioxide emissions rate would be approximately 0.4 kilogram (0.8 pounds) of carbon dioxide per kilowatt hour for net power output at base load. With duct burning, the gross carbon dioxide emissions rate would be approximately 0.5 kilogram (1.0 pounds) of carbon dioxide per kilowatt hour using calculation methods specified by EFSC.

Umatilla Generating Company, L.P. has agreed to comply with the State's carbon dioxide emissions standard by providing offset funds to The Climate Trust (formerly, The Oregon Climate Trust) as allowed by Energy Facility Siting Council regulations. The offset fund rate is $0.57 million per ton of carbon dioxide in excess of the standard for net electric power output with and without duct burning, and amounts to $5.28 million for this project. The project will produce approximately 1.9 million metric tons of CO_2 annually. This will add approximately 3% to existing CO_2 emissions in Oregon (61.6 million metric tons per year estimated by Mr. Sam Sadler of Oregon Office of Energy July 12, 2001). Project emissions represent less than one millionth of existing CO_2 emissions in the United States. The Climate Trust must use the offset funds to achieve real reductions in atmospheric gases believed to contribute to global warming.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.6.6 Construction Impacts

Assessment of Impact The two biggest sources of air pollution during the construction phase of the proposed project are equipment exhaust emissions and fugitive particulate matter emissions. Short term emissions from construction sites are exempt from any air quality permitting requirements in Oregon.

Exhaust Emissions

Construction-related equipment exhaust emissions would result from operation of heavy equipment and from construction worker's vehicles used to travel to and from the construction site.

The amount of pollutants emitted from construction vehicles and equipment and construction worker commute traffic would be small compared to total vehicular emissions in the region. To reduce combustion pollutants, idling construction equipment would be shut down where feasible and low NO_x emission tune-ups on equipment operating on site for more than 60 days would be performed.

Dust Emissions

Fugitive particulate matter ("dust") emissions are generated by actions such as grading, vehicle travel on disturbed ground, and wind erosion. Site excavation and grading activities would disturb onsite soils and would result in loose dirt and silt which could become airborne when subject to a moderate or strong wind and/or when moved during construction-related activities. Some of these airborne particles (typically less than 40 μm in diameter) might be carried off the power plant site.

Since fugitive emissions are emitted at or close to ground level, maximum impacts due to these emissions typically occur within or very close to the property line, with rapidly decreasing impacts beyond this point. To reduce fugitive dust emissions caused by construction activities, Umatilla Generating Company, L.P. would take the following precautions:

- Unpaved construction areas would be watered a minimum of twice daily during construction in dry weather. Trucks hauling dirt would be covered or wet down. Frequency of watering exposed soil surfaces would be increased when blowing dust is visible.

- Stored construction materials that could be a source of dust would be covered.

- Vehicle speeds on unpaved project areas would be limited to 32 kilometers (20 miles) per hour.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.6.3 Cumulative Impacts

The proposed project will use advanced combined-cycle gas turbine technology, clean-burning natural gas, and high efficiency air emission control technology. Resultant air emissions will meet or exceed current Best Available Control Technology (BACT) requirements[3].

Existing air quality in the project region is better than state and federal standards, with the possible exception of PM_{10} in the Wallula, Washington vicinity, as discussed above. Air quality modeling by the project proponent (described above) indicates that the project alone will not cause existing good air quality to deteriorate significantly, nor will the project's emissions limit future industrial growth. Conservative EPA-approved air quality models indicate that the project's impacts will be below Oregon's very stringent "significant air quality impact levels" (SAQIs) and also below the less stringent federal significance levels that apply in other parts of the nation, such as Washington and Idaho.[4]

This EIS will consider regional cumulative effects of existing sources, this project and other proposed turbine projects. Two new electric power plants have been approved and are currently under construction in the vicinity. One is east of Hermiston (Hermiston Power Partners) and the other is located at the Port of Morrow (Coyote Springs Unit 2). In response to the current power emergency in the Pacific Northwest and other areas of the western U.S., as of July 1, 2001, six additional electric power projects are proposed in the project region, and are under regulatory review. If all proposed power projects are built, the cumulative impact on air quality, visibility and atmospheric nitrate deposition may be significant. Recognizing this situation, BPA recently initiated a detailed modeling study of cumulative air quality and visibility impacts on the Columbia River Gorge and northwest Class I areas. BPA's Regional Air Quality Modeling Study[5] will provide clarifying information about the effects of these proposed electric power projects. The stated study objective is to analyze and disclose pertinent air quality and visibility impacts on sensitive areas from the combined emissions of 45 proposed gas-fired power plants, representing more than 24,000 MW of new generation capacity in Washington, the northern half of Oregon and the Idaho Panhandle. The study will focus on:

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[3] Emissions levels proposed for the project are equivalent to current Lowest Available Emission Rate (LAER) requirements that apply elsewhere in areas of poor air quality (i.e., non-attainment areas).

[4] Air quality impact analysis results are summarized in EIS Section 3.6.2 and further details are documented in the project's February 15, 2001 PSD/ACDP Permit Application that was submitted to the Oregon Department of Environmental Quality. Air quality significance levels are located at OAR 340-200-0020 (117), WAC 173-400-141, and 40 CFR 51.165(b)(2).

[5] 'Regional Air Quality Modeling Study', Bonneville Power Administration, 7/2001. Study can be found at http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/SUMMARIES/air2.

- Effects of PM_{10}, NO_x and SO_2 emissions on regional pollutant concentrations and compliance with the National Ambient Air Quality Standards.

- Effect of power plant emissions on PSD Class I and Class II increments.

- Visibility degradation in the Class I areas.

- Nitrogen and sulfur deposition in the Class I areas.

- Estimated CO_2 emissions from proposed power plants.

The study is being conducted in two phases. Phase I is a regional simulation of proposed power plant sources that identifies areas and sources that exceed significance criteria. Phase II will consist of a separate evaluation of each power plant's contribution to visibility impacts, and is expected to be completed by December 2001. The results of each phase will be public information.

Communication with the Oregon DEQ Pendelton Office indicates that proposed growth of major stationary air pollution sources in the project area (as indicated by air quality permit applications and pre-filing meetings with applicants) is limited to electric power projects. Thus, BPA's regional air quality modeling study addresses the dominant proposed sources of cumulative impact in the area.

The BPA study's Phase I modeling has recently been completed. Of all the parameters evaluated in the study[6], visibility was the only criteria consistently exceeded in Phase I. Assuming that all of the study's 45 proposed power projects are built and operated simultaneously at peak load, modeled regional haze from particulate, sulfur oxide and nitrogen oxide emissions was found to affect all but 2 of the regions' sensitive areas[7]. The operating assumptions used for Phase I modeling are likely to over-estimate impacts. BPA anticipates that only a portion of these plants will likely be constructed, and not all projects would operate at peak load continuously.[8] Phase II of the study will address the specific impacts to visibility for this proposed project. That information will be available in the final EIS.

[6] Other study criteria include: National Ambient Air Quality Standards, New Source Review/Prevention of Significant Deterioration (NSR/PSD) increment consumption, PSD/NSR Significant Impact Levels, and nitrogen and sulfur deposition.
[7] Sensitive areas include NW Class I areas, wilderness areas and the Columbia River Gorge Scenic Area.
[8] A more detailed overview of the modeling approach and presentation of the preliminary Phase I results can be found at http://www.efw.bpa.gov/cgi-bin/PSA/NEPA/ SUMMARIES/air2.

Table 3.6.1:
Ambient Data at Port of Morrow

Pollutant	3-hour	24-hour	Annual
NO_x	–	–	1 ppb
SO_2	21 ppb	10 ppb	1 ppb
PM_{10} (1^{st}-high)	–	105 g/m^3	20 g/m^3
(2nd-high)	–	81 g/m^3	–

Note: ppb = parts per billion by volume; g/m^3 = micrograms per cubic meter

Table 3.6.2:
State and Federal Ambient Air Quality Standards

			National Standards[1]	
Pollutant	**Averaging Time**	**Oregon Standards[2]**	**Primary[2,3]**	**Secondary[2,4]**
Ozone	8-hour	0.08 ppm (157 $\mu g/m^3$)	0.08 ppm (157 $\mu g/m^3$)	Same
	1-hour	None	0.12 ppm (235 $\mu g/m^3$)	Same
Carbon monoxide	8-hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	Same
	1-hour	35 ppm (40 mg/m^3)	35 ppm (40 mg/m^3)	Same
Nitrogen dioxide	Annual average	0.053 ppm (100 $\mu g/m^3$)	0.053 ppm (100 $\mu g/m^3$)	Same
Sulfur dioxide	Annual average	0.02 ppm	0.03 ppm (80 $\mu g/m^3$)	None
	24-hour	0.10 ppm	0.14 ppm (365 $\mu g/m^3$)	None
	3-hour	1,300 $\mu g/m^3$ (0.5 ppm)	None	0.5 ppm (1,300 $\mu g/m^3$)
	1-hour	None	None	None
PM_{10}	Annual	50 $\mu g/m^3$	50 $\mu g/m^3$	Same
	24-hour	150 $\mu g/m^3$	150 $\mu g/m^3$	Same
$PM_{2.5}$	Annual	15 $\mu g/m^3$	15 $\mu g/m^3$	Same
	24-hour	65 $\mu g/m^3$	65 $\mu g/m^3$	Same
TSP	Annual	60 $\mu g/m^3$	None	None
	24-hour	150 $\mu g/m^3$	None	None
Lead	Quarterly	1.5 $\mu g/m^3$	1.5 $\mu g/m^3$	Same

$\mu g/m^3$ = Micrograms per cubic meter. mg/m^3 = Milligrams per cubic meter.

1 Standards, other than ozone and those based on annual averages or annual arithmetic means, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.

2 Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 mm of mercury. All measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 mm of mercury (1,013.2 millibar); ppm in this table refers to parts per million by volume, or micromoles of pollutant per mole of gas.

3 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the Environmental Protection Agency.

4 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Each state must attain the secondary standards within a "reasonable time" after implementation plan is approved by the EPA.

Table 3.6.3:
Summary of July 1997 Revised Federal Air Quality Standards

Pollutant	Averaging Period	Primary Standard	Secondary Standard
Ozone (O_3), parts per million (ppm)	8-hour	0.08	Same
($PM_{2.5}$), micrograms per cubic meter (ug/m^3)	24-hour	65	Same
	Annual	15	Same

Table 3.6.4:
Maximum Predicted Emission Concentrations and Rates

	NO_x	CO	VOC	PM_{10} [1]	SO_2
Stack Concentration (ppmvd @ 15% O_2) [2]	2.5	10	5.6	N/A	0.5
Per CTG lb/hr [3]	20.2	49.2	15.4	24	4.91
Total (2xCTG) ton/yr. [4]	196	433	140	184	37.3
Firewater Pump lb/hr [5]	2.6	0.54	0.23	0.06	0.19
Firewater Pump ton/yr. [6]	$6.8x10^{-2}$	$1.4x10^{-2}$	$6.0x10^{-3}$	$1.6x10^{-3}$	$2.5x10^{-3}$
Total Annual Emissions (tpy)	196	433	140	184	37.3
'Major Source' Significant Emission Rates (tpy)	40	100	40	15	40

1 All particulates are assumed to be PM_{10}.

2 ppmvd = parts per million by volume at dry conditions

3 Hourly emissions per turbine; values based on the maximum emissions under any non-startup operating scenario for each of the turbine alternatives

4 Worst case (on a pollutant basis) of two GE Frame 7FB combustion turbines, 100% load at 53° F (Source: preliminary facility engineering data); SO_2 emissions based on a maximum natural gas sulfur content of 0.75 gr S/100 scf and a minimum fuel heat content of 995 Btu (HHV)/scf. All operations assumed for 8,760 hours/year. The NO_x, CO and VOC emission estimates also include 4,000 hours of duct firing and 200 hot starts, 40 warm, and 10 cold starts per turbine annually. PM_{10} and SO_2 emissions estimates are based on 4,000 hours of duct firing and 4,760 hours at 100% load per turbine.

5 SO_2 emissions based on a diesel fuel sulfur content of 0.1% S by weight.

6 Based on 52 hours of non-emergency use per year.

Table 3.6.5:
Umatilla Air Quality Impact Modeling Results

Pollutant	Averaging Period	Modeled Impact ($\mu g/m^3$) [1]	Oregon Significant Air Quality Impact Levels ($\mu g/m^3$)
NO_2	Annual	0.18	1.0
CO	Maximum 1-hour	398	2,000
	Maximum 8-hour	33.4	500
PM_{10} [2]	Maximum 24-hour	0.96	1.0
	Annual	0.10	0.2
SO_2 [2]	Maximum 3-hour	13.7	25
	Maximum 24-hour	0.34	5
	Annual	0.02	1.0

[1] Calculated impacts are based on conservative air quality models and assumptions and may over-predict actual impacts.

[2]The maximum modeled 24-hour PM_{10} impact is associated with reduced load operations and occurs in elevated terrain approximately 7.2 kilometers to the southeast of the proposed project. Annual PM_{10} impact occurs in low elevation terrain approximately 5.3 kilometers northeast of the proposed project. Short-term 3- and 24-hour SO_2 impacts are due to occasional maintenance operation of the diesel fueled firewater pump.

Table 3.6.6:
Class I Wilderness Areas within 200 km of Power Plant Site

Class I Wilderness Area	Distance from Power Plant Site (km)
Eagle Cap Mountains	134
Strawberry Mountains	164
Columbia River Gorge National Scenic Area [1]	117
Mt. Hood	178
Mt. Adams	159
Goat Rocks	166

[1] The CRGNSA is not a Federally protected Class I Wilderness Area; however, the ODEQ and FLM have requested a Class I visibility analysis be performed.

Table 3.6.7:
Maximum Change In Class I Wilderness Area Extinction Coefficients

Class I Wilderness Area	Change in Extinction Coefficient (%)
CRGNSA	2.72
Eagle Cap	3.72
Goat Rocks	4.71
Mt. Adams	4.89
Mt. Hood	3.73
Strawberry Mtn.	3.05

Note: These maximum modeled visibility impacts would occur one day per year or less.

3.7 TRAFFIC AND CIRCULATION

The proposed Umatilla Generating Project would affect traffic flow on roadways in the vicinity of the power plant site. During construction of the proposed power plant, up to 400 workers would be employed at the site. Approximately 10 people would staff the power plant once it was completed. There would be an increase in traffic movement in the vicinity of the power plant during both construction and operation.

3.7.1 Affected Environment

Roadway System

The proposed power plant would be located along Lamb Road, between Westland Road to the east and Interstate 82 to the west. Access to the proposed power plant site would be from Lamb Road. The existing roadway system in the vicinity is shown in Figure 3.7.1. The roadways potentially affected by the proposed project include:

Interstate 84 (I-84) – I-84 is the primary interstate route from Portland, Oregon to Boise Idaho. This east-west freeway provides four travel lanes (two in each direction). It is located approximately 1.3 kilometers (0.8 mile) south of the proposed power plant site, with interchange access via Westland Road.

Interstate 82 (I-82) – I-82 is a north-south freeway that originates at I-84 and extends north to the Tri-Cities area and Yakima, Washington. Four travel lanes (two in each direction) are provided. The freeway forms the western boundary of the proposed power plant site, with interchange access via Lamb Road.

State Highway 207 (Hermiston Highway) – The Hermiston Highway is a north-south two-lane highway which bisects the City of Hermiston, with interchange connection at I-84. It lies several miles to the east of the proposed power plant site.

Westland Road – Westland Road is a two-lane county road that has interchange connection with I-84 to the south and extends northeast into the City of Hermiston. The roadway passes to the east of the proposed power plant site and provides access to the existing Hermiston Generating Plant approximately 152 meters (500 feet) south of Lamb Road.

Lamb Road – Lamb Road is a two-lane county road that intersects with Westland Road (stop control along Lamb Road) and extends west to the US Army's Umatilla Chemical Depot (UMCD), with interchange connection at I-82. The roadway forms the northern

boundary of the proposed power plant site, with proposed site access approximately 183 meters (600 feet) west of the intersection with Westland Road.

Present Traffic Volumes

Traffic data for I-84 and I-82, including interchange ramp volumes (1999 daily traffic) and other roadways in the vicinity, were obtained from the Oregon Department of Transportation (ODOT) (ODOT, 1999). In addition, manual turning movement counts (TMCs) were conducted by URS at the intersection of Westland Road and Lamb Road on August 8, 2000 during peak weekday traffic periods (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM).

During the afternoon traffic counts, construction traffic leaving the UMCD to the west (Umatilla Chemical Agent Disposal Facility (UMCDF), now under construction) was observed at the Westland Road and Lamb Road intersection. During a 15-minute period (5:30 to 5:45), an estimated 50 additional vehicles were observed travelling eastbound along Lamb Road and turning left onto Westland Road towards Hermiston. A similar short-term increase was not observed in the morning, likely because most of the construction traffic arrived earlier than 7:00 AM.

Based on this data, the average daily traffic (ADT) for the study area roadways is shown in Figure 3.7.1. It should be noted that the temporary UMCD construction traffic was not included for the estimated daily activity along Westland Road and Lamb Road. A steady decline in activity is expected for the remainder of this construction activity, with completion expected in May 2001 (Cornett, 2000).

Peak hour volumes along Westland Road and Lamb Road for the AM and PM periods are shown in Table 3.7.1.

Future Traffic Volumes

The proposed power plant is expected to begin operation by late 2003. Traffic volumes in 2003 without the proposed power plant were estimated for the study area. The 2003 traffic volumes serve as the baseline condition for examination of the effects of the proposed power plant. Background traffic volumes were assumed to increase 5 percent annually between 2000 and 2003. This growth factor was determined from historical traffic data obtained from ODOT and expected general increases in residential population and employment opportunities for this area of Umatilla County. This assumed development includes operations at the completed UMCDF site, a minor traffic generator, particularly for local roadways east of I-82. Based on discussions with Umatilla County officials, no other major developments are planned in the vicinity at this

time (Graham, 2000). The resulting AM and PM peak-hour volumes at Westland Road and Lamb Road are shown in Table 3.7.1.

Present Traffic Level of Service

The peak hour traffic counts were used to determine the peak hour Level of Service (LOS) for the unsignalized intersection of Westland Road and Lamb Road. LOS is an estimate of the quality and performance efficiency of transportation facilities as established by the Transportation Research Board's Highway Capacity Manual (HCM) (Highway Capacity Manual 1997). The HCM system measures the degree of traffic congestion and delay using the letter 'A' (the best) for least amount of congestion and letter rating 'F' (the worst) for the most amount of congestion. Table 3.7.2 shows the letter ratings with a verbal description of the type of delay associated with it.

Geometric information such as number of lanes, width, configuration and grade was identified based on collected field data. This was combined with the observed traffic counts as input to perform the LOS analysis.

A summary of the LOS analysis for the existing condition is shown in Table 3.7.3. The results show LOS A with little or no delay for northbound left turns along Westland Road. Critical turning movements for stopped vehicles along Lamb Road show only short delays of 10 to 15 seconds, resulting in LOS B. An overall LOS of C or better (less than 25 seconds) is typically considered to be acceptable for a rural setting. It should also be noted that the existing PM peak hour analysis includes the additional UMCD construction traffic volumes that were observed during the August 2000 traffic count.

Future Traffic Level of Service

The LOS analysis for the projected 2003 condition shows that turning movements at the intersection will continue to experience little delay, even with the assumed growth in background traffic. The results of the analysis are shown in Table 3.7.3. Northbound left turns along Westland Road will continue at LOS A and eastbound turns along Lamb Road will remain at LOS B.

Proposed Roadway Improvements

There are currently no funded or planned roadway improvements in the project area.

Parking and Site Access

The proposed power plant site is vacant except for a Umatilla County access road/driveway named Generation Road. This gravel/asphalt roadway connects to Lamb Road and provides access to potato sheds south of the site, adjacent to the Union Pacific Railroad. An old gravel access also connects the driveway to Westland Road, approximately 46 meters (150 feet) south of Lamb Road. Traffic activity associated with the potato sheds was observed to be negligible during a typical weekday period.

3.7.2 Environmental Consequences and Mitigation Measures

The proposed power plant site would be developed to accommodate the proposed Umatilla Generating Project. Access to the proposed power plant site would be provided by a public right-of-way that follows the existing road alignment through the property and intersects Lamb Road approximately 183 meters (600 feet) west of its intersection with Westland Road. The proposed power plant would share the use of this roadway with the potato shed operations to the south.

Impact 3.7.1 Operation of the proposed power plant would affect traffic volumes on local roadways

Assessment of Impact The proposed power plant is designed to operate continually (24 hours a day, seven days a week) with a work force of approximately 10 full-time employees. The workforce allocation per shift would be approximately as follows:

Shift	*Employees*	*Time*
Day Shift OPS	2	6:00 AM – 6:00 PM
Day Shift Office	5	7:00 AM – 3:30 PM
Night Shift OPS	2	6:00 PM – 6:00 AM

A worst-case assumption is that each employee would drive to work alone and account for 20 daily site trips (10 entering and 10 exiting). In addition, it is estimated that 20 daily site trips (10 entering and 10 exiting) would occur for service vehicles, delivery trucks and site visitors. Therefore, a total of 40 daily vehicle trips (20 entering and 20 exiting) would be generated by the proposed power plant.

The peak-hour generation includes a total of 20 vehicle trips per hour. The AM Peak Hour would entail 15 vehicles entering and 5 vehicles exiting, while the PM Peak Hour would be the reverse, with 15 vehicles exiting and 5 vehicles entering.

It is expected that most of the employees and other visitors to the power plant site would come from Hermiston, Umatilla and the Tri-Cities. Routing would primarily be via the interstate highways, with I-82 connecting to Umatilla and the Tri-Cities to the north, and I-84 connecting to other areas further to the east and west. Westland Road is expected to be a major route for trips originating from the nearby areas of Hermiston that are west of the Hermiston Highway (State Highway 207). It is estimated that 40 percent of the trips would be on I-82, 30 percent of the trips on Westland Road northeast of the proposed power plant site, 20 percent of the trips on I-84 east of the Westland Road Interchange and 10 percent of the trips on I-84 west of the I-82 Interchange.

The potential site-generated traffic volumes were distributed onto the surrounding roadway network in accordance with the distribution noted above. The results show that maximum daily traffic increases would be along Lamb Road and amount to approximately 42 daily vehicle-trips (60 percent of total project vehicle-trips) to and from I-82, with the remaining 28 vehicle-trips (40 percent) to and from Westland Road. Peak-hour traffic volumes that include the proposed power plant traffic (a total of 20 additional vehicle-trips) were developed and are shown in Table 3.7.1.

A peak hour LOS analysis was undertaken for the intersection of Westland Road and Lamb Road. The results show that the small increase in traffic travelling through the intersection would cause little or no perceptible change to operations. As shown in Table 3.7.3, the maximum change in average stopped delay amounts to less than one second for any vehicle turning movement. The proposed site access on Lamb Road shows LOS A for westbound left turns entering the site and LOS B or better for northbound vehicles exiting onto Lamb Road.

A total of 29 permanent parking stalls are proposed for the power plant site. Peak employee use is expected during shift overlap at the beginning and end of the day shift with a need for about 20 stalls. The remaining 9 stalls would be available for visitor and delivery use. Consequently, the proposed power plant would have no adverse effects on parking in the vicinity.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.7.2 Construction of the proposed power plant would affect traffic volumes on local roadways

Assessment of Impact Construction activities for the proposed power plant would extend for about 20 months and would result in an increase in traffic activity in the power plant area. Traffic delays could occur during the maneuvering of large vehicles and due to the

overall number of additional vehicles destined to or leaving the proposed power plant site. These additional vehicles would include construction workers and trucks delivering materials.

Peak construction activity is estimated to last up to 5 months, with approximately 400 construction workers entering and leaving the site on a daily basis. Typically, some carpooling would occur for these trips. Assuming a vehicle occupancy of 1.2 workers per vehicle, 650 daily vehicle-trips would be expected. Daily truck activity is estimated to be as high as 60 deliveries per day. Therefore, there would be approximately 120 daily truck trips during this peak construction period.

The distribution of construction traffic trips is expected to be the same as for operational trips: 40 percent of the trips would be on I-82, 30 percent of the trips on Westland Road northeast of the proposed power plant site, 20 percent of the trips on I-84 east of the Westland Road Interchange and 10 percent of the trips on I-84 west of the I-82 Interchange. Peak hour traffic operations would be affected at stop-controlled intersections, where higher left turn demand is expected. Short-term delays are therefore expected during the AM peak at the I-82 Southbound Ramp/Lamb Road intersection and during the PM peak at Lamb Road and Westland Road.

Recommended Mitigation Measures The following mitigation measures are recommended to reduce adverse traffic impacts during the construction period:

- Promote ride-share and vanpool programs for construction workers to reduce vehicle-trips.

- Provide flagmen at the site driveways and at intersections along Lamb Road when very large trucks need to enter and leave the construction site.

3.7.3 Cumulative Impacts

The proposed project would create approximately 10 full-time jobs and an estimated 40 trips per day. The small increase in trips on local roads associated with the proposed project would not be expected to create traffic congestion or a diminution of the level of service at any affected intersections. However, because the areas surrounding the proposed project site are zoned commercial and industrial, future development of the area could generate increased traffic. Traffic generated by the proposed project together with traffic generated by future industrial and commercial developments could have a cumulative adverse effect on traffic flow on local roads.

Insert Excel Table 3.7.1

Table 3.7.2:
Level of Service and Delay

Level of Service	Expected Traffic Delay
A	Little or no delay
B	Short traffic delays
C	Average traffic delays
D	Long traffic delays
E	Very long traffic delays
F	Extreme delays

Source: Transportation Research Board, *Highway Capacity Manual Special Report*

3.8 VISUAL QUALITY AND AESTHETICS

The proposed power plant would be built in an area primarily zoned for industrial use and already occupied by several industrial facilities, including the Hermiston Generating Plant and the Lamb-Weston potato processing plant. Additionally, mitigation measures (e.g., use of non-reflective and color treated materials, as well as shielding and directive devices for lighting) would reduce the visual prominence of the proposed power plant. Reconductoring of existing transmission lines without replacement of existing towers would be invisible to most observers. The short sections of new transmission line at the power plant site and near the McNary Substation are in areas where transmission towers are already abundant. Thus, the proposed project would be visually compatible with its surroundings. It would not result in the obstruction or degradation of any scenic viewsheds, including scenic and aesthetic resources designated in the pertinent comprehensive plans.

3.8.1 Affected Environment

The project site is located on the Umatilla Plain lowland. The Umatilla Plain is characterized by relatively flat to moderately rolling terrain, with elevations ranging from about 76 to 229 meters (250 to 750 feet) above Mean Sea Level (MSL). The terrain is primarily a mixture of grassland and agricultural land interspersed with occasional areas of small buttes and rock outcrops. Additionally, there are numerous small drainages (e.g., Umatilla River) and wetlands found throughout the plain. The Oregon Trail crosses the Plain several miles south of the project area. Mature trees and riparian vegetation are concentrated along the drainages and wetlands. Views within the plain are relatively open and expansive, interrupted only by slight changes in terrain, vegetation, and development. Due to the relatively large concentration of power generation facilities in the region, there are several large transmission lines traversing the landscape in the vicinity of the proposed project.

The Upper Columbia River area defines the northern boundary of the project site. The Columbia River defines the northern boundary of the Umatilla Plain and is one of the most identifiable landscape features in the Pacific Northwest region. The river varies from about 1.6 to 2.4 kilometers (0.5 to 1.5 miles) across and is bordered by smooth rounded hills along its banks. Several hydropower dams have converted the river into a series of long, narrow lakes, including the McNary Lock and Dam that is located near the north end of the proposed transmission line. Several large electric power transmission lines are located along the banks of the Columbia River. Large numbers of transmission towers are concentrated near the McNary Lock and Dam and the McNary Substation. The river has multiple uses including boating, fishing, wind surfing, and commercial

shipping. Views from the river corridor are relatively open and expansive up and down the river (primarily east and west), both at the water level and from the Umatilla Plain.

Moving southward, the elevations of the Umatilla plain gradually increase from 213 meters (700 feet) to 366 meters (1,200 feet) at the foot of the Blue Mountains, which defines the southerly edge of the Plain. The Blue Mountain range is located about 18 miles (29 kilometers) south of the power plant.

3.8.1.1 Visual Characteristics of the Project Area

Much of the proposed project area consists of open agricultural lands used for grazing and growing crops (e.g., peas, small grains, corn, etc.). More intense development is concentrated in Hermiston north of Interstate 84 and along Highway 395. It consists primarily of one- to two-story residential and commercial buildings, storage yards, stockyards, agricultural buildings, light industrial buildings, streets and parking lots, commercial signage, utility poles, and railroad tracks. Interstate 84 (I-84), Interstate 82 (I-82), and Highway 395 are the major roadways traversing the project area. The residences and highways offer the primary viewpoints from which the public has views of the proposed project.

South of I-84, the area is characterized predominantly by agricultural lands used for grazing and irrigated crops. Development is very limited and consists primarily of rural residences and farm buildings.

The dominant visual elements of the landscape at the proposed power plant site include the Hermiston Generating Plant, which is currently in operation, as well as two food processing plants, Lamb-Weston and Simplot. The Hermiston Generating Plant is a combined cycle power plant similar to the proposed power plant. Lamb-Weston and Simplot each consist of a complex of buildings and storage yards. Two other industrial stacks are visible.

The Lamb-Weston plant and the Hermiston Generating Plant are located together, east of Westland Road and 1.21 kilometers (0.75 miles) north of I-84. Simplot is located several miles to the east on Highway 207 and 1.21 kilometers (0.75 miles) north of I-84. The stacks and vapor plumes from these industrial uses are visible at various locations along I-84, I-82 and Highway 207. The two other industrial stacks are located east of Highway 395 near Stanfield and are visible from I-84 and Highway 395.

Other strong vertical elements in the project area include grain silos and other storage structures used for agricultural purposes, utility poles, water towers, and stands of trees

interspersed throughout the area. See also Section 3.11 for a discussion of land uses within 0.8 kilometers (0.5 mile) of the power plant site.

3.8.1.2 Visual Resources in the Project Area

Within the 8-kilometer (5-mile)radius of the proposed power plant site, the Umatilla County Scenic-Historic Road is the only identified visual resource from which the power plant might be visible. The Umatilla County Scenic-Historic Road now comprises a collection of county roads, city streets, and state highways that follow the general course of early wagon roads between Umatilla and the Blue Mountains. At its nearest point, the road is located approximately 6.5 kilometers (4.0 miles)east of the power plant site.

3.8.1.3 Visual Characteristics of the Project Site

The project site consists of four geographic areas described below.

Power Plant Site: The power plant would be constructed on a flat, open, disturbed area in the southeast corner of the Westland Road interchange on I-82. The elevation of the power plant site is 171 meters (560 feet) above mean sea level. Vegetation on the site consists primarily of non-native grasses interspersed with some native gasses and small shrubs. There are no large trees at the power plant site.

Railroad tracks parallel the southern boundary of the proposed power plant site, 1.2 kilometers (0.75 miles) north of I-84. I-82 abuts the western boundary of the site. Lamb Road and the Westland-McNary Transmission Line parallel the northern boundary of the site. Westland Road forms the eastern boundary of the site. The Hermiston Generating Plant and Lamb-Weston plant complex are dominant features in the landscape to the east of the site.

Gas Pipeline Right-of-Way: The power plant would be fueled by natural gas from the existing PG&E Gas Transmission-Northwest ("PG&E GTN") pipeline that passes approximately five miles (eight kilometers) south of the power plant site. A new pipeline lateral would be built from the power plant site to the PG&E GTN line. The pipeline would be placed underground. Construction of the preferred pipeline route may temporarily remove about 12 hectares (30 acres) of land from agricultural use, depending on the season in which construction occurs. Construction of the pipeline is expected to take three to four months. Once construction is completed, the pipeline would be covered and agricultural lands would be returned to production.

Transmission Line Right-of-Way: The proposed project would include reconductoring the Westland-McNary electric power transmission line between the Hermiston

Generating Plant and the McNary Substation. An existing 115 kV transmission line would be replaced by a new 230 kV line carried on the existing towers. The changes as a result of line replacement would be invisible to most observers, and so this element of the project was not analyzed in detail for potential visual impacts.

Short segments of new transmission line on new towers would be constructed at the power plant and at the McNary Substation.

Water Supply and Reclaimed Water Right-of-Way: A water supply pipeline and a wastewater pipeline would be constructed between the Umatilla Generating Project and the Hermiston Generating Plant. A new 46-centimeter (18-inch) diameter water supply line would be built from the end of the existing 61-centimeter (24-inch) diameter line to the proposed power plant. The water supply pipeline extension would be approximately 0.8 kilometers (0.5 mile) long and would parallel the Union Pacific rail line for most of its length. The reclaimed water pipeline would be constructed in the same corridor as the water supply pipeline. The reclaimed water pipeline would convey blowdown water to the Hermiston Generating Plant, where it would be transported to Madison Farms in the Hermiston Generating Plant's reclaimed water pipeline.

Both the reclaimed water and water supply pipelines would be placed underground. Currently, there are no designs which locate any above-ground structures for the water pipelines.

3.8.2 Environmental Consequences and Mitigation Measures

The viewshed analysis method which assesses the visibility of the proposed project from key observation points was used to assess the visual impact of the proposed project. Key observation points (KOPs) are viewing locations identified as the most representative, visually sensitive areas that would view the proposed project. The analysis of the KOPs included identification and photo documentation of specific viewpoints, classification of visual sensitivity of specific viewpoints, and description of the visibility of the proposed project from the specific viewpoints. The KOPs were identified based upon available land use data, public and agency input, and field review of the project area. The visual sensitivity for each of the KOPs is a measure of the degree of concern for change in the visual character of the landscape. This analysis considered only KOPs with high or moderate sensitivity, since low sensitivity viewers would likely not represent significant impact resulting from the proposed project. The following KOPs were identified within the project area.

- Communities of Hermiston and Westland, including rural residences surrounding these communities (high sensitivity)

- Interstates 82 and 84 (moderate sensitivity)
- Westland Road (moderate sensitivity)

The proposed project would add industrial features into an existing landscape where industrial and agribusiness uses are already an important visual component. No existing large trees would be removed. Industrial and agribusiness use of the area around the proposed project can be expected to intensify in the future because the area is designated for industrial and agribusiness use in local land use plans. Consequently, the proposed power plant and its related and supporting features represent an insignificant impact to the visual quality and aesthetics of the area.

Impact 3.8.1 Elements of the power plant can be seen up to two miles away.

Site reconnaissance indicates the proposed power plant would be most visible at distances within 3.2 kilometers (two miles) of its site. At distances greater than two miles, the power plant would be in the background, would blend with other similar features in the area and would be too distant to constitute a significant feature in the viewshed.

The proposed power plant would consist of two combustion turbine generator enclosures (CTGs) approximately 15 meters (50 feet) tall, two heat recovery steam generators (HRSGs) approximately 26 meters (85 feet) tall, exhaust stacks approximately 65 meters (213 feet) tall, several buildings and structures ranging in height from approximately 13 meters to 20 meters (41 feet to 65 feet), storage yards and parking facilities. The stacks would be visible from the major roadways within the project area and from nearby residences. The rest of the power plant structures would be primarily visible from Lamb Road and I-82. Other visible features associated with the proposed power plant would include vapor plumes and night lighting. Figure 3.8.1 shows where the viewpoints for the visual simulation analysis are in relation to the power plant site and Figures 3.8.2 and 3.8.3 illustrate existing and proposed (simulated) views of the power plant site from these two viewpoints.[1]

There are three residences located within 1.21 kilometers (0.75 mile)of the power plant site. The first residence is located 0.40 kilometers (0.25 mile) to the south, and the second is kilometers (0.25 mile) of a mile east/southeast of the site. Views from these residences are partially screened by several buildings that are located between the residences and the proposed power plant site. The third residence is located 1.21 kilometers (0.75 mile) to the northeast of the proposed power plant site. Views from this residence are primarily

[1] Note that the simulations were performed prior to lengthening the footprint for cooling towers from 122 meters to 152 meters (400 feet to 500 feet) and adding a water storage tank to the plant design. Because these changes were small, the visual simulation specialist does not expect that these site design changes would result in any change in the outcome of the visual impact analysis presented here.

open, with the exception of partial screening due to seasonal agricultural fields. However, the Westland-McNary transmission line is located between the residence and site and dominates views to the south. Additionally, the Hermiston Generating Plant and other industrial/agribusiness facilities are prominent features visible from these residences.

The most visible features of the proposed power plant would be the HRSGs and the exhaust stacks. Impacts to the residences referenced above would be moderate and less than significant due to low visual quality of this industrial setting. Additional residences along Westland Road and south of I-84 would have more distant partially screened views of the proposed power plant. Impacts to distant residential views would be low and less than significant since the proposed power plant would be slightly noticeable to not noticeable in the landscape among several adjacent industrial facilities.

Vehicular travelers would view the proposed power plant from a distance of less than two miles as they transit Interstate 84, Interstate 82, and Westland Road. Due to the relatively high speeds at which motorists travel along these roads, their views of the power plant would be brief and in context of a moving view of the landscape, which includes other prominent industrial features. The proposed power plant would be most noticeable to travelers on Westland Road where traffic is slower and on I-82 where the viewer is close to the power plant and elevated above it on the railroad overpass (see Figure 3.8.2). The stacks at the proposed power plant would be visible to eastbound traffic on I-84 approaching the I-82 interchange and westbound traffic on I-84 approaching the Westland Road interchange. Impacts to viewers on I-82 and Westland Road would be moderate for viewers in close proximity to the power plant and low for more distant views from these roads. Impacts to views from I-84 would be low since they are more distant and the power plant would tend to blend in with the existing industrial setting.

Night lighting of the proposed power plant would increase its visibility during nighttime hours. Some night lighting is necessary for safety reasons. However, directive and shielding devices would be employed to eliminate off-site glare, and certain lights needed only for infrequent maintenance or emergencies would normally be turned off.

Vapor plumes emanating from the cooling towers and exhaust stacks would be visible during periods of low temperature and high humidity. The plumes would be more likely to be visible during the winter. Vapor plumes may also be visible during nighttime hours when the plant is illuminated. Currently there are visible vapor plumes emanating from several other industrial/agribusiness uses in the area, including the Hermiston Generating Plant.

In summary, the vapor plumes and night lighting would add to the overall visibility of the proposed power plant but would not significantly alter the visual character of this already industrial area. The proposed power plant would not be visible from either of the scenic areas designated in the Umatilla County Comprehensive Plan, the Umatilla County Scenic-Historic Road and the McNary Lock and Dam.

The following features would be incorporated into the proposed power plant to reduce its visual impacts:

- Structures at the power plant site would be painted in neutral colors.

- To minimize visibility of the proposed power plant from sensitive views, it would have a non-reflective (non-specular) finish and would be painted in neutral tones to reflect the surrounding environment.

- Directive and shielding devices would be used on all lights to minimize off-site glare. Where possible, lights would remain off except during infrequent emergency or maintenance situations.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.8.2 Construction of the proposed project would have some short-term affects on visual quality.

Construction of the proposed power plant, gas pipeline, water pipelines, and new transmission towers would have short-term impacts on visual quality. These impacts would result from equipment such as cranes, scaffolding, etc., being visible for extended periods of time. Additional impacts may occur from dust and construction lighting. However, mitigation including removing equipment when not in use, applying water to the site to control dust, and using shielding and directive devices on lighting during nighttime construction is expected to reduce the impacts to lower than significant levels.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.8.3 New transmission line on new towers may affect visual quality.

Several hundred feet of new transmission line and up to six new poles would be needed to connect the switchyard at the proposed power plant to the Westland-McNary

transmission line. Most of the new poles would be within the proposed power plant site. Visual impacts of the new transmission line would be insignificant, because the new line would be adjacent to new and existing industrial facilities and in an area with many existing above-ground electric power transmission lines.

Approximately 0.8 kilometer (0.5 mile) of new transmission line carried on as many as seven new poles would be needed to convey power from the Westland-McNary transmission line to one of the currently vacant bays at the McNary Substation. The new towers are located in an area where many transmission lines converge on the McNary Substation. The effect of the new towers on visual quality would be minimal because the area is already dominated by transmission lines and transmission towers. The new towers and transmission line may be visible to visitors to the McNary Dam and Lock Scenic Area, but they would have no adverse effect on its aesthetic quality. McNary Lock and Dam, a large-scale engineering feature, is the reason the scenic area was established. The new transmission line would be visually compatible with the dam, the lock and the many associated existing electric power transmission lines.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.8.3 Cumulative Impacts

The proposed project would add a large industrial structure to a local landscape already dominated by several other large industrial structures, including the Hermiston Generating Plant, the Lamb-Weston potato processing plant and a number of potato sheds. These structures are within one mile of the proposed project site. At times, the proposed project would emit a visible steam plume from its cooling towers. Similar plumes are emitted by the cooling towers at the Hermiston Generating Plant and the Lamb-Weston facility. Because the lands surrounding the proposed project site are zoned for commercial and industrial use it can be expected that other large industrial structures will be built in the future. The proposed project, viewed together with other existing industrial facilities and those that will be built in the future, would cumulatively create an increasingly dense industrial landscape close to the intersection of Interstate Highways 82 and 84.

3.9 CULTURAL RESOURCES

Cultural resources, also called heritage resources or historic properties, include resources significant in American history, architecture, archaeology, engineering, and traditional culture. Historic properties can be archaeological sites, historic architecture and engineering, or resources of heritage significance to Native Americans and other cultural groups. Historic properties may be districts, sites, buildings, structures, or objects.

The significance of historic and cultural properties lies both in their heritage and scientific value. Historic sites and historic architecture and engineering are embodiments of a technological and historical heritage. Archaeological sites are the raw material from which scientists reconstruct specific events and general trends of prehistory and therefore have scientific value. Traditional cultural properties embody significant patterns of culture.

Several historic properties exist in the project vicinity, and construction of the proposed project could affect two properties potentially eligible for nomination to the National Register of Historic Places: the High Line and West Extension irrigation canals. In addition, excavation for the proposed power plant foundations, the various underground pipelines and new power poles could affect archaeological resources that are currently unknown.

3.9.1 Affected Environment

Cultural History

Native Americans occupied the project area for approximately 11,500 years prior to the arrival of European Americans in the early 19th century. They settled at favorable salmon fishing sites along the Columbia and lower Umatilla Rivers and also made use of upland areas on the Columbia Plateau and in the Blue Mountains for gathering food. Archaeological resources in the project area include the remains of riverside base settlements, as well as residential and short-term occupation sites in upland areas.

The aboriginal inhabitants of the project area were the Umatilla dialect group of the Sahaptin linguistic and cultural entity. The Umatilla occupied both sides of the Columbia River and the lower Umatilla River Basin. The Sahaptin-speaking peoples occupied the central Columbia and, lower Snake River Basins. Umatilla economy depended on the harvesting of anadromous fish, the hunting of large and small mammals, and the gathering of starchy roots and berries for storage. The Umatilla signed a treaty in l855, ceding their traditional territory to the United States government in exchange for reservation lands located approximately 48 kilometers (30 miles) east of Hermiston.

Historic era exploration of the project area began with the Lewis and Clark Expedition of 1805 to 1806. A few years later, the Pacific Fur Company and its successors, including the Northwest and Hudson's Bay companies, began sending trading parties up and down the Columbia River from forts at Astoria, Vancouver, NezPerce, Okanogan, and Spokane.

The European American settlement of the Pacific Northwest began with the first use of the Oregon Trail by emigrants in 1844. The earliest sustained European American settlement in the project area occurred when the town of Umatilla was founded in the 1860s to serve as a shipping point on the Columbia River to supply the Clearwater gold rush in northern Idaho (Brawley 1991). The construction of the transcontinental railroad in 1884 improved access to agricultural markets and stimulated emigration. Local area farmers began building irrigation works as a series of small diversions in the Umatilla River bottoms during this period. In 1905, Congress authorized the Umatilla Project, which included the Cold Springs and McKay storage dams and a network of irrigation canals. The town of Hermiston grew significantly as a result of the Umatilla Project.

Known Historic Resources

Prior to initiation of field work, a record search and literature review were conducted for the project area. Research included a review of ethnographic and historic literature and maps and a search of archaeological base maps, site records, and survey reports on file at the Oregon State Historic Preservation Office in Salem, Oregon. This review indicated that no cultural resources have previously been documented for the proposed power plant site and its related pipeline and transmission line alignments.

A number of studies have been conducted in the general vicinity of the project. Most have focused on the old townsite of Umatilla (35UM1; 35UM35), a major prehistoric and historic occupation site on the Columbia River at the mouth of the Umatilla River (CTUIR 1998; Minor and Toepel 1986; Rice 1971). This site is located more than 1.6 kilometers (1.0 mile) north of the nearest proposed project facilities and underlies the present city of Umatilla.

Other known sites in the vicinity include a multi-component site atop Hermiston Butte (35UM9), a small lithic scatter located along the Umatilla River (35UM58), and an historic can dump on the Umatilla Chemical Depot (35UM16). None of these sites is located near the components of the proposed project. With the exception of sites 35UM 9 and 16, all the known cultural resources are closely associated with the Columbia or Umatilla rivers.

Two additional properties were identified in the course of cultural resources studies for the existing Hermiston Generating Plant, which is located about 0.8 kilometer (0.5 mile) east of the proposed project site (CTUIR and Heritage Research Associates, 1992, 1994). They are the High Line Canal, also called the Westland B Canal, and the West Extension Canal. The High Line Canal, located

about 8 kilometer (5 miles) southwest of Hermiston, is an irrigation ditch that is part of the U.S. Bureau of Reclamation's Umatilla Project, constructed between 1907 and 1916. It measures 5 meters (15 feet) wide and 2 meters (5 feet) deep and would be crossed by the proposed natural gas pipeline. The Oregon State Historic Preservation Officer has determined that portions of the Umatilla Project are eligible for the National Register of Historic Places (NRHP), given the project's role in regional agricultural development and because it is a well preserved example of an early twentieth-century irrigation system.

The West Extension Canal was constructed in 1914, also as part of the U.S. Bureau of Reclamation's Umatilla Project. It extended the irrigation system west from Umatilla to Irrigon and areas east of Boardman. Although it is not a part of the Umatilla Project that has been determined eligible for listing on the NRHP, it is a system that serves a similar and parallel function and may be eligible under the same criteria. The proposed transmission line crosses this canal about one mile south of Umatilla.

Another historic feature of note in the vicinity of the proposed project is the Oregon Trail. The Oregon Trail is the wagon road from St. Louis, Missouri to the Willamette Valley of Oregon by which European American settlers entered the Pacific Northwest between the 1840s and 1870s. It runs 2.4 kilometers (1.5 miles) south of the southerly extremity of the proposed natural gas pipeline. Agriculture has destroyed most of this section of the Oregon Trail.

In addition to the record search and literature review, representatives of the Confederated Tribes of the Umatilla Indian Reservation were contacted by letter and telephone to solicit potential Native American concerns about the proposed project. They have not expressed any concerns about the proposed project.

Site Inventory Results

Archaeologists conducted an intensive historic properties survey of the proposed power plant site and the natural gas and electrical transmission line rights-of-way in September 2000. Follow-up surveys were made in October 2000 and January 2001. No new cultural resources were found.

3.9.2 Environmental Consequences and Mitigation Measures

Construction and operation of the Umatilla Generating Project could affect two known cultural resources, the High Line Canal and the West Extension Canal. Other undiscovered cultural resources could also be affected by the proposed project.

Impact 3.9.1 Known cultural resources could be adversely affected by the proposed project.

Assessment of Impact The proposed natural gas pipeline alternatives must pass over or under the High Line Canal. To avoid any adverse effects on the canal, this section of the pipeline would be installed by horizontal boring or jacking under the canal rather than trenching through it. Horizontal boring involves drilling a hole under the canal and then pushing a pipe section through it. Jacking involves driving a pipe section under the canal using jacks. A reconductored electrical transmission line would pass over the West Extension Canal. None of the activities associated with reconductoring the transmission line would affect the canal.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.9.2 Unknown cultural resources could be adversely affected by the proposed project.

Assessment of Impact The possibility exists that currently unknown properties of cultural significance to Native Americans or other cultural resources could be disturbed during construction of the proposed project. Excavation may uncover subsurface resources or reveal resources covered by vegetation during the field surveys. While discoveries are possible, they are relatively unlikely because the area affected by the proposed project is some distance away from watercourses where the highest density of resources would be expected and because much of the area has been cultivated or otherwise disturbed.

Construction personnel would be instructed in the identification of cultural materials and directed to halt ground-disturbing activities in the vicinity of a find until a qualified archeologist could evaluate the significance of the find. If significant cultural materials are found, recommendations for mitigation measures would be made in consultation with the Oregon State Historic Preservation Office and other appropriate parties. Mitigation measures could include avoidance or data recovery.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.9.3 Cumulative Impacts

The proposed project would have no adverse effect on cultural resources and consequently would not contribute to cumulative impacts on this environmental element.

3.11 SOCIOECONOMICS

In 2001, PG&E National Energy Group expects to pay approximately $2.7 million in county property taxes on the Gas Transmission Northwest natural gas pipeline system and its 50 percent ownership share in the existing Hermiston Generating Plant. If built, annual tax payments for the Umatilla Generating Project alone would be approximately $4.3 million. The company's combined $7.0 million annual payment would be used for the County's general fund, County bond levies, the County Educational Service District, Blue Mountain Community College and its associated bond levy, the Port of Umatilla, Hermiston School District and associated bonds, the Hermiston Fire District, the Hermiston Cemetery District, the West Vector Control District, and the Umatilla County Special Library.

Construction of the Umatilla Generating Project would have a positive impact on employment in the Hermiston-Umatilla area. Incoming construction workers would have a potentially negative effect on housing. The average construction work force would be approximately 270 workers, with a peak of about 400 workers. Of the total construction work force, the Umatilla Generating Company, L.P. expects that 90 to 215 workers would be attracted from outside the region. The remaining 185 to 310 would be recruited from the regional labor pool. The Umatilla Generating Company, L.P. would work with local community officials to alleviate potential housing problems associated with introducing workers into a local rental housing market that has a low vacancy rate.

3.11.1 Affected Environment

A relatively large area around the proposed power plant site was identified as the project area to assess potential socioeconomic impacts. The project area encompasses portions of Umatilla and Morrow Counties and includes the communities of Hermiston, Umatilla, Stanfield, Pendleton, Echo, Irrigon, and Boardman.

3.11.1.1 Population

The Umatilla County population in 1999 was 68,000. The populations of the five project area cities in Umatilla County are Hermiston (12,165), Umatilla (3,625), Stanfield (1,875), Echo (675), and Pendleton (17,175). The Morrow County population in 1999 was 9,550. Irrigon had a population of 1,540 and Boardman had a population of 3,070 (Center for Population Research and Census, 2000). The region's population is growing slowly, less than one percent annually for the past several years, three-fifths Oregon's rate overall (Ayre 2000).

3.11.1.2 Employment

During the late 1970s, employment in Morrow and Umatilla Counties expanded rapidly. In the 1980s, this growth slowed down, leveled off, and declined. The labor force grew rapidly in the 1970s to keep pace with the new jobs. Labor force growth continued during the early 1980s even though employment opportunities were diminishing. In 1981, employment peaked at 31,360 jobs while the labor force did not peak until 1986 at 34,900 people. The most recent data available from the Oregon Employment Department are the 1999 estimates based on a County population of 68,000. Total employment for Umatilla County in 1999 was 33,963.

Since 1981, Morrow-Umatilla has been a high unemployment area. Jobs in eastern Oregon don't pay as well as those in other areas. People in this region earn about three-fourths the statewide average salary (Ayre 2000). The unemployment rate for December 2000 in Umatilla County was 6.4 percent and in Morrow County, 10.4 percent (OLMIS, 2001).

Comparing the average employment for January through October of 2000 with the same period for 1999, Umatilla County saw a gain of 800 jobs (2.9 percent) for the period. In contrast, Morrow County saw 90 fewer jobs for the period in 2000 than in the same period in 1999 (Ayre, 2001).

3.11.1.3 Housing

According to the Oregon Blue Book, there are 13,082 housing units in the project area. The average vacancy rate for communities in the project area is 6.6 percent which indicates that the permanent housing supply is somewhat limited. Housing availability and supply in the project area are described in Table 3.11.1.

According to the Oregon Lodging Association, Umatilla County has 1,726 rooms in hotels, motels, bed & breakfasts, and resorts in the area. There are 453 RV park spaces in Umatilla County, as well. Between the cities of Irrigon and Boardman in Morrow County, there are 110 rooms and 67 RV Park spaces (Groskopf 2000).

3.11.1.4 Tax Base

Umatilla County is largely an agricultural area. The Oregon Employment Department reported that the net real market value of property (or tax base) in Umatilla County was $3.6 billion in 1999. The school district lost a portion of its tax base due to Oregon's tax reduction Measure 5, which limited funding for local school districts to a maximum of $5 per $1,000 of valuation from tax year 1995/96 to today (Brookshier 1994a).

3.11.2 Environmental Consequences and Mitigation Measures

The average construction work force would be approximately 270 workers, with a peak of about 400 workers over the two-year construction period. Of the total construction work force, it is expected that between 90 to 215 workers would be attracted from outside the region. The remaining 185 to 310 would be recruited from the regional labor pool in an effort to reduce demands on housing and public services. Umatilla Generating Company, L.P. would work with the local community and local businesses to find housing for the workers that would come from outside the project area. Upon completion of the project, approximately 10 workers would be responsible for operating the facility. Payrolls and taxes paid during construction and operation of the project would have positive effects on socioeconomic conditions.

Impact 3.11.1 Project will result in some short-term and long-term population increase.

Limited in-migration is expected to occur as a result of operation of the proposed project. The Umatilla Generating Company, L.P. expects to fill most of the approximately 10 full-time plant operations jobs with local residents. New full-time jobs would be limited in number as a result of a plan that the Hermiston Generating Plant and the Umatilla Generating Project would share staff and plant operational duties. Because new employees hired to operate the proposed power plant would be, for the most part, existing residents of the local communities, the project would result in minimal direct population increases.

As previously discussed, the construction work force would be recruited from the regional labor pool and in part attracted from outside the region. Umatilla Generating Company, L.P. anticipates that 25 percent of the construction work force would relocate to the project area during the development of the project. The remaining 75 percent are anticipated to reside locally and commute to the project site daily. Construction workers that would relocate to the area for development of the project are not likely to bring their families with them, because most would remain on the project site for only a matter of months.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impacts 3.11.2 Proposed project would increase short-term and long-term employment opportunities in the area.

The proposed Umatilla Generating Project would result in the creation of approximately 10 full-time jobs. Five employees would work in the office from 7:00 a.m. to 3:30 p.m., and two employees would cover each of the two 12-hour plant operation shifts. Residents of the local community would be hired to fill these jobs if practicable.

The number of new full-time jobs created as a result of the project is considered to be moderate and would not significantly increase demand on local services. The new jobs would provide a positive impact to the local economy, and the proposed project would contribute to the local tax base.

Construction is expected to last approximately two years and create an average of 270 jobs over that time, with a peak of about 400 short-term jobs. Umatilla Generating Company, L.P. would make a good-faith effort to hire as many construction workers from the local area and the Tri-Cities area, as possible.

The temporary construction jobs created by the proposed project would contribute to the local economy through the purchase of goods and services by the temporary construction work force during their stay in the area.

The relatively high-wage construction jobs that would be created by the project might result in a temporary employee shortage for some local small businesses. Employees could conceivably leave their current jobs for better paying project-related jobs and create a temporary shortage of workers for some local businesses during construction of the project.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.11.3 Proposed project may have short-term and long-term impacts to housing availability.

The demand for permanent housing in the project area is not anticipated to increase significantly, because the proposed project would require very few full-time employees (approximately 10). These employees would be hired from the local community as practicable.

The local area would offer adequate short-term accommodations for construction workers (Groskopf 2000).

Umatilla Generating Company, L.P. would work with local housing authorities to ensure adequate housing accommodations are available with the increase in demand for short-term housing during the 20- to 24-month construction period. As possible, construction workers would be bused to the project site daily rather than staying locally.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.11.4 Proposed project would result in an increase in tax base.

Property taxes generated by the project would be $4.3 million annually. This tax payment by PG&E National Energy Group, combined with taxes paid for its ownership share of the Hermiston Generating Plant, would be used for payments to the County's general fund, County bond levies, the County Educational Service District, Blue Mountain Community College and its associated bond levy, the Port of Umatilla, Hermiston School District and associated bonds, the Hermiston Fire District, the Hermiston Cemetery District, the West Vector Control District, and the Umatilla County Special Library.

Recommended Mitigation Measures None are recommended.

3.11.3 Cumulative Impacts

The proposed project would create approximately 10 full-time jobs that could cause a very small in-migration of skilled workers and a small increase in local population. The cumulative effect of the proposed project and other similar projects would be to contribute to the current moderate population and economic growth rate in Umatilla County.

Table 3.11.1:
Permanent Housing Supply and Availability in the Project area

City	Total Housing Units	Vacancy Rate
Hermiston	4,110	6.00 percent
Umatilla	1,026	5.00 percent
Stanfield	582	12.70 percent
Echo	229	3.05 percent
Pendleton	6,174	7.50 percent
Irrigon	311	9.30 percent
Boardman	650	2.80 percent

Source: Community Profiles at http://www.econ.state.or.us/.

3.12 PUBLIC SERVICES AND UTILITIES

Construction and operation of the proposed project could affect certain services and utilities supplied by communities within the designated project area.

3.12.1 Affected Environment

Public services and utilities that may be used by the proposed project are provided by Umatilla and Morrow Counties and by the communities of Hermiston, Umatilla, Stanfield, Pendleton, Echo (in Umatilla County), Irrigon and Boardman (in Morrow County).

3.12.1.1 Utilities

Sewer and Sewage Treatment

Domestic sewage from ranches and residences in rural parts of the project area is discharged to individual, privately owned septic tank and drain field systems. Some of the larger communities have engineered wastewater collection and treatment systems.

The city of Hermiston collects sewage from residents of the city and discharges it after treatment to the Umatilla River. Although Hermiston's treatment plant has a nominal capacity of 10,977.7 m^3/day (2.9 million gallons per day [MGD]), higher than expected organic loads have reduced its effective capacity to between 6,435.2 and 7,132.3 m^3/day (1.7 and 1.9 MGD). The plant is currently operating close to its capacity. The City of Hermiston Public Works Department has advised that retrofit of the facility to increase sewage capacity is probably 3 to 5 years out (Schiffner 2000).

Water Supply

Ranches and residences in rural parts of the project area obtain their water from individual privately owned wells. There are a few community potable water systems in the project area, and the Port of Umatilla operates a system that supplies raw Columbia River water to industrial uses and the City of Hermiston.

The City of Hermiston supplies potable and raw water obtained from wells and the aforementioned Port of Umatilla raw water system to community residents. The city's potable water system has a capacity of about 45,425 m^3/day (12 MGD) and supplies between 11,356 and 26,498 m^3/day (3 and 7 MGD) to residents (Hermiston Community Profile 2000). The Port of Umatilla's raw water system provides around 15,142 m^3/day

(4 MGD) of domestic water to the region and approximately 5,300 m^3/day (1.4 MGD) of this goes to Hermiston residents (Napolitano 2000).

Stormwater

Because the project area receives little precipitation and local soils are quite permeable, storm water runoff volumes are small. In rural areas, if runoff occurs, it drains to ditches, farm ponds, creeks and the Umatilla River. A few communities have separate storm drainage collection systems. These include the cities of Hermiston, Pendleton and Boardman.

Solid Waste

Municipal solid waste from the communities in the project area is collected and taken to transfer stations rather than landfills. The Hermiston and Pendleton landfills were closed as of April 1994. Now, franchised haulers transfer the waste to disposal sites that are mostly outside the project area. The following franchises service Umatilla County and parts of Morrow County (Perry 2000):

- East Umatilla County: Humbert Refuse and Recycling
- South Umatilla County: Pilot Rock Sanitation (hauler)
- Hermiston: Sanitary Disposal, Inc. (hauler) and Desert Wind, Inc. (disposal site) that also services Boardman
- Pendleton: Pendleton Sanitary Service (hauler and disposal site)

3.12.1.2 Police and Fire Protection

The following is a description of the current levels of police and fire protection available to each of the communities within the project area. The discussion is summarized in Table 3.12.1.

Oregon State Police

OSP officers are stationed in Pendleton, Hermiston, Heppner and Milton-Freewater. There are 22 officers in patrol services (Hoffman 2000).

Umatilla County

The West County office of the County Sheriff's Department has six deputies including one domestic violence deputy. The West County office services Umatilla, Hermiston, Stanfield and Echo and would provide first response to the proposed Umatilla Generating Project (LeBlanc 2000).

Hermiston

The Hermiston Police Department provides police protection services within the city limits. The Department maintains a staff of 21 officers and 10 dispatchers. The Hermiston Police Department would provide secondary response capabilities for the proposed Umatilla Generating Project through its mutual aid agreement with the Sheriff's Department. The Department coordinates emergency response through the Hermiston Safety Center (Megan 2000).

The fire department has 18 line fighters, 25 volunteer firefighters, one Chief, one Assistant Chief, one fire marshal, one secretary, and one part-time assistant, a total of 22 full-time staff. The Hermiston Rural Fire Protection District covers the area in which the proposed Umatilla Generating Project would be sited. The Hermiston Fire Department would provide fire and protection services to the proposed power plant site. The department is equipped to handle fire, medical emergencies, and hazardous materials spills (Stockman 2000).

Umatilla

There are eight officers and one Chief. There is one part-time code enforcer and one daytime dispatcher. Emergency 911 response is dispatched through the Hermiston Safety Center. The Department maintains mutual aid agreements with nearby police departments, the County Sheriff's Department and Oregon State Police (Schaefer 2000).

The Umatilla Fire District has 30 volunteers and one full-time and one part-time staff member. Umatilla has mutual aid agreements with all of the other fire districts in the project area (Stokoe 2000).

Stanfield

The Stanfield Police Department has five officers and six reserves. The department contracts out for dispatchers and previously used the Hermiston Safety Center for 911 emergency response dispatch. However, as of September 1, 2000, 911 response is now controlled by the Umatilla County Sheriff's Department (Akers 2000).

The Stanfield Fire Department has 18 volunteer firefighters and one full-time staff member. The Department just signed a mutual aid agreement with both Umatilla and Morrow counties (Wheelan 2000).

Echo

Police protection services are provided by Umatilla County through mutual aid agreement with the Sheriff's Department's West End office (Echo Community Profile 2000).

The Echo Fire Station has 25 volunteers on its roster. The station has mutual aid agreements with Stanfield, Hermiston, Pendleton, and Pilot Rock. Echo also has two satellite fire stations, one at Buttercrick that would be closer to the proposed Umatilla Generating Project and the other near Pendleton off I-84 (Enright 2000).

Pendleton

In the Pendleton Police Department, there are 22 officers and one open seat at present. There are six dispatchers and one dispatch supervisor. The police department has its own 911 capabilities (Powell 2000).

There are 24 full-time employees at the fire department along with 20 volunteer firefighters. With supervisors and support staff, the total is 52 staff. The Department has three fire stations that serve a population of 17,330 people and an area of 38.1 km^2 (14.7 mi^2) (Pendleton Community Profile 2000).

Irrigon

Police protection services for the City of Irrigon is provided through mutual aid agreements with the Morrow County Sheriff's Department (Irrigon Community Profile 2000).

The Irrigon Rural Fire Protection District has 19 volunteer firefighters, as well as mutual aid agreements (Irrigon Community Profile 2000).

Boardman

The Boardman Police Department has 12 paid and reserve officers. The Department maintains mutual aid agreements with the Morrow County Sheriff's Department and the Oregon State Police. Morrow County Emergency Management provides 911 emergency response services (Boardman Community Services, 2000).

The Boardman Rural Fire Protection District maintains a roster of 14 paid and volunteer firefighters and mutual aid agreements with other districts (Boardman Community Profile, 2000).

3.12.1.3 Health Care

The Good Shepherd Community Health Care System in Hermiston provides the health care services in the project area. St. Anthony Hospital is just outside the 48-kilometer (30-mile) radius of the project area and provides health care services to communities such as Stanfield and Pendleton that are within the project area. The Hermiston Community Health Clinic provides outpatient care, laboratory, pharmacy, outreach and social services. The project would be served by the Good Shepherd Community Heath Care System, which is a fully equipped hospital including a helicopter pad for air evacuation. Good Shepherd Community Health Care System has arrangements with hospitals in Pendleton, The Dalles, and the Tri-Cities area to handle overloads in the event of an emergency situation (e.g., failure of primary and back-up power supplies).

3.12.1.4 Libraries

Libraries are available in the communities of Hermiston, Umatilla, Stanfield, Pendleton, Echo, and Boardman. The community of Irrigon does not have a library.

3.12.1.5 Schools

This section discusses the enrollment and capacity of the schools within the project area. There are six school districts within the 48-kilometer (30-mile) project area: Hermiston, Umatilla, Stanfield, Echo, Pendleton, Irrigon, and Boardman. There are 25 schools located within the six school districts. Table 3.12.2 summarizes the number of students currently enrolled in each school and the current level of capacity.

Hermiston

A new high school is being built in Hermiston. Part of the new high school was functional as of September 2000, providing a total capacity of 1400 students. As of September 2000, Hermiston High School was operating at 81 percent capacity.

The architectural capacity for Sandstone Middle School is 750. Based on this and the midyear enrollment of 376, the school is at 50 percent capacity. However, according to school officials, the architectural capacity is too high for feasible operating conditions so the reported percent capacity based on this is an underestimate.

Highland Hills Elementary School has a total capacity of 655 with three modular classrooms in addition to the permanent classrooms. The school is at 78 percent capacity

with midyear enrollment. West Park Elementary School (K through 5) has a capacity of about 535 students. Hermiston plans to build a new elementary school to accommodate increasing demand and alleviate the burden on Rocky Heights and Sunset elementary schools (Michael 2000).

Umatilla

Clara Brownell Middle School in the City of Umatilla is made up of grades 6, 7 and 8 and McNary Elementary School is K through 5. Capacity for the Umatilla High School is around 500 students (Tracy 2000).

Stanfield

The Stanfield School District planned to have a new elementary school built by January 2001 (Lee 2000).

Pendleton

All the schools in the Pendleton School District are at capacity. There are no plans for system expansion at present (Jordan 2000).

3.12.2 Environmental Consequences and Mitigation Measures

There would be no significant adverse effects on public services during the construction or operation of the project. Hiring mostly local personnel to operate the project would minimize any additional demands on public services.

Impact 3.12.1 The proposed power plant may affect the capacity of local utilities.

Sewage Collection and Treatment

Very little sanitary sewage would be generated by operation of the proposed Umatilla Generating Project. The wastewater would be discharged to a septic tank and drain field at a rate of about 1,893 liters (500 gallons) per day.

Employees would be hired from the local area to the extent practicable. Therefore, the project would not measurably increase the local population nor increase demand on local sewage collection and treatment systems. During construction, a special contractor would provide chemical toilet service.

Process and Cooling Water

The proposed Umatilla Generating Project would obtain water from the Port of Umatilla's raw water system. No new water rights or permits would be needed to accommodate the proposed project's peak (14,006.0 m^3/day [3.7 MGD]) and annual average (12,113.3 m^3/day [3.2 MGD]) water requirements (see Section 3.3). The raw water system was designed to meet the proposed project's expected demand. Therefore, water use for process and cooling would not impact the ability of the local municipal water system to serve its other users.

Domestic Water Supply

The proposed Umatilla Generating Project would install a water treatment facility on site to purify some of the raw water received from the Port of Umatilla for the project's minimal domestic water needs. During construction, bottled water would be used as the potable water source for workers.

Storm Water

Storm water runoff from the proposed power plant site would be collected from impermeable surfaces and routed to a detention basin on site. Water remaining after evaporation would be used in the cooling water system. Therefore, storm water discharge from the proposed power plant would not adversely impact the ability of the storm water system to provide services to communities within the project area.

Solid Waste

The capacity of the solid waste removal system for the project area is sufficient to adequately manage current and foreseeable waste. The facilities managing waste for Umatilla County are designed to handle two and a half to three times the current volume of waste. Solid waste for the Hermiston area is hauled about 32 to 40 kilometers (20 to 25 miles) away to a disposal site that has a design capacity of 50 years, taking current growth rates into account (McHenry 2000). It is estimated that the operation of the proposed power plant would produce approximately 36 metric tons (40 tons) of domestic solid waste per year. The estimated amount of construction wastes is 4.5 metric tons (5.0 tons) per month. Construction wastes from the proposed power plant would mainly consist of pallets, wood packing, steel banding, steel cutoffs, cardboard packing, wood cutoffs, concrete waste, and office refuse. Therefore, without a significant permanent population increase and with a construction period of only two years, the proposed Umatilla Generating Project would not compromise the capacity of the solid waste facilities in the area.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.2 Proposed project may affect the level of service provided by local public services.

The proposed Umatilla Generating Project would employ approximately 10 full-time staff who would be hired from the local area, as practicable. As a result, there would be no measurable population increase attributed to the project; and therefore the project would not place additional demand on local police and fire protection services.

Short-term increases in demand workers for local public services from in-migration of out-of-area construction is not expected to cause significant impacts on the level of service because on-site services are planned and a health and safety program would be put in place for the construction period.

Police

The proposed Umatilla Generating Project would place an insignificant demand on local police and fire services. The new plant would be fenced and would operate 24 hours a day with personnel on site at all times, thereby minimizing opportunities for theft and vandalism. Police protection provided by the Oregon State Police and the Umatilla County Sheriff's Department (West County office) is adequate to serve the project and communities in the project area (Leblanc 2000).

Fire

The proposed Umatilla Generating Project would be constructed with full hydrants in addition to a sprinkler and deluge system. Plant employees would be trained in emergency first aid procedures. The proposed Umatilla Generating Project would provide all fire protection equipment and facilities in accordance with the Oregon Fire Code and would not significantly impact the Hermiston Fire Department's ability to provide service to the community (Stearns 1995).

Health Care

The proposed Umatilla Generating Project would not adversely impact medical services in the project area given that the full-time employees would be hired from the local community, as practicable. The Good Shepherd Community Health Care System is the

closest emergency health care facility to the plant and would be capable of providing services to the plant in case of emergency.

Libraries

The project would not adversely affect project area libraries because it would not result in significant increase in population in the project area.

Schools

Because the proposed Umatilla Generating Project would require only about 10 full-time employees who would be hired from the local community, as practicable, no significant new numbers of households would be created. Consequently, there would be no significant increase in the student population. Therefore, the new plant would not adversely impact the school districts in the project area.

The construction work force is not expected to include families. Therefore, temporary increases in the project area population caused by in-migration of an average of 170 construction workers over a two-year period would not result in significant increases in the student population. No adverse impact to local schools would occur.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.12.3 Cumulative Impacts

The proposed project would result in a substantial increase in the local property tax base but very little increase in the demand for public services. Consequently, the proposed project would enable provision of a better level of public services than is provided today. The cumulative effects of proposed project and other industrial developments in the area on the demand for public services would depend on the nature of the future industries. If future projects were similar to the proposed project, there would be a cumulatively beneficial effect on the quality of public services.

Table 3.12.1:
Summary of Police and Fire Services

Jurisdiction	Police		Fire	
	Staffing	**Services**	**Staffing**	**Services**
Oregon State Police	22 officers	Primary Response		
Umatilla County (Sheriff's Department West County Office)	6 deputies	Primary Response		
Hermiston	21 officers 10 dispatchers	Mutual Aid/Secondary Response	18 line-fighters 25 volunteers 3 full-time staff	Primary Response
Umatilla	8 officers 1 Chief 1 part-time code enforcer 1 day-time dispatcher	Mutual Aid	30 volunteers 1 full-time staff 1 part-time	Mutual Aid
Stanfield	5 officers 6 reserves	Mutual Aid	18 volunteers 1 full-time	Mutual Aid
Echo	None	N/A	25 volunteers	Mutual Aid
Pendleton	22 officers 7 dispatchers	Mutual Aid	31 full-time 20 volunteers	Mutual Aid
Irrigon	None	N/A	19 volunteers	Mutual Aid
Boardman	12 officers	Mutual Aid	14 volunteers	Mutual Aid

Source: Personal communication with officials from the police and fire departments in the project area.

Table 3.12.2:
Summary of Level of Service of the School Districts in the Project Area

School	Enrollment	Percent Capacity*
Hermiston		
Hermiston H.S.	1129	81
Armand Larive M.S.	552	Not available
Sandstone M.S.	376	50
Highland Hills E.S.	512	78
Rocky Heights E.S.	511	At Capacity
Sunset E.S.	461	At Capacity
West Park E.S.	496	93
Umatilla		
Umatilla H.S.	300	60
Clara Brownell M.S.	300	At Capacity
McNary Heights E.S.	700	At Capacity
Stanfield		
Stanfield H.S.	250	Not available
West E.S.	255	Not available
Echo		
Echo Public School		
Pendleton		
Pendleton H.S.	1,020	At Capacity
Sunridge M.S.	860	At Capacity
Hawthorne E.S.	338	At Capacity
McKay E.S.	283	At Capacity
Lincoln E.S.	151	At Capacity
Washington E.S.	331	At Capacity
West Hills E.S.	145	At Capacity
Sherwood E.S.	457	At Capacity
Irrigon		
Columbia M.S.	365	At Capacity
A.C. Houghton E.S.	302	At Capacity
Boardman		
Riverside H.S.	452	At Capacity
Sam Boardman E.S.	407	At Capacity

*At capacity means that mid-year student enrollment is equal to the capacity of the school according to the school's administration.

Source: Personal communication with school district officials from the cities in the project area.

3.13 HEALTH AND SAFETY

The Umatilla Generating Project has been designed with attention to the reduction of hazards associated with its operation and meets or exceeds state and federal safety standards in all its components. Its design includes safety and emergency systems that would be included during construction to ensure safe and reliable operation of the proposed power plant. Through continuous monitoring of process variables and a thorough maintenance program, safety and reliability would be further increased.

This section discusses health and safety issues including: occupational health and safety; fuel management; use, handling, and storage of hazardous non-fuel substances; fire protection; solid and liquid waste disposal; electric shock hazard; electric and magnetic fields; and noise.

3.13.1 Construction and Operation of Proposed Project

Occupational Health and Safety

Umatilla Generating Company, L.P. intends to implement a comprehensive occupational health and safety program to protect workers during all phases of construction and operation of the proposed power plant. The program would meet or exceed all federal, state, and local requirements.

Health and Safety During Construction: A construction safety program would be implemented by the prime contractor, based on Umatilla Generating Company, L.P.'s safety program and industry standards for accident prevention. At a minimum, the construction safety program would comply with all existing federal, state, and local health and safety regulations. All contractors involved with the proposed project would be required by their contract terms to comply with the construction safety program. Key elements of the plan would include:

- Responsibilities of construction team and subcontractors
- Job site rules and regulations
- Emergency response procedures
- Safety inspections and audits
- Medical services and first aid
- Safety meetings, employee training, and communications, including the hazard communications program and a review of procedures when performing high risk tasks
- Personal protective equipment
- Standard construction procedures
- Accident investigation and reporting

Hazardous materials on site during construction would most likely be limited to equipment fuels (gasoline and diesel), lubricants, solvents, and paints. These would be handled according to standard safety precautions described in the Construction Safety Program, such as no smoking in refueling areas, storing materials in original containers, and proper disposal of empty containers.

Health and Safety during Operation: An employee safety program for plant operations would be implemented by Umatilla Generating Company, L.P. It would include regular employee education and training in safe working practices for general work practices and for particular tasks; communication of hazards in accordance with state and federal standards; accident incident evaluations; administrative safety procedures; emergency response; fire protection and fire response; and maintenance of safety performance data. All operations personnel would be provided with written safety guidance similar to that used at other PG&E National Energy Group facilities. A first aid station containing basic first aid equipment would be established near the control room. First aid training would be offered to all operators.

The project as proposed would provide adequate safety measures for workers, so no significant impacts are identified.

Fuel Management

The natural gas that would fuel the Umatilla Generating Project would be provided by a pipeline connected to the PG&E GTN pipeline, approximately five miles south of the site. The proposed power plant would not have an alternative fuel source. Diesel fuel for the fire pumps would be stored on site in an above-ground tank.

Hazardous Non-fuel Substances:

Several hazardous materials would be used at the power plant. The following list summarizes typical chemicals currently planned for use at the proposed power plant. The chemicals and quantities may change as the plant design is refined.

- Aqueous ammonia used as a reagent in the control of NO_x
- Lubricating oils, insulating oils, hydraulic fluids, and other hydrocarbons used to operate and maintain plant equipment
- Battery acid used in all batteries
- Sodium hypochlorite used as a disinfectant and biocide in cooling tower water
- Sulfuric acid for corrosion control in cooling tower water and to neutralize the pH of cooling tower water
- A neutralizing amine solution, an oxygen scavenging solution, and inorganic phosphates to be used for boiler feedwater treatment

Fire Protection

The proposed power plant site is located in an industrial area with agricultural land nearby. Personnel from the power plant would provide fire control for incipient fire fighting only. Primary fire fighting would be provided by nearby fire departments identified in Section 3.13, Public Services and Utilities.

Electrical Shock Hazard

Power lines can cause serious electric shocks if they are not constructed to minimize the shock hazard. Also, high-voltage transmission lines can cause nearby ungrounded metal objects to become charged, such as wire fencing mounted on wooden fence posts that prevent the energy from discharging into the ground. Providing grounding for the charged object solves this problem.

Noise

There are several significant noise sources in the vicinity of the proposed power plant site, including Interstate Highways 82 and 84 (I-82 and I-84), a railroad line, the Hermiston Generating Plant (a 474-MW combustion turbine electric power generation plant similar to the proposed power plant) and a food processing facility. The proposed power plant would generate additional noise that would increase ambient noise levels and could potentially affect homes and businesses in the project area.

The potentially affected environment includes the vicinity of the proposed power plant site and those areas that could be affected by construction noise at the gas pipeline and electrical transmission line construction sites.

Noise Measurement and Terminology

Noise is commonly defined as unwanted sound that disrupts normal human activities or diminishes the quality of the human environment. Ambient noise consists of all noise generated in the vicinity of a chosen location by typical noise sources, such as local traffic, wind blowing in trees, neighboring industries, and aircraft. The total noise level as measured with a sound level meter is comprised of a typical mix of all sources, both distant and nearby, which constitutes the ambient noise environment at the measurement location.

Noise is measured as a sound pressure level exerted on the microphone of a sound meter. The magnitude of audible sound levels, decibels (dB), has a very wide range. Decibel measurement scales are based upon the logarithm, which is not linear, and consequently sound pressure levels

from different noise sources cannot be added arithmetically. For example, a 70 dB sound added to another of equal magnitude will equal a sound of 73 dB.

The apparent loudness of sound is not directly related only to the decibel level as detected by the microphone, since the human ear is more sensitive to higher frequency (or higher pitched) sound. Sound levels are adjusted (or weighted) by the sound meter for the variation in ear sensitivity and are reported as A-weighted decibels (dBA).

Noise levels also change with time. The following methods of averaging noise are commonly used to describe the noise environment and time-varying noise levels:

- Maximum sound pressure level (L_{max}) – the highest sound pressure level observed during a measurement, either from the ambient noise or from a particular noise source.
- Statistical noise level (L_{10}, L_{50}, etc.) – for time-varying noise sources, the statistical sound levels describe how often a given sound level is exceeded during the period of the measurement. For example, L_{10} is the noise level exceeded 10 percent of the time. The L_{90} noise level would be exceeded 90 percent of the time, and would represent the background noise level or lowest ambient noise levels of the noise environment. Particular, identifiable noise sources are added to the background noise, forming the total noise environment.

Typical ambient noise levels are shown in Table 3.13.1.

- Equivalent sound pressure level (L_{eq}) – the sound level of a steady, non-time varying noise which is equivalent in total acoustic energy to the noise level of time-varying noise. The L_{eq} is measured over a specified period of time, usually one hour, and represents an average acoustic energy for that time period.

Noise Regulations

The Oregon Department of Environmental Quality has established noise regulations to "protect the health, safety and welfare of Oregon's citizens from the hazards and deterioration of the quality of life imposed by excessive noise emissions." The regulations are contained in OAR 340-035-0035. New industrial and commercial noise sources are not permitted to increase ambient noise levels above the levels shown in Table 3.13.2. Because the proposed power plant would typically operate 24 hours each day the more stringent nighttime noise limits would apply. In addition, new commercial and industrial sources are not allowed to increase ambient noise levels by more than 10 dBA. Temporary, daytime construction activities are exempt from the noise standards.

Noise Emissions

Operation of the proposed power plant would produce noise. Noise sources would include the combustion turbines and generators, the heat recovery steam generator, the steam turbine, the transformers and the cooling towers. Once built, the gas pipeline and electrical transmission lines would not be noise sources.

Noise would also be produced during project construction. Noise would be produced by a range of construction equipment, including light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines and power hand tools. Pile driving, typically the noisiest of construction activities, would probably not be required.

Sensitive Receptors

Because the proposed power plant would be located in an industrial area there are few sensitive receptors in the vicinity. The closest sensitive receptors are two residences located approximately 762 meters (2,500 feet) northeast and 579 meters (1,900) feet south of the proposed power plant site.

Ambient Noise Measurements

Baseline noise measurements were made at two locations in the vicinity of the proposed power plant site. The two locations are shown in Figure 3.13.1 and are adjacent to the two sensitive receptors referred to above. Traffic on I-82 and I-84 was the dominant source of continuous noise. Intermittent noise sources include traffic on local roads, frequent freight trains on the Union Pacific Railroad tracks just south of the proposed power plant site, and aircraft flyovers. Daytime L_{50} noise levels were in the range of 41 to 53 dBA. Nighttime L_{50} noise levels were in the range of 49 to 58 dBA. The higher nighttime noise levels are probably attributable to higher volumes of truck traffic on I-82 and I-84 during the night.

3.13.2 Environmental Consequences and Mitigation Measures

Construction and operation of the proposed project would not have a significant adverse effect on health and safety. Various features would be built into the proposed project, and operational practices adopted, to ensure that the proposed project meets or exceeds state and federal safety standards in all its components.

Impact 3.13.1 Natural Gas Leakage

Assessment of Impact Natural gas could leak, posing a risk of fire. The proposed project includes design features to reduce the chance of a natural gas leak, as well as prescribed measures to be taken in case of a gas leak. The natural gas pipeline would be constructed in accordance with the requirements of the U.S. Department of Transportation as set forth in 49 CFR and OAR 345-24-060.

Fuel control systems on the gas turbines would include separate fuel shut-off valves to stop all fuel flow to the units under shutdown conditions. Fuel flow would be restarted only when all permissive firing conditions have been satisfied. Each fuel shut-off valve would have a mechanical device for local manual tripping and a means for remote tripping. A vent valve would be provided on fuel gas systems downstream of the pipeline to automate venting of the piping downstream of the shut-off valve when the valve closes.

Isolation valves would be installed on the gas pipeline at the GTN pipeline connection point and at the power plant. Gas handling facilities would be operated in accordance with accepted, proven industry standards and procedures.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.2 Diesel Fuel Spill

Assessment of Impact Three hundred and seventy-nine liters (100 gallons) of diesel fuel would be stored on site for use by the fire pump. Diesel fuel could leak from the tank, posing a fire risk and possible contamination of soils.

The proposed project would include measures to reduce the risk of fire and to contain any spill to prevent contamination. A complete fire protection system would be installed within the buildings and yard areas at the proposed power plant site, reducing the fire risk. Approximately 379 liters (100 gallons) of diesel fuel would be stored in an above-ground tank located on a curbed concrete pad. The volume of the curbed area would be sufficient to contain any spill of fuel without overflow to unsurfaced areas. In the event of a spill, the contents would be contained within the curbed pad and removed by a licensed spill response contractor.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.3 Aqueous Ammonia Spills

Assessment of Impact A 19 percent aqueous ammonia solution would be stored onsite in a 75,708-liter (20,000-gallon) tank. The design of the aqueous ammonia storage and handling subsystem was done with careful attention to the goal of eliminating hazards associated with the use of ammonia. Nonetheless, ammonia could spill and/or ammonia vapor could be released to the atmosphere, posing a health risk.

By using a lower-concentration aqueous ammonia solution, the rate of evaporation for any spilled ammonia is reduced, lowering the risk to humans. Additionally, secondary containment for the ammonia tank would inhibit release of ammonia in the event of a spill. The secondary containment would have the capacity to contain 110 percent of the volume of the ammonia tank, plus the hundred-year, twenty-four-hour storm event. The secondary containment would isolate any spill to a small area, thereby minimizing evaporation of ammonia.

Recommended Mitigation Measures An SPCC Plan should be developed in accordance with 40 CFR 112 and implemented prior to the arrival of any hazardous materials at the proposed power plant site. The SPCC should address issues regarding storage and the proper response should a release or other incident occur. In addition, all applicable reporting requirements mandated under SARA Title III should be met, including the notification of Local Emergency Planning Committees of the quantities and types of chemicals used at the proposed power plant.

All hazardous materials should be stored in structures that meet the requirements of the Uniform Fire Code, Article 80. In addition, a Hazardous Materials Inventory Statement and a Hazardous Materials Management Plan should be written and filed with the Hermiston Fire Department.

Impact 3.13.4 Spills of Other Hazardous, Non-fuel Substances:

Assessment of Impact Hazardous non-fuel substances could spill, with the potential to harm people in the plant and in the surrounding area.

The following measures would be taken in order to prevent and minimize the impacts of a spill of any hazardous, non-fuel substance:

- Management of hazardous substances would be conducted in accordance with all applicable federal, state, and local regulatory standards for public and occupational safety and health protection. Training would be provided to appropriate workers in materials handling and disposal. The storage and conveyance systems for liquid hazardous chemicals have been designed to prevent and contain spills through pumping and storage controls and secondary containment for tanks. Pumping and storage tank controls would include:

  - Dry disconnect transfer hose and piping connections
  - Automatic pump shut-off on tank high-level indicators
  - Redundant tank level indicators and alarms
  - Daily inspections
  - Supervised unloading and transfer operations

- Foundations and slabs for equipment containing lubricating oil, insulating oil, or hydraulic fluid would be designed to contain any spill.
- Suitable garment coverings would be provided for all personnel handling sulfuric acid
- Curbs would be installed at all chemical storage areas. If a spill occurred, it would be contained in the curbed concrete containment area until it could be removed by a licensed spill contractor.
- Sulfuric acid used for pH control would be stored in two tanks on site. The tanks would be supported on saddles and surrounded by a secondary containment crib. A normally closed drain valve would be provided at the bottom of the crib. The area enclosed by the crib would be partially filled with coarse limestone to passively neutralize any potential leakage from the tank.
- The power plant would incorporate an on site fire suppression system and would be constructed from fire retardant materials to the extent reasonably feasible. The power plant design would incorporate spill prevention and containment designs for storage of all hazardous materials. Compliance with all applicable fire suppression and hazardous material safety requirements would be established in consultation with the Hermiston Fire Department, the State Fire Marshall, and the Building Codes Agency.
- The Umatilla Generating Company, L.P. has submitted a plan as part of the Application for Site Certificate for responding to an emergency at the Umatilla Chemical Depot. The plan is the same as that developed in consultation with the Umatilla County Chemical Stockpile Emergency Preparedness Program for the Hermiston Generating Plant.
- Umatilla Generating Company, L.P. would conduct an Accidental Release Assessment for the proposed project. The assessment would provide the basis for the Emergency Response Plan that would be in place before operations commence.

Recommended Mitigation Measures As noted in the discussion of aqueous ammonia, Umatilla Generating Company, L.P. should prepare an SPCC Plan and emergency response plan regarding storage, handling and spill response for hazardous materials. Preparation and implementation of the plan would be adequate to mitigate the potential impacts of other non-fuel hazardous material spills.

Impact 3.13.5 Fire Potential

Assessment of Impact A fire could occur at the power plant, posing a threat to workers and nearby people and structures. To reduce the risk and consequences of fires:

- A complete fire protection system would be installed within the buildings and yard areas at the proposed power plant site. The system would be designed to meet the requirements of the Uniform Fire Code, as amended by Oregon and the National Fire Protection Association, and all other applicable fire protection standards.
- The fire water system would include a fire water supply loop, fire hydrants, sprinkler systems and hoses placed at appropriate locations. Reserved capacity in the cooling tower basin would serve as the water source for the fire system.
- The turbine housings, the mechanical/electrical control enclosures of the turbines and the switchgear room would be protected by foam or CO_2 extinguishing systems. If the systems were to be activated, an alarm would sound or a visual indicator would light up on the gas turbine control panel.
- Portable fire extinguishers would be placed at key locations within the proposed power plant site. The type and number of portable extinguishers would conform with code requirements.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.6 Electrical Shocks

Assessment of Impact High-voltage transmission lines can cause electrical shocks directly and from induced charges. The transmission line would be designed so that induced currents resulting from the transmission line and related facilities would be as low as reasonably achievable. Umatilla Generating Company, L.P. would agree to a program or ensure that the entity responsible for the transmission line agrees to a program that would provide reasonable assurances that all fences, gates, cattle guards, trailers, or other permanent objects or structures that could become inadvertently charged with electricity would be grounded through the life of the line.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.7 Increase in Electric and Magnetic Fields

Assessment of Impact This section contains a discussion of electric and magnetic fields (EMFs), a brief description of the current understanding of their health effects, and estimates of the maximum electric and magnetic field strengths produced by reconductoring and reinsulating the

UEC's existing Westland-McNary Transmission Line from 115/230 kV to 230/230 kV. These estimates are computed for a height of 1 meter above the ground and include the canceling effects of other electrical transmission lines existing along the proposed transmission line right-of-way.

Oscillating electric and magnetic fields (EMF) at power frequency are generated by all electrical devices. The Earth itself has naturally occurring steady-state magnetic and electric fields. When a conductor (in this case, the power line) is energized, an electric field is formed around the conductor that is proportionate to the voltage. The strength of the electric field is independent of the current flowing in the conductor. When alternating current (AC) flows through a conductor, an alternating magnetic field is created around the conductor. Areas of equal magnetic field intensity can be envisioned as concentric cylinders with the conductor at the center. The magnetic field intensity drops rapidly with distance from the conductor.

In AC power systems, voltage swings positive to negative and back to positive, a 360-degree cycle, 60 times every second. Current follows the voltage, flowing forward, reversing direction, and returning to the forward direction, again a 360-degree cycle, 60 times every second. Each AC transmission circuit carries power over three conductors. One phase of the circuit is carried by each of the three conductors. The AC voltage and current in each phase conductor is out of sync with the other two phases by 120 degrees, or one-third of the 360-degree cycle. The fields from these conductors tend to cancel out because of the phase difference. However, when a person stands on the right-of-way under a transmission line, one conductor is always significantly closer and will contribute a net uncanceled field at the person's location. The strength of the magnetic field depends on the current in the conductor, the geometry of the structures, the degree of cancellation from other conductors, and the distance from the conductors.

Typical Electric and Magnetic Field Strengths: Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01 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 given in Table 3.13.3. Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 milligauss. Very close to appliances carrying high current, fields of tens to hundreds of milligauss are present.

Studies of Health Risk Associated with Electric and Magnetic Fields: Both electric and magnetic 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 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

United States and other countries. Studies of laboratory animals generally show that these fields have no obvious harmful effects.

Concern about health effects arose in 1979 when researchers looked at wire code classifications for residences and the incidence of leukemia. The study resulted in a weak statistical link between proximity to power lines and childhood leukemia. Since the release of this study there has been a lot of effort to determine if this statistical link is reproducible and if there are any other human health effects from exposure to EMFs. The National Academy of Sciences (NAS) reviewed more than 500 studies from a period of 17 years and issued a report in October 1996 which says that there is no conclusive evidence that EMFs play a role in the development of cancer, reproductive and developmental abnormalities, or learning and behavioral problems (NRC, 1996). An additional report issued May 4, 1999 by the National Institute of Environmental Health Science came to the conclusion that the data showing the link between EMFs and cancer showed only marginal scientific support and concluded that aggressive regulation was not warranted. The report did recommend that attempts be made to minimize the exposure of the public to EMFs (NIEHS, 1999).

Magnetic Field Analysis and Exposure Assessments: The proposed project calls for reconductoring and reinsulating the UEC's existing Westland-McNary Transmission Line from 115/230 kV to 230/230 kV. The proposed conductor arrangement for the reconductored Westland-McNary Transmission Line consists of two, three-phase, 230-kV circuits with two conductors per phase (a total of 12 wires). In Chapter 2, Figure 2.8 illustrates the typical proposed structural configuration of the Westland-McNary Transmission Line. Figure 3.13.2 illustrates the configuration for that segment of the transmission line that parallels the BPA transmission corridor. Except for special construction required for crossing under other transmission lines, the ground-level magnetic field intensity across the corridor is determined by the currents and geometry of these facilities.

There are 22 residential dwellings found within the 61 meter (200 feet) of the transmission centerline. These houses are located near Powerline Road just south of Umatilla. See the overall map in Figure 3.13.3. The detail map and residential locations with lot location numbers shown for each house are on Figure 3.13.4. Table 3.13.4 lists each lot number and the corresponding distance from the transmission centerline to the house at that location. The table also shows the calculated electric and magnetic field intensity produced by the proposed construction. These estimates are computed for a height of 1 meter above the ground and include the canceling effects of other electrical transmission lines along the proposed transmission line right-of-way.

The maximum peak magnetic field increase at the nearest home or business (11 meter [35 feet] from the centerline of the transmission pole) due to the proposed transmission line route is predicted to increase by 51.5 milligauss. The corresponding maximum peak electric field increase occurs at the same location and is expected to increase by 0.966 kV/m.

Power utilities that operate transmission lines attempt to organize the conductors attached to structures in ways that are consistent and intuitive, so that line workers are less apt to make mistakes in maintenance operations. For the double circuit transmission line proposed here, the most common transmission conductor arrangement would place both A-phase conductors at the top position, both B-phase conductors in the middle, and both C-phase conductors on the bottom. For the case where the power in all circuits flows in the same direction, there is some field cancellation to be gained by rearranging the locations of the phase conductors. Field reduction will be achieved by rearranging the conductors of the second 230-kV circuit so the phases are A-phase, B-phase, and C-phase (top to bottom) on one side of the tower, and C-phase, B-phase, and A-phase (top to bottom) on the other side. Due to resultant cancellation effects, the overall field strengths for this configuration would be less than the existing transmission line configuration.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.8 Exposure of Workers to Electric and Magnetic Fields

Assessment of Impact Any electrical generation plant produces some level of electric and magnetic fields within the plant. Workers in such a plant are exposed to these fields while performing their jobs. The levels and duration of exposure to those that would be working at the Umatilla Generating Project cannot be calculated accurately until the energy facility is designed in detail. However, because worker's exposure to electric and magnetic fields would be intermittent, it is not expected that there would be an unacceptable risk to health.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.9 Operation of the proposed power plant could affect noise levels

Assessment of Impact Noise sources at the proposed power plant would include the combustion turbines and generators, auxiliary equipment in enclosure, the heat recovery steam generator, the steam turbine, the transformers and the cooling towers. The proposed project includes a number of features to reduce noise emissions. They include incorporating shielding, noise dampening and other noise control measures into the design of buildings and equipment.

Total noise emissions for the proposed power plant were estimated by summing the emissions of proposed power plant components that were obtained from the component manufacturers. Generally accepted noise models were used to predict noise levels at the sensitive receptors.

Noise levels at the two closest residences were predicted with the proposed power plant in operation. The L_{50} or median noise levels at the two nearest residential receivers would be 48 and 49 dBA. These noise levels are in compliance with limits established by the Oregon Department of Environmental Quality. Because the proposed power plant would be a relatively constant noise source, compliance with the L_{10} and L_1 limits would also be achieved.

In addition to complying with the noise limits described above, the proposed power plant would not be allowed to increase ambient noise levels by more than 10 dBA. The minimum ambient noise level measured was 41 dBA. To comply with the standard, the proposed power plant would not be permitted to increase noise levels above 51 dBA at the nearest residences. The noise levels at the residences are predicted to be 48 and 49 dBA, and thus compliance would be achieved.

Because the proposed power plant would comply with Oregon's noise standards for new industrial and commercial sources, the proposed power plant would have no significant adverse impacts on noise levels standards.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

Impact 3.13.10 Construction of the proposed project could affect noise levels

Assessment of Impact Construction of the proposed power plant would involve the operation of a range of construction equipment including light and heavy trucks, backhoes, bulldozers, graders, cranes, air compressors, welding machines and power hand tools. Pile driving, typically the noisiest of construction activities, will probably not be required. Noise levels would be similar to those from any medium to large construction project and would continue for about 20 months.

The equipment used and the noise levels at the gas pipeline construction site would be similar to those at the power plant site but would not persist for more than two weeks at any single location. Noise levels at the transmission line reconductoring sites would be less than at the pipeline construction site, because no excavation would be involved. Noise from transmission line reconductoring would not persist at any one site for more than two weeks.

As noted above, the proposed power plant site is within an industrial area that is subject to noise from a number of existing sources. The nearest sensitive receptor is 579 meters (1,900 feet) away from the proposed power plant site. Although the noise produced by construction activities would be audible at the receptor it would not be qualitatively different from noise already experienced. Engine noise from construction equipment would blend with similar vehicular

noise on I-82 and I-84. It is not expected that the increase in noise levels attributable to construction of the proposed power plant would have a significant adverse effect on sensitive receptors.

To reduce noise impacts on nearby residences during construction of the proposed project, most heavy construction work would be scheduled to occur during daylight hours when people are generally less sensitive to noise. Construction work at night would be limited to relatively quiet activities such as work inside buildings and other structures.

All combustion engine-powered construction equipment would be equipped with exhaust mufflers. A complaint response system would be set up at the construction manager's office to address noise complaints if they occur.

Recommended Mitigation Measures No measures beyond those included in the proposed project are recommended.

3.13.3 Cumulative Impacts

Some elements of the proposed project could potentially increase risk to public health and safety. They include the transmission of natural gas in an underground pipeline and use and storage of hazardous chemicals. Although safety features would be built into the proposed project to reduce hazards to public health and safety, the risk of accidents cannot be completely eliminated. The same is true for the other existing and future industrial facilities. Thus, the proposed project and other industrial facilities in the vicinity pose some cumulative risk to public health and safety.

Electric and Magnetic Fields

The effect of electric and magnetic fields on human health has been a matter of controversy for about 20 years, but currently there is no conclusive evidence that electric and magnetic fields cause adverse health effects. The proposed project would decrease the strength of electromagnetic fields along most of the reconductored transmission line. Thus, the proposed project would not contribute to a cumulative increase in electromagnetic field strength.

Noise

The proposed project would be a new source of noise but one that complies with Oregon's noise control regulations. Other significant noise sources in the vicinity of the site include the Hermiston Generating Plant, traffic on Interstate Highways 82 and 84, and trains on the Union Pacific Railroad line. Future industrial and commercial development in the vicinity would likely

further increase noise emissions, although these new uses would also have to comply with Oregon's noise control regulations.

Noise levels at the residences nearest to the proposed project would be at or slightly less than noise standards. While the proposed power plant would be in compliance, any new noise sources located near the proposed project would have to be controlled to the degree necessary to prevent any further increase in noise at the residences.

Table 3.13.1:
Typical Sound Levels (Daytime Residual Level Exceeded 90 Percent Of The Time, L_{90})

Descriptor	Typical Range (dBA)	Average
Very Quiet Rural Area	25 to 35 inclusive	33
Quiet Suburban Residential	36 to 40 inclusive	38
Normal Suburban Residential	41 to 45 inclusive	43
Urban Residential	46 to 50 inclusive	48
Noisy Urban Residential	51 to 55 inclusive	53
Very Noisy Urban Residential	56 to 60 inclusive	58

Source: Hessler Associates, Inc. 1994

Table 3.13.2:
Allowable Statistical Noise Levels in Any One Hour

	Measurement Period	
Statistical Noise Level	**7 AM to 10 PM**	**10 PM to 7 AM**
L_{50}	55 dBA	50 dBA
L_{10}	60 dBA	55 dBA
L_1	75 dBA	60 dBA

Source: OAR, Chapter 340, Division 35, Section 035

Table 3.13.3:
Typical Electric and Magnetic Field Strengths from Common Appliances[1]

Appliance	Electric Field (kV/m)	Magnetic Field[2] (mG)
Coffee Maker	0.030	1 to 1.5
Electric Range	0.004	4 to 40
Hair Dryer	0.040	0.1 to 70
Television	0.030	0.4 to 20
Vacuum Cleaner	0.016	20 to 200
Electric Blanket[3]	0.01 to 1.0	15 to 100

[1] Values are calculated using a distance of 30.5 centimeters (1 foot) from appliance.

[2] By 1 to 1.5 meters (3 to 5 feet), the magnetic field from appliances is usually decreased to less than 1 mG

[3] Values are for distances from a blanket in normal use, not 1 foot away.

Source: Miller 1974, Gauger 1985

Notes: kV/m = kilovolts per meter

mG = milligauss

Table 3-13-4. Electric and Magnetic Fields Calculated for Residences along Powerline Road Due to Project.

LOCATION NO.	DISTANCE FROM THE POLE CENTERLINE * (FT)	ELECTRIC FIELD (KV/m)		MAGNETIC FIELD (m-GAUSS)	
		Proposed	Existing**	Proposed	Existing**
1	35 W	0.969	0.448	51.79	24.79
2	54 W	0.387	0.290	27.84	33.25
3	125 W	0.023	0.114	4.78	8.81
4	180 W	0.020	0.080	1.85	4.26
19	112 E	0.016	0.102	6.54	5.71
20	87 E	0.053	0.086	11.92	8.14
22	125 E	0.023	0.097	4.76	4.75
23	119 E	0.021	0.099	5.27	5.04
24	109 W	0.016	0.102	6.54	5.71
30	203 W	0.018	0.068	1.40	3.46
32	195 W	0.018	0.071	1.50	3.65
34	192 W	0.019	0.074	1.60	3.84
36	186 W	0.020	0.077	1.72	4.06
38	186 W	0.020	0.077	1.72	4.06
41	185 W	0.020	0.077	1.72	4.06
42	190 W	0.019	0.074	1.60	3.84
43	48 W	0.641	0.415	37.86	37.19
44	48 W	0.641	0.418	37.86	37.19
45	61 W	0.293	0.192	23.96	29.75
46	73 W	0.160	0.049	17.92	21.56
50	54 W	0.387	0.290	27.81	33.25
333	200 E	0.018	0.059	1.38	2.27

* For the distances shown with W, W designates west of the pole centerline.
For the distances shown with E, E designates east of the pole centerline along Powerline Road.

** Existing data from the study Hermiston Generating Project EIS July 1994

4.0 ENVIRONMENTAL CONSULTATION, REVIEW, AND PERMIT REQUIREMENTS

A number of Federal environmental laws and administrative requirements must be satisfied by the proposed project. This chapter provides a summary of these requirements and discusses their applicability to the project. Requirements of the State of Oregon must be satisfied; they are not described in detail in this chapter but are listed in the final section.

4.1 NATIONAL ENVIRONMENTAL POLICY ACT (NEPA)

This document contains information necessary for preparation of the EIS that BPA will prepare pursuant to regulations implementing the National Environmental Policy Act (42 USC §4321 et seq.), which requires Federal agencies to assess the impacts that their actions may have on the environment. BPA's potential transmission of power from the Umatilla Generating Project requires that BPA assess the potential environmental effects of the proposed project and describe them in an EIS. Decisions will be based on an understanding of the proposed project's potential environmental consequences and the actions that will be taken to protect, restore, and enhance the environment.

The Rural Utilities Services, which regulates activities affecting UECA's transmission lines, will be a cooperating agency in the NEPA process.

4.2 ENDANGERED AND THREATENED SPECIES AND CRITICAL HABITAT

The Endangered Species Act of 1973, as amended, (16 USC §1536 et seq.) requires Federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. Sources of information for the potential occurrence of sensitive species in an area include both Federal and state lists.

Consultation letters were sent to the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to identify Federal species of concern. The Oregon Natural Heritage Program (ONHP) was queried for information on listed and sensitive species. The Oregon Department of Agriculture (ODA) was contacted for information about protection and conservation programs. The following species were either known to occur or considered to potentially occur within the project area, based on habitat suitability and information received from the USFWS and ONHP:

- *Washington ground squirrel* (*Spermophilus washingtoni)* - state endangered species and a federal candidate species
- *Bald eagle* (*Haliaeetus leucocephalus)* - threatened in Oregon and the U.S.
- *Steelhead trout (Middle Columbia River Evolutionarily Significant Unit [ESU])* (*Oncorhynchus mykiss)* - federally listed as threatened

Potential impacts of the proposed project on the listed species are discussed in Sections 3.4 and 3.5. A biological assessment was performed at the time the Port of Umatilla's intake structure was approved. No new biological assessments were prepared for any of the species listed above, as the impact of the project-related construction and operation activities would be negligible.

4.3 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. Water resources that promote fish and wildlife habitat have not been identified at the Umatilla Generating Project site. The Umatilla Generating Project would use an existing water right with water supplied by the Port of Umatilla. The water diverted for the proposed project would represent about 0.005 % of Columbia River discharge during the low-flow period and about 0.01% during extreme droughts. Such a small change in river discharge would not be expected to have any effect on water quality, fish or any other beneficial uses of the river.

4.4 HERITAGE CONSERVATION

The National Historic Preservation Act of 1966 as amended (16 USC §470 et seq.) requires BPA to take into account the potential effects of their undertakings on properties that are eligible for nomination to the National Register of Historic Places. BPA must consult the SHPO regarding the inventory and evaluation of properties potentially eligible for National Register nomination and to determine whether the undertaking would adversely affect them. An archival search and field survey were conducted.

The Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 USC §3001 et seq.) assigns ownership of Native American graves found on Federal land to Native Americans. It requires the Federal agency managing land on which the grave was found to consult with the most likely descendent of the buried person or with a culturally related person regarding the disposition of the remains.

The Umatilla Generating Project includes a quarter of a mile of new transmission line route that is located on Federal land. Any Native American graves found in this segment would be subject to the NAGPRA.

4.5 STATE, AREAWIDE, AND LOCAL PLAN AND PROGRAM CONSISTENCY

4.5.1 Land Use

The project would be located in two jurisdictions: Umatilla County and the City of Umatilla. The Umatilla County Comprehensive Plan and the City of Umatilla Comprehensive Plan govern development in the project area. The proposed Umatilla Generating Project would alter land use at the power plant site from vacant to industrial use; and the site is zoned for light industrial use. The transmission line route would consist of the upgrade of an existing electric transmission line right-of-way. The natural gas pipeline would be constructed below the surface of lands zoned for agricultural use in large part and zoned for light industrial use.

4.5.2 Pacific Northwest Electric Power Planning and Conservation Act

The Pacific Northwest Electric Power Planning and Conservation Act (USC §839 et seq.) contains provisions intended to protect, mitigate, and enhance the fish and wildlife (including spawning grounds and habitat) of the Columbia River and its tributaries. Impacts to fish are addressed in section 3.5. A biological assessment was conducted at the time the Port of Umatilla's intake structure was approved. Most provisions of the Act are not relevant to BPA's action in this case, because BPA is not acquiring the output of the Umatilla Generating Project under terms that ensure the economic feasibility of the project.

4.5.3 Notice to the Federal Aviation Administration (FAA)

Construction of any facility 61 meters (200 feet) or taller above ground level requires that notice be given to the FAA. The stacks proposed at the proposed power plant would be approximately 65 meters (213 feet) tall, requiring notification of FAA.

Additionally, proximity of a facility to an airport requires that notice be given to the FAA. The closest airport to the power plant site is located approximately 10 kilometers (6 miles) northeast of the site.

A Notice of Proposed Construction or Alteration has been submitted to the FAA for construction of emission stacks and use of construction cranes at the proposed power plant site.

4.5.4 Construction-Related Permits

Grading, building, and related permits would be required from Umatilla County. The County Department of Public Works regulates development activities. The Umatilla County Board of Commissioners, in addition to requiring the proper building permits, also requires developers to complete the following activities before starting construction:

- Obtain land use approvals from Umatilla County and the City of Umatilla
- File a landscaping plan with the County prior to issuance of a building permit
- Establish fire suppression and hazardous material safety designs in consultation with the Hermiston Fire Department and the State Fire Marshal
- File a site plan with the County prior to issuance of building permits
- Submit a plan acceptable to EFSC for responding to an emergency at the Umatilla Chemical Depot
- Have the power plant facility design reviewed by the Oregon Building Codes Agency for compliance with the building codes. Issuance of building permits, electrical permits, and other plant operational permits will be coordinated through the Salem Office of the Building Codes Agency. The local office in Pendleton will be responsible for construction inspection of the project during and upon completion of construction.

4.6 COASTAL ZONE MANAGEMENT PROGRAM CONSISTENCY

The proposed project is not in the coastal zone, nor would it directly affect the coastal zone.

4.7 FLOODPLAINS

The proposed project is not in any floodplain, nor would it directly affect floodplains or contribute to flooding elsewhere.

4.8 WETLANDS

A review of National Wetlands Inventory maps and a field survey for the potential presence of jurisdictional wetlands identified nine wetland sites in the project area. Five of these wetland sites are located along the existing transmission line and four wetland sites are located along the proposed gas pipeline corridor or within the power plant site.

No wetlands are located within the area that would be the permanently disturbed footprint of the power plant. The wetland features identified include a portion of the riparian corridor along the Umatilla River, a pond that has been constructed and used for storage of potato processing reuse water, a gravel quarry, and irrigation canals. The proposed project would have no adverse effect on any wetland within the project area.

4.9 FARMLANDS

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

The power plant site is currently vacant and zoned for light industrial use. The Soil Conservation Service soil survey for the area indicates that the site is not prime or unique farmland.

The construction right-of-way for the natural gas pipeline is zoned for agricultural use in large part. Construction of the pipeline would result in temporary disturbance to these agricultural lands, about half of which are prime farmland. Overlying soils disturbed during construction would be restored according to the mitigation plan described in Section 3.1 to ensure that the subsurface pipeline would have no negative impacts on the current agricultural operations.

The electric transmission upgrade would occur primarily within an existing right-of-way that crosses agricultural lands. Agricultural use of prime farmland could continue under the transmission lines in the rights-of-way. Construction of new transmission lines on new towers at the power plant site would be within the light industrial use zone and therefore not likely to impact agricultural land. Construction of new transmission lines on new towers at the McNary Substation would be within the city's urban growth area, and again unlikely to impact agricultural land.

4.10 RECREATION RESOURCES

No public recreation occurs at the proposed power plant site, a privately owned area zoned for light industrial use. The natural gas pipeline and electric transmission line rights-of-way are located primarily on privately owned land. It is unlikely that the proposed project would interfere with the present use of any recreation resource in the vicinity.

4.11 GLOBAL WARMING

A discussion of CO_2 and its contribution to global warming is presented in Section 3.6. The project would produce negligible amounts of other greenhouse gases, such as methane and NO_x.

4.12 PERMIT FOR STRUCTURES IN NAVIGABLE WATERS

The proposed project does not include work or structures that are in or on any navigable waters of the United States, as defined in the Rivers and Harbors Act of 1899 (33 USC §403).

4.13 PERMIT FOR DISCHARGES INTO WATERS OF THE UNITED STATES

Discharge of dredged or fill material into waters of the United States is regulated by the Army Corps of Engineers pursuant to Section 404 of the Clean Water Act. The proposed project site is located in an upland area. Although the transmission line would pass over water of the United States, it would not affect these features. There is no proposed discharge of dredged or fill materials into waters of the United States.

4.14 PERMITS FOR RIGHT-OF-WAY ON PUBLIC LANDS

The power plant and the gas pipeline for the Umatilla Generating Project would be constructed on private property. Sections of the transmission line and gas pipeline would cross irrigation canals, which would require consultation with the Bureau of Reclamation but no new right-of-way permit. The reconductoring of the transmission line will require an amendment of the existing crossing agreement. At its approach to McNary Substation, the transmission line would cross land formerly administered by the Bureau of Land Management (BLM) but which has been transferred to BPA. Therefore, no right-of-way permit would be required from the BLM. The Corps would be kept informed of actions involving the upgrade of the transmission line located along the eastern border of the Umatilla Chemical Depot, because a portion of the right-of-way is on Umatilla Chemical Depot land.

4.15 ENERGY CONSERVATION AT FEDERAL FACILITIES

The proposed project does not include the operation, maintenance, or retrofit of an existing Federal building or the construction or lease of a new Federal Building.

4.16 POLLUTION CONTROL

Several pollution control acts would apply to the project, including:

- Clean Air Act
- Clean Water Act
- Resource Conservation and Recovery Act
- Toxics Substance Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

4.16.1 Air

Emissions produced by the proposed project must meet standards established by the Environmental Protection Agency. The Clean Air Act is the principal Federal law governing air pollution control. It was most recently amended in 1990. In the project area, authority for ensuring compliance with the provisions of the Clean Air Act is delegated to ODEQ. The Umatilla Generating Project would comply with all applicable standards, as described in Section 3.6.

4.16.2 Water

The Clean Water Act of 1977, as amended, is the principal Federal law governing water pollution control. The Act was most recently amended in 1987 and reauthorized in 1991. The Clean Water Act authorizes Federal and state regulations of discharges into waters of the United States and municipal sewer systems. The NPDES is the primary instrument for implementing the Act. ODEQ is authorized to administer the NPDES program within the state. A NPDES Stormwater Discharge Permit is not required for plant operation because stormwater would not discharge to surface water at a point source. However, a NPDES Stormwater Discharge General Permit for Construction is required to address erosion control for construction activity, and the Umatilla Generating Company, L.P. applied for this permit on February 5, 2001.

4.16.3 Solid and Hazardous Waste

Solid waste generated at the proposed project site during construction and/or operation would consist of domestic refuse, office waste, pallets, cardboard, steel banding, steel cut-offs, concrete waste and miscellaneous debris. It is estimated that about 4.5 metric tons (5.0 tons) per month of solid waste would be produced during construction and approximately 36 metric tons (40 tons) per year of refuse would be produced during operation. Solid waste would be collected in roll-off bins and trucked to a landfill. Recyclable material would be separated from the solid waste stream, stored and delivered

periodically to a recycling facility. It is expected that special disposal permits would not be required during construction and that the proposed power plant would not produce any solid wastes classified as "special wastes". The project would comply with all Federal and state regulations dealing with the use, storage, and disposal of hazardous materials and hazardous wastes, including those covered under Division V of the 1991 Uniform Fire Code entitled "Stationary Tank Storage, Aboveground, Outside of Buildings."

4.16.4 Safe Drinking Water

The proposed project would receive its water supply from the Port of Umatilla's regional water supply system. The primary uses of water at the proposed power plant would be for boiler water make-up for generation of steam and cooling water make-up for the recirculating cooling water system. During plant operation, a small portion (four liters [one gallon] per minute) of the water supplied to the power plant would be treated on-site for domestic water use. This treatment process would be in compliance with the provisions of the Safe Drinking Water Act.

4.16.5 Noise

The proposed project is subject to maximum allowable levels of noise by the State of Oregon (OAR 340-035-0035). Regular operation of the project with mitigation as proposed would comply with noise standards for nearby sensitive receptors. Potential noise-related impacts of project construction and operation are discussed in Section 3.7.

4.16.6 Pesticides and Asbestos

The proposed project would not use or produce pesticides and would not distribute, use, or dispose of polychlorinated biphenyls (PCBs), although the landscaping conducted for the project may include a small amount of pesticides.

Asbestos would not be used in the facilities.

4.16.7 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

The proposed power plant site was previously used as a quarry. During the construction of the Hermiston Generating Project, it was used as a laydown area for material storage (nonhazardous).

- Waste and debris piles were not observed on the subject property. Spoils (nonhazaradous) from the potato cleaning process deposited on the southeastern portion of the site.
- Stained soils were not observed on the subject property.
- No obvious hazardous substance use, storage, or disposal was observed on the subject property at the time of the site visit.
- There were no buildings or evidence of foundations in the aerial photographs or identified during the site visit on the subject property.
- The proposed power plant site was formerly used as a gravel yard and currently is sparsely vegetated.
- No uses of aboveground or underground tanks were indicated in the regulatory databases or observed at the subject property.
- No indications of groundwater or petroleum wells were identified during the site visit on the subject property.
- The subject property was not listed in any regulatory databases checked.
- Two sites within one-half mile of the subject property were listed in the regulatory databases that were checked.

4.16.8 Radon

There is no evidence to suggest that the proposed project area is affected by regulations concerning radon gas or would be affected by the Radon Gas and Indoor Air Quality Research Act of 1986 (42 USC §7401).

4.17 PERMITS

Permits would be obtained from a number of agencies before power plant construction and operation could begin. The following state and local permits would be required:

- Energy Facility Site Certificate (EFSC)
- Water Pollution Control Facility Permit (ODEQ) (this will be in the form of an amendment to Hermiston Generating Plant's existing WPCF permit)
- NPDES Stormwater Discharge General Permit for Construction Activities (ODEQ)
- On-site Sewage Disposal System Permit – Construction and Operation (ODEQ)
- Air Contaminant Discharge Permit (ODEQ)
- Title V Operating Permit (ODEQ)

- Title IV Acid Rain Program (ODEQ)
- Hazardous Waste Generator Registration (ODEQ)
- Permit for Performing Miscellaneous Operations upon a State Highway (ODOT)
- Conditional Use Permits (Umatilla County)
- Zoning Permits (Umatilla County)
- Conditional Use Permit (City of Umatilla)
- Utility Permit (Umatilla County)
- Access Permit (Umatilla County)

This list does not include Federal permits or permits pertaining to details of construction.

5.0 LIST OF PREPARERS

The draft Umatilla Generating Project EIS was prepared by BPA with the assistance of URS, a consulting firm. Tom McKinney was BPA's project manager. The individuals responsible for preparing the EIS are listed below:

Thomas C. McKinney, BPA Project Manager. Provided environmental analysis and policy services at BPA since 1979. Education: BA, Geography.

John Davis, Task Manager. Thirty years experience in water resources engineering and management, watershed management, and environmental assessment. Education: BS, Civil Engineering; MS, Sanitary Engineering.

Gillian Friedrichs, Assistant Task Manager. Three years experience in environmental permitting, land use planning, and NEPA compliance. Education: BA, Geology; MA, Environmental Management.

John Horne, Geology, Soils and Seismicity. Fifteen years experience in geotechnical engineering, geotechnical earthquake engineering, foundation design, retaining wall design, subsurface exploration, and structural analysis and design. Education: BS, Mechanical Engineering; BS, Civil Engineering; MS, Civil Engineering; PhD, Civil Engineering.

John Davis, Hydrology and Water Quality. Thirty years experience in water resources engineering and management, watershed management, and environmental assessment. Education: BS, Civil Engineering; MS, Sanitary Engineering.

Lynn Sharp, Vegetation and Wildlife. Thirty years experience in wetland ecology, terrestrial ecology, and NEPA compliance. Education: MS, Zoology; BA, Biology.

Jeremy Sikes, Fish. Four years experience in fisheries biology, aquatic ecology, permitting support, and stream restoration. Education: BS, Biology.

William Steiner, Air Quality. Twenty-eight years experience in regulatory compliance, air quality, and environmental impact statements. Education: BS, Chemistry.

Fred Moritz, Noise. Thirty years experience in architectural and mechanical noise control systems and environmental analysis of central station and combustion turbine power plants. Education: BS, Architecture; MBA.

Dave Ivany, Traffic and Circulation. Twenty-five years experience in transportation engineering/planning and environmental assessment. Education: BS, Civil Engineering.

Randy Simpson, Visual Quality and Aesthetics. Ten years experience in visual analysis, visual simulations, and Forest Service and BLM Visual Management Systems. Education: BS, Environmental Design; BLA, Landscape Architecture.

Mike Kelly, Cultural Resources. Twenty-one years experience in cultural resource management, Section 106 compliance, project management and field direction, and prehistoric and historical archaeology. Education: BA, Anthropology; MA, Anthropology.

Gillian Friedrichs, Land Use, Plans and Policies. Three years experience in environmental permitting, land use planning, and NEPA compliance. Education: BA, Geology; MA, Environmental Management.

Gillian Friedrichs, Socioeconomics. Three years experience in environmental permitting, land use planning, and NEPA compliance. Education: BA, Geology; MA, Environmental Management.

Gillian Friedrichs, Public Services and Utilities. Three years experience in environmental permitting, land use planning, and NEPA compliance. Education: BA, Geology; MA, Environmental Management.

Erik Bakkom, Health and Safety. Three years experience in health and safety programs and environmental compliance. Education: BS, Environmental Engineering.

6.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF THE EIS ARE SENT

6.1 FEDERAL AGENCIES

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

U.S. Army Corps of Engineers

U.S. Department of Agriculture
- Rural Utilities Service
- Natural Resource 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

U.S. Department of Commerce
- National Oceanic and Atmospheric Administration
- National Marine Fisheries Service

6.2 STATE AGENCIES

6.2.1 Oregon

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

6.2.2 Washington

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

6.3 OTHER AGENCIES AND LOCAL GOVERNMENTS

Columbia River Gorge Commission
Columbia River Intertribal Fish Commission
Mid Columbia Council of Governments
Affiliated Tribes of Northwest Indians
Confederated Tribes of the Umatilla Indian Reservation
City of Boardman
Port of Umatilla
City of Irrigon
City of Umatilla
City of Hermiston
City of Stanfield
City of Pendleton
City of Echo
County of Umatilla
County of Morrow
Northwest Power Planning Council

6.4 INTEREST GROUPS

Audubon Society of Portland
Common Cause
Columbia Basin Institute
Columbia Improvement District
Don't Waste Oregon
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
Oregon Rivers Council
Oregon Rural Electric Coop Association
Oregon Shores Conservation Coalition
Oregon State Grange
Oregon Wilderness Society
Salmon for All
Sierra Club

6.5 DEPOSITORY LIBRARIES

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

6.6 OTHERS

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

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* The Hermiston Generating Project was developed by an affiliate of the proponent of the Umatilla Generating Project, and the power plant designs are similar enough to warrant use of the Hermiston EIS as a reference guide for the Umatilla DEIS.

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8.0 GLOSSARY OF TERMS AND ACRONYMS

A-weighted decibel (dBA)	Sound measurements made on the A scale.
AAL	Acceptable ambient level.
AAQS	Ambient Air Quality Standards.
ac	Alternating current.
Acre-foot	The volume of water that will cover an area of one acre to a depth of one foot.
ADT	Average daily traffic.
Alluvial deposits	Material such as sand or silt, deposited on land by streams.
Alluvium	Unconsolidated deposits of transported particles.
Ambient	Air surrounding a particular spot, such as a power plant. Ambient air, for example, is the existing air quality; ambient noise is the existing noise level of the area.
aMW	Average megawatt.
Anadromous fish	Fish, such as salmon or steelhead trout, that hatch in freshwater, migrate to and mature in the ocean, and return to freshwater as adults to spawn.
Anticline	A fold in stratified rock units that is concave downward
Anticlinal	Landforms originally created by anticline structures
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.
Artesian	Water that is naturally under pressure and flows from the ground.
ASC	Application for Site Certificate.
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 1 year.
BACT	Best Available Control Technology.
Basalts	Lava flows.
Best Available Control Technology (BACT)	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.
BLM	Bureau of Land Management.
BPA	Bonneville Power Administration.
British Thermal Unit (Btu)	A quantity of heat required to raise the temperature of 0.45 Kg (1 pound) of water one degree Fahrenheit.
C	Celsius.
C1	Commercial neighborhood.
CEMS	Continuous Emission Monitoring System.
Centimeter (cm)	A unit of measurement (in the metric system) equivalent to 0.3937 inches.
CFC	Chlorofluorocarbon.
CFR	Code of Federal Regulations.
cfs	Cubic feet per second.
Circuit breakers	A switching device that is capable of closing or interrupting an electrical circuit under over-load or short-circuit conditions as well as under normal load conditions.
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.

Clastic dikes	Planar to subplanar structures composed of fine-grained sedimentary particles which cut across sedimentary rock layers.
CNG	Cascade Natural Gas.
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 or natural gas.
CO_2	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.
Cogeneration	The technology of producing electrical energy together with useful thermal or mechanical energy for industrial or commercial purposes, using waste heat from one process to fuel the other.
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.
Containment dike	A berm designed to contain a potential release.
Cooling tower drift	Dissolved solids in cooling tower emissions that are deposited on soils and vegetation.
Corps	United States Army Corps of Engineers.
CRBG	Columbia River Basalt Group.
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.
CTUIR	Confederated Tribes of the Umatilla Indian Reservation.

Cubic feet per second (cfs)	A unit of measurement pertaining to flow or discharge of water. One cfs is equal to 449 gallons per minute.
Cultural resources	The 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.
dB	Decibel.
dBA	A-weighted decibel.
Decibel (dB)	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.
EFSC	Energy Facility Siting Council.
EFU Zoning	Exclusive farm use.
EIS	Environmental Impact Statement.
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 in this document, a plant that is rooted and has parts extending above a water surface.
EMF	Electric and magnetic fields.

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 species	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 listed 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 kilowatt hours.
Environmental Impact Statement (EIS)	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.
Eolian	Wind-deposited.
F	Fahrenheit.
F1	Exclusive farm use, 7.7-hectare (19-acre) minimum.
F2	General rural, 7.7-hectare (19-acre) minimum.
FAA	Federal Aviation Administration.
Fecal coliform bacteria	Tiny organisms associated with the intestines of warm-blooded animals and commonly used to indicate the presence of fecal material and the potential presence of organisms capable of causing human disease.
Feeder dikes	Linear openings from which lava flows erupt.
Filter cake	Solids that are removed from process water and made into nonhazardous filter calves that are disposed of in a landfill.
Flood basalts	Lava flows characterized by very low viscosity and wide aerial extent.
Fluvia1	Deposited by water.
FP	Floodplain.
g	Acceleration of gravity.

Geologic hazard	A geologic condition, either natural or artificial, that poses a potential danger to life and property, e.g., landslides.
Glacial outwash	Sediment deposits as a result of meltwater outflow from glaciers or ice sheets.
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.
gpm	Gallons per minute.
Greenhouse gas	A gas that contributes to global warming.
Groundwater	The supply of fresh water under the earth's surface in an aquifer or in soil.
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.
Hectare-meter (ha-m)	The volume of water that will cover an area of one hectare to a depth of one meter.
HGC	Hermiston Generating Company.
Holocene	Period of geologic time extending from about 10,000 years ago to the present.
Hydric (soil)	A soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic (able to grow in saturated areas) vegetation.
Impact	Positive or negative environmental consequences of a proposed action.
Infiltration	Seepage of water into the ground.

Jurisdictional wetland	Wetlands that are subject to Section 404 of the Clean Water Act and to the Swampbuster provision of the Flood Security Act.
kg/ha-mo	Kilogram per hectare-month.
Kilogram per hectare-month (kg/ha-mo)	A unit used to measure the amount of a substance deposited over a hectare in one month.
Kilometer (km)	One thousand meters.
Kilovolt (kV)	One thousand volts.
Kilowatt (kW)	An electrical unit of power equal to 1,000 watts.
Kilowatt hour (kWh)	A basic unit of electric energy equal to one kilowatt for the period of one hour.
km	Kilometer.
kV	Kilovolt.
kV/m	Kilovolt per meter.
kWh	Kilowatt hour.
L_{50}	A symbol that represents the maximum permitted noise level a project may create 50 percent of the time in an hour.
LAER	Lowest achievable emission rate.
lb/ac-mo	Pounds per acre-month.
L_{eq}	A symbol that represents the logarithmically weighted average noise level.
LI	Light industrial.
Lineament	Structure or series of structures or features that have the same alignment.
Liquefaction	Liquid-like behavior of a solid material.
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).

LOS	Level of service.
lpm	Liters per minute.
M2	Heavy industrial.
m^3	Cubic meter. Equal to 1,000 liters or 263 gallons.
m^3ls	Cubic meters per second.
Magnetic field	An energy field produced by the movement of electrons in a wire (current), measured in milligauss (mG).
MCE	Maximum credible earthquake.
MCL	Maximum Contaminant Level.
Megawatt hour (MWh)	A basic unit of electrical energy equal to one megawatt for the period of one hour.
Megawatt (MW)	One thousand kilowatts (kW) or one million watts (W).
Meter (m)	Unit of length equal to 3.28 feet.
mG	Milligauss.
MGD	Million gallons per day.
Milligauss	Unit of magnetic field equal to 0.001 of a gauss.
Mitigation	Actions to avoid, minimize, reduce, eliminate, or compensate for the impact of a proposed activity or management practice.
MLD	Million liters per day.
MMBtu/hr	Million British thermal units per hour.
ms1	Mean sea level.
MWh	Megawatt-hour.
NAGPRA	Native American Graves Protection and Repatriation Act.
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.

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 decision-maker, prior to a decision being made on the project.
NO_2	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.
Nonattainment	An area which does not meet air quality standards set by the Clean Air Act for specified localities and time periods.
NO_x	Oxides of nitrogen.
NPDES	National Pollutant Discharge Elimination System. Federal water quality program administered by the State agency responsible for water quality.
NR	Natural resource.
NSPS	New Source Performance Standards.
NSR	New Source Review.
O_3	Ozone.
OAR	Oregon Administrative Rule.
ODA	Oregon Department of Agriculture.
ODEQ	Oregon Department of Environmental Quality.
ODEF	Oregon Department of Fish and Wildlife.
ODOE	Oregon Department of Energy.
ONMP	Oregon Natural Heritage Program.
OWL	Olympic-Wallowa Lineament.
Palustrine	General freshwater wetlands classification associated with partially saturated areas not part of a surface water system.

Parent material	The unconsolidated material from which soil develops.
Particulate matter	Fine solid particles that remain individually dispersed in stack emissions.
Pb	Lead.
PCB	Polychlorinated biphenyl.
PCE	Passenger car equivalents.
Permeability (soil)	The quality of soil that enables water to move downward through the profile, measured as the number of centimeters (inches) per hour that water moves downward.
PF	Public facilities.
PGA	Peak ground acceleration.
PGT	Pacific Gas Transmission.
Physiographic province	A region of similar structure and climate that has a unified geomorphic (pertaining to surface form) history.
Pleistocene	Period of geologic time extending from about 1.8 million years ago to about 10,000 years ago.
PM_{10}	Particulate matter less than 10 microns (μ) in diameter.
Pound per acre-month (lb/ac-mo)	A unit used to measure the amount of a substance deposited over an acre in one month.
ppm	Parts per million.
ppmvd	Parts per million by volume dry.
Profile (soil)	A vertical section of the soil extending through different layers (horizons).
PSD	Prevention of Significant Deterioration.
psi	Pounds per square inch.
Pyroclastic flows	Rock material formed by a volcanic explosion.
R-O/S	Recreation-open space.

R1	Residential single-family in City of Umatilla Comprehensive Plan. Agricultural residential, 1.6-hectare (4acre) minimum, in Umatilla County plan.
R2	Residential multi-family.
REA	Rural Electrification Administration.
Record of Decision	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 E1S 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	An easement for a certain purpose over property owned by someone else, such as a strip of land used for a transmission line, roadway, or pipeline.
Runoff	Water from precipitation or irrigation that flows over the ground surface and returns to streams or other water bodies. It can collect pollutants from the air or land and carry them to the receiving waters.
RV	Recreational vehicle.
Scarify	To scrape or churn up soil.
SCR	Selective catalytic reduction.
Selective catalytic reduction (SCR)	An air pollution control technology that reduces NOx to nitrogen and water when combined with a reducing agent, such as ammonia.
Sensitive receptors	Hospitals, residences, sensitive vegetation and wildlife, or any other receptor that may be particularly sensitive to certain adverse effects, such as from noise or air pollution.
Shear zones	Localized deformation areas characterized by crushed and/or smeared rock material.
SHPO	State Historic Preservation Officer.

Shrink-swell	The potential of a soil to expand or contract due to the presence of water-absorbing clay minerals.
Shrub-steppe	A community of low drought-tolerant shrubs and bunch grasses.
Significant Emissions Rate	Annual rate of emissions for specific pollutant that identifies a "major" air pollution source in ODEQ regulations.
SIL	Significant impact level.
SO_2	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.
SR	Suburban residential.
Stratovolcano	Type of volcano formed by explosive eruptions and characterized by extreme height and steep flanks.
Surface water	Any water, temporary or permanent, which is above the ground surface and observable with the unaided eye.
Syncline	A fold in stratified rock units that is concave upward.
Synclinal	Landforms originally created by syncline structures.
TDS	Total dissolved solids.
Tectonic basins	A basin formed by the movement of geologic plates.
Tectonic	Related to the interaction of geologic plates.
Threatened species	Those species officially designated by the U.S. Government as likely to become endangered within the foreseeable future throughout all or a significant portion of their range.
Total Suspended Particulates (TSP)	The total volume of small particles suspended in a water column, expressed in percent.
Transmission line	The structures, insulators, conductors, and other equipment used to transfer electrical power from one point to another.
Transpression	Stress Regime that combines both translational and compressional stress, producing faults that are referred to as oblique-slip faults.
TSP	Total suspended particulates.

mg/m^3	Unit of measurement commonly used to measure pollutants in air, specifically the number of micrograms per cubic meter.
UCDO	Umatilla County Development Ordinance.
UECA	Umatilla Electric Cooperative Association.
UGB	Urban growth boundary.
USFWS	United States 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.
VOR	Vehicle occupancy rate.
Wastewater	Water that carries wastes from buildings, institutions, and industrial establishments.
Water table	The upper limit of the soil or underlying rock material that is wholly saturated with water.
Watershed	The area drained by a single river system.
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, solid 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.
Xerofluvents	Soils of the entisol order that are developed on water-laid deposits in a Mediterranean-type climate.
Xerollic durorthids	Soils having a duripan (dense, compact soil horizon) within 100 cm of the surface and found in a cool Mediterranean climate bordering on arid.

9.0 INDEX

BONNEVILLE POWER ADMINISTRATION

Notice of Intent to prepare an Environmental Impact Statement for the Umatilla Generating Project

AGENCY: Bonneville Power Administration (BPA). Department of Energy

ACTION: Notice of intent to prepare an Environmental Impact Statement (EIS) under section 102(2) (c) of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321)

SUMMARY: BPA intends to prepare an EIS on an electrical interconnection requested by Umatilla Generating Company, L.P. to integrate electrical power from the Umatilla Generating Project into the federal transmission grid. Electrical power from the Umatilla Generating Project would enter the federal transmission grid at BPA's McNary Substation. BPA proposes to execute an agreement with Umatilla Generating Company, L.P. to provide the latter with an interconnection. The EIS will assess the environmental consequences of the agreement and of any modifications to the transmission system needed to provide an electrical connection under the terms of the agreement. In addition to these federal actions, the EIS will consider the environmental consequences of construction and operation of the Umatilla Generating Project.

DATES: BPA has established a 45-day scoping period beginning on the data this notice is published in the Federal Register. During the scoping period, affected landowners, concerned citizens, special interest groups, local governments and any other interested parties are invited to comment on the scope of the proposed EIS. Scoping will help BPA ensure that a full range of issues related to this proposal is addressed in the EIS, and also will identify significant or potentially significant environmental impacts that may result from the proposed project. Written comments should be sent to the address below.

Comments may also be made at an EIS open house to be held at Hermiston High School on January 30, 2001 from 7 to 9 pm. The high school is located at 600 S. First Street, Hermiston, OR 97838. At the meeting, representatives of BPA and the Umatilla Generating Company, L.P. will be available to discuss the proposed project and the topics to be addressed in the EIS. Information on the proposed project will be available for review. BPA staff will answer questions and accept oral and written comments.

The draft (DEIS) will be circulated for review and comment and BPA will hold a public comment meeting for the DEIS. BPA will consider and respond to comments received on the DEIS in the final EIS.

FURTHER INFORMATION AND COMMENTS: BPA invites comments and suggestions on the proposed scope of the DEIS. For further information or to make a comment or suggestion please:

Call us toll free:
1-800-622-4519

Write to us:
P.O. Box 12999
Portland, OR 07212

E-mail us:
Comment@bpa.gov

Additional information can be found at BPA's web site: http://www.bpa.gov

SUPPLEMENTARY INFORMATION: The proposed project that is the subject of this EIS has several components. They include an electrical connection at BPA's McNary Substation for the Umatilla Generating Company, L.P., a natural gas-fired combined-cycle combustion turbine electric power generation plant (Umatilla Generating Project), a natural gas pipeline, and new and modified electric power transmission lines.

The Umatilla Generating Project is proposed by the Umatilla Generating Company, L.P., an independent power producer. Umatilla Generating Company, L.P. would build and operate the power plant. It would also pay for the construction of approximately three-quarters of a mile of new transmission lines and modification of approximately 11 miles of existing transmission lines owned by the Umatilla Electric Cooperative. The new transmission lines would be owned by the Umatilla Electric Cooperative. PG&E Gas Transmission-Northwest Corporation (GTN) or Cascade Natural Gas would build a natural gas pipeline to supply fuel to the power plant that would be up to five miles in length.

A. Proposed Action

The proposed Umatilla Generating Project would be a combustion turbine/combined cycle electric power plant with a nominal generating capacity of 550 MW. The energy facility site would be located about four miles southwest of the city of Hermiston and about one-half mile west of the existing Hermiston Generating Plant.

The proposed Umatilla Generating Project would consist of two essentially identical combustion turbine generators, two heat recovery steam generators (HRSG) and one steam turbine. The proposed generating project would be fueled by natural gas from the existing

GTN pipeline that passes approximately five miles south of the energy facility site. Natural gas would be burned in the combustion turbines. Expanding gases from combustion would turn rotors within the turbines that are connected to electric generators. The hot gases exhausted from the combustion turbines would be used to raise steam in the HRSGs. Steam from the HRSGs would be expanded through a steam turbine that drives its own electric generator.

Water would be needed at the facility to generate steam and cool the steam process. Water would be supplied from the Port of Umatilla's regional water supply pipeline that currently extends to the Hermiston Generating Plant. A recirculating cooling system employing mechanically induced draft evaporative cooling towers would be used to minimize water use. Water would be added to the cooling system to compensate for evaporative losses (make-up water) and blowdown. Blowdown is the water bled from the cooling system to limit the build up of salts. Blowdown would be conveyed by pipeline to Madison Farms, located approximately three miles south of the proposed generating project, where it would be applied to crops.

The proposed Umatilla Generating Project would deliver electric power to the regional power grid at the Bonneville Power Administration's McNary Substation in Umatilla using the Umatilla Electric Cooperative's (UEC's) existing Westland-McNary Transmission Line. A new 230 kV radial transmission line-tap would be constructed to connect the switchyard at the proposed Umatilla Generating Project to the Westland-McNary Transmission Line. Presently, the transmission line consists of one 115 kV circuit and one 230 kV circuit. The existing 115 kV line would be removed and replaced with a 230 kV line. BPA will make modifications to the McNary Substation to accept electric power from the Umatilla Generating Project.

In addition, the section of the 115 kV transmission line between the Umatilla Generating Project and the Hermiston Generating Plant would be reconductored for 230 kV. This portion of the circuit reconductoring would increase the overall efficiency and reliability of the transmission line.

All proposed facilities are located within Umatilla County, Oregon.

B. Process to Date

BPA has assumed the role of lead agency for the project EIS. The State of Oregon Energy Facility Siting Council (EFSC) is currently evaluating Umatilla Generating Company, L.P.'s Application for a Site Certificate for the Umatilla Generating Project. Oregon's site evaluation process, like NEPA, provides opportunity for public participation. Umatilla Generating Company, L.P. held a public informational meeting on December 7, 2000.

Umatilla Generating Company, L.P. expects to submit an application for Air Contaminant Discharge and Prevention of Significant Deterioration permits for the proposed project to the Oregon Department of Environmental Quality (DEQ) in January 2001.

C. Alternatives Proposed for Consideration

Alternatives thus far identified for evaluation in the EIS are: (1) the proposed action; and (2) no action. Other alternatives may be identified through the scoping process.

D. Identification of environmental issues

BPA plans to prepare an EIS addressing both the Umatilla Generating Project and the associated electric power interconnection facilities. BPA decided to prepare the EIS for two reasons: (1) the Umatilla Generating Project would depend on BPA's transmission grid to deliver power to consumers; and (2) no other federal or state agency is currently preparing an EIS on the proposed project. Because no other EIS is being prepared, the scope of BPA's EIS will cover both the interconnection elements and the Umatilla Generating Project.

The principal issues identified thus far for consideration in the DEIS with respect to the Umatilla Generating Project are as follows: (1) air quality impacts; (2) noise impacts from plant operation; (3) aesthetic impacts; (4) socioeconomic impacts created by an influx of construction workers into a sparsely populated area; and (5) impacts on wildlife habitat. The principal issues identified thus far for consideration in the DEIS with respect to the electric power transmission facilities are as follows: (1) impacts of transmission line construction on wetlands and wildlife habitat; (2) aesthetic impacts; and (3) cultural resource impacts.

These issues, together with any additional issues identified through the scoping process would be examined in the EIS.

Issued in Portland, Oregon on December --, 2000.

Administrator